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United Nations
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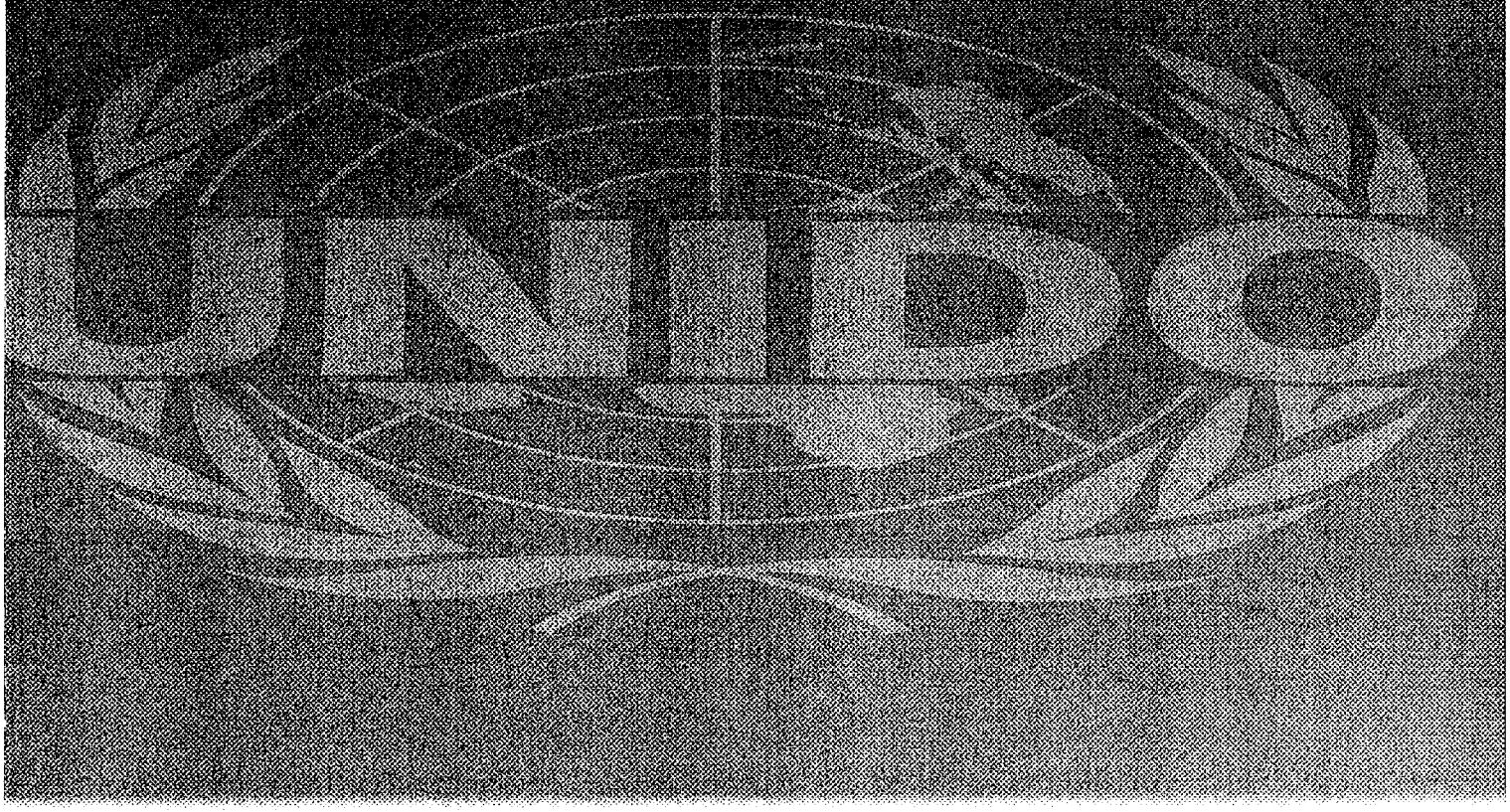
NEW TRENDS AND CHALLENGES IN INDUSTRIAL POLICY

Vienna, 16–17 October 1997

Proceedings and Seminar Papers



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Contents

Part I: Summary of Proceedings

INTRODUCTION

Background

1. The seminar on New Trends and Challenges in Industrial Policy was organized by UNIDO, from 16 to 17 October 1997, in Vienna, Austria. Over 20 representatives from more than 20 countries participated in the seminar, including policy-makers, academicians and reputed experts on various aspects of industry and technology.

2. The seminar was part of UNIDO's ongoing efforts to enhance the industrial and technological capacities of its Member States through its role as a global forum for debate. The aim was to stimulate international dialogue and share experience on industrial development issues as well as to provide new perspectives on the latest trends and challenges, approaches and best practices for sustainable industrial development in a rapidly changing world economy.

3. The seminar was considered to be particularly timely since rapid changes in the world economic environment during the last two decades have significantly altered the foundations of industrial development. New economic forces have emerged with profound implications for the coming decades. Among the most important are four major developments: (a) rapid globalization based on increasing liberalization and advances in technology; (b) dramatic changes in the world trading system, such as the conclusion of the Uruguay Round and the establishment of the World Trade Organization (WTO); (c) proliferation of regional trading groups; and (d) reform and transformation of economies in transition.

4. These developments have brought about a more integrated and interdependent world economy manifested in the increasingly important role that industrialization, trade and investment are playing throughout the globe. During the last 15 years, world trade grew some two and a half times more than global gross domestic product (GDP) while the increase in foreign direct investment (FDI) outstripped that of world trade by more than double. Developing countries, as a whole, grew faster than industrialized nations, both in terms of GDP and manufacturing value added (MVA). Their share in world MVA rose from some 13 per cent in 1980 to 20 per cent in 1995 while their per capita income, in constant US dollars, grew by 1.9 per cent annually during this time compared with 1.6 per cent in industrialized countries.

5. At first sight, the changes in the world economy may seem to have heralded a greater degree of convergence in income between North and South. But they have also led to an economic landscape that has grown increasingly polarized. The gap between rich and poor has widened, with disparity in income growth prevailing even among developing countries and economies in transition. High growth has eluded many of them accompanied by a decline in per capita income over the years.

6. The gains from an integrated world economy, which have provided tremendous opportunities for trade and much larger foreign investment inflows accompanied by new technologies and skills, have been uneven among developing countries and economies in transition. Their prospects for growth depend largely on their ability to integrate into the globalizing world. Full participation will enable countries to take advantage of the new opportunities and reap the benefits of globalization. The successful industrializers, such as

the tigers of East and South-East Asia, have been able to respond and adapt to changes within a short time frame. On the other hand, countries such as those in sub-Saharan Africa, which have failed to integrate into the dynamic and globalized world economy, are in jeopardy of being marginalized and left behind by the tide of economic progress.

7. Hand in hand with trade and investment, advances in technology are playing an increasing role in the growth process of the world economy. Recent estimates suggest that more than 50 per cent of long-term economic growth in industrialized countries stems from technological changes that lead either to improvement in productivity or new products, services or industries. Moreover, high-technology industries have grown at a much faster rate than traditional labour-intensive industries, making up an increasing share in world MVA.

8. Advances in technology have not only led to a more global world but a more efficient and competitive one. Competition has intensified significantly, spreading to all sectors of the economy. At the same time, the notion of competitiveness has changed from one based on price competitiveness to one defined by technological capabilities. This new form of competition is rapidly spreading to all industrial sectors, including those previously stagnant labour-intensive ones. Surviving in a rapidly globalizing world economy depends as much on the ability to build up technological and innovative capabilities as on reducing costs. Such efforts call for radical change in traditional approaches to competition as well as greater investment in education and technological capabilities.

9. Increasing liberalization is another factor that has intensified competition beyond national borders. Domestic producers do not have only to contend with local competition but are facing the challenge of a large influx of foreign products and investors that have a leading edge in technologies. The conclusion of the Uruguay Round and the establishment of WTO are promoting further liberalization, which will, no doubt, have a positive impact on the growth prospects for the world economy in the long run. However, developing countries and economies in transition face the short-term problems of a surge in competition, in domestic as well as in export markets. For many developing countries and economies in transition that are just beginning to look at export markets as a source of growth, problems of access to markets, capital and new technologies will eventually emerge as they attempt to integrate further into the global economy.

10. Another issue affecting industrial development in the coming decades is the new role of government. Liberalization and deregulation have established the dominance of the market system, with the private sector increasingly becoming the engine driving industrial development. In this new climate, the role of government has been put in the spotlight. It is often supposed that with the increased market orientation associated with liberalization and deregulation, the role of government should be reduced substantially. Yet, effective government intervention has been one of the main factors contributing to the success of many fast-growing developing economies. Government has a distinct role to play in ensuring sustainable industrial development, particularly in areas where market failures prevail.

11. One of its essential tasks, for example, is to foster the active participation of the private sector in economic and industrial growth. However, the development of that sector in developing countries and economies in transition alike, requires a new policy framework. In particular, policies are needed to increase competitiveness through enhancement of technological capabilities and human capital and to promote entrepreneurship through development of a dynamic small- and medium-scale industrial sector. The latter, in particular, has been put at the centre of economic development in recent years, its role having been redefined by the process of rapid globalization. Small- and medium-scale enterprises (SMEs)

have become critical agents for enhancing socio-economic development as well as seedbeds for entrepreneurship. However, recent trends in globalization of SMEs in industrialized countries pose another challenge to their development in developing countries and economies in transition. As a result of these trends, SMEs in developing countries will have to face competition from beyond their domestic borders.

12. Against this background, rapid changes in the global economic environment could affect world industrial development in fundamental ways in the coming decades. While the results are still unclear, certain fundamental questions were asked and addressed during the seminar:

- What are the new industrial policy agenda in the context of the rapidly changing world economy?
- Are the new liberal rules of the games sufficient for sustainable industrial development? If not, what kinds of interventions are required to promote competitive and sustainable industrial development?
- What are the best practices in terms of government intervention with regard to enhancing industrial competitiveness?
- How can SMEs survive in an increasingly competitive environment?
- How should governments and the international community respond to new trends and challenges in world economy that have varying impacts on developing countries and economies in transition?

Main themes

13. The seminar was organized into four sessions, each with a separate theme relating to industrial policy formulation. The first theme concerned new industrial policy: concepts and essentials in the changed global context. Since rapid changes in the world economy have had a fundamental impact on industrialization in developing countries and economies in transition, traditional industrial policies are unlikely to be suitable for this and coming decades. Session I, therefore, focused on some of the important changes in the ground rules for industrial development associated with rapid changes in the world economy as well as the nature and basic concepts of industrial policy in this context. The theme paper was presented by Claudio R. Frischtak, who underscored the new global context and constraints faced by developing countries and economies in transition in the formulation of new industrial policies. He also provided alternative ways to conceptualize industrial policy including the notion of vision for formulating industrial policy. Commenting on the paper were Sanjaya Lall, Herman Muegge and Wilson Perez.

14. The second theme of the seminar related to policies for building industrial competitiveness. Increased competition and a new definition of international competitiveness call for a rethinking of the concept and framework within which industrial competitiveness policy operates. In this new context, technology emerged as the key determinant of industrial competitiveness and the focal point of industrial policy-making. With the aid of specific case studies, the second session discussed new concepts and frameworks for building industrial competitiveness with special emphasis on technology policy. Two papers, "Technology Policies and Strategies for Building Industrial Competitiveness", by Linsu Kim and "Policies for Building Systemic Competitiveness: Conceptual Framework and Case Studies of the Republic of Korea, Brazil, Mexico and Thailand", by Tilman Altenburg, Wolfgang Hillebrand and Jörg Meyer-Stamer, were presented by Linsu Kim and Tilman

Altenburg during the session.

15. Mr. Kim put forward two frameworks for analysing technology policy and strategy at national and firm levels. He stressed the importance of covering technology policy from both the supply and demand side as well as the linking mechanisms between the two. The experience of the Republic of Korea was used to draw implications for other developing countries. Jorge Mattar and Wing-Yin Yu commented on his paper. Mr. Altenburg presented a conceptual framework for building systemic competitiveness and analysed meso-level policy using four case studies that highlighted different aspects of industrial policy: new governance patterns for industrial and technological targeting; role of meso-level policies and institutions below central government level; strengthening linkages between large- and small-scale enterprises; and strategies and policies for balancing economic and eco-efficiency. John Martinussen, Hirohisa Kohama and Jorge Katz commented on his paper.

16. The third session focused on industrial policy initiatives to support small- and medium-scale enterprises, with special emphasis on clustering and networking. This area has gained significant attention in recent years partly as a result of recent trends that suggested that industrial organization frameworks tailored to the needs of the sector could enhance its prospects for growth and competitiveness. Collective efficiency and economies in both scale and scope, for example, could be achieved by clustering small-sized firms in special industrial districts and networking them beyond national borders. The session, therefore, focused on the impact of changes in the world economy on industrial structure and organization with respect to SME development. Comparative case studies of the experiences of different countries and some of the efforts taken by UNIDO in SME development were also presented.

17. The three theme papers of the session were "Impact of Changes in Industrial Structure and Integration on SME Clusters", by Patrizio Bianchi; "SME Responses to Global Challenges: Case Studies of Private and Public Initiatives", by Khalid Nadvi and Hubert Schmitz; and "UNIDO's Programme to Promote and Support the Organization and Development of Competitive and Innovative SME Clusters", by Jean Frederic Richard. Robert Crawford, Faisal Nasr, S. B. Mishra and Huijiong Wang commented on these papers. Mr. Bianchi highlighted new roles for SMEs as well as macro and micro levels of industrial policy in creating an environment for SMEs, against the background of changes in the world scenario. Mr. Nadvi focused on private and public responses to the new competition based on the analysis of three aspects of two case studies: upgrading vertical ties, horizontal co-operation and policy intervention. Clustering and networking of SMEs were emphasized in both papers.

18. The final session of the seminar was devoted to industrial development issues and industrial policy concerns of least developed countries (LDCs) and economies in transition in their quest for competitive and sustainable industrial development. Compared with other developing countries, they face a very different set of issues and challenges. LDCs, in particular, require special attention and support from the international community, including UNIDO. During the session, Tony Hawkins presented the paper "Industrial Development Issues and Industrial Policy Concerns of African Countries". He highlighted the problems and priorities of African countries in the face of rapid globalization of the world economy. Charles Soludo and Geoffrey Mwau commented on his paper. Mojmir Mrak presented the paper "Recent Trends, Obstacles and Strengths of European Economies in Transition". He also examined the conceptual framework and actual implementation of industrial policy in the region, including the roles that UNIDO could play in the process. Rsyzard Rapacki and Tatyana Kouznetsova commented on his paper.

SESSION I: NEW INDUSTRIAL POLICY: CONCEPTS AND ESSENTIALS IN THE CHANGED GLOBAL CONTEXT

■ New Industrial Policy: Concepts and Essentials in the Changed Global Context

Summary of presentation

19. The underlying objective of the paper was to discuss the nature of industrial policy in the changed global context. The author began by presenting five stylized facts associated with the phenomenon of globalization. The first was an accelerated rate of technical progress resulting in a revolution in information technology and communications. The advent of the Internet has expanded access to information, products and services and reinforced the notion that investment in knowledge and R&D is the key to competitiveness. Globalization has forced countries to rethink the effectiveness of national innovation systems and question how best to use locally available scientific and educational resources to enhance domestic technological capabilities.

20. Secondly, globalization is accompanied by intensified competition. Managers, workers and, increasingly, governments, have become aware of the need to compete and of the costs, quality, service and other requirements of firms operating in competitive markets. Traditional forms of support---subsidies to individual firms and tariff and non-tariff protection measures---although still part of policy packages, have lost some of their appeal.

21. Thirdly, the combination of intensified competition and technological progress has spurred continuous restructuring across a large number of industries. This has led to changes in organizational structures of firms and industries, with vertical structures replacing the traditionally horizontal organization. There is an increasing effort to achieve economies of scale and scope --- in R&D, procurement, marketing, logistics and distribution--- driving up firm size and increasing industrial competition. The author stressed that firms are now exploiting the scale of business itself resulting in mergers and acquisitions as well as in growing alliances between firms in order to compete more effectively in more markets at lower costs.

22. The fourth stylized fact of globalization is that economies are growing closer to each other through trade and investment. Expansion in trade flows is increasingly a product of transnational firm strategy of disaggregating production processes and outsourcing component production to regional and global production centres. In this context, the author pointed out that not only is FDI growing at a high rate, but the nature of the investment is also changing. Moreover, if FDI is a precursor to trade and trade drives growth, the ability of developing countries to attract a sizeable proportion of FDI would be tantamount to ensuring higher rates of growth. Thus, policy agenda should give priority to creating the right environment to attract FDI, with an educated labour force, efficient logistics and information networks. The author stressed that economic integration also had an important financial dimension. During the past decade, private capital flows have become a key source of external finance for domestic investment needs of developing countries.

23. The fifth stylized fact of globalization is that not only are countries competing with each other in this new economic context, but they are also co-operating with one another. Real and financial integration has provided the basis for inter-country co-operation and exchange. Such interaction has two faces: one that is voluntary, such as exchange of information and establishment of rules followed by consensus and another characterized by collective imposition of compliance requirements regarding universal rules of behaviour. With global institutions increasingly calling for greater policy coordination and harmonization, design of industrial policy is becoming more complex and constrained by such rules.

24. The author presented some basic ideas and new concepts of industrial policy to respond to the facts described above. He cited three basic categories of policies that could be used in the changed global context: those that address framework conditions within which firms operate; those concerned with capacity building, with an emphasis on accumulation of knowledge-related and other endowments; and those targeted at creating or enhancing the competitive position of a sector or a cluster of sectors---thus translating into some form of vertical targeting.

25. Framework policies not only build upon, but go beyond, traditional structural adjustment policies, to include property rights to ensure the enforceability of contracts; macroeconomic stability and predictability as reflected in low inflation, tax and interest rates, and a competitive exchange rate; market supportive institutions to ensure competition and factor mobility; elastic supply of infrastructural and industrial services; and policy and regulatory regime encouraging private sector development.

26. Capacity-building policies stress an active technological strategy, inducing and facilitating firms to learn to produce efficiently and design and differentiate products, while ensuring that governmental, institutional and material resources are allocated to expand the supply of an educated labour force and oriented to respond to the demands of society, particularly in R&D.

27. Policies that stress vertical targeting could be aimed at sectors or industrial clusters. In either case the author advocated that a vertical approach to industrial policy is more effective than, or at least should be undertaken in parallel with, improving factors responsible for the competitiveness of industry or the economy as a whole. The vertical or sectoral approach is generally associated with an explicit or direct attempt to change industrial composition of output. By their very nature, such approaches are more amenable to success at local and regional levels than at the national level.

28. Summarizing his presentation, the author emphasized that the role of policy is to provide an organizing principle that brings coherence to action framed against a vision of the future of industry. From this perspective, the process of establishing a path for industrial development would involve: first, articulation of a shared vision of a country's future and of the scope and limits of government action; secondly, definition of an operative concept of development derived from this vision; thirdly, specification of the basic institutional and resource requirements associated with, or determined by, the operating concept; and fourthly, designing of an implementation strategy that identifies barriers to the operative concept and establishes an action programme to remove them, as well as defines a set of investments consistent with long term goals.

Discussion and comments

29. Seminar participants felt that vision-building as a role for industrial policy is a useful idea but that more thought needs to be given to the constraints on how this vision can be

translated into action. It was felt that the definition of industrial policies as a vision of the future of industry might not be fully convincing. Industrial policies should rather be understood as measures that facilitate the formation of visions of a future industrial structure by various economic actors.

30. The meeting was in general agreement that the real policy issue is one of adjusting industrial structure to changing conditions. Different countries do this differently depending on their internal technological and resource factor dynamics. In support of this, it was stressed that there was no one Asian model of success. The Asian tigers followed different strategies but possibly used similar tactics. Whereas economic growth in the Republic of Korea was technology-driven, in Taiwan Province, it was driven by SMEs and, in Singapore, by transnational corporations (TNCs). The new tigers, on the other hand, such as Thailand, have developed their exports by exploiting static resource endowments and not by investing in education and technological advancements. This indicates that, in the latter cases, industrial policy has not kept pace with FDI-driven growth.

31. There was consensus that industrial policy should concentrate on selective creation of human capital and promotion of R&D efforts. Industrial policies cannot be seen as purely sector-specific policies. They have to take into consideration social, environmental, technological and human resource development aspects as well.

32. The seminar agreed that a major problem with industrial policy in the changed global context is the need for institutional reform to support new functions. In many instances, reform of state ministries to ensure better coordination is essential for effective implementation of industrial policy. Suggestions for ensuring more effective implementation included internal consistency within the industrial policy package; transparency and comprehension in the application of industrial policies; and sufficient lead time and avoidance of erratic changes in policy measures.

33. The meeting highlighted the importance of decentralized policy-making that takes into consideration local dimensions and regional imperatives. The rapid advancement of information technology has resulted in peripheral regions becoming linked to international markets and exposed to fierce international competition. Clearly, industrial policy should attempt to provide specific measures targeted at local and regional levels.

34. The seminar recommended that special attention be given to policies for SMEs. It is difficult for SMEs to acquire modern, competitive technologies without government or other external support. The real issue for industrial policy in this case is one of governance. Since governments cannot replace the private sector, they have to play a supportive role by networking with the private sector and providing more funds linked to capacities of local actors.

35. The issue of public sector policy attracted considerable attention. It was agreed that in many cases public sector performance has been poor and that the public sector finds it difficult to cope with recent economic changes. It was remarked that privatization of public sector companies may not always be a suitable solution. There is no apparent reason to privatize a profit-making public enterprise, whereas privatization of loss-making units could turn out to be fairly costly. The meeting agreed that, in the latter case, policy measures to build capacity and commercialize these undertakings may prove a better option.

SESSION II: POLICIES FOR BUILDING INDUSTRIAL COMPETITIVENESS

■ Technology Policies and Strategies for Building Industrial Competitiveness

Summary of presentation

36. The author noted that rapid changes in the world economy during the last decades had put technology at the core of industrial competitiveness policy. Industrial development has become a process of acquiring technological capabilities and translating them into product and process innovations in the course of continuous technological development, with governments having a significant role to play in this process.

37. The author presented two frameworks for analysing the process of building technological capabilities in developing countries. At the macro level, technology policy was analysed within the context of technology trajectories, market mechanisms, technology flows and an integrated model. At the micro level, firms' technology strategies were viewed from the perspective of absorptive capacity, crisis construction, dynamic learning process and technology transfer.

38. The author considered that the process of technological development in industrialized and developing countries could be analysed from a technology trajectory perspective. In industrialized countries, technological development followed a life cycle model comprising three distinct stages, fluid, transition and specific stages. In the fluid stage, radical - rather than incremental - product innovation and flexible production organization were essential to meet rapid changes in technology and market demand. The transition stage, on the other hand, was characterized by the production of a dominant product design using mass production methods and radical changes in processes undertaken to reduce costs. In contrast, the specific stage was characterized by the production of highly standardized products for a mature market using more automated and system-like production process. At this stage, the focus of innovation shifted to incremental process improvements, and manufacturing facilities were often relocated to developing countries with lower production costs.

39. Developing countries, on the other hand, demonstrated a different trajectory of technological development, which usually moved in the opposite direction, from specific to fluid stage. During the early stage of industrialization, mature technologies in the specific stage were acquired from industrialized countries in a packaged form. Production processes, characterized by assembly operation, were generally developed from unbundling these technologies. Once the acquisition task was accomplished, production and product design technologies were quickly diffused within the country. Increased competition from new entrants spurred indigenous assimilation of foreign technologies for manufacture of differentiated products. As technological capabilities were accumulated, indigenous efforts were made to improve the imported mature technology, which was then applied to different product lines.

40. The author pointed out that this technological development process in developing countries took place in growing and emerging technologies in the transition stage as well as in mature technologies in the specific stage. If the former technologies were successfully assimilated and improved, sufficient indigenous technological capability could be built up to spawn emerging technologies in the fluid stage and compete with firms in industrialized countries. When a substantial number of industries attained this level of achievement, a country could be considered industrialized.

41. Market mechanism perspective includes both the demand and supply sides of technology development. From this perspective, policies fall into three major categories: (a) those designed to create the market needs for technology by strengthening demand-side factors; (b) those designed to enhance technological capabilities by strengthening supply-side factors; and (c) policies designed to ensure that innovative activities are technically and commercially successful through effective linkages between demand and supply sides. The three policy components should be well balanced for the effective accumulation of technological capabilities.

42. Technology flow perspective is mainly concerned with three key elements, which are not necessary sequential, in the flow of technology from abroad to developing countries: transfer of foreign technology, diffusion of imported technology and indigenous R&D. The first element involves technology transfer from abroad through such formal mechanisms as FDI, purchase of turnkey plants and machinery, foreign licences and technical services. The second element concerns the effective diffusion of these imported technologies within an industry and across industries. The third element is concerned with local efforts to assimilate, adapt and improve imported technology and, eventually, develop indigenous technology.

43. The author highlighted that the mode and effectiveness of technology flows and market mechanisms change over time as industries in developing countries advance through different stages of technological trajectories. An integrative model combining the three above-mentioned concepts would, therefore, enable policy-makers to identify areas that have been neglected and to assess the efficacy of existing policy instruments.

44. With the help of this analytical framework, the author used the market mechanism perspective as a structural framework to draw implications for other developing countries to build their technological capabilities, based on the experience of the Republic of Korea.

45. One of the considerations in the formulation of technology policy is that such policy should cover both demand and supply sides of technological development as well as their linking mechanisms. Demand-side policies include export promotion, trade liberalization, industrial structure and crisis imposition, while supply-side policies include education, technology transfer, technology diffusion and indigenous R&D activities.

46. The author underlined the importance of export promotion as one of the most effective ways to create a competitive environment for firms and foster industrialization in developing countries. First, export promotion strategy not only creates business opportunities but, concurrently, imposes crises for firms to respond to. In order to survive in an increasingly competitive international market, firms have to accelerate learning by importing and rapidly assimilating production technology from abroad. Secondly, exporters usually make lump-sum investments for capacity in excess of local market size to achieve economies of scale. This could lead to a crisis, forcing them to accelerate technological learning so as to improve productivity and maximize capacity utilization. Thirdly, original equipment manufacturers may rely heavily on foreign buyers to market their products in the international market, which

provides invaluable help in the acquisition of the required capability through interactive tutorial processes.

47. Another important function of governments in facilitating effective technological learning is to create a competitive domestic market. While protecting local markets could create initial business opportunities and shelter critical industries at the infancy stage, prolonged protection would not create a competitive domestic market nor stimulate technological learning in industry. On the other hand, import liberalization, which brings a large influx of foreign products into the domestic market, would force local firms to compete with multinational firms in the market.

48. Sustained long-term industrial growth in developing countries can only be achieved if governments create a well-balanced industrial structure, as in Japan and Germany. The lack of strong support from dynamic SMEs in the Republic of Korea has resulted in large-scale firms, or *chaebols*, having to rely heavily on foreign SMEs for supply of critical components. Similarly, in Taiwan Province, industrial structure skewed towards SMEs led to a lack of large firms to challenge scale-intensive industries.

49. Another important measure that could induce market competition and, hence, technology learning is the imposition of antitrust legislation. Consistent with the framework of WTO, this type of legislation reduces the concentration of economic power in a small group of companies and prohibits unfair cartel practices.

50. Crisis imposition could be a strategic tool for governments to expedite technological learning in industry. In time of crises, ill-prepared firms are forced to assimilate technology very rapidly and upgrade their capacity utilization by expediting learning in order to survive. In this regard, setting ambitious export goals and localization targets would force local firms to be competitive in both price and quality in the international market. More importantly, it speeds up the process of acquiring technological capability.

51. On the supply side, the author stressed that education is one of the most important foundations for building technological capability. Successful industrializers in East Asia had invested heavily in education. A well-balanced expansion at all levels of education is crucial to support rapid economic development. In addition to quantitative supply of educated human capital, policy-makers also have to be mindful of the quality of education. Under investment in quality education and the consequent short supply of highly trained human resources could impede development of a nation-wide system for innovation, resulting in a major bottleneck for future development.

52. According to the author, developing countries should adopt a liberal policy on brain-drain and allow scientists and engineers to migrate to advanced countries before or in the early stage of industrialization. At that point, there was generally a lack of suitable jobs at home for scientists and engineers to advance their technical competence. They would, however, become important elements in an overseas technical network and a high calibre manpower pool for subsequent development. Nevertheless, a policy on reverse brain-drain is required as industrialization progressed, so governments need to vigorously pursue a policy of repatriating experienced scientists and engineers.

53. Most developing countries lack technological capability at the early stage of industrial development and, therefore, have to rely heavily on foreign technology imports. At that stage, mechanisms such as foreign licensing and foreign direct investment might not be as effective for acquiring foreign technologies as mechanisms such as procurement of turnkey plants, in the case of continuous process industries such as chemicals and capital goods. The

latter provides more management independence to local firms and allows them to take the initiative and play a central role in learning activities, such as acquisition, assimilation and improvement of imported technologies. Success depends, however, on availability of a pool of well-trained, hard working and motivated personnel that could maximize technological learning from readily available foreign products and are equipped with sufficient tacit knowledge to reverse-engineer foreign goods successfully.

54. The author considered that changes are needed in technology transfer policy to keep up with the changing needs of industries. As industrialization progresses, more sophisticated foreign technologies are needed to sustain international competitiveness in high value-added industries. Restrictive investment and technology policy should, therefore, be relaxed to enable industries to acquire more sophisticated foreign technologies, which were protected by patents or were difficult to reverse-engineer.

55. Effective diffusion of imported technology across firms within an industry and across industries within an economy is considered as important, if not more, than the acquisition of foreign technology for upgrading the overall technological capability of an economy The establishment of a network of specialized diffusion agents such as capital goods producers, consulting engineering firms and government research institutes constitutes an important approach to maximizing the effectiveness of foreign technology transfer.

56. Indigenous R&D activities are deemed crucial to augmenting technology transfer and expediting acquisition of technological capability, given that technology can be transferred from abroad but the ability to make effective use of it cannot be done in a similar way. This ability can only be acquired through indigenous R&D efforts. For this reason, governments in developing countries need to introduce various incentives to encourage corporate R&D. They also need to invest in R&D activities at universities and government research institutes. To maximize resources, investment in universities offers a greater potential for diffusion through the flow of students compared with that in government research institutes.

57. The author emphasized that some of the most important mechanisms governments can use in strengthening linkages between demand and supply sides and encouraging corporate R&D activities are preferential finance and tax incentives. The effectiveness of these instruments increases as industrialization progresses, and at that juncture, governments in developing countries also have to take initiatives to establish venture capital industries. Technology-based venture firms play an important role not only in emerging high technology industries but also in supporting large firms in existing industries by supplying high technology parts and components. Finally, it is also important for governments in developing countries to create a pool of capable entrepreneurs who are able to take risks and can effectively manage resources to generate wealth by meeting existing and potential market needs.

58. At the micro level, the author described four basic concepts - absorptive capacity, crisis construction, dynamic learning process and technology transfer at firm level - for technology strategy to be used to build industrial competitiveness.

59. Technological capability is acquired through the accumulation of technological learning, and effective technological learning requires absorptive capacity. Two important elements in the concept of absorptive capacity are an existing knowledge base and intensity of effort. The latter refers to efforts made to internalize external knowledge intensifying interaction among organizational members and technological learning at the organizational level.

60. Crises construction helps to stimulate technological learning by influencing firms to invest heavily in acquisition of new knowledge as well as in technological learning activities in

order to overcome the crisis in the shortest possible time. At the firm level, crisis may be constructed as a strategic means for opportunistic learning, bringing about a valuable transformation in the firm. An effective learning organization could frequently evoke constructed crises and institutionalize the process and structure to make discontinuous, or step-wise, learning possible and to turn the crises into opportunities.

61. The author considered that the understanding of a dynamic learning process at firm level is essential because technological change is localized at this level. Firms develop their technological capability through in-house learning efforts at individual and organizational levels, augmented by interacting with domestic and foreign institutions. New knowledge is created through the building of explicit and tacit knowledge and through the dynamic process of four different types of conversion: (a) conversion from tacit to tacit knowledge; (b) conversion from explicit to explicit knowledge; (c) conversion from tacit to explicit knowledge; and (d) conversion from explicit to tacit knowledge. Among the four, conversion from explicit to tacit knowledge tends to become faster and larger as more actors in and around the firm become involved in knowledge conversion. Moreover, technological capability of a firm depends more on accumulation of tacit knowledge embodied in its members than on explicit knowledge.

62. Technology transfer from foreign firms in industrialized countries can be an important source of new knowledge for developing countries. Such foreign technology transfer can be analysed in two dimensions, market mediation and the role of foreign suppliers. In the first dimension, technology transfer is market-mediated whereby supplier and buyer negotiate payment for technology transfer, either embodied in or disembodied from physical equipment. Alternatively, foreign technology can also be transferred to local users informally without written agreements and payments, that is, without the mediation of market. In the second dimension, the foreign supplier takes an active role, exercising significant control over the way in which technology is transferred to and used by the local recipient. Alternatively, the supplier can take a passive role with regard to the way the user takes advantage of available technical know-how.

63. The above-mentioned concepts can be integrated into a model that demonstrates that the existing knowledge base and intensity of effort affect the dynamics of knowledge conversion through a spiral process that started at individual level and moved upward to firm level. Firm level learning tends to become faster and larger in scale as more actors in and around the firm with adequate existing knowledge intensifying their efforts to convert knowledge within and among themselves. The outcome of knowledge conversion and creation increases the level of the existing knowledge base, further raised by technology transfer efforts. It was noted that individuals migrating from one organization or country to another furthered the transfer of tacit knowledge thereby raising the level of the existing knowledge base. At the same time, top managers could construct crises internally, either in response to or in the absence of an external crises, to intensify efforts to improve the absorptive capacity of firms and expedite technological learning.

64. In summarizing his presentation on competitiveness strategies at firm level, the author considered that dynamic firms need to have multiple sources of foreign technologies, continually upgrade tacit knowledge embodied in human resources, continually invest in indigenous R&D efforts on imported technologies and monitor technological changes in advanced countries. They also require aggressive entrepreneurs, who can successfully manage all imitation and innovation activities as well as constructed crises. The absence of any of these factors is likely to retard the pace of the firm's technological learning.

Discussion and comments

65. The meeting considered that in the context of rapid globalization and liberalization of the world economy, government intervention remains crucial for successful industrialization. Success is easier achieved if government policies are the result of close interaction between government and the private sector, policy errors are corrected and policies are designed to accommodate a rapidly changing environment and adapt to the needs and conditions of different stages of industrialization.

66. The meeting also noted that although education is the main foundation of competitiveness, the problem with it is often not a lack of recognition of its crucial role, as reflected by the substantial share of federal budget usually receives by education in many developing countries, such as those in Latin America. Rather, the issue appears to be a structural one related to whether set objectives and plans are achievable. Development plans are often made for a short time frame of five to six years, which result in less than optimal use of resources and the need to start almost all over again every five to six years. The meeting considered that a balanced approach to investment of education might not be feasible for LDCs, taking into account their scarce resources and immediate needs at early stages of industrialization.

67. Although TNCs could be a critical source of technology for many developing countries, many operated in a close enclave and were disconnected from the rest of the productive system, especially SMEs. Backward linkages with the rest of the economy were generally limited because of considerable dependence on imported raw material and other inputs. Therefore, the process of technology transfer and diffusion, if at all, took place in a closed environment and the majority of firms, in particular SMEs, were not able to participate in technology transfer associated with TNCs.

68. The meeting also noted that trade liberalization undertaken by developing countries was normally unilateral and often too fast and extensive. This posed difficulties for a majority of firms, which could not meet the challenges of a sudden surge in competition from imports. Only large firms associated with TNCs managed to take advantage of the opening of the economy, since they were already prepared technologically and often already had a global strategy to penetrate international markets

69. Another policy consideration for building industrial competitiveness is to promote networking among firms. Continuous relationships between enterprises have contributed to enhancing industrial competitiveness in Japan and the newly industrializing Asian economies. Several factors need to be considered in ensuring effective networking, among which are (a) ensuring transparency in government policy; (b) promoting entrepreneurs' interests and confidence in government policies; (c) promoting co-operation within the framework of competition; and (d) ensuring a stable macroeconomic environment. The concept of club mechanism followed the same line of thinking.

70. Success of networking also depends on a continuous process of monitoring and evaluating networking schemes in relation to technological and competitive enhancement. This process allows implementation failures to be corrected speedily. A specialized agency for this might be appropriate, as in the case of some South-East Asian countries. Moreover, the design of new networking schemes or redesign of existing ones have to take into account the needs of industry. It also requires the right attitude to be cultivated within various offices in the public sector coupled with improved communication and coordination among them.

These have to be supported with clarity and a good understanding of the set objectives by all related parties.

71. The meeting considered that historical context and micro and macro interaction plays a role in building industrial competitiveness. For example, naturally evoked crises are normally influenced by historical context. At the same time, differences in macroeconomic environment explain a large portion of behavioural differences of firms across countries.

72. The meeting considered that export promotion strategies should be complemented by policies that minimized information asymmetry and promoted financial access, particularly to SMEs. FDI policy must take into account clear sets of objectives, be it for the generation of employment or for the transfer of technology.

73. The meeting also noted that the transferability of competitive models depends considerably on socio-economic conditions, culture, historical context and institutional arrangements. Initial conditions are often different and certain parts of the model should not be emulated.

74. The meeting considered that industrial policy in the new world context is quite different from that of the past given the increasing liberalization and globalization of the world economy. Industrial systems are now more open and fragmented. Therefore, policy design is required to induce greater integration in the industrial system. Macroeconomic stabilization policy should not lead to destabilization of industry. A diverse set of policies are required that need to be managed by a variety of well-coordinated authorities.

75. The fragmentation of industrial structures pose challenges to coordination that are becoming crucial for building competitiveness. Pressure for effective coordination has increasingly been derived from sources outside government, such as the private sector, business clubs and other societal actors.

■ Policies for Building Systemic Competitiveness: Conceptual Framework and Case Studies on the Republic of Korea, Brazil, Mexico and Thailand

Summary of presentation

76. The author considered that successful industrial development of a country depends on its ability to build up systemic industrial competitiveness. Dynamic industrial development requires deliberate action by both government and societal actors in order to stimulate and support firms. The secret of successful development is to find an appropriate balance between intervention and market forces.

77. In presenting the conceptual framework for building systemic competitiveness, the author stressed the importance of focusing on systemic factors critical to industrial competitiveness and taking a holistic view when formulating competitiveness policy. These factors could be classified into four levels, meta, macro, meso and micro.

78. At the macro level, an enabling macroeconomic environment is crucial for ensuring efficient allocation of resources. This includes a stable and predictable macroeconomic framework, realistic exchange rate policy and trade policy that stimulates growth and competitiveness of local industry.

79. At the micro level, firms have to undergo profound changes in the organization of production, product development and value chain to increase efficiency, product quality and variety and responsiveness to changes in market environment. At this level, learning by interaction is a key element in the innovation process of firms while feedback loops between firms and supporting institutions are critical for establishing dynamic comparative advantages.

80. Support demanded by industries at meso level differs greatly depending on types of industries. Innovative industries normally build on positive external economies, such as the existence of world class suppliers of intermediary goods and machinery, consumer demands and specialized business services. On the other hand, mature production processes, such as the labour-intensive wearing apparel industry, require only basic infrastructure and minimal education of the workforce.

81. Increasing competition calls for increasing demand on meso support at local, regional and national levels, which imply close co-operation between governments and non-government entities, such as trade associations and business clubs. It also implies that meso policies have to be increasingly formulated at regional and local levels, and decentralization of meso policies is, therefore, desirable.

82. Nevertheless, the central government has an important role to play in stimulating local and regional meso-policy formulation by: (a) monitoring subsidies offered by regional and local governments, thus inhibiting subsidy races between regions; and (b) promoting creative local strategy formulation as a condition for allocation of subsidies, such as regional development funds, thus introducing performance incentives. Apart from that, meso level tasks, such as initiatives on large-scale technology programmes and formulation of an overall long-term strategy should remain with central government. Moreover, successful industrialization depends on the capacity of central government to link the meso policies and meso institutions as well as various levels of policy-making.

83. The key variables for successful industrial development can be found at the meta level. First, the key actors in a society - the political-administrative system, the private sector, trade unions and other parts of civil society - need to share a clear development commitment. Secondly, there has to be a consensus on the desirability of an industrial development process, rather than, for instance, reliance on natural resources. As long as there is fundamental disagreement on these issues, macro and meso policies would be erratic, making formulation and implementation of an effective and comprehensive long-term policy impossible. In this regard, a well-developed structure at the meta level, characterized by a strong capacity for governance on the part of government and high degree of collective problem-solving arrangements, is a crucial precondition for optimizing performance potentials at the micro, macro, and meso levels.

84. As systemic competitiveness cannot emerge without social integration, its creation requires fundamental restructuring of business associations and trade unions, as well as other key organizations of civil society. With the clientelist and top-down institutional relationships prevalent in many developing countries, de-linking among state, trade unions, industrial associations, scientific community and other societal actors could be a necessary first step towards a profound internal restructuring of societal organizations. Only after de-linking, that is, destroying clientelist systems, would it be possible to re-link, or, to establish patterns of interaction that would facilitate problem solving in a bottom-up approach. A basic social consensus on the necessity and direction of change is, therefore, crucial.

85. However, these changes have to be made within the framework of the world market. Firms should strive for international quality and efficiency standards, since even in their open

domestic markets they compete with imported goods. Moreover, medium-term directions and visions are important for asserting future interests over current interests and for generating stable expectations. If the effort to develop them fails, the required structural change would be delayed and the process of social disintegration prolonged. To overcome obstructive social structures, durable patterns of social organization and values that societal actors shared in terms of concerted action and co-operative approaches to problem-solving are needed in the medium term.

86. The author noted that major groups in society have to be aware that safeguarding government from influential, privileged groups could bring about a positive-sum game. Only a relatively autonomous government is able to gear its activities towards overall social and economic interests. Transparency and accountability are crucial. Autonomous functional subsystems are based on a clear-cut division of responsibilities between government, industry and societal actors. They can then be further developed by intrinsic learning processes, flexibility and responsiveness, as well as dialogue and efforts to search co-operatively for optimal solutions involving government and societal actors. This could occur at national as well as regional and local levels.

87. Within the context of rapid globalization and liberalization, new forms of governance have emerged, characterized by the concept of policy networks. Under this new concept, government no longer plays an interventionist role but acts as a coordinator, moderator and communicator in policy networks with firms and their associations, intermediary institutions and trade unions. Networking makes it possible to relieve government's burden by shifting decision-making processes into intermediary areas, ensuring a higher degree of information availability, heighten the legitimacy of government decisions and mobilizing creativity available among societal actors by involving them and their respective problem-solving capacities in a strategic fashion.

88. As societies become more differentiated and firms, as well as other actors, undergo learning processes, competence and capacity in strategic planning move from the public to the private sector as evident in industrialized countries and industrially advanced developing countries. In this respect, top-down approaches are unsuitable in industrial location policy and development of meso policies because the capacity to move towards a certain goal, the know-how required to formulate long-term policies and implementation capacities are distributed across a variety of government, private and intermediary agencies. One-dimensional, etatist and centralist patterns of governance are not suitable for development and support of complex entrepreneurial networks and specialized institutional landscapes.

89. Even at meso level, emerging forms of governance are characterized neither by simple market allocation, in terms of competition and price nor by centralist governance mechanisms in terms of hierarchic control and state interventionism but by policy networks, which tend to be organized on a sectoral basis, dealing with fields like science, technology or health policies. These networks tend to be embedded in political structures where there is some higher level that could intervene in case a policy network runs astray. The role of the state could be directed at promoting the development of effective local or regional policy networks.

90. The author stressed that sustained success in industrial development is dependent on a multi-dimensional organizational pattern based on: (a) interaction between the four levels of systemic competitiveness; (b) mutually reinforcing factors at local, regional, national and supranational level; and (c) on a governance pattern that involved markets, hierarchies and networks.

91. Meta level factors shape behavioural dispositions and potentials for action at other levels. For example, a stable macroeconomic framework that does not impede industrialization would only emerge if there is strong development and industrialization orientation at the meta level. Yet, there is also an interaction the other way around. If firms experience, for instance, rapidly increasing competitive pressures and demand better support and services from meso institutions (including business associations), and if this happens in an environment that has evidenced little interaction so far, changes at the meta level could be the result.

92. At the micro level, competitive firms would only emerge if two factors at the macro level coincide: competitive pressure that forces firms to upgrade continuously and a sufficiently stable framework so that opportunities arise and firms can act in a strategic way. Substituting these factors with meso level policies usually does not work. After the initial stages of growth, competitiveness of firms increasingly relies on a well-structured meso level.

93. Meso level is shaped by factors at the other three levels. There will only be an attractive supply of services if there are appropriate factors at meta and macro levels, that is, if there are strategically oriented actors and if the macroeconomic framework is stable. Likewise, there will be a strong demand for the services of meso institutions only if firms depend on their support to thrive in competitive markets.

94. The author also presented four case studies on the Republic of Korea, Brazil, Mexico and Thailand to highlight the strengths and weaknesses of industrial policies at the meso level. Each study dealt with different aspects of meso-level policy support. The study of the Republic of Korea revealed that successful industrial and technological targeting policies were based on a new governance pattern involving many key societal actors in policy formulation and implementation. By contrast, the study of Mexico showed that poor linkages between large industries and SMEs were largely due to the lack of a clearly defined strategy and governance capacity to formulate and implement collective strategies. The case of Brazil demonstrated the importance of policy-networking in the formulation of locational policy, while the study on Thailand focused on strategies and policies in balancing economic and eco-efficiency.

Discussion and comments

95. The meeting considered that comprehensive industrial policies are better for competitiveness than *ad hoc* measures. Case by case policies often lead to failure, which is evident from the experiences of the Republic of Korea, Brazil and India.

96. The meeting noted that clientelism and heavy reliance on personalistic relationships impedes the building of industrial competitiveness. Extensive government control and a degree of discretionary powers vested in controlling authorities and individual government officials tends to increase the scope for rent-seeking, thereby adversely affecting productivity and competitiveness.

97. The meeting considered that industrial policies should be looked at not only as the outcomes of good quality economic analyses but more as the outcome of a struggle between contending actors, each responding to initial economic conditions by promoting those policies that would further their own interests. The direct involvement of the various actors would not only be confined to policy-making but would extend into implementation. At least three types of interference with implementation processes could be identified: (a) interference with institutional arrangements for implementation; (b) interference with specific decisions made by implementing bodies and their employees; and (c) circumvention of rules and regulations

at micro level, that is, by individual firms. The resulting growth pattern and industrial competitiveness becomes extremely complex, so there is a need to focus on the implementation aspects of industrial policy.

98. The meeting noted that implementation could be more important than policy formulation in weak states in developing countries and where personalistic relationships tend to dominate. Government officials often have wide discretionary powers, which, in turn, add to the scope of personal interaction. These conditions tend to increase the scope for outside influence and for discrimination based on personal relationships.

99. The meeting considered that the vast dissimilarities in the industrial structure of and challenges faced by developing countries call for different types of approaches or strategies for different groups of these countries. Differentiation is particularly necessary on two dimensions, regarding the level and pattern of industrial development and institutional development. In the area of industrial structure, a distinction has to be drawn between countries where the challenge is to provide basic preconditions for industrial development, that is, supporting establishment of industrial clusters and where it is to build the international competitiveness of firms and clusters already established under the state protection provided by import-substituting industrial development.

100. The meeting considered that the dynamism of the private sector plays a critical role in industrialization. Industrial policy should aim at promoting efficient management of the economy based on this factor. Competitive conditions have, therefore, to be ensured even in protected and oligopolistic markets. Entrepreneurs need to be motivated to improve productivity and international competitiveness.

101. The meeting noted that protection policy could be rationalized from an economic standpoint when the protected industry is an infant one. However, it is difficult to identify the infant industry *ex ante*, and protection policy in the course of import substitution tends to be prolonged. Hence, one of the most crucial issues in industrial policy is to maintain and promote efficiency-oriented economic management in a protected market. Efforts towards liberalization of the economy should be gradual, transparent and preannounced. Once announced, liberalization schedules should not be substantially changed by political pressures. On the other hand, the private sector should be motivated to make every effort to improve its competitiveness within the schedule of liberalization. The essence of industrial policy is co-operation between government and the private sector with a close exchange of information where government enjoys the full confidence of the private sector.

102. The meeting noted that the prevalence of serious flaws in design, sequencing and implementation of macroeconomic stabilization policies could severely undermine the success of industrial policy as evident from the experiences of many Latin American countries during the 1980s. Successive failures in macroeconomic stabilization programmes significantly increased the rate of uncertainty in the macroeconomic environment and mistrust of the private sector on government policy impeding industrial development. In a highly uncertain macroeconomic environment, it is unrealistic to expect the private sector to invest in R&D activities.

103. The meeting noted that the same macroeconomic variables will affect different industries in different ways. For example, devaluation of currency tends to provide positive incentives for export growth of natural resource-intensive industries but reduces the external competitiveness of labour-intensive and high technology industries due to higher import prices.

SESSION III: INDUSTRIAL POLICY INITIATIVES IN SUPPORT OF SMALL- AND MEDIUM-SCALE ENTERPRISES

- **Impact of Changes in Industrial Structure and Integration on SME Clusters**
- **SME Responses to Global Challenges: Case Studies of Private and Public Initiatives**
- **UNIDO's Programme to Promote and Support the Organization and Development of Competitive and Innovative SME Clusters**

Summary of presentations

104. The three papers presented during the session pointed to the serious implications of the rapid pace of globalization and trade liberalization for SMEs. As their failure to respond to new growth impulses and emerging global challenges could have severe socio-economic consequences, it is being increasingly realized that industrial policy responses and conducive institutional frameworks tailored to SMEs are needed to enhance their growth prospects and competitiveness. Reflecting on challenges and opportunities, the authors argued that policy tenets have to be aimed at achieving collective efficiency and economies, in scale and scope, through clustering of small-sized firms in special industrial districts, with networking stretching beyond national borders.

105. The deliberations pointed out that historically policies for SMEs had been intended to protect local markets for smaller-sized firms, which were considered economically inefficient and marginal but socially desirable because they created diffused employment opportunities. In the face of increasing competitive pressure, the policy accent was on efficiency gains in terms of productivity, profitability and wages in order to keep pace with the rapidly changing dimensions of industrial development.

106. In the face of rapid and revolutionary changes in the world economy, the role of SMEs has changed dramatically. They have become increasingly specialized in specific productive functions, and operate in co-operative networks taking advantage of local externalities and creating a strong cluster identity. During the last ten years, two parallel but inverse phenomena had emerged with major implications for SMEs. On the one hand, large-sized firms had reorganized their production throughout the world into networks of interconnected activities, and successful small-sized firms had organized themselves into clusters, which have evolved into international networks, on the other.

107. These phenomena demonstrated the vital importance of networking for development, which encouraged market liberalization, increased the number and variety of economic actors, allowed new economic leaders to emerge, broadened the range of specialization and innovation and reinforced social stability.

108. The nature of larger-sized firms has also been transformed becoming, in effect, a web of commercial interlocking associates while a crucial division had emerged within networks. Individual companies were responsible for different stages of production, with a core company managing the services that were driving production processes and marketing outputs.

109. Successful firms, according to one of the authors, worked within well established institutional frameworks characterized by national institutions for education, training, research and diffusion of technological progress. The convergence of national systems of innovation, therefore, was crucial to creating a local environment conducive to SME development.

110. To this end, SME policy needs to focus increased attention on creating and reinforcing a supportive institutional context. This should be based on opening and liberalizing markets, regulating market power to avoid distortions and unfair competition against smaller-sized firms, developing a more advanced and efficient organization of production and establishing external knowledge-based networks. The seminar viewed the first two factors as micro-friendly, macro-related policies aimed at creating an enabling environment conducive to SME development and the latter as micro-specific policies designed to develop complementarities among firms and promote the relative specialization of SMEs.

111. The crucial issue in this type of policy approach was considered by the authors as a continuous process of institutional adjustment between top-down and bottom-up interventions, with constant introductions of conditions for the effective integration of market forces beyond the national context. In this respect, the ability to create new firms, reinforce co-operation and foster relationships between firms, education and research was considered essential.

112. The authors cited an emerging trend in the evolution of SME policy that was bridging the traditional dichotomy between micro and macro approaches. In the past, most public initiatives to promote SMEs assumed that the key problems at micro level were deficiencies in firms, especially lack of skills and capital and, at macro level, distortions in policy and legal frameworks. More recent initiatives, however, are stressing a middle course, including relationships between enterprises, learning by interaction and local self-help organizations.

113. Meso-level organizations were also seen as essential partners for policy dialogue as well as crucial channels for outside assistance. Public institutions and programmes to support SMEs were more likely to be relevant and sustainable with the active involvement of those targeted beneficiaries. To include them, a devolved strategy for policy formulation and implementation is required. For such collaboration to succeed, it needs to be flexible and sector-specific, organized through representative industrial associations, with commitment of firms driven by their agendas.

114. External factors resulting from a historic process, one of the authors stressed, were central to cohesion within SME clusters. These included a common culture and language, basic technical knowledge and strong sense of belonging to a local community. From a policy perspective, strategy for developing SME clusters should aim at recreating this common framework in order to sustain a dynamic aggregation of firms, which, in turn, fostered innovation and efficiency.

115. Coupled with the meso-level approach to SME development, there was mounting evidence, according to the authors, that clustering and networking helped SMEs to compete while coping with the new challenges posed by liberalization and globalization. Close and

co-operative business networks--both in terms of vertical supply chains and horizontal ties with other producers--allowed firms to capitalize on new orders, respond to market fluctuations and ensure that they retained capacity on ongoing orders. Networking aided them through information sharing and solving common problems, such as training and co-operating in design, production and marketing, to overcome their inherent handicap of scale.

116. The authors stressed that with their scale of production SMEs are often in an advantageous position to respond to changing market conditions through their high degree of flexibility to alter production for quick response, increased quality and short turn-round time. But SMEs need to focus on core competencies and build close ties with other producers, vertically and horizontally.

117. The ability of SMEs, in clusters and networks, to respond to competitive challenges is conditioned by the nature of the markets in which they operate, contended one of the authors. They could gear their production to an exclusively local network, integrate it into industries within their country or expand into an international supplier of components to other companies on a similar or larger scale. While these various levels of orientation call for different sets of policies, they have to be linked to avoid fragmentation. Divisions could be overcome by encouraging internationally oriented companies to become involved in local production and locally-oriented companies to work closely with them.

118. In the context of clusters and networks, close inter-firm co-operation played a crucial role in achieving collective efficiencies. Liberalization, quality requirements and new competition could foster greater vertical co-operation with the forging of more interactive, obligational relationships within vertical chains. Although horizontal co-operation was often marked by intense rivalry, SMEs benefited from multilateral horizontal activities, especially through trade and business associations.

119. On a more macro level, the creation of free industrial and trade zones offered prospects both of promise and peril for SME development, warned one of the authors. Despite tax concessions, the creation of industrial islands within countries lacking adequate infrastructure and networks of local production to ensure services and supplies is insufficient, in itself, as a catalyst for national development in general. To provide opportunities to develop contacts with foreign firms, new industrial areas had to embrace domestic enterprises whose output is directed to local and regional markets, as well as those directed to export markets.

120. The experience gained from free zones could stimulate national development only if it permeated the rest of the country with new work techniques, international connections and management and production procedures. Otherwise, there was the risk of creating two distinct regimes that relegated SMEs into economic ghettos of purely local or international companies.

121. In establishing free zones, SME policy has to look beyond inherent advantages, such as reduced start-up and fixed costs and low labour costs. Reliability in all aspects of production is a prerequisite for viability. Local enterprises have to be able to satisfy international standards of quality, while decentralized production destined for export markets require an efficient network of transport and communications.

122. The most advantageous direct foreign investments in SMEs were those that introduced new technologies and organizational capacities and encouraged development of local companies to rise to international standards.

123. As to the contours of SME policy-making, the authors concluded that the first step is to analyse the relations among as well as the structures of economic actors, firms and institutions. The second is to place existing industrial clusters in the organization of production. The third is to define pathways along which SMEs could develop. Throughout this process, fostering of close, interactive relationships between government, institutions and firms is essential for successful SME development in both local and international settings.

124. To support this process, UNIDO could play a significant role as a matchmaking agency in the international arena. The Organization's SME cluster programme includes assistance to government and the private sector in developing countries and economies in transition to co-operate in designing and carrying out national programmes for competitiveness and innovation in SME clusters aimed at promoting sustainable industrial development. UNIDO also helps to establish national and regional centres to identify and analyse SME clusters with strong growth potential and to design and implement strategies for development and co-operation. Particular reference was made to UNIDO services, such as advice and training to build capacities in design, implementation and evaluation of cluster programmes as well as professional study tours to visit model clusters and international forums on cluster programmes.

Discussion and comments

125. General discussion and comments focused on the importance of reorganization and networking featuring high levels of subcontracting based on firm specialization and inter-firm co-operation. This led to emergence of industrial associations that established co-operative institutions for the organization of technology upgrading and marketing. Such collaboration represented a response to changing market conditions.

126. In support of reorganization and networking, it was argued that the development of efficient SME clusters is crucially important for increasing their competitiveness, especially in international markets. Typically, such clusters were formed around and under the leadership of large-scale firms, which facilitated concentration of core competencies by even small-scale producers. The challenge of globalization required increased inter-enterprise co-operation. In Brazil, for example, large-scale firms had provided effective leadership in reorganizing small firms and in internationalizing their operations by physically linking them to large firm production structures. Obligational relationships had developed and SMEs were able to take advantage of the closer links that major firms had developed with buying groups. The role of industrial associations became crucially important as they had been the main pressure groups responsible for obtaining government financial and technical support for SMEs.

127. On policy support for SMEs, it was said that government intervention should encourage the type of clusters in which a core company would be responsible for the logistical functions of financing, innovation and marketing and consolidating clusters. Policy norms should also concentrate on establishing conditions of regrouping among SMEs. It is particularly important to link export-oriented to domestic demand-oriented manufacturing activities. This could contribute significantly to domestic capacity building.

128. Reflecting on the principal constraints impeding the healthy growth of SMEs, market intelligence failure was identified as a major constraint adversely affecting many crucial aspects of SME businesses, including their capacity to export, apply higher levels of technology, enhance the skill base of their workforce and develop new products. Thus, information asymmetry was noted as a primary barrier among others.

129. One of the major constraints was related to the scarcity of institutional credit. Many innovative schemes had been developed to address this issue, but such schemes suffered from structural weaknesses. Credit schemes for SMEs were often initiated and operated with social rather than commercial orientation. Hence, the problem of multiplicity of objectives had obstructed the growth of efficient resource allocation. Highly published credit schemes were often attuned to employment growth rather than to upgrading enterprise. Loans extended under such schemes were often insufficient to meet the needs of technology upgrading.

130. One of the participants concurred with the contention that, notwithstanding an array of structural problems, there were support services that could be supplied by outside agencies. Rather than a massive government initiative, these could come in the form of very modest resources amounting to little more than mediation between large-scale firm procurement departments and matchmaking services. Such services could also facilitate links between SMEs. This could take the form of formal joint-ventures, distribution arrangements, subcontracting, design and development partnerships and technology transfers.

131. SMEs could forge both regional and international partnerships that circumvented deficiencies of scale. To this end, initiatives could include export development services, finding international joint-venture partners to gain access to technology and markets and sampling selling products or services to large foreign-sized firms.

132. Modest public support for SMEs, it was argued, could prove more successful than initiatives on a grand scale. Based on practical experience, it was said that assistance with complying with quality control norms would be an effective support for service agencies to offer SMEs. In this context, key support services could include identification of quality control or related problems and, thereafter, persuading large-scale foreign buyers to commit time and resources to working with local firms in order to overcome such impediments.

133. Suggesting practical solutions to problems that surfaced in free zones or new urban communities, some crucial prerequisites were suggested: (a) first-rate customs and drawback systems; (b) excellent infrastructure, efficient loading and unloading and delivery facilities; (c) good estate/zone management and service delivery, including utilities; and (d) formal mechanisms for training.

134. Commenting on competitiveness, it was argued that cheap labour was not necessarily a shortcut to competitiveness. The surgical instruments industry concentrated in Sialkot had succeeded in making Pakistan a major global player in the market for such goods. This occurred because of clustering and the collective efficiency gains that it generated, in the form of passive external economies and actively pursued joint action benefits. External economies of a cluster, though important, are not sufficient to compete in the fast changing global market. Joint action and co-operation, vertically and horizontally, are needed.

135. Referring to China's success in penetrating the United States markets for cheap standardized leather shoes and the adverse effect on Brazil's leather shoe exports to its main market outlet, it was said that the trading shock was made worse by the new inventory cost awareness of overseas retailers and domestic Brazilian ones alike. This placed immense pressure on the Sinos Valley shoe-producing region of Brazil to reposition itself and readjust through better vertical and horizontal ties with its suppliers, subcontractors, buyers and local trade associations.

136. As country experiences were considered during the session's deliberations, one of the participants dwelled on the crisis that was surfacing in television manufacturing in India. Ten

to 15 years ago, 60 to 70 television manufacturers were operating amidst fierce competition among themselves. Their number was reduced to five or six over the years. Many SMEs supplying components to assembly units passed through ups and downs in the business environment. Large-scale Japanese and South Korean television manufacturers started to locate production facilities in India, posing a threat to major local producers, who continued to source their components from outside. Local SMEs could face a crisis unless they are able to quickly establish relationships with the new large-scale manufacturers with competitively priced high-quality components.

137. Textile manufacturing in India was cited as another case of change forced by competitive pressure. Ready-made garments and furnishings worth $300 to $400 million were exported annually from India mostly from a few large clusters in southern and northern India. With the increasing effects of globalization and the entry of highly competitive Chinese products into international markets, these clusters began to suffer from the competition. But they quickly learned to adapt themselves by improving their response time, introducing new designs and specifications and conforming to strict production and delivery schedules.

138. The seminar discussed three types of transnational co-operation arrangements: (a) stand-alone, working as affiliates in host countries as a smaller wing of a parent company; (b) simple integration, with transfer of technology as well as financial resources to host country affiliates; and (c) complex integration, both horizontal and vertical integrations, around the processes of their production chain. These types of transnational co-operation could be effected through government intervention to favour clustering and networking of SMEs. In this context, it was said that industrial policy initiatives could foster compatibility between parent firms and local SMEs although national innovation systems were rooted in a country's history.

139. One of the participants referred to the marked divisions among SMEs in developing countries, with some 5 to 10 per cent of them quite modern and export-oriented applying new management principles and concepts, while the vast majority remained distinctly very traditional. Empirical evidence indicated that the latter did not upgrade production despite the provision of credit and institutional support, while the will to emerge as dynamic modern enterprises was lacking. Lack of spirit to pursue technical progress and become part of the changing dimensions of the respective manufacturing activities could be attributed to donors' approaches to rejuvenation. Development of public-private enterprise partnership with a view to linking the dynamic core to small-scale enterprises was seen as important.

140. Responding to the discussion, one participant said that it would be wrong to expect all clusters to be dynamic and that the art of policy should be to separate static clusters from those that could become dynamic. Explaining the industrial miracle of Sialkot in Pakistan, the participant ascribed much of its success in making tennis rackets, hockey equipment, domestically marketed footballs and surgical instruments to cultural spillover, effectively enabling every other household to be a complete export-oriented unit in an environment of export dynamism. This was made possible in spite of lack of infrastructure and a low literacy level. Commercial attitude could have been the driving force behind the dynamic cluster effect. These types of clusters, based on traditional artisanal skills, low levels of technology and education and fairly low levels of technical support, were in danger of reaching a plateau and failing to move on to the next level, which required tremendous precision in production processes.

141. The seminar also considered the paradox of expecting small-sized economies to liberalize faster when they were least prepared because of lack of domestic capacity-building,

infrastructural base and institutional framework. The discussion focused on a set of preconditions for opening up small-sized economies and their clusters to competitive pressures stemming from globalization and trade liberalization.

142. The importance of understanding the local conditions and relations while applying a set of different instruments in order expose major players to new experiences was stressed. The experience of cluster activities in some countries, such as Italy, demonstrated that it was possible to jump from local to international levels. The crucial factor related to the mechanism to create special linkages between the local environment and international experience.

143. One participant felt that it is much more important to learn lessons from cluster failures than success stories. A serious attempt is required by academic and industrial communities to analyse systematically the changing determinants of success from the perspective of failures because today's dynamism could be tomorrow's failure. It is essential to recognize that, in the process of industrialization, there will be failures. The important issue would be to see where competencies, especially knowledge-based ones, could be created and used for stimulating growth and employment in a range of subsectors.

144. It was asked whether clustering and networking could be a future model to apply to all regions of the world and to the Arab region, in particular. The answer required further interdisciplinary research into the nature of the regions where SME clusters had been successful. It was pointed out that UNIDO could play a pivotal role by conducting seminars on replicating successful clustering and networking and creating awareness of the changing determinants of success in such endeavours.

SESSION IV: SPECIAL POLICY CONCERNS OF DEVELOPING COUNTRIES WITH SPECIAL REFERENCE TO AFRICA AND ECONOMIES IN TRANSITION IN CENTRAL AND EASTERN EUROPE

■ Industrial Development Issues and Industrial Policy Concerns of African Countries

Summary of presentation

145. Sub-Saharan Africa has become marginalized in the sphere of global industrialization, with the region's share of MVA falling from 0.6 per cent in 1970 to 0.3 per cent in 1995. The process of deindustrialization across countries in the continent is evidenced by the declining share of manufacturing in GDP. Average per capita incomes have halved, from 14 per cent of industrial-country levels in 1965 to 7 per cent 30 years later. At current growth rates, it will take until 2004 to regain 1982's level of per capita income, which will still be lower than that of the mid-1970s.

146. Focusing on the reasons for marginalization and deindustrialization, the author contended that African countries have also been disadvantaged in terms of their efforts towards industrialization because the fastest growing sectors of manufacturing during the 1980s were skill- and technology-intensive industries while LDCs' comparative advantages continued to be in labour-intensive manufacturing. The increasing tempo of technological advance, coupled with the increased intensity of global competition, has raised the industrialization entry fee in terms of technology, skills and finance, with severe consequences for LDCs, making it increasingly difficult for late starters to catch up.

147. Reflecting on the threats to the low-cost advantages of LDCs in labour- and resource-intensive manufacturing, the author pointed out that these tended to be slow-growth sectors relative to high technology industries. Moreover, a number of emerging economies were creating competitive pressures in unskilled and labour-intensive sectors on the basis of lower order advantage, especially low-wage labour, which was relatively easy to replicate.

148. The weak performance of sub-Saharan African economies has been reflected in their failure to benefit from globalization by attaining convergence. Instead there has been divergence as most African countries became marginalized. Citing empirical evidence, the author felt that convergence and globalization were related in those countries that were able to integrate themselves into the world economy, as indicated by their increased shares of world trade. This included East and South-East Asian economies that had exploited globalization as a vehicle for industrialization and income convergence. Such countries were able to attract foreign investment and used exports as the engine of economic growth. The author warned, however, that it would be simplistic to emulate the East and South-East Asian model. The question arose as to what late-comers should do to foster the pace of industrial

expansion in order to use manufacturing as a dynamic force for achieving rapid socio-economic transformation of their societies.

149. As noted by the author, technological terms of trade had proved disadvantageous for late-comers as the admission fee for the acquisition of new technology rose in monetary terms as well as in terms of skills needed by operators, technicians and managers. As a result, sub-Saharan African countries have become more dependent on foreign technical assistance and expatriate skills.

150. In the least developed sub-Saharan economies with small markets, weak infrastructure and a poor skill and technology base, manufacturing had been largely confined to the production of simple consumer goods for domestic markets possibly supplemented by some inputs for agriculture. Their small markets meant poor prospects for attracting FDI. To improve the situation, four different--in some instances overlapping--growth paths could be followed to develop manufacturing:

a) One group of countries with a strong primary resource base--Angola (oil), Democratic Republic of Congo (copper, cobalt and diamonds) and Zambia (copper)--have greater potential for domestically-driven manufacturing growth than most others among African LDCs.

b) A second group, comprising those that are members of embryonic customs or free trade unions and/or that are attracting resource-specific investments from within the economic union, could also expand their manufacturing sectors more rapidly than in the past. A case in point is Mozambique, while Lesotho, Malawi and Madagascar have benefited from the relocation of some foreign factories in the clothing industry. In the long term, Tanzania and Uganda and, possibly, Ethiopia stand to gain from the revival of the East African Community.

c) A third group, for which the spin-off effects of cluster-style links with neighbours and/or metals- or energy resource-driven industrialization are limited, would have to rely primarily on an agriculture demand-led industrialization strategy. This would depend on the country's comparative advantage in agriculture, with growth prospects enhanced in countries with large populations, such as Ethiopia, Democratic Republic of Congo and Tanzania. Zambia, with vastly under-utilized agricultural resources, lower production costs and the potential to export food to South Africa and other regional markets, would also fit into this category.

d) While the most attractive growth path--drawing on East Asian and Mauritian experience-- would be export-led industrialization, which no sub-Saharan economy, except Mauritius, has managed, the obstacles are formidable. The chief constraints are infrastructure, technology, skills and an undeveloped private sector.

151. What is true for much of the world might not be true for Africa. Industrial policy is generally concerned with adjustment and restructuring rather than development. In Africa, policy is both adjustment in those countries that are currently being de-industrialized or are restructuring, such as Nigeria, Zimbabwe and Kenya, and development from a very low base. Correct pricing is not enough. For this reason, policy has to be viewed in a broad context; reversing agricultural decline, for instance, is crucial for future industrialization.

152. During the presentation, a strong case was made for an agriculture demand-led industrialization strategy. Africa not only has a comparative advantage in several agro-based industries but such industries are relatively labour-intensive as well as being based on relatively low technology. There are three main links between agriculture and industrial

growth: (a) manufacturing output rises as larger volumes of farm produce are processed and value-added increases; (b) farm demand for manufactured inputs--fertilizers, chemicals, pesticides, implements, fuel, vehicles and building materials--boosts domestic demand; and (c) there is a high income elasticity of demand for manufactured goods as increased agricultural output generates consumer demand for manufactures as a result of increased employment, productivity and real wages.

153. Agriculture-led industrialization has a particular appeal for low income countries. Given the difficulties encountered in trying to develop an export-platform from an existing state of low industrialization and the severe limitations on import-substitution industrialization in small-scale economies, the driving force for industrialization would have to be a spin-off from exploitation of natural resources.

154. As to the extent of market and investment opportunities, the author referred to regional integration arrangements aimed at widening market and investment opportunities and, thereby, enhancing industrialization and development. These included the Common Market for Eastern and Southern Africa (COMESA), South African Development Community (SADC), East African Co-operation (EAC) and Economic Community of West African States (ECOWAS). Such integration would be inhibited by inadequate scale in small-scale low-income economies and by the missing middle level between large- and small-scale enterprises.

155. Reflecting on the implications for sub-Saharan African countries of the finalization of the Uruguay Round and the emergence of WTO, the author said that, while the benefits are expected to be substantial, there are fears that these would be largely exploited by the developed countries and newly industrializing countries, with poor sub-Saharan countries losing out and becoming more marginalized. The author demonstrated that developing countries, including LDCs, would be unlikely to be affected significantly by the Uruguay Round agreements in terms of lost preferences or losses in demand from their exports. The potential gains were likely to be indirect, as the Uruguay Round would provide substantial opportunities to create the requisite economic environment for investment, particularly in terms of improving competitiveness. African countries would need to come out with offers based on a comprehensive analysis of their interests and potential benefits that could be derived from further liberalization.

156. The immediate imperatives are macroeconomic stability, outward orientation in the sense of eliminating anti-export biases, creation of an enabling environment, rebuilding and expanding physical infrastructure and enhancing institutional capacity. African countries will have to rethink education policy with greater emphasis on quality and vocational/tertiary training, which had been neglected relative to primary education. Governments need to put more faith and trust in private industry while eliminating or minimizing financial, administrative and legislative barriers.

157. There was a tendency for competitiveness to be seen as an industrial-country or newly industrializing-country issue rather than one for LDCs. Globalization has changed all that. UNIDO could play a significant role within the framework of its global forum function not just in raising the profile of the competitiveness issue but also reminding governments and policy-makers of the need for this kind of global benchmarking as they endeavour to promote industrialization.

158. The author concluded his presentation with emphasis on doing more at grassroots than at national policy level, the aim being to discover and understand what works and why.

Discussion and comments

159. The meeting considered whether Africa could make a major start in the context of the demands of globalization and a changing environment. The trend in industrial policy in Africa is rapid liberalization of trade and markets without any national industrial strategy, against the background of very weak institutions and capacity as well as the absence of a minimum micro-friendly macroeconomic policy environment. The result is massive de-industrialization in an environment of a near-zero industrial base, with continuing disinvestment and massive capital flight. The challenges stem mainly from these trends. The key issue is to have Africans invest in Africa. If Africa manages to limit the proportion of its resources remaining outside of the continent to just 30 per cent, it could easily be on the threshold of rapid industrial transformation. The question is how to make Africa attractive for Africans.

160. The seminar noted that Africa could be differentiated from other regions not only by the level and structure of industries but also by the enabling environment for industrialization. Some 11 per cent of the sub-Saharan population suffered due to an inadequate social order, while 46 per cent due to inadequate macroeconomic policies. Only 23 per cent of the continent's population enjoyed a minimum adequate environment. Institutional capability to ensure property rights and contract enforcement, as well as bureaucratic competence to ensure predictability and transparency capable of responding to changing realities, constituted the most immediate needs. Apart from system-wide capacity in skills, infrastructure and entrepreneurism, social capital is crucial including organizational skills, social arrangements that reduce moral hazards or transaction costs in general, creation and governance of markets, social relations in the work place that guide management-labour relations, state-society relationships, political arrangements that guarantee stability, institutions that define property relations, organizational characteristics of factor and goods markets and production units, regulatory environments and incentive structures. Social capital also includes ideological predisposition, social attitudes, cultural determinants of thriftiness and consumption patterns along class, gender and ethnic lines. The meeting agreed that the key challenge is to make a start in this direction, for which the effectiveness of the state and its ability to design an industrial policy embracing these elements is crucial.

161. In the participants' view, the main problem in finding policy solutions for African countries is, to a large extent, that they are in conflict with leaders' economic and political interests. In response to international pressures for economic and political reforms, these countries have undertaken piecemeal reforms that are, for the most part, to their advantage. For example, privatization had been instituted in ways that benefited the ruling elite by buying prime public properties at undervalued prices. In some cases, the situation was so extreme that the countries had failed to utilize much needed foreign assistance for critical sectors such as infrastructure simply because the elite did not personally benefit from it. Participants were also of opinion that there is lack of clear vision regarding where African leaders and policy-makers want their countries to be in the future. Treating the private sector as a competitor to state enterprises represented another malaise impeding the private sector from exploiting opportunities that stemmed from globalization and new waves of liberalization.

162. The seminar noted that poor management of reforms in some countries is not due to lack of technical and institutional capacity but because it runs counter to the interests of the authorities. Some countries have adequate and well-trained personnel and capacity to manage their economies. But often professional civil servants do not have incentives to make appropriate policy decisions and implement them efficiently.

163. Reflecting on the lessons to be learned from the East Asian experience, the seminar pointed out that African countries could learn more from the second generation of tigers in terms of appropriate macroeconomic policies, outward orientation, ability to attract FDI, infrastructure, institutional capacity and investment in human capital. An additional lesson to be learned from East Asian economies is that African economies require a long-term industrial vision of where they want their economies to be in the next 50 years, with clearly stated goals as well as strategies for attaining them.

164. The session considered industrial development in some developing countries, such as Bangladesh and Sri Lanka, which have been doing well on the export front. The type of structural transformation that took place in the first and second generations of NICs is not taking place in these countries. As NICs moved into higher degrees of structural change and climbed the ladder of industrial development, they experienced a constant shift from labour-intensive to skill- and capital-intensive and to high-technology-intensive manufacturing activities. This type of structural change in manufacturing value added has not been taking place in the economies of major exporters, such as Bangladesh and Sri Lanka, for more than two decades, with exports of labour-intensive garments continuing to dominate their exports.

165. Focusing on comparative advantage, the seminar noted that it would be important to identify potential comparative advantages of countries, particularly those that could constitute potential sources of future growth. In this regard, UNIDO's global forum function has a pivotal role to play. This point of view was endorsed by a participant's account of Jamaica's experience. Jamaica benefited from in-depth analytical studies of comparative advantages, growing from strength to strength by exploiting analytically identified potential comparative advantages.

166. Indonesia's rapid economic transformation was compared with the sombre economic performance of Nigeria, in view of similar natural-resource endowments. Much of what went wrong in Nigeria was ascribed to inept policies.

167. Issues related to leadership crisis and to the attitude of treating the private sector as political competitors dominated the general discussion. Participants were interested in a potential role for international organizations to help find a solution to this problem. A starting point is needed from which international organizations could serve as a platform for dialogue between the private sector and government.

■ Industrial Development Issues and Industrial Policy Concerns of Economies in Transition

Summary of presentation

168. All countries in transition, the author pointed out, had experienced a painful economic contraction in the early 1990s due to price and exchange rate liberalization, general collapse of the former system of enterprise linkages and finance and breakdown of the socialist trading bloc. Poor industrial performance in the first few years of transition to market economies had caused a significant drop in the Central and Eastern European (CEE) countries' contribution to world industrial output. The decline had been most pronounced in the countries of the former Soviet Union, where their 1995 share of world MVA was 56 per cent below that of 1990. The contribution of CEE countries to global industrial output declined much less drastically. The varying degrees of industrial sector losses could be partly ascribed

to differences in manufacturing structure and partly to differences in timing and sequencing of the transformation process applied by different groups of countries.

169. The revival of industrial growth in industrially more developed countries of the region during the last few years had not led so far to a significant revival in registered employment. This was partly explained by the continuing process of laying off redundant workers and partly by the fact that a substantial proportion of new jobs had been created in the informal sector. Bolstered by reductions in redundant labour and increases in output, labour productivity grew significantly in the formal sector. Increasing labour productivity could also be ascribed to better utilization of existing manufacturing capacities. This type of productivity gain occurred independently of capital investment. Taking into account the large technological gap between advanced economies and countries in transition, there continues to be considerable scope for productivity gains through technological progress. Positive trends in labour productivity had been accompanied by rapid growth of wages, measured in dollar terms, in most of the economies in transition.

170. A dramatic change had taken place in the geographical orientation of trade. CEE countries and the Baltic states had gone the furthest in shifting their trade from the former Council for Mutual Economic Assistance countries and in integrating themselves into the global trading system. Their share in total exports and imports was nearly double that of advanced countries by 1995. Several factors contributed to the success of CEE countries and the Baltic states in reorienting their industrial exports. They benefited from their geographical proximity to Western Europe and had better initial economic conditions. They were also able to stabilize their economies rapidly and start the process of industrial restructuring earlier. A number of CEE countries and Baltic states received most-favoured-nation status under the General Agreement on Tariffs and Trade at an early date and, later on, became members of the WTO. Less favourable geographical proximity and slower progress in macroeconomic stabilization and industrial restructuring as well as lack of institutional trade arrangements with Western partners explained why Russia and other members of the Commonwealth of Independent States (CIS) had been less successful in reorienting their trade flows.

171. Reintegration of the region into the global financial system started at the outset of the transition process, when practically all countries of the region rapidly joined the three multilateral financial institutions, International Monetary Fund, World Bank and European Bank for Reconstruction and Development. By the end of 1996, these, together with other multilateral and bilateral institutions, provided an equivalent of some $75 billion to the region in the form of medium- and long-term loans and grants. These developments also paved the way for an increasing flow of funds from private sources, their share rising from 15 per cent in 1991 to 65 per cent in 1996. While CEE countries and the Baltic states practically ceased to rely on official financing --seven of them having been investment-grade rated and, therefore, having full access to international capital markets --a number of other countries, such as Russia, Kazakstan, Moldova and Romania, continued to rely on official resources although they had limited access to private sources. The third group consisted of other members of CIS to which access to international capital was still denied. They continued, therefore, to depend entirely on official sources of foreign financing.

172. By far the most important single source of foreign financing for the region, and particularly, for its industrial sector is FDI. Not only does it complement domestic savings but also promotes the inflow of new technologies, better management practices and

conditions for improved access to foreign markets. One problem relates to the banking sector's continued reluctance to go into corporate financing.

173. As to enterprise restructuring, the key issue relates to competitiveness. For transition economies, it not only means maintaining enterprise profitability. It also involves a process of transforming a highly distorted economy, with many large-scale loss-making industrial companies, into a viable market economy in which most industrial companies were internationally competitive and profitable. The process of industrial restructuring takes place at policy as well as enterprise levels, including management and organizational skills, marketing, accounting and financial control, specific training and technical and technological matters related to product adaptation.

174. A large number of small firms, which did not exist before, emerged in the face of liberalization but financial constraints and frequent changes in legislation impeded their normal pace of expansion. Privatization of state-owned enterprises has become the crucial test, the process of which proved to be far more complicated than originally thought. The pace of privatization was slower than expected and less uniform across countries in the region.

175. In spite of a high quality of labour force in terms of skills, transition to a market economy has, nevertheless, revealed some serious systemic weaknesses in education and training systems. Education under the socialist system was targeted towards the needs of the socialist state, emphasizing vocational and career-specific training. In recent years, there has been recognizable changes in human resource development.

176. In general, government policy measures are aimed at creating a stable macroeconomic environment and at establishing conditions for full integration of transition economies into the global environment. Industrial-sector restructuring measures include those aimed at increasing industrial sector competitiveness through horizontal and non-discriminatory supply-side policies. A high degree of selectivity would be needed in government interventions.

177. The author concluded with comments on the role of UNIDO as a honest broker for industrial co-operation and as a neutral provider of technical assistance in various areas related to efficient and environmentally sustainable industrial development. By virtue of its extensive experience, UNIDO has acquired the potential for providing comprehensive expertise at all levels of industrial development, including policy and strategy, institutional and enterprise levels. The Organization's global forum function has a unique purpose in constantly surveying the changing pattern of industrial development in economies in transition and in benchmarking determinants of industrial efficiency and competitiveness.

Discussion and comments

178. The meeting considered that the peculiarities of transition and lessons from this process would need to be examined from different angles. The industrial contraction in these economies in the early 1990s should be understood in the context of the transformation shock; the so-called shock therapy was often just a shock with no immediate therapy. In the early 1990s, most of these countries witnessed the collapse of well-established trading networks, so even with a positive supply response, it would not have been possible for them either to reach new markets or re-establish traditional markets in the early years of transition.

179. Differences in the magnitude of unemployment across countries reflected differences in labour market regulations and enterprise restructuring, which was practically non-existent in the Czech Republic, Ukraine and Russia, as opposed to Poland.

180. As to the composition of unit labour costs as a source of comparative advantage, the meeting noted that in Poland, which was an extreme case, extra labour costs represented as much as 48 per cent of social contributions. On the other hand, in countries like Slovenia, it was much lower. High labour unit costs does not seem to be an issue if the quality of labour is relatively high. Western investors invested and formed strategic alliances in Poland in 1994. They withdrew their investments in the wake of rising unit costs of labour and redeployed their manufacturing units to neighbouring countries in 1995 in search of cheap labour as a short cut to competitiveness. Most of these investors came back to Poland in 1996 and 1997, as they found that the quality of labour and resultant productivity levels were much higher in Poland than in other CEE countries. These developments lend credence to the belief that as long as the rise in productivity, as a result of high quality of labour, is faster than the rise in the wage level increasing unit labour costs are not a major cause for concern.

181. During the deliberations, participants focused on the issue of internal brain-drain in CEE countries, implying reallocation of human capital from science and technology capacities to business. There had been a dramatic flight of the most dynamic faculty members, professors and students from science subjects and mathematics to business, leading to de-stabilization of the science and technology base. In this respect, it was felt important to understand the cost of transition.

182. The session pointed to a failure of structural and anti-monopoly policies, the weakest component of the transformation package. Many heavy industries continue to hold strong positions, particularly in non-privatized infrastructure, such as power generation, telecommunications and transport. The continued strong monopolistic positions of companies explains the growing inter-company debt.

183. The session cited two reasons for poor performance and the high operating costs in the banking sector. In the early stages of systemic transformation, management of state-owned enterprises and privatized firms attempted to expand or survive through increased sales revenues rather than through cutting costs. The former option had been predominantly based on price hikes, relatively easy to introduce in an inflationary and non-competitive environment. The second explanation stemmed from the fact that top managerial positions in banking in many transition economies had been originally taken in so-called spontaneous privatization by former members of the *nomenklatura* who brought with them their habits and management styles learned and developed in socialist bureaucracy. One of the features of these behavioural patterns was low sensitivity or even negligence of cost economies. Institutional, cultural and behavioural factors, as well as attitudes, systems and values, are equally important. These factors are historically rooted.

184. The session recognized that available data on privatization could be misleading as they normally refer to formal transfer of ownership titles and do not reflect changes in corporate governance. In some countries, aggregate privatization statistics include both firms where ownership changes have been initiated and those where privatization has been implemented. There is also no immediate link between privatization of firms and their restructuring.

185. The session questioned the notion of competitive exchange rates as an effective instrument of industrial competitiveness policy. It was debatable whether maintaining systematically undervalued national currencies had proven effective in sharpening the competitive edge. It was also argued that devaluation tended to adversely affect the effectiveness of anti-inflationary policy. Therefore, it would be more effective to advocate a broader use of supply-side policies aimed at fostering international competitiveness with emphasis on longer-run systematic and structural changes.

186. Reflecting on the peculiar characteristics of transition in Russia, participants pointed out that the decline in internal demand puts export-oriented branches in a better position. However, the growth of exports was restrained by the lack of the requisite technical base and resources as well as reluctance of private capital to invest in industry. Competitive pressures, from imports, for efficiency are considerable in Russia, as it is becoming increasingly open. One of the viable avenues for accelerating the export-drive is to recapture traditional markets in CEE countries. This represents a formidable challenge in the face of a number of CEE countries already moving into a higher degree of Western-style industrialization by vigorously trying to keep pace with the changing dimensions of global industrialization through investment and marketing networks.

187. The meeting raised a number of basic questions regarding the issue of no industrial policy as the best industrial policy. Do CEE countries have an industrial policy at all? Taking into account conditions of implementation and scope of response by industrialists, lack of enforcement or compliance with rules and regulations and inefficiency in the institutional set-up, the major actors feel that there is no industrial policy, except a macroeconomic policy framework. Legal frameworks governing FDI might be the only policy frameworks for industrial development.

188. The meeting expressed reservations about less importance being attached to unit labour costs. Rising wage costs have a decisive impact, despite significant increases in productivity levels. Central European countries feared that wage costs will go up rapidly. There might be a new wave of industrial restructuring, in terms of MVA, underlying structural transformation from labour-intensive to skill-, capital- and technology-intensive operations. This could soon be re-established in these countries when the first round of labour-intensive operations is completed.

189. The seminar expressed concern about the drastic decline in R&D activities in companies and institutions as a result of FDI. Responding to the concern about declining R&D activities, one of the participants explained the trend as an unavoidable short-run phenomenon.

190. The crucial issue for former centrally planned economies is not one of the capability of the industrial sector. The real weakness relates mainly to other aspects, namely management skills, marketing and the legal systems.

191. Though the region had a good start in terms of literacy and skills, this has proved to be a necessary, but not a sufficient, condition for adjusting to the market environment. In recent years there has been a significant shift, particularly in secondary and higher level of education, from a narrow to more flexible system that has widened the scope for keeping pace with the changing dimensions of industrial transformation.

192. Concerns were expressed about increasing income inequality across CEE countries. Concentration of industrial assets might be unavoidable in the face of globalization and oligopolistic competition resulting from alliances among firms. These developments are not negative as there is still competitive pressure for efficiency gains, in terms of output, productivity, profitability and wages. The real challenge for industrial policy is to ensure that these increases are widespread. But this can only happen when small-scale firms are linked with large firms. In the absence of widespread increases in productivity, profitability and resultant increases in wage levels, inequality will persist.

CONCLUDING SESSION

The seminar concluded with the following recommendations:

193. Industrial policy is important for development in whatever form it exists. Government has a role to play when the market and the private sector fail to achieve the long-term development goals of a nation. Government intervention today is totally different from that in the past. Some framework is needed to increase efficiency, ensure competition and promote overall social interest.

194. UNIDO technical assistance should be directed not only at national level but also to local government.

195. The private sector should play a fundamental role in formulation of industrial policy, strategy and vision as well as in implementation and evaluation of policies.

196. Non-public institutions, such as labour unions and non-governmental organizations, should participate in development initiatives at local level.

197. There is a need to exchange experiences and ideas, and a forum of this type should be convened annually or biennially in order to:

- review emerging developments related to industrial policies and institutional arrangements at global, regional, country and local levels
- review new challenges and suggest possible and appropriate policies, strategies and institutional development initiatives, focusing mainly on:
  - LDCs and countries in transition
  - SMEs
  - environmental issues
- review UNIDO's role in the context of the changing dimensions of industrialization, in particular, in the context of the changing role of the state.

198. Seminars of this type should be considered as a means for UNIDO to be close to the thinking of academics, governments, institutes and the private sector.

199. Specific cases could be presented at such seminars in order to share the experiences of best practices in industrial policy formulation, industrial restructuring, product development and marketing and capacity-building.

200. UNIDO should serve as an industrial policy observatory. As part of the global forum function of the Organization, statistical research should be strengthened in order to monitor and support benchmarking, in which UNIDO has already done substantive work. There is considerable need for dialogue with policy-makers, based on the ideas that transpired during the seminar. UNIDO's efforts in benchmarking should be a continuous process.

201. An advisory group of this nature would be useful for the policy-making organs of UNIDO in order to pursue and de-idealize the concept of industrial policies, paving the way for a clear understanding of the exact scope of industrial policy and to develop analytical tools and systems of classification of industrial sectors.

202. The proceedings of the seminar and ideas that emerged during the presentation of papers and interventions should be published. UNIDO should disseminate the publication widely in order to share these ideas with major players in the sphere of industrial development.

Part II: Seminar Papers

New Industrial Policy Concepts and Essentials in the Changed Global Context

Claudio R. Frischtak*

1. Introduction

The challenge posed to national governments and industry by the process of globalization is not small. In many ways, the world has become in the last two decades far more complex and demanding: *technologically*, as knowledge becomes central to the wealth of nations and the competitive standing of firms; *structurally*, as firms (and other economic agents) organize themselves around networks, within which information and resources flow, steered by relationship-based signals; and *functionally*, as firms and nations operate within less predictable and faster changing environments.

This end century is also witnessing greater economic interdependence among nations; yet, as they are drawn together, commercial and other conflicts become more frequent. And while firms establish closer links through joint ventures and strategic partnerships, they interface more often in the market place as competitors. Firms and nations are living the paradox of *intense rivalry and closer cooperation* in an "enlarged" and increasingly unified world.

To regulate economic conflict and promote cooperative solutions, multilateral institutions have come to embrace ambitious global policy liberalization and harmonization agendas. At their core are trade and investment issues. In this new environment, there is a high explicit premium for macroeconomic consistency (above all, in the amount and quality of capital flows) and a large potential penalty for industrial and trade policies not in line with multilaterally-set rules. What then is the scope for national industrial policies in a context of supranational rules which leave governments a shrinking stage to perform as independent actors?

It is unquestionable that global markets and institutions impose new and tighter constraints on governments and firms. From national firms, they require the twin ability to compete and cooperate, to continuously reshape strategies and restructure operations. But, possibly, the greatest demands are on national governments. "More market" does not necessarily imply "less state", but just a smaller and more effective one. Global markets and rules, require, in fact, more government capacity; they call, in particular, for better informed and less intrusive industrial policies, simultaneously strategic in approach and results oriented,

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and which "sponsors" rather than "intervenes", coopting the private sector, leveraging upon its human and informational resources.

The object of this paper is to discuss the nature of industrial policy in the changed global context. Section II presents some of the stylized facts associated with recent changes in the world economy relevant for the design of industrial policy. Section III discusses basic concepts which inform industrial policy making. It suggests that no single notion can become a reference for "optimal policy"; a hybrid might be preferable. Section IV defines industrial policy as "vision", and, specifies its operative requirements. Section V offers brief concluding remarks.

2. The New Global Context: Some Stylized Facts

In recent years, the world economy has undergone major changes in some of the fundamentals which underlie economic behaviour: an information revolution in the context of an accelerated rate of technical progress; and an enlarged market in a world drawn together by major advances in telecommunications and transportation logistics. Competition - stimulated by policy liberalization, less segmented markets, larger investment flows and a growing acquiescence to universal rules - has become more intense, demanding from firms a global presence.

Five stylized facts are associated with the phenomenon globalization: *First*, an accelerated rate of technical progress. Radical innovations in the information industry, derived from exponential improvements in the price-performance ratio of computing power and major advances in digital communications, has enabled individuals and organizations to be "wired" and become part of a truly global market[1]. In this regard, the advent of the Internet is nothing short of a revolution. It has expanded access to information, products and services, to an unimaginable degree[2]. It has redefined the concept of distance: in principle,

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[1] The share of investments in information technology in total equipment expenditures in American firms increased from around 5 per cent in 1960s, to an average of 10 per cent in the 1970s, reached 20 per cent in the mid 1980s, 35 per cent in the mid 1990s, and is edging towards 50 per cent in 1997 (according to Data stream). It has been recently argued that the combination of such large outlays in information technology and far more open borders to trade on goods and services (and a flexible labour market), has propitiated the emergence of a "new economy", unbounded (according to the techno-optimists) by the economic cycle. Growing productivity would explain higher profits and wages, *and* low inflation. The recent (18-month) performance of the American economy (1996-mid 1997) would seem to bear this out: while GDP has grown at an yearly average of 3.6 per cent, unemployment is at a 30-year record low of 4.9 per cent, while inflation is not creeping up.

[2] It is estimated that the number of users have been doubling each year. By mid September 1997, there were some 55 million people using the net; by the year 2000, it could be as many as 550 million, as the quality and speed of connection improves and personal computer prices fall significantly below the $1000 threshold (a level which was reached in early 1997 in the United States market). According to the UNCTAD, trade through electronic means will grow from approximately $50 billion in 1997 to $250 billion in three years. Firms are establishing intra and entrants, using Internet´s protocols and applications, both to integrate people and facilities, and access clients and suppliers, at dramatically lower transaction costs. Websites, until recently an information dissemination locus for firms, have become a purchase/sales centre of significant proportions for Cisco Systems (with over $1 billion worth of goods sold over the Internet), Dell Computers (with sales of over $2 million per day) and GE (which is expecting over $1 billion of sales over the Internet in 1997).

one is instantaneously close to the market no matter how physically apart[3]. And it has made relative the concept of economic size, by magnifying the reach of small firms: in a virtual sense, they serve the global market.

Possibly most important, the ease with which the Internet disposes of information has only reinforced the notion that knowledge - *which to be created or absorbed requires information to be intelligently used* - is becoming the foundation of competitiveness. Investment in the acquisition of knowledge - through a renewed emphasis in education and improved access to information - is now considered as, if not more, important than its creation, which requires large and growing R&D budgets. And that is even the perception in countries with a history of decisive private sector involvement in R&D. Globalization has forced countries to rethink the effectiveness of their national innovation systems and question how to best use locally available scientific and educational resources to enhance domestic firms´ technological capabilities[4]? How to help them benchmark against and catch industry leaders? What kind of information levers has to be provided to help local firms overcome size and resource-related weaknesses in order to approach the price-performance frontier[5]?

Second, globalization has been accompanied by - and in fact is often taken as a synonym of - more intense competition[6]. While the reaction by developed country firms to the price, interest rate and currency shocks of the 1970s and early 1980s was, at least initially, defensive in nature, most underwent since a paradigmatic shift in managerial strategy and practice with the adoption of universal concepts and standards of productivity, (total) quality, delivery time and customer support. Such a shift that has also been embraced by management in industrializing countries, this time in reaction to the more open and competitive markets allowed by trade and investment liberalization of the last 15 or so years. The Hicksian "easy life" of sheltered environments has been abandoned by all producers vying to have a presence in the global market. A growing number of national firms find themselves in highly contestable markets. Entrepreneurial risk is growing in view of more crowded markets, shorter product lives and shifting consumer preferences.

Managers, workers and increasingly governments, have become keenly aware of the need to compete, and the costs, quality, service and other requirements of firms operating in competitive markets. Traditional forms of support - subsidies to individual firms and industries, protection in the form of tariff and non-tariff barriers - although still part of the

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[3] See Frances Cairncross, *The Death of Distance*, Harvard Business School Press, 1997 (forthcoming in November), and by the same author, *The Economist: A Survey of Telecommunications*, September 13 1997. A new metric of distance is being established not only as a function of dramatic advances in information and telecommunications, but also of rapid technological progress in transportation. New logistical systems based on intermodality and the economies of size, aided by liberalization of trade in transportation services, have contributed to lower the costs of moving production on a global scale.

[4] See Appendix A "A Note on Technology Policy on Institutional Delivery Systems"..

[5] See Appendix B, " A Note on SME Development".

[6] As a recent report noted, "Worldwide reductions in policy barriers to international trade and investment and substantial continuing declines in international transport and communication costs are making markets everywhere more contestable, increasing the competitive pressure on firms and stimulating and facilitating their efforts to improve efficiency and gain access to new markets by reorganizing their production processes on a global basis." See The World Bank, *Global Economic Prospects and the Developing Countries*, Washington, D.C., 1997, chapter 2. A recent survey among 220 CEOs and other individuals in executive positions undertaken by International Institute for Management Development, uncovered that two of the tree key trends affecting firms is intensifying price competition and of competition generally. The third, is the growing importance of services to clients.

industrial policy instrumentality of many if not most countries, have lost some of their appeal. They may have worked as part of a defensive strategy; they are far less effective in open and competitive environments, where countries are being scrutinized to ensure their policies follow internationally-agreed rules.

Third, competition on a global scale and technological progress - most evidently in information and telecommunications - spurned continuous restructuring efforts across a large number of industries[7]. These efforts have been reflected in profound and ongoing changes in the organization of firms and the structure of industry. Internally, horizontal organizations are replacing vertical structures; hierarchies are being collapsed into teams; and functions are being re-engineered into processes. "Lean" production and its variants are becoming the norm at the shop floor. What started in the mid 1970s as a defensive move by companies attempting to adjust their cost structures on a one-time basis, in the face of market shifts, input price and interest rate increases, or other external shocks, has changed to a regular activity.

Managerial efforts to create value by raising efficiency at the shop floor, has been accompanied by attempts to capture economies of scale and scope - in R&D, procurement, marketing, logistics and distribution - driving up firm size and industrial concentration. The type of scale economies firms are attempting to internalize do not reside only, or necessarily, at the shop floor level. To the contrary, technical progress in a large number of sectors have come to allow efficient production in smaller or more compact plants. There are, on the other hand, growing economies associated with setting up and operating logistical systems (as firms compete in time), and in distribution and marketing, among other activities.

Increasingly, firms concentrate their efforts in what they do well, selling off peripheral assets and businesses outside their core, while outsourcing non-core activities. The objective is not simply to specialize, but to concentrate forces and gain specific weight in the marketplace. It is as if to have a seat at an imaginary table, to be heard and respected, firms need increasingly to be one of the major players in their main line of business. Thus a different type of scale economy is becoming important for firms to exploit, namely, the scale of the business itself, resulting in a massive process of mergers and acquisitions, which is changing the face of industry and services worldwide[8]. Focus, weight and knowledge are attributes which firms have come to perceive as key to defend and expand their market position in industries as diverse as steel, petrochemicals, capital goods, consumer durables, food products, electricity, telecommunications, shipping, among others.

Restructuring is also driven by global efficiency objectives combined with the need to expand market presence, and which have led to the rise of truly transnational corporations. As opposed to the classical multinational firms - which can be characterized as national firms with subsidiaries with foreign countries - the "new transnationals" are supranational in nature[9]. Though sales, technical assistance and related matters are undertaken locally - which is where they establish their presence - their core activities (R&D, planning, financing,

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[7] See, for instance, Izak Atyias, Mark Dutz and Claudio Frischtak, "Fundamental Issues and Policy Approaches in Industrial Restructuring," *Industry Series Paper no. 56*, The World Bank, May 1992.

[8] There seem to be a definitive trend for large-scale cross-border mergers and acquisitions. In 1996, 78 per cent of the world DFI flows were for M&As, an increase of 16 per cent over 1995. See UNCTAD, *World Investment Report 1996*, Geneva, September 1997.

[9] See Peter Drucker, "The Global Economy and the Nation-State," *Foreign Affairs*, Sept.-Oct. 1997.

sourcing, production, marketing) are conceived and carried out on a global scale, obeying a value-maximizing logic[10].

The same leitmotiv - global efficiency and closeness to the client - is driving interfirm cooperation and the formation of alliances. In industry and services, firms are associating themselves in order to compete more effectively in a greater number of markets while reducing costs, through the joint use of research, production, sales and distribution platforms, and logistical systems[11].

Finally, competition on a global scale is not only taking place among firms but also among nations[12]. Countries compete - more or less explicitly - for third party markets, for direct and portfolio investment, and other financial flows. Politicians and policy-makers are rarely passive bystanders; they (and the international business community) are paying increasing attention to country rankings - no matter how imperfect or subjective - and assessments undertaken, *inter alia*, by multilateral institutions, investment banks and international consulting firms, of where their country stands relative to other economies in the region and elsewhere[13]. Policy makers have become particularly interested in, and aware of, policies and instruments used in other jurisdictions to attain (industrial and trade) development goals. And the value of such information has grown, as policy competition has intensified.

Fourth, globalization is also bringing economies closer to each other through trade and investment. As measured by the trade intensity of production, the degree of interdependence has grown over the last decade and a half. The growth of world merchandise trade has been systematically above the expansion of production (Table 2.1).

Table 2.1. World Merchandise Trade

	1981-90	1991-95	1996	1997-2006
World Trade growth[a]	4.1	6.3	5.4	6.4
World output growth	2.9	2.0	2.9	3.4
Trade – output growth ratios	1.41	3.15	1.86	1.88

Source: World Bank *Global Economic Prospects 1997*, Washington, D.C., 1997.
[a] Growth rate of the sum of merchandise export and import volumes. Growth over historic intervals computed as compound annual rates.

[10] For a detailed discussion on the globalization of production, see The World Bank, *Global Economic Prospects and the Developing Countries*, chapter 2.

[11] According to a Booz-Allen and Hamilton survey of 5,500 alliances undertaken by 500 major companies over a 5-year period ("Cross-Border Alliances in the Age of Collaboration"), rates of return from alliance investments have been significantly higher compared to those undertaken by firms individually (18 per cent vs. 11 per cent).

[12] This is not to say that nations engage in zero-sum games when they trade with each other; to the contrary, trade under normal assumptions is welfare enhancing for both parties. See the discussion in Paul Krugman, *Pop Internationalism*, MIT Press, 1996.

[13] The two foremost rankings are undertaken by the World Economic Forum and the International Institute for Management Development at Lausanne.

Moreover, the ratio in growth rates (of world trade and output) jumped from 1.41 in the period 1981-90 to 3.15 in 1991-95, meaning that in the recent period, world trade flows have grown more than three times faster than output. In 1996, the ratio decreased to 1.86, and is projected to settle at 1.88 over the next decade. Thus trade will still be growing at nearly twice the rate as output over the next decade, with the strong implication that economies will be increasingly open and interlinked; and that trade will remain for the foreseeable future the engine of growth.

Yet this expansion in trade flows - driven by a combination of lowering policy barriers to import competition and improvements in transportation and communications[14] - is increasingly a product of transnational firm strategy of disaggregating production processes and outsourcing component pieces to regional and global production centres, thereby tying countries in "global production networks". Thus not only foreign direct investment inflows have grown at an unparalleled pace in recent years, but the nature of such investment is changing.

Indeed, foreign direct investment inflows have grown by 53.8 per cent in 1994-1996 (an annualized rate of 24 per cent, approximately four times as fast as growth in world trade), while to developing countries, FDI in the period expanded at a rate of 62.1 per cent (Table 2.2). Furthermore, even though such high rates may not be sustainable over the longer term, still it is expected that FDI will continue to expand at rates consistently higher than world trade and output. On its turn, such stream of DFI is reflecting "a rising outward orientation of MNE affiliates and the increasing importance of intrafirm trade in world trade: instead of aiming to primarily serve previously protected domestic markets, global production activities are increasingly serving to integrate host countries in the world economy."[15]

Thus, a fundamental corollary of globalization is that countries are becoming part of a single market, tied through trade and investment flows, which increasingly follow a global value-maximizing logic. For developing countries, this presents an unparalleled opportunity. If FDI is a precursor or driver of trade, and if trade is the "handmaiden" of growth, the ability of developing countries to attract a sizable proportion of FDI (which in fact they did - 40.8 per cent in 1996), would be tantamount to ensuring higher rates of economic growth for those countries. High in their policy agenda should be creating the right environment - with an educated labour force, efficient logistics and information networks - for such flows to take place.

Countries are being drawn into a global web of economic relations which do not only revolve around trade and direct investment; integration has an equally important financial dimension. At the most general level, it involves financial transactions in a multiplicity of markets, and through the use of a growing number of instruments and institutional arrangements which amount to some $13.4 trillion daily. These short-term flows - particularly in currency markets - are becoming a straightjacket on governments and their central banks, conditioning fiscal and monetary behaviour more effectively than international organizations (such as the IMF) have even been capable of; in view of the need to prevent speculative attacks, governments (both developed and developing) are being obliged to pay

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[14] Developing country import tariffs, as well as transportation and communication costs are estimated to have fallen by a third since the mid 1980s. See *Global Economic Prospects 1997, op.cit.*, chapter 2.

[15] See Ibid, p. 2-7 and seq. See also *World Trade Organization, Trade and Foreign Direct Investment: A New Report by the WTO*, Geneva, 1996.

attention to macroeconomic fundamentals, avoid policy mistakes, while building defensive walls against short-term movements.

Table 2.2. Foreign Direct Investment Inflows (in $ million)

1994		1995		1996	
Country		**Country**		**Country**	
United States	49 903	United States	60 848	United States	84 629
China	33 787	China	35 849	China	42 330
France	16 628	France	23 753	United Kingdom	30 053
Mexico	10 972	United Kingdom	22 030	France	20 809
United Kingdom	10 300	Sweden	14 273	Brazil	9 500
Spain	9 359	Australia	14 251	Singapore	9 440
Belgium Luxembourg	8 514	Netherlands	10 766	Indonesia	7 960
Netherlands	7 382	Belgium Luxembourg	10 299	Mexico	7 535
Canada	7 299	Germany	8 940	Spain	6 396
Sweden	6 241	Mexico	6 963	Netherlands	6 290
Singapore	5 480	Singapore	6 912	Australia	6 043
Denmark	5 006	Spain	6 118	Sweden	5 486
Malaysia	4 342	Italy	4 878	Malaysia	5 300
Switzerland	4 104	Brazil	4 859	Poland	5 196
Australia	3 881	Hungary	4 519	Argentina	4 285
Brazil	3 072	Indonesia	4 348	Germany	3 851
Total Inflows a/	**225**		**315**		**346**
To Developing Countries	**87**		**100**		**141**
Percentage: DCs/World	**38.7**		**31.7**		**40.8**

Source: World Investment Report 1996, 1997
Note: a/ in billions of US$

Although recent (mid 1997) events in currency markets - most particularly in East Asia - have drawn attention to the risks associated with this enormous and highly volatile mass of "virtual money", financial integration and the growth in "non-speculative" flows have had a far more significant implication for developing countries. Between 1990 and 1996, net long-term private capital flows to those countries (in the form of portfolio investment in equity, bonds and other instruments, as well as loans) have grown from 1 per cent to 4.5 per cent of developing country GDP. In 1996, such flows reached $245 billion (an increase of over 30 per cent relative to 1995), while official development assistance fell to $41 billion[16].

Thus, during this decade private capital flows have become - and it is arguable that short of a major disaster will remain - the key source of external finance for the domestic

[16] See *Global Economic Prospects 1997*, chapter 1.

investment needs of developing countries. Moreover, better macroeconomic management reflected in institutional investor credit ratings in all developing regions (which have systematically improved since 1992) and relatively low interest rates in international markets, have allowed a growing number of countries (over 30 in 1995-96) to gain access to international bond and equity markets, expanding these countries' investment (and consumption) possibility frontier.

Financial globalization has both accompanied and reinforced the trend towards "real-side" integration. If one hypothesizes that the world is moving towards an era of capital abundance, insofar as opportunities in developed countries are becoming less attractive as those economies mature and consumption needs are tapering off (thereby generating an excess supply of savings), then international private capital flows can be expected to function as an effective and increasingly important development finance "bridge", smoothing consumption, complementing domestic savings and - possibly most important - spilling over to developing countries market-generated knowledge on the real economy. Ultimately, just as with trade and investment, deepening financial integration serves to universalize concepts and provide a common language, thereby tying countries closer to each other.

Fifth, and finally, real and financial integration are providing the "material" basis for intercountry cooperation and exchange. Such interaction has two faces: one, which is voluntary - such as the exchange of information (as among antitrust bodies) and the establishment of rules which are followed by consensus (as in the case of the Basel Committee on Banking Supervision)[17]; another which is characterized by the collective imposition of compliance requirements regarding universal rules of behaviour. With global institutions increasingly calling for greater policy coordination and harmonization, the design of industrial policy, in particular, is becoming a more complex process, being clearly constrained by such rules.

The nature of inter-state interaction changes as one moves from a global to a regional perspective. Although WTO and other multilateral institutions have gained preeminence with the widespread recognition of the importance of open trade and investment regimes (in goods and services) to economic growth, regional arrangements are becoming the cornerstone of economic (and political) partnership. For one, four-fifths of world trade is conducted within blocs, and intrabloc trade has been growing at faster pace since the late 1980s than extra-bloc trade in all four major regional blocs (EU, NAFTA, ASEAN and MERCOSUR)[18]. It is arguable that "deep" integration that culminates the formation of regional

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[17] Although the national state is not being replaced by some kind of global governance arrangement, and while power does not yet seen to be shifting from the state to non-hierarchical, network-based non-state and other institutions based on voluntary association (as the "new mediavelists" seem to suggest), still the nature of the state is changing and so is inter-state exchange. Globally, "transnational government networks" are forming among national regulatory institutions. Interagency cooperation is most frequent in competition and antitrust policies, capital markets regulation, banking and insurance supervision, environment protection, among others. The objective is to make more effective the implementation of national legislations. See Jessica T. Mathews, "Power Shift," *Foreign Affairs*, January-February 1997. According to Anne-Marie Slaughter, "the state is not disappearing; it is unbundling into its separate, functionally distinct parts. These courts, regulatory agencies, executives, and legislatures are then networking with their counterparts abroad, creating a new transgovernmental order." See "The Real New World Order," *Foreign Affairs*, September-October 1997.

[18] See UNIDO, "From Open Regionalism to Multilateralism: Forging Partnerships for Global Competitiveness in ASEAN and MERCOSUR," report presented at the G-77 and China Conference on Trade, Finance and Investment, San José, Costa Rica, 13-15 January 1997 (Table 1).

blocs will impose further limits on industrial policy making; more than harmonization, it will eventually lead to the unification of policies.

In sum, the world economy is undergoing a profound transformation with the acceleration of technical progress - particularly as it relates to information technology -, heightened competition, the reorganization of firms and the restructuring of industry, trends which only tend to intensify in the future. Global enterprises - and among them, the transnational firms - have become the major actors of this process. Micro, small and medium-sized firms will remain competitive if integrated within networks organized around complex, multifaceted firms or groups. Countries, tied through trade, investment and financial flows, will be interacting increasingly as partners, while policy-makers will need to devise new means to ensure the effectiveness of policies in a new, and far more complex environment.

3. What is Industrial Policy? Basic Ideas and New Concepts

In the last two decades, industrial policy has become a concept pregnant with different meanings. To many people - including politicians and policy makers - it is equated with government intervention in (functioning) markets. And insofar as markets have been increasingly regarded as the central institution for efficient resource allocation, industrial policy - distinct from other government policies - have become identified with economic distortion and significant mistakes in the form of protection and promotion of inefficient firms and non-viable sectors. Thus, it is not uncommon to hear that "the best industrial policy is no policy". Yet, semantics apart, industrial policy simply means *policy towards industry*: its economic impact - on markets and incentives - depends on the specific objectives of policy, instruments and circumstances in which it is applied.

Fundamentally, there are three basic (and to some degree complementary) recognizable categories of policies whose focus is industry: those which address the *"framework conditions"* within which firms operate; those concerned with *"capability-building"*, with an emphasis on the accumulation of knowledge-related and other endowments, within an industrial development perspective; and those targeted at creating or enhancing the competitive position of a sector or a cluster of sectors - thus translating into some form of *" vertical targeting"*.

Industrial Policy as Framework Conditions

This approach is characterized by policy neutrality in the sense that no specific industrial or economic sector is privileged. The objective is to address the industry and economy wide factors which impact the competitiveness of industrial firms[19].

The objective would be to improve the elements of "systemic nature" which impinge on the incentive regime firms face, their cost structure and competitive position. *Framework policies* thus encompass, build upon and are not independent of "structural adjustment", including the liberalization of trade, the deregulation of domestic factor and product markets (with the lowering and elimination of policy-generated barriers to competition), and the privatization of state assets geared to the production of goods and services.

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[19] For a brief discussion on this "new policy paradigm" see Rauf Gorenç "A New Approach to Industrial Policy," *The OECD Observer*, 187, April/May 1994. For a comprehensive discussion, see Michael Porter, *The Competitive Advantage of Nations*, New York, The Free Press, 1990, possibly the most influential work on the "systemic competitiveness" paradigm.

Yet, a supportive framework for industrial firms would need to go beyond such "first-generation" reforms and include:

- property rights and a system of justice which ensures the enforceability of contracts;
- macroeconomic stability and predictability as reflected in low inflation, tax and interest rates, and a competitive exchange rate;
- market-supportive institutions to ensure competition and factor mobility;
- an elastic supply of infrastructural and industrial services; and
- a policy and regulatory regime encouraging of private sector development and which establish the basis for national firms to operate globally in an increasingly open environment.

The point here is not to make an exhaustive list of the exogenous (to the firm) factors which drive industrial competitiveness, but to stress the conceptual importance of a framework approach to policy formulation[20]. It has a clear, operational message: industrial firms to compete in global markets require supportive domestic conditions. Factors which hinder their competitive efforts should be removed; elements in the environment which are critical to their competitive advantage - including effective government - need to be reinforced.

A framework approach to policy is also a politically powerful tool insofar as people and politicians can readily understand the notion of "country costs", namely the economic burden (in most instances measurable) that negative conditions of the economic and regulatory framework impose on the competitive standing of firms. Moreover, such an approach is politically "neutral": both developmentalists and economic liberals (and even fundamentalists) accept the principle that unnecessary costs should not be imposed on national firms at a time of intensifying competition, and that government has a role in minimizing such costs.

Industrial Policy as Capability Building[21]

This notion could be construed as particular case of the "framework" approach to policy design. The scarcity of technological and human resource endowments could be read as a competitive disadvantage for firms and nations. An improvement of the competitive framework would call for building up such endowments. Yet, there is a fundamental difference which justifies placing this policy approach on a different category: the perspective in this case is that of the requirements of long-term industrial *development*. The build-up of capabilities is a purposeful act of creating comparative advantages, while helping move firms

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[20] For a more systematic discussion see Claudio R. Frischtak, "Manufacturing Competitiveness," paper presented at the UNIDO workshop on the Industrial Policy Report, Vienna, January 1997. See also Klaus Esser, Wolfgang Hillebrand, Dirk Messner and Jörg Meyer-Stamer, "Systemic Competitiveness. International Competitiveness of Enterprises and Challenges for Policy Makers," *German Development Institute Report*, Berlin, 1994.

[21] A number of authors stressed the importance of building technological and related capabilities as a prerequisite to long term industrial development. See, for instance, L. E. Westphal, L. Kim and C. Dahlman, "Reflections on the Republic of Korea's Acquisition of Technological Capability," in N. Rosenberg and C. Frischtak (eds.), *International Technology Transfer: Concepts, Measures and Comparisons*, New York, Praeger, 1985.

along the technological gradient. Thus, in attempting to build *industrial capabilities*, the object is not only to improve the environment for technology development but materially contribute to enlarge the endowment base.

The central issue for industrial development within a "capabilities"approach is how to accumulate technological endowments and human resource skills to make the transition from an industrial base focussed on the production of light consumer goods (typically textiles, garments and foodstuff), typical of the early stages of industrial development, to more complex manufacturing characteristic of intermediates, capital goods and (eventually) consumer durables. The answer laid in the accumulation of some critical resources which allowed firms to absorb and adapt foreign technology, and eventually embark in their own innovative efforts. The unit of analysis shifted from the "economic framework" to the individual firm: industrial policy, in this perspective, would be targeted at facilitating firms to acquire the knowledge embodied in capital goods, designs and other non-tacit sources of technology, as well as the operative and decodifying skills required to master and use efficiently technology.

In this paradigm, the environment is taken as a given, and assumed to be favourable or at least benign to accelerated industrial growth. Effective government capacity exists to deliver the fundamentals for firms to compete: an elastic supply of skilled labour, finance, access to imported capital goods and technology, and, at the early stages, a protected domestic market for firms to use as a springboard to world markets. The role of policy is to maintain government and firms focussed on the essentials of industrialization: the accumulation and application of knowledge to production; learning to produce (assemble), manufacture, copy, adapt and innovate; and a relentless effort by managers and workers to improve on existing processes and products, and slowly catch up with the frontier, in a matter of few generations. Japan was the model to be emulated. The government was assumed to provide a friendly environment to business; the latter would do their part by mobilizing resources (including a regimented labour force), accumulating capital at the fastest possible pace (with the support of government-supplied finance), while committing itself to aggressively penetrate export markets.

If this is a feasible strategy for most developing countries to follow is an open and extensively debated question; the reading of the East Asian experience is as varied as the perspectives on development. Yet, irrespective of the greater or lesser relevance of the industrialization path followed by these countries, the latter served to establish the *importance (if not the primacy) of education, skill acquisition and the accumulation of knowledge to long-term industrialization*. On its turn, the central merit of the capabilities approach is the insistence on an active technological strategy, inducing and facilitating firms to learn to produce efficiently, design and differentiate products; while ensuring that government institutional and material resources are allocated to expand the supply of an educated labour force (including scientists and engineers - the latter the actual "carriers"of technology), and oriented to respond (as in the case of research institutes) to the demands of society[22].

Industrial Policy as Sectoral or Vertical Targeting

Sectoral policies are generally associated with an explicit and direct attempt to change the industrial composition of output. Yet, targeting capacity creation and expansion should

[22] See Appendix A "A Note on Technology Policy for Institutional Delivery Systems", for suggested measures to promote the flow of knowledge from universities and research institutes to firms.

not be regarded as synonym of vertical policies. It is true that historically, the import substitution industrialization strategy (ISI) has been associated with policies to change the structure of industry. Development analysts and policy-makers read the experience of the late industrializers of the 19th century (particularly that of Germany, but also France and the United States) and the late-late comers of the 20th (Japan, above all), as providing a rationale for targeting the creation of capacity in increasingly complex industries. This was undertaken on the belief that there was a set of industries which were strategic to long-term development: steel and chemicals, among intermediates; and capital goods in general and the goods that make capital goods (machine-tools) in particular[23].

It is unquestionable that this has been the policy most subject to criticism - though there is no necessary and immediate association between ISI and sector-specific targeting: to the contrary, ISI was often implemented through blanket protection, and it is arguable that it was such across-the-board insulation that condemned the strategy, at least after the initial years of domestic demand-led growth.

Moreover, the strategy of export-led growth was equally adept at targeting individual sectors through a combination of regulatory barriers to competition (such as capacity licensing and other entry deterrent measures), protection against imports and promotion. What differed, in the case of South Korea for instance, was the insistence of the authorities on the achievement of export targets, combined with a far more selective use of protection. In particular, capital goods (and technology) imports, as well as that of other critical inputs and raw materials, were not banned or restricted, and exporters saw an export-biased or in the worst case, a "neutral" incentive regime[24].

Although the criticism against sectoral policies has left a deep imprint, de facto few countries have a completely unbiased, horizontal approach to policy making. First, horizontal policies more often than not have a sectoral projection when it comes to implementation. One does not have to be "picking winners" to target specific sectors. In other words, generic policies, such as those supporting SME development, or worker education and skill acquisition, are often defined, made operational and carried out at the sectoral level. And rarely such policies apply equally to all sectors. Generally, governments choose specific sectors to implement specific programs. Sectoral targeting could therefore be read as a means to increase the efficacy of industrial support programs.

There is an additional reason why some degree of targeting might be acceptable, despite the implicit risks, and even taking as a given the primacy of "horizontal" sector-neutral policies. Certain industrial segments are important in and of themselves. It is unlikely (and possibly unwise) for governments not develop a long-term or strategic view on those sectors. The point is relatively simple: the existence of sectors or activities with a specific non-marginal weight in the economy cannot and rarely is ignored by politicians and policy makers. As long as they represent a substantial proportion of output, exports or employment, directly or indirectly (through their input-output linkages), these sectors tend to be the object of policy, even if they don't have strategic value per se.

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[23] See Nathan Rosenberg, *Perspectives in Technology*, London: Cambridge University Press, 1976 (Chapters 8, 9).

[24] See Yung Whee Rhee, Bruce Ross Larsen and Garry Purcell, *Korea's Competitive Edge - Managing the Entry Into World Markets*, Baltimore, The Johns Hopkins University Press, 1984.

The rationale for supporting the creation of new sectors is often equally couched in terms of their relative importance to the economy. Yet, as opposed to industries which governments simply cannot overlook (and which in any case they de facto don't), there are significant risks in targeting "greenfield" industries, given that the government's limited ability to assess the economic and strategic value of an activity which does not yet exist[25].

Value Chains, Industrial Complexes and Clusters

Governments do not only target sectors. The scope of policy - particularly when the object is to remove bottlenecks for the competitive insertion of firms, as opposed to creating *de novo* an industry - has been extended increasingly to more encompassing constructs. Vertical disintegration (which has accompanied firms' search for more efficient processes) and new and more service-intensive demand patterns have not only blurred industries' boundaries but made the task of targeting individual sectors more elusive. As a result, the effectiveness of policy has become increasingly predicated on looking beyond the sector to value-added chains, industrial complexes and "clusters".

Input-output vectors have become the object of policy quite naturally. Figuratively speaking, the value chain is as strong as its weakest link. In other words, the competitiveness of a sector "down" the chain is a reflection of the competitive standing sum total of its parts. Thus addressing a weakness at the base of the input-output vector may have a multiplier effect on the competitive standing of all sectors along the chain, particularly if the weak link is from an activity which is either non-tradable or naturally protected (otherwise the input buyer would be seeing international prices).

The same basic reasoning would justify having *industrial complexes* (or "filières") being the object of policy. From an analytical perspective, it stands to reason that a competitive output is a function of a multiplicity of (competitive) inputs, not only those along the input-output chain. Thus the industrial complex is more than an input-output vector or matrix, but encompasses activities with an indirect or roundabout impact on production[26]. It could be argued that in the limit, this logic leads to a "framework approach" to the competitive analysis of products or product groups. The fundamental difference, of course, is that the object is to improve the standing of a subset of industrial activities (organized around a "complex", but having for reference a product or product-group), not the industrial sector as a whole.

The notion of "*cluster*" has been used with increasing frequency as an operational construct for industrial policy[27]. Potentially competitive industries would tend to be clustered

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[25] In order to target capacity creation in new areas, there should be a satisfactory answer to the following questions: *first*, what externalities or market imperfections would be leading to under invest in these emerging sectors? Are they significant? Why not intervene at the "point of distortion" as opposed to the investment allocation proper? *Second*, what informational advantage government has in singling out one or more sectors to be the object of special support measures? More generally, under what circumstances those (supposedly sizable) market failures - the justification for targeting - dominate government failures, the latter resultant from bureaucratic and regulatory weaknesses?

[26] Thus, for example, the textiles or food processing complexes would encompass textile machinery producers and their suppliers; while the information technology industry would subsume institutions related to training and innovation.

[27] The notion has been introduced and popularized by M. Porter in *The Competitive Advantage of Nations, op.cit.*

through the economy, drawing on "common inputs, skills, and infrastructure"[28]. Those clusters, as much as individual industries, would constitute the basis for national advantage. Arguably, government policy would more likely succeed in nurturing and reinforcing an existing or nascent industry cluster than in trying to promote an entirely new one[29].

Targeting clusters, though not akin to targeting sectors, is essentially similar. In all such instances, there is a presumption that a "vertical" approach to industrial policy is more effective than, or at least should be undertaken in parallel with, improving the factors responsible for the competitiveness of industry or the economy as a whole. Clearly there are "horizontal"policies which must be implemented along sectoral or equivalent lines. Yet, the issue goes beyond implementation effectiveness: should the sector, cluster or some functional equivalent be the focal point of policy efforts towards industry? Or should policy makers' emphasis be on the general conditions of the economy which affect the competitiveness of industrial firms and look at sectors or clusters on an exceptional basis?

With the benefit of hindsight, it is unquestionable that a neutral, horizontal approach to industrial policy is not as risky, informational-intensive or resource-absorbing as vertical measures, particularly when the latter involves complex constructs which go beyond a well defined sector. Identifying and targeting policy and regulatory obstacles, as well as high-cost economy wide factors, which confer a competitive disadvantage to firms can be done with limited resources. Detailing an action plan and carrying out the necessary reforms may be more costly, but the benefits appear to be compelling: a number of countries have been relatively successful in lowering their systemic costs and building a more competitive environment.

Improving the overall competitive framework of a country should be a regular activity undertaken by national governments. All firms should see progressively lower "external" costs within an incentive regime which pushes them to the price-performance frontier. Yet, it is arguable that under certain circumstances, horizontal actions may be quasi-innocuous, or have at most a marginal or long-term impact on the competitiveness of individual industries.

This may be the case, for example, when an industry comes under growing competitive pressures, and unless radical restructuring measures are undertaken, it will not survive. A hands-on, proactive policy, targeting the industry under competitive stress, may be therefore required, if economically feasible, and taking into account that restructuring tends to be a resource-intensive exercise. However, what characterizes this example is its exceptionality and the clear focal point that an industry under stress becomes. Otherwise, targeting the development of a new or existing activities should be preferably circumscribed as part of regional or local development efforts; which brings as a rule a lower implicit risk, insofar as policy makers are closer to their object. Moreover, explicit targeting involving protection and promotion (through fiscal and financial subsidies, for example), unless "hidden" as part of regional development efforts, would tend to attract and be the object of close scrutiny from other countries.

Thus, the balance between "*framework policies*" and "*vertical policies*" shifts depending where policy makers stand, with an emphasis on the former at the national level, and a greater justification for vertical strategies - such as cluster development - at the regional

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[28] M. Porter, *op.cit.*, p. 135.

[29] Ibid, p. 655.

level[30]. And one generally finds a hybrid use of industrial policy concepts, both at the level of discourse and in practice[31]. Yet, policy-makers not only need to come with a proper policy mix to establish a pro-competitive framework and selectively address sectoral issues. Above all they must ensure that industrial policy looks beyond the short and medium term, and fits a development strategy.

In this perspective, the role of policy is to provide an *organizing principle* which brings coherence to action, framed against a vision of the future of industry. As argued in the next section, the notion of policy as vision is of sufficient generality to produce alternative operating concepts of development, a fundamental prerequisite for policy to fit the development needs in a fast changing global environment.

4. Policy as Vision

When analysts posed the "capability-building" paradigm, they provided an organizing principle and an integrating concept or construct of development - the accumulation of technological competence. The task of mobilizing critical factors of technological nature was then an immediate consequence. Yet, this paradigm, if not outdated, does not provide an effective response to the challenges posed by the forces of globalization, as described in section II. In fact, no single model does. What one needs is a *flexible development tool*, capable of generating (industrial) development models capable of responding to specific circumstances.

Industrial policy, as argued in this section, is more than a framework which establishes the competitive conditions within which firms should operate; or a path for building some critical capabilities for the industrial sector; or still, programs targeted at vertical constructs. Industrial policy should instead be understood as *a strategic vision of the economic and industrial future of the country* (or region, city), and the means - instruments, mechanisms and institutional arrangements - necessary make this vision a reality.

The specific paradigm or model which informs policy action is not given ex-ante. In an increasingly complex and uncertain environment, what policy makers need - more than an anchor - is a flexible and operable concept of development. The *vision* should be understood as an *organizing principle (or frame of reference), from which an operating concept* -

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[30] The proposition that targeting individual clusters may enhance the competitive advantage, particularly of regions and cities (because of the tendency for cluster to be geographically concentrated), is in the process of being tested in the Andean countries. In Colombia, Peru, Bolivia and Venezuela, "...el centro de la estrategia no es tanto una visión del desarollo industrial, como la búsqueda del aumento de la competitividad de sectores productivos industriales, primarios y de servicios a partir de la creación de ventajes competitivas a nivel de grupos de actividades (*clusters*), con concreción a nivel regional o local." See Wilson Peres (coord.), *Políticas de Competitividad Industrial: América Latina y el Caribe en los años noventa*, Mexico, Siglo Veinteuno Editores, 1997, chapter I (pp. 17-8).

[31] Take Brazil's recent "Investment and Competitiveness Policy" as articulated by the National Economic and Social Development Bank. "The restructuring of the most affected sectors [by import liberalization and stabilization], increasing the density of production chains, the increase in value-added and the technological modernization of exports, are the main objectives to be reached...[involving] the reduction of the so-called "Brazil cost" through privatisation, ,logistical improvements, tax rationalization, deregulation, debureaucratization, interest rates reduction, generic horizontal policies, insofar as comparative advantages are "created" by massive investments in training, education, technology and information. The systemic competitiveness of the country has to be built, after being weakened by years of protection, stagnation and inflation." See Luiz Carlos Mendonça de Barros and Lídia Goldenstein, "O BNDES e a Política de Reestruturação Industrial," *Gazeta Mercantil*, August 26, 1997.

and a synthetic objective - of (industrial) development is defined, and the associated medium and long-term requirements to attain development objectives established.

In general terms, the process of establishing a path for industrial development within this perspective would involve:

First, articulating a *shared vision of the country's future* and its position in the international economy. Equally important at this stage is to denote the legitimate arena - the scope and limits - of government action[32];

Second, defining an *operative concept of development*, derived from this vision. This concept should have a synthetic quality, and be anchored on a strong rationale;

Third, specifying the *basic institutional and resource requirements* associated with, or determined by, the operating concept; and

Fourth, devising an *implementation strategy* which

- identifies the barriers to the operative concept of the vision;
- establishes an action program to remove them; and
- defines a set of projects (and correspondent investments) consistent with the long-term goals; and

Two brief examples follow for only illustrative purposes.

Take, in the first instance, a country which aspires to become an important producer for the regional market and a non-marginal player in world markets: this is its *vision* of the future.

➥ The derived operable concept would be that of a "*competitive production platform*" for world markets (such as South Korea and Taiwan in East Asia, or Chile in Latin America).

➥ The underlying *rationale*: the forces that shape the world at this end-of-the-century are international in nature: direct foreign investment, intra and interregional trade and the international flows of technology; growth is to an increasing extent being driven by such forces. The increasing importance of DEI and of industrial exports as sources of investment and economic growth imply that successful industrialization strategies would hinge upon the internationalization of domestic economies

➥ *Requirements*: a set of decisive actions to integrate the country's economy in the global market and in the investment, trade and technology networks. They would include the acquisition of administrative capabilities to deal effectively with WTO's rules; promote exports and enhance the export-orientation of domestic industry within those rules; and engage in regional trade arrangements.

Assume instead that the country's ambition is to become a centre for integrating - and standing at the nexus of - regional production and distribution networks. This is its *vision* of the future.

➥ The *derived operable concept* here is that of an "*entrepôt*".

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[32] This includes defining what is unacceptable and won't be condoned, eg., uncompetitive and rent-seeking practices at home; and policies that give direct or indirect support to such practices Often a critical issue is to define in an unambiguous way the scope and limits of Government action. In the absence of a clear framework, governments have a lesser resistance to the introduction of ad-hoc measures, and special regimes, favouring incumbents in mature segments, which is inconsistent with a progressive view of the economy.

➥ The underlying *rationale*: The notion of entrepôt was originally associated with a centre for concentrating, handling and distributing commodities. This role - preeminent during mercantilism - is again gaining importance. At the post-industrial stage, the entrepôt's function is to integrate the different activities of the value-added chain, a highly attractive and economically rewarding role, as attested by the contemporary experiences of the Netherlands, Singapore, the city of Los Angeles, and more recently, Jamaica.

➥ *Requirements*: efficient logistical systems and related infrastructure; telecommunications backbone to facilitate access to information and an educated population to transform this information into knowledge; the presence of advanced, high-value services (that is, those intensive in knowledge); a strategy to either capture exogenous trade flows (as for the Netherlands, with its outstanding ports, transportation systems and distribution bases, or in the case of Jamaica, which was able to route and distribute a significant volume of East Coast imports/exports through Kingston with an effective new legislation) or building endogenous flows by establishing an export platform and/or a dynamic local market, or both (as with Singapore). Finally, an entrepôt is predicated on an effective government, able to commit to invest in critical infrastructure and associated logistical systems, service-oriented education and skills, and regulatory reforms (including the tax system) to attract firms specialized in adding value by linking and integrating production and distribution.

None of those examples should in any way be construed to mean more than a simple illustration of how the notions of *vision, derived operable concept, and development requirements* would be worked in a "concrete" setting. The point, however, is to show that the concept of vision has some basic characteristics that make it highly desirable: it is flexible, general and brings an implicit development perspective, insofar as the objective is to project into the future a collective aspiration and establish the conditions for realizing it.

In fact, there is a significant amount of experimentation currently taking place in attempts at "vision framing"[33]. Some are specifically geared towards industrial development objectives; more often, however, such exercises have a broader agenda, encompassing the social and economic development of some economic jurisdiction. Most of them involve establishing consensus-building institutions. This is no accident. The *vision* is as good as the multivariate experiences and commitments it incorporates. In this sense, if the objective is to project a shared vision - a collective "ambition" or aspiration framed in strategic terms - the substance of that vision cannot be separated from the process by which the vision was arrived at.

Thus the exercise of arriving at a vision presupposes a minimum amount of accumulated social capital and a critical mass of individuals capable of credibly committing to investment projects[34]. That does not deny the need for leadership - coming from government or civil society. To the contrary; rarely are those processes spontaneous. However, insofar as the vision and the derived operable concept of development only reflect the perceptions

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[33] See Appendix C "Some Illustrative Examples of Shared Vision Partnerships".

[34] By social capital one understands as "the ability of people to work together for common purposes in groups and organizations." See Yevgeny Kuznetzov, "Principle of Hidden Hand: Putting Private Sector-led Shared Vision in Action - Proposal Outline," *mimeo*, April 8 1997.

and experience of few individuals, it is unlikely that it will amass sufficient mutual trust to sustain the public and private commitments to effect change.

Finally, the locus of discussion and vision sharing exercises would be focal points of exchange between government and the private sector. Experience shows that these arrangements are instrumental in opening lines of communication; aggregating interests; while providing information and coordination externalities. And in this process, the government - a strategic player and with who generally rests the policy initiatives - should be a partner, neither isolated from nor captured by, but instead imbedded in the dynamic forces of the economy and society.

5. Concluding Remarks

As argued in this paper, industrial policy should be understood as a *vision of the future of industry,* a product of consensus-building within new forms of public-private partnerships. The notion of vision - and the mechanisms used to cast it in concrete terms and arrive at some operative concept of (industrial) development - has an essential characteristic: it is sufficient general so as to accommodate alternative development models or paradigms. In this sense, it fits with the requirements of an increasingly complex and fast changing environment within which firms and nations interact.

Appendix A: A Note on Technology Policy for Institutional Delivery Systems

The acceleration of technical change which accompanies the process of globalization calls for a radical reorientation of S&T efforts in many (if not most) developing countries.

Technology policy would need to be geared towards:

- promoting the inflow and dissemination of knowledge, fundamentally through FDI and a massive effort at improving access to information (by basically making the Internet and its resources available to all), combined with the universalization of basic education, and demand-sensitive efforts at skill acquisition and training; and
- improving the use of existing technological resources, by ensuring the transfer of knowledge generated in universities and government R&D institutes to industry (and society at large), in view of the fact that universities and research institutes remain in general isolated from, and unresponsive to, the productive sector..

Maximum priority should be placed in promoting effective connections between the S&T institutional network (including public-funded universities) and the productive sector, in view of their fragile links. Science and technology for their own sake should be avoided.

A decisive program to strengthen the industry-research institutes links would involve:

(i) the imposition of a tight budget constraint on applied research and other S&T institutions. All such institutions (except those engaged in basic science) should be encouraged to restructure their activities in order to progressively become financially self-sufficient by selling services, training and recycling researchers from the private sector, and seconding in-house research staff to enterprises for periods of up to three years; and

(ii) the denial of funds to S&T activities of applied nature unless a **client** willing to contribute counterpart funds, and capable and interested in monitoring a specific program has requested such activities or has been identified by the research team or unit receiving the funds. All clients must have a material interest in how efficient is the institution (or the research division or group) and the quality of the results. The lax management of S&T resources which resulted from the absence of effective monitoring of inputs and evaluation of outcomes must be stopped.

One of the basic problems facing many institutional delivery systems is the lack of direction in where it counts most: the allocation and use of S&T resources. The general orientation towards S&T institutions should be grounded on the following **principles and actions**:

First, **decentralized monitoring of S&T activities**. Generally, government's ability to effectively monitor the use and allocation of its resources, and the quality of output derived from S&T activities undertaken by institutions and teams it finances, is very limited. As a result, there tends to be no credible evaluation of the quality and social relevance of these activities.

Second, **increased financial autonomy of research institutions and teams**. Governments resources should be matched by private funds in the financing of S&T activities of applied nature. In general no funds should be allocated without counterpart resources, where the responsibility for finding resources (or, more generally, selling their properly

coasted services) should fall on the institution or research team receiving the funds. In this regard, it is important that well-accepted, cost-accounting methods be introduced and specific marketing capabilities developed, as part of the institutional restructuring efforts.

Third, **mobility of S&T resources and their flexible deployment**. In order for institutions and teams to respond to their clientele and approach financial self-sufficiency, it is essential that S&T resources -- particularly technical staff -- be movable to other institutions of the system, to private firms (on a secondment basis, for example), or be simply fired, if necessary. Systems of de facto lifetime employment in many, if not most, S&T institutions, do not generate the incentives neither for individual nor institutional efficiency. Conversely, institutions should be ready to "open" their laboratories, train and recycle technical staff of private firms (and agencies which house technical services).

An important part of restructuring plans should be devoted to stimulate mobility, in view of the fact that many, if not most, agencies and institutions in developing countries are overstaffed. Governments may want to issue broad guidelines regarding the secondment of technical staff to private firms and institute a pilot program that establishes material inducements for mobility (in the case of Germany, for example, a proportion of the researcher's salary is covered for an initial period of time). Governments may want to assign temporary, or permanent, researchers to companies with active technological strategies, through the use of research fellowships which would cover a declining share of the salaries of researchers (for instance, 50 per cent in the first year, 30 per cent in the second and 10 per cent in the third).

Finally, **emphasis should be placed on the so-called "transfer disciplines and sciences"** -- those situated at the interface between basic knowledge and the solution of concrete problems, such as engineering, information, materials, chemical, biological and agricultural sciences. In many countries this would involve a reallocation of university resources to those areas and a reorientation of governmental budget towards these discipline areas.

Appendix B: A Note on SME development

Small and medium-enterprise development has been traditionally the object of supportive policies and mechanisms in a large number of countries. The result of those efforts has been uneven, with substantial administrative and financial resources spent with limited results.

SME development must emphasize networking while focusing on improving the entrepreneur's ability to "look beyond the immediate horizon", understand the environmental factors at play in the industry, -- such as the nature of demand, industry technological trends, the behaviour of competitors -- and be able to transact and negotiate with competitors, buyers, government agencies.

Networking, in this regard, has two distinct, but related dimensions.

First, linking up electronically SMEs to buyers and suppliers. In particular, a combination of low costs and reduced number of intermediaries propitiated by electronic commerce, has enhanced the possibilities of SMEs participating in the international market[35]. An immediate priority would be structure an Internet-based system, with up-to-date information about international markets, demand patterns, potential buyers, foreign technologies, alternative suppliers, contract terms, which would be made available on a decentralized basis[36]. Non-discretionary access to such databases should be provided to producers and trade associations.

Second, there is growing consensus that SME's ability to enter vertical or horizontal networks is critical for their market resilience and success, and in large measure dependant on the quality of management. It is through those relationships -- with larger buyers (on a subcontracting basis) or with other SMEs grouped in clusters and acting cooperatively (as in industrial districts) -- that technical assistance and finance is supplied on the most effective, incentive-driven basis.

An SME program would have to reflect the importance of developing networks with other firms, either in the Italian tradition of horizontal links within industrial districts; or following the East Asian and Irish experience of vertical linkages between larger producers and their subcontracting network, or a combination of both. The development of intranets is an enormous facilitating factor for linking up firms along the input-output chain or within geographically (or virtually) clustered "districts".

The promotion of vertical (subcontracting) networks is generally based on a "hands-on" approach to SME promotion, often involving a significant degree of sectoral and firm targeting. This has been the case, for example, with Singapore's Local Industry Upgrading

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[35] UNCTAD is proposing to establish the first SME-focussed Internet-based global network of commercial transactions, using 60 of the 140 Trade Points which make up its Global Trade point Network. A more decentralized approach is predicated on significant improvements in the national telecommunications infrastructure, which remains a major obstacle for the dissemination of Internet services in most developing countries.

[36] Brazil's SEBRAE, for example, presents an interesting model of SME informational support with its decentralized network of one-stop "windows" (balcões) and the Sipri (Investment Promotion and Technology Transfer) system. This project allows SMEs to connect themselves to international flows of technology, investment and trade. SMEs register in the system in one of SEBRAE's windows, supplying information concerning their needs and commercial interests, including the formation of joint ventures and other types of partnerships, which is then relayed through the network of Brazilian commercial attaches in 33 countries.

Program, Taiwan's Centre-Satellite Factory Production Program and Ireland's National Linkage Program, as well as South Korea's SME assistance program.

These programs focus on specific sectors which concentrate the largest number of potential buyers (often assembly industries and producers of intermediate materials); and, from the vendor side, segments in which the country possesses strongest comparative advantage and/or adequate production capability. Typically, the latter includes metal working, light engineering, plastic parts and components, and mould and die manufacturing. Within those subsectors, potential suppliers are chosen on the basis of quality of management, product and services, as well as reliability, delivery and cost competitiveness.[37]

The promotion of horizontal consortia of geographically clustered SMEs to internalize collective efficiencies, and of backward linkages within subcontracting networks should be part of a broader effort at SME development. This would generally involve elimination of cascading tax structure, that encourages vertical integration of production processes, by making subcontracting a more costly alternative; assistance in product testing, standardization, calibration and technology development; finance, including financial planning; management, with a strong focus on training towards total quality management; and marketing, through information centres, trade and investment promotion fairs, training and consulting services.

All these measures would be predicated on a shared understanding and broad base political commitment to SME development. It is noteworthy that in South Korea, the President himself used to chair a semiannual national conferences on SMEs, with monthly visits, regularly covered by the media to any SME. Countries with successful SME programs have attracted strong political support for SMEs, placing their development high in the political agenda. Further, they have placed overall responsibility for the SME program in a highly visible and adequately funded centre, in charge of implementing existing and developing new programs, serving as an ombudsman for SMEs and acting as a national advocate for SME development.

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[37] These programs offer the following services: searching for specific backward linkage opportunities, usually within targeted sectors; matchmaking individual firms for linkages; advising domestic SMEs on business development and planning; and providing support to buyer firms to develop vendor networks. The latter may need to be sensitized to the potential gains of closer and more durable relations with SME subcontractors, possibly with the help of study tours and expert advice from individuals with actual experience in establishing subcontracting systems.

Appendix C: Some Illustrative Examples of Shared Vision Partnerships

The exercise of defining a strategic or long-term vision has been undertaken to sensitize economic and political agents, mobilize society and build consensus around common development objectives in a significant number of instances since the early 1990s[38]. In Colombia, Peru, Bolivia and Venezuela, for example, proposals to enhance firm competitiveness were developed on the basis of a vision of competitiveness shared by public and private sectors[39]. A similar approach has been attempted in countries as diverse as Morocco and Jamaica. In Mexico, university, entrepreneurs and government are being engaged in defining a long-term vision as an instrument of social and economic development[40].

These exercises not only take place at the national level, but also in states (provinces) and cities[41]. The Consejo Empresarial Mendocino in Mendonza, Argentina, for example, was founded on the presumption that they should help reestablish the foundations of the province ("refundar" Mendonza), by "contributing for the long-term, thinking what has to be done for this society to survive and be competitive in a globalized world"[42].

In the state of Ceará, Brazil, possibly one of the most important contemporary experiments in social transformation is taking place over the last 10 years, anchored on an effective public-private partnership, the so-called "Pacto de Cooperação"[43]. After breaking up with the political oligarchy that dominated the state and implementing critical fiscal, administrative and other reforms, the state has been enjoying unprecedented growth and improvement in the standards of living, fuelled by private and public investments, many of them defined in the context of the Pacto.

The "Pacto", an instrument of civil society embedded in the state apparatus, has a broad agenda revolving around economic and social issues. Development and industrial policy is generated though extensive discussions concerning the future of the state, the constraints it faces, and the actions needed to remove them. Taking part in these discussions is a cross-section of most vocal and conscious elements in the state, including entrepreneurs, professionals, labour, media, NGOs, university, and government. Though the state government does not abdicate its role of policy setter, policies are de facto a result of a shared vision partnership. The case of Ceará is illustrative of the importance of defining common goals within public-private institutional arrangements in overcoming economic backwardness and launching the basis for sustainable industrial growth.

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38 One of the original "vision statements" was that issued by the Prime Minister of Malaysia in February 1991, popularly known as "Vision 2020". See *Malaysia: The Way Forward*, Malaysian Business Council, 1991.

39 See Wilson Peres, *op.cit.*, p. 18.

40 See Instituto Tecnologico de Monterrey, *Vision Mexico 2020*, Centros de Estudios Estrategicos, 1997.

41 In Mexico itself, for example, there are state-based movements such as Chihuahua Siglo XXI. There are also numerous cities engaged in similar exercises, including Barcelona, Rio de Janeiro, Lisbon, among others.

42 See interview with Enrique Percarmona, *Gazeta Mercantil Latinoamericana*, 25-31 August 1997, p. 11.

43 See Osmundo Rebouças, Cláudio Ferreira Lima, Flávio Paiva e João de Paula Monteiro, *Gestão Compartilhada: o Pacto do Ceará*, Rio de Janeiro, Quality Mark Editora, 1995, and "Ceará 2020," *Parceria*, 1, n.8, July 1997.

Technology Policy and Strategy for Building Industrial Competitiveness

Linsu Kim*

1. Introduction

Building industrial competitiveness draws increasing attention from policy makers, corporate managers, and academicians not only in advanced countries (Porter, 1990; OECD, 1996; Schacht, 1997) but also in developing countries (Cho, 1994; Lall, 1990; STEPI, 1995). In the case of developing countries, the issue is increasingly important for many reasons. First, the World Trade Organization regime preempts local market protection from foreign products, services, and investment, forcing firms in developing countries to compete against foreign firms in the domestic market. Second, the enforcement of intellectual property rights blocks imitative reverse engineering practice, forcing firms in developing countries to develop their own products and services or to pay royalties for technologies. Third, anti-dumping rulings make it difficult to cut export price, forcing firms in developing countries to compete on "fair terms." These factors make it imperative for developing countries to build industrial competitiveness in order to survive and grow in the increasingly competitive international market. What can governments and firms in developing countries do to build industrial competitiveness?

Industrial competitiveness may be defined at the two different levels: national and firm. At the national level, the term refers to the national economy's ability to produce goods and services that meet the test of international markets while expanding the real incomes of its citizens and employment opportunities. The above definition implies that industrial competitiveness at the national level rests largely on competitive firms in the nation generating the productivity levels needed to support high wages and generate employment, indicating the importance of the firm level competitiveness. At the firm level, the term may be defined similarly as a firm's ability to produce goods and services that defend or expand market position with its long-run profit margin relative to its rivals. That is, industrial competitiveness at the national and firm levels are analytically distinct but practically intertwined (Cohen, et al, 1984).

These definitions connote that technology is a major determinant of industrial competitiveness. Many studies in advanced countries have shown that more than 50 percent

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of long term economic growth stems from technological changes that improve productivity or lead to new products, services or industries (Denison, 1967; Goldsmith, 1970; Grossman, 1991). For this reason, the question often raised is how science and technology (S&T), which appear to be the key to industrial development in advanced countries, can be effectively used for building industrial competitiveness in the developing regions of the world (Kim, 1980).

Industrial development is, in fact, the process of acquiring technological capabilities and translating them into product and process innovations in the course of continuous technological change (Pack and Westphal, 1986). Technological capability refers to the ability to make effective use of technological knowledge in production, engineering, and innovation in order to sustain competitiveness in price and quality. Technological capability enables one to assimilate, use, adapt, and change existing technologies. It also enables one to create new technologies and to develop new products and processes in response to the changing economic environment. For these reasons, governments and firms should be concerned with technological capability to build industrial competitiveness.

In advanced countries, technological capability is accumulated through "learning by research," which expands the technological frontier. In developing countries, in contrast, technological capability is built primarily in the process of imitative "learning by doing." A few newly industrialized countries (NICs) have made the rapid transition from "learning by doing" to "learning by research." Korea is one of them (Kim, 1997a).

Korea has, indeed, transformed itself from a subsistent agrarian economy into a newly industrialized one during the past three decades. Beginning in 1962, the Korean economy grew at an average annual growth rate of almost 8 percent, raising GNP per capita in current prices from $87 in 1962 to $10,007 in 1995. Exports increased from a mere $40 million to $125 billion during the same period. In the mid-1960s, Korea began exporting textiles, apparels, toys, wigs, plywood, and other labour-intensive mature products. Ten years later, ships, steel, consumer electronics, and construction services from Korea challenged established suppliers from the industrially advanced countries. By the mid-1980s, computers, semiconductor memory chips, video cassette recorders, electronic switching systems, automobiles, industrial plants and other technology-intensive products were added to Korea's list of major export items. Korea is now working on such next-generation products as multi-media electronics, high density television, personal communication systems and a new type of nuclear breeder. By 1994, Korea ranked second in the world in shipbuilding and consumer electronics; third in semiconductor memory chips; fifth in textiles, chemical fibres, petrochemicals, and electronics; and sixth in automobiles, iron and steel (KDB, 1994). Such phenomenal growth and structural change in exports may be attributed to many social, economic, and technological factors, but most important of all may be the accumulation of technological capability.

Many political leaders and economic planners in other developing countries have shown keen interest in studying the Korean experience to see if what made Korea successful could be emulated in their own countries. What are the implications of the Korean experience for other developing countries to bring about the effective management of technology policy and strategy for building industrial competitiveness?

The term "technology policy" in this paper refers to a set of instruments that governments use in promoting and managing the process and direction of acquiring technological capabilities, while the term "technology strategy" refers to the way firms formulate their technological goals and objectives and mobilize resources to achieve them. It is evident that factors considered to be critical for building industrial competitiveness vary

according to a country's specific socio-cultural, economic, and technological conditions, calling for different policies and strategies. Nevertheless, and despite the evident differences, an OECD report implies that there is a remarkable degree of convergence in policy response among countries at the similar stage of industrial development (OECD, 1996).

This paper first presents two analytical frameworks. These frameworks will be used as tools to discuss the implications of Korea's experience for technology policies and strategies that may be effective for building industrial competitiveness in other developing countries.

2. Analytical Frameworks

The process of accumulating technological capability and in turn building industrial competitiveness is so dynamic and complex that it defies a simple analysis. Nevertheless, as an attempt to shed light on the dynamic process of capability building in developing countries, this section introduces two major analytical frameworks: one for analysing technology policy and the other for analysing technology strategy.

2.1 Analytical Framework for Technology Policy

This framework introduces three perspectives of technology policy: technology trajectory, market mechanism, and technology flow. For technology policy to be effective, it must respond adequately to global technology trajectories. Otherwise, a nation cannot be competitive in the international market. It must also address issues related to market mechanism. The demand side of the market creates the need for new technology, while the supply side of the market provides technological capability to meet the need. In developing countries, technology policy should also deal appropriately with technology flow from abroad.

2.1.2 Technology Trajectory Perspective

This perspective analyses and integrates two technological trajectories: one in advanced countries and the other in developing countries. Technological trajectory refers to the evolutionary direction of technological advances that are observable across industries and sectors.

Utterback (1994) postulates that industries and firms in advanced countries develop along a technology trajectory made up of three stages -- fluid, transition, and specific. Firms in a new technology will exhibit a fluid pattern of innovation. The rate of radical (rather than incremental) product innovation is high. The new product technology is often crude, expensive, and unreliable, but it fills a function in a way that satisfies some market niche. Product changes are frequent as are changes in the market, so the production system remains fluid and the organization needs a flexible structure to respond quickly and effectively to changes in market and technology (Abernathy and Utterback, 1978; Utterback, 1994).

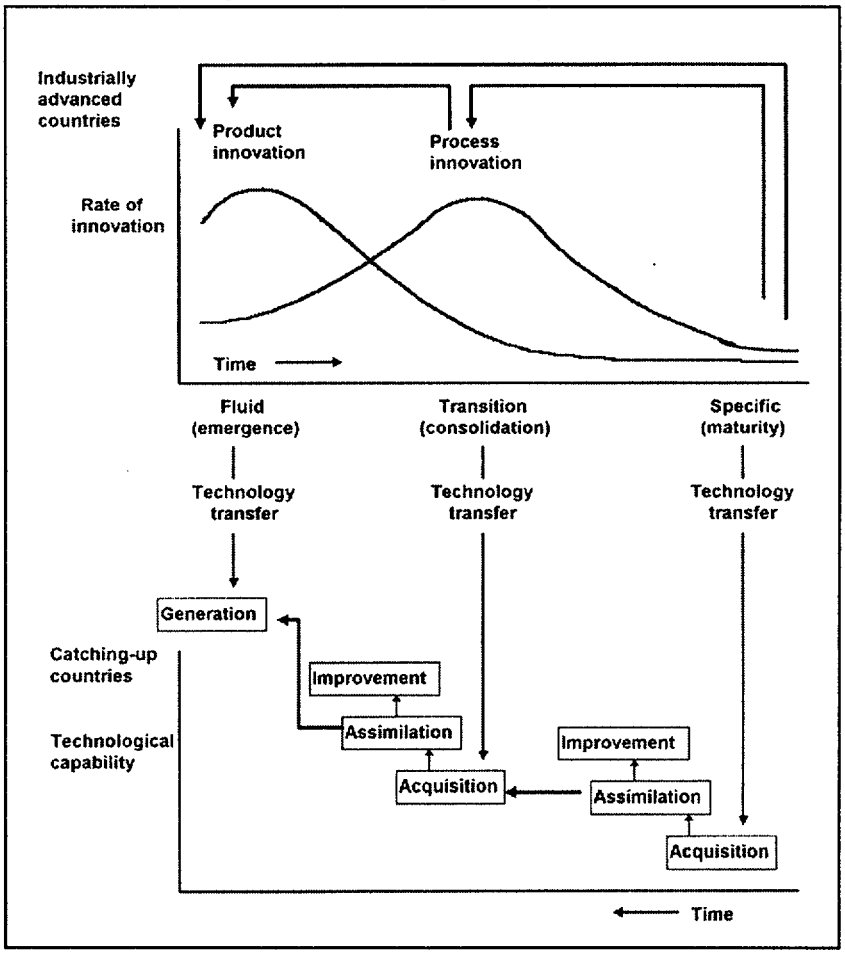
As market needs become better understood and alternative product technologies converge or drop out, a transition begins toward a dominant product design and mass production methods, adding competition in price as well as product performance. Cost competition leads to radical change in processes, driving costs rapidly down. Production capability and scale assume greater importance to reap scale economies.

As the industry and its market mature and price competition grows more intense, the production process becomes more automated, integrated, system-like, specific, and rigid to

turn out a highly standardized product. The focus of innovation shifts to incremental process improvements, seeking greater efficiency. When the industry reaches this stage, firms are less likely to undertake R&D aimed at radical innovations, becoming increasingly vulnerable in their competitive position. Industrial dynamism may become regenerated through invasions by radical innovations introduced by new entrants (Anderson and Tushman, 1990; Cooper and Schendel, 1976; Utterback and Kim, 1985). Often, these are innovations generated elsewhere that migrate into the industry. Some industries, however, are quite successful in extending the life of their products in this specific stage with a series of incremental innovations to add new values (Baba, 1985).

It is at the later part of this stage that industries are typically relocated to developing countries where production costs are lower. The upper part of Figure 1 depicts the above model. This technology trajectory model may change significantly with a shift in the techno-economic paradigm (Freeman and Perez, 1988). The Utterback model is, however, still useful in analysing technology policy and strategy in developing countries.

Figure 1. Technological trajectories



On the basis of research in the electronics industry in Korea, Kim (1980) developed a three stage model -- acquisition, assimilation, and improvement -- to extend Utterback's model. During the early stage of their industrialization, developing countries acquire mature (specific stage) foreign technologies from industrially advanced countries. Lacking local capability to establish production operations, local entrepreneurs develop production processes through the acquisition of "packaged" foreign technology that includes assembly

processes, product specifications, production knowhow, technical personnel and components and parts. Production at this stage is merely an assembly operation of foreign inputs to produce fairly standard, undifferentiated products. For this purpose, only engineering (E) efforts are required.

Once the acquisition task is accomplished, production and product design technologies are quickly diffused within the country. Increased competition from new entrants spurs indigenous technical efforts in the assimilation of foreign technologies in order to produce differentiated products. Technical emphasis is placed on engineering and limited development (D&E) rather than research (R).

The relatively successful assimilation of general production technology and increased emphasis upon export promotion, together with the increased capability of local scientific and engineering personnel, lead to the gradual improvement of mature technology. Imported technologies are applied to different product lines through local efforts in research, development and engineering (R,D & E).

Linking the technology trajectories of Utterback (1994) and Kim (1980), Jinjoo Lee and his associates (1988) postulate that the three-stage technology trajectory in developing countries takes place not only in mature technology in the Specific stage, but also in growing and emerging technologies in the Transition stage. As shown in the lower part of Figure 1, firms in developing countries, which have successfully acquired, assimilated and sometimes improved mature foreign technologies, may aim to repeat the process with higher-level technologies in the Transition stage in advanced countries. Many industries in the first tier NICs (e.g., Taiwan and Korea) have arrived at this stage. If successful, they may eventually accumulate indigenous technological capability to generate emerging technologies in the Fluid stage and challenge firms in advanced countries. When a substantial number of industries reach this stage, the country may be considered to be a member of the advanced countries. In other words, developing countries reverse the direction of technology trajectory in advanced countries.

2.1.2 Market Mechanism Perspective

This perspective includes both the demand and the supply side of technology development. It organizes policies into three major components: (i) policies designed to strengthen the demand side, creating market needs for technology; (ii) policies designed to strengthen the supply side, increasing S&T capabilities; and (iii) policies designed to provide effective linkages between the demand and supply sides, attempting to ensure that innovation activities are both technically and commercially successful.

The three policy components should be well balanced in order to facilitate the accumulation of technological capability effectively. For example, unless there is a competitive market, little investment will be made for innovation activities, as innovation is usually uncertain and risky. Also, capabilities established in public R&D institutes and universities cannot be utilized in the absence of societal demand for innovation. In this sense, S&T policies should be an integral part of the overall industrial policies that shape market structure and industrial development.

However, even though the market calls for the introduction of new products and processes, countries without indigenous technological capabilities cannot be expected to grow industrially. That is, industrial competitiveness stems from the ability to accumulate

technological capability and to translate it into competitive products and services in the international market. This is the problem many developing countries face today.

Despite the presence of both demand for innovation and supply of capabilities, few innovations can be expected to take place unless there is good management of the R&D system, effectively linking demand with supply. It is the absence of some critical elements in this linkage that explains why industries and societies in advanced countries often fail to innovate despite the presence of strong demand for innovation and an adequate supply of technological capabilities.

2.1.3 Technology Flow Perspective

Government policies related to technology development may also be assessed by the technology flow perspective. This perspective is mainly concerned with three key sequences in the flow of technology from abroad to developing countries: transfer of foreign technology, diffusion of imported technology, and indigenous R&D. The first sequence involves technology transfer from abroad through such formal mechanisms as foreign direct investment (FDI), the purchase of turnkey plants and machinery, foreign licenses (FLs), and technical services. Such transfer can facilitate the acquisition of technological capability in developing countries.

The effective diffusion of imported technology within an industry and across industries is a second sequence in upgrading technological capability of an economy. If a technology is transferred to a firm and its use is limited only to its original importer, it may give the firm monopoly power over others for a period of time; however, the broader economic effect of the technology may be considerably limited. To maximize its economic benefits, imported technology has to be diffused throughout the economy.

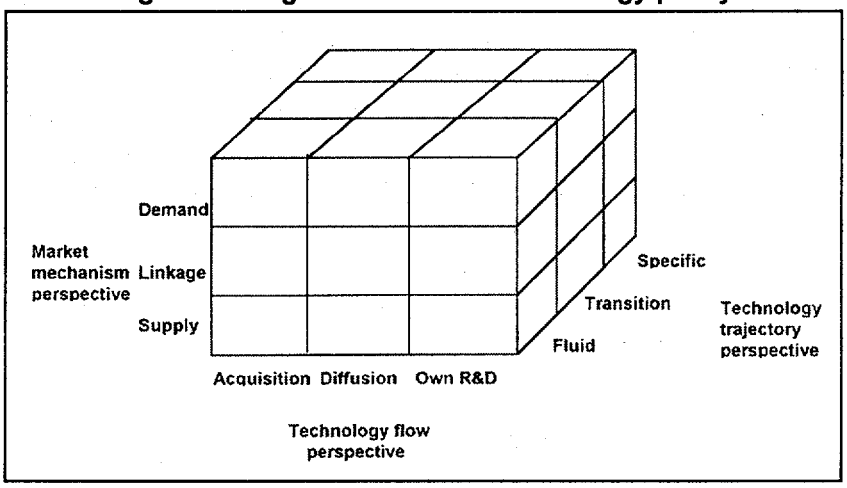
The third sequence involves local efforts to assimilate, adapt and improve imported technology and eventually to develop one's own technology. These efforts are crucial to augmenting technology transfer and expediting the acquisition of technological capability. Technology may be transferred to a firm from abroad or through local diffusion but the ability to make effective use of it cannot. This ability can only be acquired through indigenous technological effort. These local efforts can include self-directed efforts aimed at the imitative reverse-engineering of foreign products and processes, those aimed at improving and adapting previously acquired technology, and one's own research and development. Such efforts become increasingly important as industrialization progresses.

These three elements -- foreign technology transfer, diffusion of imported technology, and indigenous R&D effort -- are not necessarily sequential; rather, they may occur simultaneously. They are, however, important issues for policy makers to address explicitly in designing and evaluating their technology policy instruments.

2.1.4. Integrative Model

The three perspectives outlined here -- technology trajectories, market mechanism and technology flow -- may be combined as a two-by-two matrix, as illustrated in Figure 2. The mode and effectiveness of technology flow and market mechanisms will change as industries in developing countries advance through different stages of development over time. Such an integrative framework enables policy makers to identify the areas that have been neglected and to assess the efficacy of policy instruments presently deployed.

Figure 2. Integrative model for technology policy



2.2 Analytical Framework for Technology Strategy

This framework introduces four concepts: absorptive capacity, crisis construction, dynamic learning process, and technology transfer at the firm level. These four concepts help one understand how a firm could use technology strategy for building its competitiveness.

2.2.1 *Absorptive Capacity*

Technological capability is acquired through the accumulation of technological learning. And effective technological learning requires absorptive capacity, which has two important elements: existing knowledge base and the intensity of effort (Cohen and Levinthal, 1990).

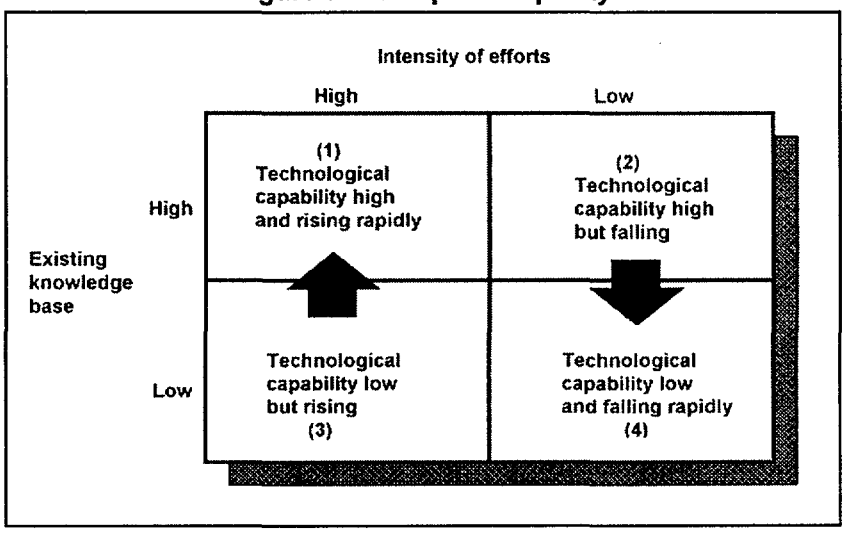
First, existing knowledge is an essential element in technological learning, as knowledge today influences learning processes and the nature of learning tomorrow. That is, today's knowledge enables individuals or organizations to create tomorrow's increased knowledge. Existing knowledge base refers to existing individual units of knowledge available within an organization. Accumulated existing knowledge increases the ability to make sense of, assimilate and use new knowledge. Relevant knowledge base includes the basic skills and general knowledge necessary to support the relatively easy technological tasks in developing countries as well as the most recent scientific and technological knowledge in advanced countries.

Second, the other important element is the intensity of effort or commitment. The intensity of effort refers to the amount of energy relinquished by the organizational members to solve problems. It is insufficient merely to expose firms to the relevant external knowledge without exerting effort to internalize it. Learning how to solve problems is usually built up over many practice trials on related problems. Thus, it requires considerable time and effort directed at solving problems early on before moving on to solving the more complex problems. Such effort intensifies interaction among the organizational members that facilitate technological learning at the organizational level.

These two variables -- existing knowledge base and the intensity of effort -- in the organization constitute, as presented in Figure 3, a two-by-two matrix that indicates the dynamics of technological capability. When both existing knowledge and the intensity of effort are high (Quadrant 1), technological capability is high and rapidly rising. On the contrary,

when both elements are low (Quadrant 4), technological capability is low and falling. Organizations with high existing knowledge and low intensity of efforts (Quadrant 2) might have high capability now but will gradually lose it, as existing knowledge will become obsolete as technology moves along its trajectory. Such organizations will gradually move down to Quadrant 4. In contrast, organizations with low existing knowledge but high intensity of effort (Quadrant 3) might have low technological capability now but will acquire it rapidly, as both continuous and discontinuous learning can take place through significant investment in learning, moving progressively to Quadrant 1. In short, it can be said that the intensity of effort or commitment is a more crucial element than existing knowledge for long-term learning and competitiveness of the firm.

Figure 3. Absorptive Capacity



2.2.2 *Crises Construction*

How then should firms manage the intensity of effort? When does the firm or its members search actively for new technological knowledge? When do individuals within the firm vigorously commit their energy for technological learning? To state differently, when does discontinuous learning take place?

Cumulative technological learning can take place under normal circumstances. Discontinuous learning, however, takes place normally when a crisis is perceived in market competition and a strategy is implemented to turnaround the situation. In such a case, the firm has to invest heavily in the acquisition of new knowledge as well as in technological learning activities in order to overcome the crisis in the shortest possible time. Just as the term "crisis" in the Chinese character (weiji,) is a combination of two characters (threat and opportunity), some firms manage to turn a crisis into an opportunity to transform their technological capabilities in a discontinuous manner and enhance their competitiveness. A crisis may be creative in this sense; otherwise, it can be destructive (Kim, 1997b).

A crisis may be generated naturally when the firm loses its competitive standing in the market (Meyers, 1990) or intentionally when an external principal or top management evokes a sense of crisis by proposing challenging goals (Nonaka, 1994). Intentionally evoked crises may be imposed by the external coalition on the focal firm or industry in general. In developing countries, particularly where the state plays an orchestral role in industrialization,

the government could impose a crisis by setting challenging goals for firms in a strategically designated industry. This type of crisis is called imposed crisis (Pitt, 1990).

Or the dominant coalition within the firm could intentionally construct a crisis. A crisis is largely a negative word for mediocre managers. It may mean imminent, unfolding disaster, most possibly resulting in management failure and loss of face. Thus, crisis-oriented learning is discouraged. But for visionary entrepreneurs, crisis construction may be a strategic means of opportunistic learning, bringing about a valuable transformation in the firm. This type of crisis is called constructed crisis (Pitt, 1990). The effective learning organization may frequently evoke constructed crises and institutionalize the process and structure to make discontinuous learning possible and to turn the crises into opportunities.

2.2.3 Dynamic Learning Process

The understanding of the dynamic learning process at the firm is essential, because technological change is localized at the level of firms (Cooper, 1991). These firms develop their technological capability through in-house efforts, augmented by interacting with domestic and foreign institutions, constrained by regulations, and stimulated by government incentives in the dynamically changing global technology environment. When an economy has many firms that grow dynamically by sustaining competitiveness through effective technological learning, the economy will enjoy international competitiveness and healthy growth (Klein, 1977).

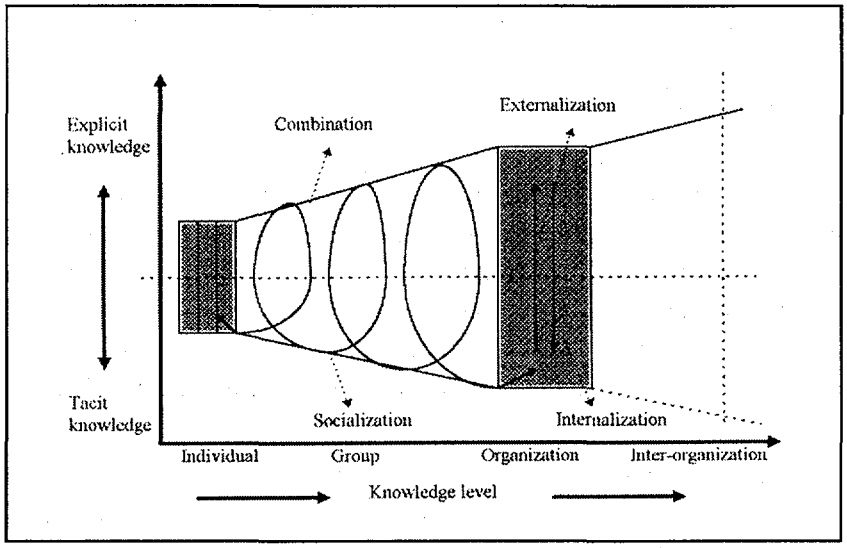
Technological learning takes place at two different levels: individual and organization. The prime actors in the process of organizational learning are the individuals within the firm. Organizational learning is not, however, the simple sum of individual learning; rather, it is the process that creates knowledge, which is distributed across the organization, is communicable among members, has consensual validity, and is integrated into the strategy and management of the organization (Duncan and Weiss, 1978). Individual learning is, therefore, a necessary condition for organizational learning, but it is not by itself a sufficient condition. Only effective organizations can translate individual learning into organizational learning.

Technological learning is a process in which the firm identifies real or potential problems and then actively develops new knowledge to solve them. Knowledge has two dimensions: explicit and tacit. Explicit knowledge refers to knowledge that is codified and transmittable in formal, systematic language. Explicit knowledge may, thus, be acquired in the form of books, technical specifications, designs, or as embodied in machines. Badaracco (1991) calls it "migratory knowledge." In contrast, tacit knowledge is so deeply rooted in the human mind and body that it is hard to codify and communicate and can only be expressed through action, commitment, and involvement in a specific context. Tacit knowledge can be acquired only through experience such as observation, imitation, and practice.

Nonaka (1994) postulates that the organization creates new knowledge through the building of both explicit and tacit knowledge and, more importantly, through the dynamic process of four different types of conversion between these two dimensions of knowledge. Conversion from tacit to tacit (called socialization) takes place when tacit knowledge within one individual is shared by another through training, while conversion from explicit to explicit (combination) takes place when an individual combines discrete pieces of explicit knowledge into a new whole. Conversion from tacit to explicit (externalization) can be said to have taken place when an individual is able to articulate the foundations of his or her tacit knowledge, whereas conversion from explicit to tacit (internalization) takes place when new explicit

knowledge is shared throughout the firm and other members begin to use it to broaden, extend, and reframe their own tacit knowledge. Such conversion tends to become faster in speed and larger in scale as more actors in and around the firm become involved in knowledge conversion. Using Japanese examples, Nonaka and Takeuchi (1995) provide excellent, detailed discussions of a spiral model of organizational knowledge creation, showing how an upward spiral process starts at the individual level and moves up to the organizational level (see Figure 4).

Figure 4. Spiral of Organizational Knowledge Creation



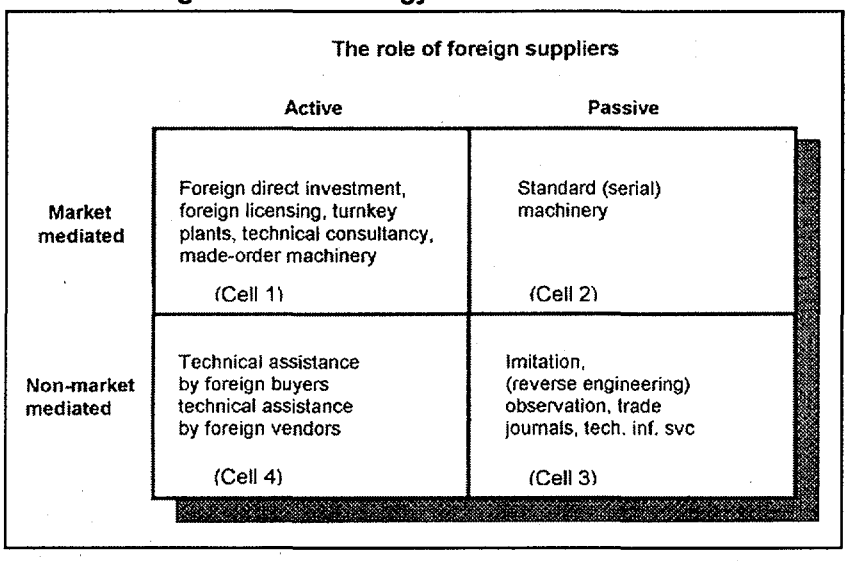
Technological capability at the firm is not a collection of explicit knowledge; rather, it is largely a collection of tacit knowledge. The firm may have some proprietary explicit knowledge such as firm specific blueprints and standard operating procedures. But they are useful only when tacit knowledge enables its members utilize them. Nelson and Winter (1982) also note that much of the knowledge that underlies the effective performance in the organization is tacit knowledge embodied in its members.

2.2.4 *Technology Transfer*

Technology transfer from foreign firms in advanced countries can be a very important source of new knowledge in developing countries. Such foreign technology transfer may be analysed by two dimensions: market-mediation and the role of foreign suppliers. In the first dimension, technology transfer may or may not be mediated through the market. In market-mediated technology transfer, the supplier and the buyer negotiate payment for technology transfer, either embodied in or disembodied from the physical equipment. Foreign technology may also be transferred to local users without the mediation of market; in this case the technology transfer usually takes place informally without written agreements and payments. In the second dimension, the foreign supplier may take an active role, exercising significant control over the way in which technology is transferred to and used by the local recipient. Alternatively, the supplier may take a passive role, having almost nothing to do with the way the user takes advantage of available technical know-how either embodied in or disembodied from the physical items. These two dimensions -- the mediation of market and the role of foreign suppliers -- offer a useful two-by-two matrix, as shown in Figure 5, to

identify and evaluate different mechanisms of international technology transfer (Fransman, 1985; Kim, 1991).

Figure 5. Technology Transfer Framework

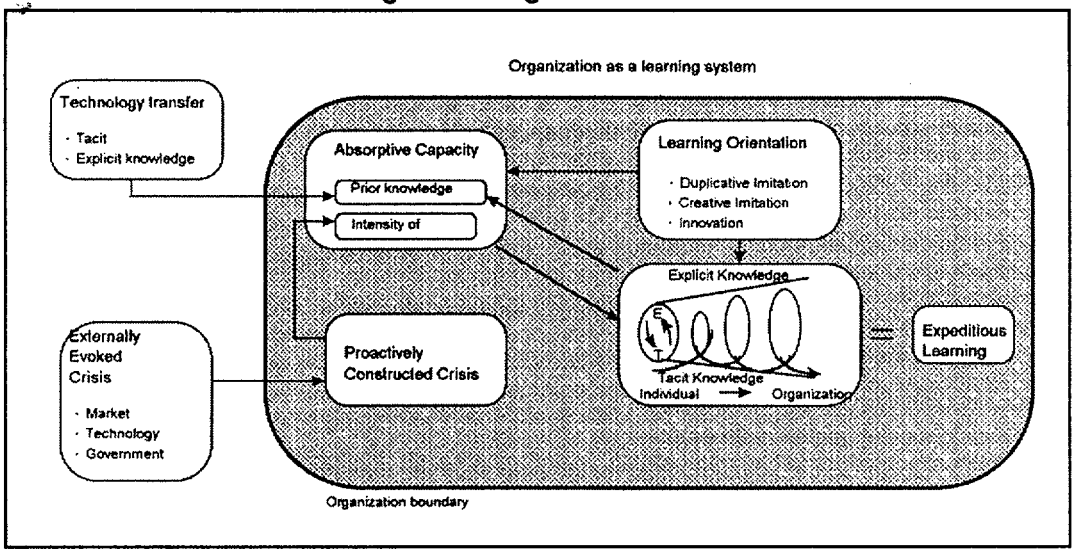


In other words, firms in developing countries have many alternative mechanisms in acquiring foreign technology. FDI, FL, and turnkey plants are major sources of formal technology transfer in Quadrant 1. Capital goods transfer machine-embodied technology (Quadrant 2). Foreign suppliers and original equipment manufacturer (OEM) buyers often transfer critical knowledge to producers to ensure that products meet the buyers' technical specifications (Quadrant 3) (Kim, 1991). Printed information such as sales catalogues, blueprints, technical specifications, trade journals, and other publications, together with observation of foreign plants, serve as important informal sources of new knowledge for firms in developing countries (Quadrant 4) (Kim and Kim, 1985). In addition, reverse brain drain or return of foreign trained professionals and moonlighting foreign engineers give significant rise to technological learning of the firm in developing countries (Kim, 1993). If firms in developing countries have absorptive capability, they can effectively acquire foreign technology informally without any transactions costs (Quadrants 3 and 4).

2.2.5 Integrative Model

Figure 6 depicts the integrative model of the dynamic process of building technological capability at firms in developing countries. It shows that the exiting knowledge base and the intensity of effort affect the dynamics of knowledge conversion through a spiral process that starts at the individual level and moves upward to the firm level. Firm level learning tends to become faster and larger in scale as more actors in and around the firm with adequate existing knowledge intensify their efforts to convert knowledge within and between themselves. The outcome of knowledge conversion and creation feeds back to the existing knowledge base to increase its level.

Figure 6. Integrated model 2



In addition, technology transfer significantly affects the building-up of the existing knowledge base in developing countries. Books, technical specifications, designs, or as embodied in physical equipment transfer explicit knowledge, while the mobility of individuals migrating from one organization or country to another transfers tacit knowledge, also elevating the level of the existing knowledge base. Top managers can construct a crisis internally, either in response to or in the absence of an external crisis. The shared sense of the internally constructed crisis among the organization's members intensifies their efforts, which elevates the absorptive capacity of the firm, expedites technological learning, and leads to a higher level of technological capability.

In short, this section introduces two analytical frameworks that are used as tools to analyse technology policy and strategy for building industrial competitiveness. The first framework integrates three perspectives -- technological trajectory, market mechanism, and technology flow -- to analyse the role of the government (technology policy) in building industrial competitiveness. The second framework integrates four concepts -- absorptive capacity, crisis construction, dynamic learning process, and technology transfer -- to examine a firm's technology strategy that may be used in building a firm's competitiveness. The following sections use these frameworks to delineate the specific policy and strategic instruments that developing countries could use in building industrial competitiveness.

3. Technology Policy for Building Industrial Competitiveness

This section uses the market mechanism perspective as the structural framework to discuss the implications of the Korean experience for formulating technology policy in other developing countries. The ideas of technology trajectories and technology flow perspectives are incorporated in the discussion.

3.1 Demand Side Policy

The demand side policy creates market needs for technology by shaping market competition through policies on trade (export promotion and trade liberalization) and industrial structure. Imposed crises will also be discussed here to see how the government

could expedite the acquisition of technological capability at the firm level. These instruments are usually viewed as part of industrial policy in the narrow sense of the term.

3.1.1 Export Promotion Policy

Export promotion is one of the most effective ways to create the competitive environment for the firm and in turn expedite industrialization in developing countries. At least three major effects may be mentioned.

First, this policy creates business opportunities and concurrently imposes crises for firms to undergo "a life or death" struggle in the competitive international market. The Korean experience shows that to survive the crises, Korean firms had to accelerate learning by importing and rapidly assimilating production technology from abroad. As the export promotion policy continually placed pressure on firms to sustain competitiveness in the changing international technology and market environment, export-oriented firms acquired more foreign technologies and exerted more efforts for technological learning than did import-substituting firms.

Second, Korean exporters made lump-sum investments for capacity in excess of local market size to achieve economies of scale. This resulted in crises, forcing local firms to accelerate technological learning to improve productivity and, in turn, elevating international competitiveness so as to maximize capacity utilization.

Third, Korean firms relied heavily on foreign OEM buyers to market their products throughout the world. These foreign buyers provided invaluable help to Korean firms in acquiring the required capability through interactive tutorial processes and allowed Korean firms to focus their efforts primarily on acquiring production capability.

3.1.2 Trade Liberalization

Another important function that government should do to facilitate effective technological learning in industry is to create a competitive domestic market. Protecting the local market creates initial business opportunities and a shelter for infant industries, as seen in Korea in the 1960s and 1970s. However, prolonged protection fails to create a competitive domestic market and falls short to stimulate technological learning throughout industry.

The Korean experience shows that the local market was highly protected from foreign imports during the 1960s and 1970s. But imports were liberalized in the 1980s. The Korean government promulgated the Tariff Reform Act in 1984, which was aimed to phase in general reductions in the tariff levels. As a result, the import liberalization ratio (defined as the ratio of the number of unrestricted items to the total) rose from 51 percent in 1973 to 95.2 percent in 1988, and to 98.6 percent by 1994. The government also brought down the average tariff rate from 26.7 percent in 1984 to 7.9 percent by 1994. Non-tariff barriers, such as delays in custom clearance, have also largely been eliminated in the recent years. As a result, imports increased, for instance, by 20.1 percent in 1989 compared to the 2.8 percent increase in exports that forced Korean firms to compete with multinational firms not only in the export market, but also in the domestic market with little government assistance (Kim, 1997a).

3.1.3. Industrial Structure Policy

Governments in developing countries should create a well-balanced industrial structure, as in Japan and Germany, to sustain long-term industrial growth. One of the major mistakes made by the Korean government in the 1960s and 1970s was neglecting to encourage a balanced growth between large firms and small firms. To overcome the disadvantage of a small domestic market and to exploit the stable nature of mature technologies on which initial industrialization strategy was to be built, the Korean government intentionally created large firms, *chaebols*, the Korean version of Japanese *Zaibatsu*, and helped in capital formation as well as their subsequent diversification. The huge growth of *chaebols* resulted in both positive and negative consequences.

On the positive side, the *chaebols* played a crucial role in the rapid acquisition of technological capability in Korea and stood out as world-class multinational corporations. They were in the most advantageous position to attract the cream of the crop from best universities. They had the organizational and technical resources to negotiate and finance foreign technology transfer and assimilate and improve imported technologies. They also played a major role in drastically expanding and deepening R&D activities in Korea during the 1980s and 1990s.

On the negative side, the *chaebols* dominated Korea's industrial scene. By 1977, 62 percent of all shipments were produced under monopoly, duopoly, or oligopoly conditions, in which the top three producers accounted for more than 60 percent of the market share, giving rise to such monopolistic abuse such as creating scarcities, price gouging, and predatory behaviour in the domestic market. As a result, Korea lacks the strong support of dynamic SMEs to make its large-scale assemblers innovative. As a result, large Korean firms have relied heavily on Japanese SMEs for critical components for automobiles and electronics.

In contrast, Taiwan's advantage over others is the strength of its dynamic SMEs (Gereffi and Wyman, 1990). But Taiwan lacks the large firms to challenge scale-intensive industries. As a result, Taiwan is behind Korea in such industries as steel, automobile, and memory semiconductors. Such a skewed industrial structure in Korea and Taiwan stemmed largely from the government's biased strategy. Taiwan deliberately kept large businesses under the state-ownership for political reasons. These two economies belatedly recognized the importance of balanced industrial structure to sustain healthy growth.

It was in the late 1970s, when the Korean government belatedly realized the importance of SMEs for healthy economic growth. The government began promoting SMEs, particularly technology-based small firms, to remedy the imbalance that existed between the large and small business sectors. Although the government's effort has had some positive effect by the mid-1980s, the imbalance between large and small firms had not been corrected to any significant extent.

3.1.4 Antitrust Regulation

Another important measure governments in developing countries must take to ensure market competition is antitrust legislation. In this regard, the Korean experience should be viewed as a warning. In response to the *chaebols*' increasing economic power, the Korean government shifted its policy of promoting *chaebols* during the 1960s and 1970s to regulating their growth in the 1980s by adopting the policy of "economic democratization." The Fair Trade Act of 1980, drafted along the lines of American antitrust legislation, among other things, prohibits unfair cartel practices and mutual investment among the *chaebol*'s affiliated

companies, sets a ceiling on investment by and on credit to large *chaebols*, and restricts their vertical and horizontal integration.

However, the *chaebols* continued to grow and economic concentration further increased until the mid-1980s, then slightly declined thereafter. Why? Although the antitrust policy made a small impact on the economy during the mid 1980s, the economic power of *chaebols* and their collusion with political power were so strong that the government could not implement some of announced policy programs. In addition, the government bailed-out insolvent enterprises in order to mitigate their impact on downstream sectors and not to tarnish the credibility of *chaebols* in the international market.

3.1.5 Crisis Imposition

The final major instrument that governments in developing countries are able to use to facilitate the acquisition of technological capability by firms and, in turn, build industrial competitiveness may be crisis imposition on firms. The Korean experience shows that crisis imposition was a strategic tool that the government often used to expedite technological learning in industry. For instance, the hasty creation of heavy and chemical industries (HCIs) on a gigantic scale without adequate preparation in technological capability, more for building a self-reliant national defence capability than for economic purpose in the 1970s, investing $12.7 billion in the 1973- 979 period. This resulted in the foreign debt rising from $2.2 billion in 1970 to $27.1 billion in 1980 (Bello and Rosenfeld, 1992). It also bred misallocation of resources, rapid inflation, wage increases far in excess of productivity gains, and further concentration of economic power in several *chaebols* involved in HCIs. But the steel, shipbuilding, heavy machinery, petrochemical, industrial electronics and nonferrous metals industries were created as a result of promoting the HCI.

The most significant effect of hastily promoting the HCI, however, was the major crisis in technological learning. Lacking capability, these *chaebols* had to rely almost entirely on foreign sources for technology. The tasks required to assimilate imported technology were so far beyond the capability available at these firms that the HCI program imposed a major crisis in the areas of setting up and starting-up plants, let alone mastering them. Firms were forced to assimilate technology very rapidly and, in turn, upgrade their capacity utilization by expediting learning in order to survive. As a result, it took only fifteen years for the ratio of value added in light industries over HCIs to fall from four to one in Korea; whereas, the same shift took twenty-five years in Japan and fifty years in the United States (Watanabe, 1985).

Other industries such as automobiles and electronics also experienced similar crises imposed by the Korean government. The government's radical shift in promoting the automobile industry from knocked-down assembly of foreign cars to the development of locally designed cars by the mid-1970s imposed a major crisis on ill-prepared local firms that caused them to expedite technological learning. That led to the appearance of two original new vehicles in Korea (Kim, 1997b).

In the electronics industry, the Korean government released an ambitious Long-term Electronics Industry Promotion Plan. The government was determined to promote the industry as a leading exporter. In 1969, when the industry was still exporting at the level of a mere $42 million, the government set the goal for export to $400 million for 1976 (the last year of the Plan). The government's export drive not only set specific export goals and directives that forced local firms to be competitive in both price and quality in the international market, it also provided incentives that compelled local firms to acquire

technological capability quickly. In 1976, exports exceeded $1 billion, almost 259 percent of the aforementioned target, indicating the rapid learning in production and product design that the industry accomplished.

3.2. Supply Side Policy

The supply side policy is aimed at helping industry strengthen technological capability. This includes policies related to education, technology transfer, technology diffusion, indigenous R&D activities.

3.2.1. Education Policy

Education to develop human resources is one of the most important foundations for building technological capability. Korea's strategy to invest heavily in education in the early decades built the most important part of the foundation for the subsequent industrialization. The Korean experience shows that its first move toward modernization was in education. This can be seen in the growth of government investment. The share of education in the total government budget, for instance, rose from 2.5 percent in 1951 to over 17 percent by 1966. Government expenditures, however, accounted for only one-third of the total expenditures in education, the remainder being borne by the private sector and parents, reflecting the high commitment for education within the Korean society. Out of eight industrialized countries and two NICs, this commitment was the strongest in Korea (Porter, 1990). Enrollment at the various levels of the formal education system increased rapidly from 1953 and reached the level of the advanced countries by 1980. As a result, the illiteracy rate dropped from 78 percent in 1945 to 27.9 percent by 1960, to 10.6 percent by 1970 and to an insignificant level by 1980 (McGuin, 1980).

Several other developing countries attained the same rapid growth in elementary education. But what was unique in Korea was the well-balanced expansion at all levels of education early enough to support its economic development. Using data from the late 1950s for seventy-three developing countries, Harbison and Myers (1964) found three nations -- Korea, Taiwan, and Yugoslavia -- with levels of educational achievements far above what would be expected, given their levels of economic development. That is, with a per capita income of $90, Korea's educational achievement stood fairly close to the level expected for a country twice as wealthy. When its per capita GNP reached $107, Korea's educational level was equivalent to that of countries with a GNP per capita of $380. The expansion of education more rapidly than the economic development, however, created a short-term unemployment problem. The number of graduates in most fields exceeded demand, creating a serious social problem in the 1960s. The subsequent development of the economy soon absorbed the surplus.

Progress was impressive in terms of quantity but dreadful in terms of quality. Under investment in education (relative to national needs to upgrade quality) and the consequent short supply of highly trained human resources in recent decades was one of the major mistakes made by the Korean government in developing a nation-wide system for innovation, resulting in a major bottleneck for future development.

The problem of underinvestment in education is most critical at the higher education levels. Recognizing the seriousness of the poor quality of university education, the government has implemented a major reform program to upgrade at least about a dozen

universities to a globally competitive level in research. It will, however, take a decade or long before the effects can be seen.

3.2.2. Brain-drain and Reverse Brain-Drain

A liberal policy on brain-drain is necessary for developing countries over the long-run to allow scarce scientists and engineers to migrate to advanced countries before, or in the early stage of industrialization. Otherwise, many of them will not find suitable jobs at home in the early stage to continue to advance their technical competence. Brain- drain was also a serious problem for Korea through the 1960s. As of 1967, 96.7 percent of Korean scientists and 87.7 percent of engineers educated abroad remained there, mainly in the United States, compared with the corresponding world comparisons of 35 and 30.2 percent for all countries (Hentges, 1975). They, however, became important sources of an overseas technical network and a high caliber manpower pool for Korea's subsequent development.

A policy on reverse brain-drain also called for as industrialization progresses. The first systematic government efforts to repatriate Korean scientists and engineers abroad began in 1966 when the government established the Korea Institute of Science and Technology (KIST) as the first government research institute (GRI). The nature of state involvement was very "directive" rather than "promotional" in orientation. The government vigorously pursued the repatriation of experienced scientists and engineers with a highly attractive compensation package, a significant departure from the administrative culture of Korea where the literati-bureaucrats historically exerted power over technicians (Yoon, 1992). The state-led repatriation program was quite successful, as few repatriates went back to advanced countries. The program also served as a model for the private sector, which assertively recruited high caliber scientists and engineers in the 1980s and 1990s to "leapfrog" into state-of-the-art technologies.

3.2.3. Technology Transfer Policy

Policy on technology transfer should also evolve over time in response to industry's changing needs. Lacking in technological capability at the outset of industrial development, developing countries have to rely heavily on foreign technology imports. It should, however, be recognized that in the early stage of industrialization, such formal mechanisms as foreign licensing (FL) and foreign direct investment (FDI) are not important for acquiring foreign technologies. Rather, the procurement of turnkey plants (in the case of continuous process industries such as chemicals) and capital goods can be a more effective means. The Korean experience shows that Korea restricted FL and FDI but promoted instead technology transfer through other means such as capital goods imports in the 1960s. Such a policy, designed to maintain Korea's management independence from foreign multinationals, was effective in forcing Korean firms to take the initiative and play a central role in learning (i.e., acquiring, assimilating, and improving imported technologies) rather than relying entirely on foreign sources. Well-trained, hard working Koreans were motivated to maximize technological learning from readily available foreign goods and were equipped with sufficient tacit knowledge to reverse-engineer them successfully (Kim and Kim, 1985). One drawback for developing countries today is that the flow of foreign technology or investment may not easily be restricted under the World Trade Organization regime.

The Korean government also tightened its control over foreign direct investment (FDI). As a result, unlike other developing countries, FDI had a minimal effect on Korean economy. For example, Korea's stock of FDI in 1983 was only 7 percent of that in Brazil, 23

percent of that in Singapore, and less than a half of that in Taiwan and Hong Kong. The proportion of FDI to total external borrowing was only 6.1 percent in Korea compared with 91.9 percent in Singapore, 45 percent in Taiwan, and 21.8 percent in Brazil (KEB, 1987). FDI's contribution to the growth of GNP in Korea in the 1972-1980 period amounted only to 1.3 percent, while its contribution to total and manufacturing value added was only 1.1 percent and 4.8 percent, respectively, in 1971, and 4.5 percent and 14.2 percent, respectively, in 1980 (Cha, 1983).

As industrialization progresses, restrictive policy should, however, be relaxed to enable industries to acquire increasingly more sophisticated foreign technologies, which are protected by patents or are difficult to be reverse-engineered. For this reason, after two decades of restrictive policy toward FDI and FL, Korea liberalized its technology transfer policies in the 1980s and 1990s. Progressively, more sophisticated foreign technologies were needed in order to sustain its international competitiveness in high value-added industries.

3.2.4. Technology Diffusion Policy

Developing countries should establish a network of specialized diffusion agents to maximize the effect of foreign technology transfer. In upgrading the overall technological capability of the economy, the effective diffusion of imported technology across firms within an industry and across industries within an economy is as important, if not more, as the acquisition of foreign technology. There may be many specialized diffusion agents such as capital goods producers, consulting engineering firms, and GRIs.

Korea's experience shows that those agents were not effective in diffusing imported technologies in the early stage of industrialization. For example, the government's plan to develop the capital goods sector was first initiated in 1968, but was not seriously implemented until the mid-1970s. The development of local consulting engineering firms was promoted by the Engineering Service Promotion Law of 1973, but local infant engineering service firms were not capable of playing the role of diffusion agents in the early years of industrialization. The government established a scientific and technological information centre in 1962 as a linking mechanism for disseminating technical information, but its use by industry was limited in the early years, because mature products were easily imitated through reverse-engineering without consulting technical literature. The government established KIST in 1966 as a research and diffusion agent. But Korean researchers, mostly from academic fields or from R&D centres in advanced countries, lacked the manufacturing know-how that was in greatest demand during the early years, failing to serve as a diffusion agent. The most important diffusion agents the government unintentionally created were the state-owned enterprises established in the 1950s and 1960s. Engineers, who accumulated modern production experience in these fertilizer and machinery plants, spun off later to head engineering and production departments of private enterprises.

It was not until the 1980s when an extensive network of government, public, and non-profit (private) technical support systems began to function more effectively as diffusion agents, particularly for SMEs (Kim and Nugent, 1994). Many of the support systems dated back to the 1970s but flourished in the 1980s with the growing importance of technology. That is, it is important to establish them early in preparation for subsequent stages, as institutions require a significant period of set-up time.

3.2.5. Indigenous R&D Promotion Policy

Indigenous R&D activities, as mentioned earlier, are crucial to augmenting technology transfer and expediting the acquisition of technological capability, as technology may be transferred from abroad, but the ability to make effective use of it cannot. This ability can be acquired only through indigenous R&D efforts. For this reason, governments in developing countries should introduce various incentives to encourage corporate R&D activity. They should also invest in R&D in universities and GRIs.

One of the major mistakes made by the Korean government is neglecting the underdeveloped research activities in universities. It was not until the mid-1970s when the Korean government began promoting university R&D activities. Frustrated in its efforts to reform the undergraduate teaching-oriented tradition in universities, the government conceived of a dual system. Since almost all universities under the Ministry of Education (MOE) were essentially teaching-oriented, the Ministry of Science and Technology (MOST) founded a research-oriented S&T school in 1975 and started another one again in 1995, establishing a new research tradition in university education. As a result, university R&D expenditures have increased significantly from W.572 million ($1.5 million) in 1971 to W.771 billion ($1 billion) in 1995. But they still accounted for only 8.2 percent of the nation's R&D expenditures in 1995, while universities accounted for 34.8 percent of the nation's R&D manpower and 77.1 percent of its PhD-level R&D manpower. Underdeveloped university research has been a major bottleneck in producing well-trained researchers. The government's recent efforts are expected to make significant reform in university R&D in the near future.

Given the inadequacy of university research activities, the government has used GRIs as the backbone of advanced R&D in Korea. The government has made these institutes the major instruments in various National R&D Programs. The most ambitious national R&D program is the Highly Advanced National (HAN) R&D Project, also known as the G-7 Project, which is aimed at lifting Korea's technological capability to the level of the G-7 countries by the year 2020. But in the face of increased intensity of university R&D and the rapid expansion of private R&D activities, redefinition of the role of the GRI is in order.

The Korean experience indicates that the role of GRIs should evolve over time. In the early years of industrialization, GRIs should provide the private sector with technical assistance so the private sector is able to strengthen its bargaining power in technology transfer and assimilate and adapt imported technology rapidly. In other words, during this period, GRIs should not be evaluated in terms of the number of patents or significant research results generated and transferred to the private sector. Rather, they should be evaluated in terms of the number of experienced researchers generated, who later play a pivotal role in industrial R&D in the private sector.

Governments in developing countries should also promote corporate R&D. The Korean government has launched various programs to induce the private sector to set up formal R&D laboratories. These include tax incentives and preferential financing for setting up new laboratories and exemption from military service obligation for key R&D personnel. Spurred partly by these programs and partly by increasing competition in the international market, the number of corporate R&D laboratories increased from one in 1970 to 2,272 in 1995, reflecting the seriousness with which Korean firms are pursuing high technology development. Although small and medium-sized firms account for over 50 percent of the total number of corporate R&D centres, *chaebols* dominate R&D activities. R&D spending in

the manufacturing sector has grown faster than sales. The machinery and electronics industry spent over 4 percent of sales on R&D activities beginning in the mid 1980s.

Consequently, there has been significant structural change in R&D investment. The Korean government played a major role in R&D activities in the early years, when the private sector faltered in R&D investment despite the government's encouragement. More recently, the private sector has been assuming an increasingly larger role in the country's R&D efforts. For example, the private sector accounted for only 2 percent of the nation's total R&D expenditure in 1963. This had risen to 81 percent by 1995, which is one of the highest among both the advanced and newly industrialized countries.

As a result, total R&D investment increased from 10.6 billion won ($28.6 million) in 1971 to 9.44 trillion won ($12.24 billion) in 1995. Though the Korean economy recorded one of the world's fastest growth rates, R&D expenditure rose even faster than GNP. R&D increased its share of GNP (R&D/GNP) from 0.32 percent to 2.69 during the same period. It should be pointed out, however, that there are many reasons to suspect bubbles in the R&D statistics, particularly those of the private sector.

3.3 Linkage Policy

Important policies that help link the demand and supply sides of technological development may include such instruments as preferential finance, tax concession, venture capital industry, and entrepreneurship.

3.3.1. Financial Policy

One of the most important mechanisms governments can use in strengthening linkage between demand and supply sides and encouraging corporate R&D activities is preferential finance. Its effectiveness changes over time as industrialization progresses. For instance, the Korean government offered preferential finance for R&D activities in the 1960s and 1970s, but the interest rate for R&D loans was one of the highest, reflecting the low priority of R&D in government policies. At the same time, these mechanisms were largely ignored by industry due to the absence of the clearly felt need to invest in R&D given the relatively easy means of acquiring and assimilating foreign technologies then available from many sources.

It was only in the early 1980s that preferential R&D loans became one of the most important means for financing private R&D activities. Preferential financing amounted to W.671.6 billion ($848.0 million) in 1987, accounting for 94.3 percent of total corporate R&D financing funded by the government. In contrast, direct R&D subsidy by the government through NRPs accounted for only 4 percent of the total and direct investment through venture capital firms accounted for 1.7 percent. The impact of this financing, however, may be overstated. With rates on preferential loans paying between 6.5 percent and 15 percent, they conferred little advantage over financing terms available in the international market (KITA, 1994).

3.3.2. Tax Policy

Tax incentives are another important linking mechanism to make funds available for corporate R&D. In Korea, tax incentives may be classified into five categories according to objectives to be served. Most important are tax incentives aimed at promoting corporate R&D investment: reduced tariffs on import of R&D equipment and supplies, deduction of

annual non-capital R&D expenditures and human resource developments costs from taxable income, and exemption of real estate tax on R&D related properties. The incentives also include a tax reduction scheme, called the Technology Development Reserve Fund, whereby an enterprise can set aside up to three percent (four percent for high technology industries) of sales in any one year to be used for its R&D work in the following three years. The private sector did not take advantage of this scheme in early years in the absence of needs for technological activities, but now considers it an important means to finance its R&D.

3.3.3. Policy on the Venture Capital Industry

As industrialization progresses, governments in developing countries must take initiatives in establishing the venture capital industry. Technology-based venture firms play an important role not only in emerging high technology industries but also in supporting large firms in the existing industries by supplying high technology parts and components.

The Korean experience shows that the government had to take initiatives in developing a foundation for the venture capital industry, when the private sector was not ready to do so. In 1981, the Korean government enacted a special law to establish the Korea Technology Development Corporation in a joint venture involving the government and a group of private firms. It also helped in the formation of a private venture firm in 1982 along with eleven local financing firms, the International Finance Corporation in Washington, DC, the Asia Development Bank in Manila and DEG in Germany. Another public venture firm owned solely by the state-owned Korea Development Bank, was created in 1984. In addition, two banks, majority-owned by the government, offered a limited venture capital service. The government took a further step with the enactment of the Small and Medium Enterprise Formation Promotion Act in 1986, whereby twelve venture business firms, in which the private sector and the government invested jointly, were established. There are now over thirty private venture capital companies operating in Korea.

3.3.4. Policy on Promoting Entrepreneurship

It is important for governments in developing countries to foster entrepreneurs. Almost all developing countries have a good number of competent economists, scientists, and engineers and have enough literate manpower to promote industrialization programs. Capital and technology may be acquired from abroad. What some of the developing countries lack is entrepreneurs to bring these resources together and manage them effectively to generate wealth by meeting existing and potential market needs. In the case of Korea, the government privatized Japanese properties and state-owned enterprises to selected local entrepreneurs on favourable terms to help them form the necessary capital. The government then managed these entrepreneurs with relative effectiveness by penalizing poor performers and rewarding only the good ones. Good performers were rewarded with further licenses to expand. The government also encouraged these entrepreneurs to enter risky businesses by granting industrial licenses in the more lucrative sectors (Amsden, 1989). They are the entrepreneurs who had the managerial capability to build the *chaebols*.

In short, this section introduced various policy instruments governments in developing countries can deploy in building industrial competitiveness. Major demand side policy instruments include export promotion, trade liberalization, balanced industrial structure, antitrust regulation, and crisis imposition. They are designed to create the market needs for technology. In contrast, major supply side instruments include education, brain-drain, technology transfer, technology diffusion, and indigenous R&D. These instruments are

designed to strengthen industry's technological capability. Preferential finance, tax concession, and the promotion of the venture capital industry and entrepreneurship can be useful means to strengthen linkages between the demand and supply sides.

4. Technology Strategy for Building the Competitiveness of Firms

This section uses the two elements of absorptive capacity -- existing knowledge base and the intensity of effort -- as a main structural framework to discuss the firms' technology strategy for building their competitiveness. Other concepts -- crisis construction, dynamic learning process, and technology transfer -- introduced in the presentation of analytical frameworks will be dealt with in subheadings.

4.1 Building an Existing Knowledge Base

Learning is path-dependent. Today's existing knowledge base provides the platform for learning, and enables individuals and organizations to create tomorrow's increased knowledge through various forms of knowledge conversion. Thus, it is essential for firms to build an existing knowledge base by formulating and implementing strategies on technology transfer, tacit knowledge acquisition, indigenous R&D and the globalization of R&D activities.

4.1.1. Technology Transfer Strategy

Lacking in technological capability, foreign technology is the most important source of learning for firms in developing countries. What then should firms in those countries do to maximize the benefits of technology transfer from abroad? First, for SMEs that have neither the financial resources nor organizational capability to identify and negotiate collaborative agreements with foreign suppliers, the least expensive and relatively effective way to tackle mature technology is to acquire informal technology transfer (non-market mediated) by taking the imitative approach.

The Korean experience shows that the majority of important or crucial information needed to solve technical problems in the early years of industrialization can be obtained free of charge through non-market mediated informal mechanisms. Informal technology transfer to Korea has not been quantified, but many studies indicate clearly that they have been very important in Korea's acquisition of technological capabilities. This mode of technology transfer has clearly prevailed in innovative small firms and has, for a long time, been significant in broadening the capabilities of all exporters. These small firms are called "imitators" (Westphal, Kim, and Dahlman, 1985; Kim, 1997a).

Second, for large firms that have financial and organizational capability to negotiate with foreign suppliers, the most effective way to tackle a large-scale mature technology is to enter collaborative agreements with foreign suppliers. Given the scale of large investment required and the lack of technological capability and experience in the early years, large Korean firms looked to experienced foreign firms to ensure the swift construction and smooth start-up of their production processes and to acquire technical information and training to manufacture goods with stringent specifications (Kim and Lee, 1987). These large firms are called "apprentices."

As industrialization progresses in developing countries, these firms lose their competitiveness in low-wage-based labour-intensive industries, as their real wage goes up and late developing countries catch up rapidly with them in those industries. They can easily

become squeezed between the catching-up late developing countries and advanced countries. They may often have to master complex technologies that may be beyond their own capability. Then, foreign technology transfer becomes increasingly important for both small and large firms in developing countries. Foreign technology transfer can provide new dimensions in raising the knowledge level and can serve as a catalytic source of technological change that enables firms in those developing countries to make a quantum jump in indigenous technological learning.

The Korean experience, however, shows that foreign direct investment or joint-venture is not necessarily an effective way to acquire foreign technology. A fully owned FDI or a joint venture as a means of technology transfer may lead to either foreign dependency or conflicts. These mechanisms definitely transfer production capability, but they do not necessarily transfer engineering capability or innovation capability, particularly when the parent company uses FDI to exploit the local market in developing countries.

When, then, should firms in developing countries go independent or enter joint venture with technology suppliers? When firms in developing countries invest aggressively for technological learning and consequently accumulate technological capability, it is better to go independent of foreign equity participation (Quadrant I in Figure 7), particularly when they have a global vision. Even if some equity participation is allowed for some reasons, management independence should be maintained. Hyundai Motors is a good example. Otherwise (Quadrant 3), conflicts arise between the two joint parties, as learning and marketing strategy of the joint venture subsidiary can be constrained by those of the parent company. Daewoo Motors is a case in point. Similar evidence is ample in other industries in Korea. In contrast, when technology recipients are not aggressive in technological learning, then a joint venture arrangement will definitely benefit them (Quadrant 4). Learning will, however, be paced by the parent company. As a result, the technology recipients will become dependent on the technology supplying parent company.

Figure 7. Recipient's Strategy

	Strategy for technological learning	
	Aggressive	Not Aggressive
Independent	Slow initial learning but dynamic learning in long-run (1)	Slow learnig throughout (2)
Association with foreign firms — Joint venture	Rapid initial learning but conflicts restrict dynamic learning in long-run (3)	Learning at the pace of the parent firm's strategy. Dependency (4)

Third, what is the best way to use the foreign license (FL) as a means to expedite technological learning? "Unpackaged" FL is better than "packaged" FL for technological learning. As in the FDI discussed above, FL in a "packaged" form from a single source involves little risk to the technology recipient, as the performance of the transferred technology is guaranteed by the supplier. However, it leads to a passive attitude on the part of the recipient in the learning process. In contrast, when the recipient unpackages technologies, acquires them from multiple sources, and takes the responsibility to integrate them into a workable

system, it entails a major risk. This forces and motivates the recipient to expedite technological learning (Kim, 1997b).

In addition, it is also important for firms in developing countries to develop effective links with local universities and GRIs. Unlike foreign technology suppliers, these R&D actors can provide day-to-day interaction in response to emerging technical problems in firms.

4.1.2. Strategy to Acquire Tacit Knowledge

Firms in developing countries acquire largely explicit knowledge from FDI, FL, or turnkey plant transfer, although training involved in such transactions transfers tacit knowledge. Thus, it is important for firms in developing countries to formulate and implement strategy to acquire tacit knowledge that enables firms to make effective use of explicit knowledge.

The Korean experience shows that the hiring of people with higher tacit knowledge is one of the most effective ways for firms to build a tacit knowledge base. For small firms, a quantum leap in technological capability is commonly associated with the arrival of technical people recruited from other firms. These people bring with them new tacit knowledge, enriching their firms' technological base and enabling the firms to tackle tasks that were previously beyond their competency. The mobility of experienced technical personnel is, indeed, the most effective means for diffusing technology within the industry and the economy.

In addition to poaching experienced technical personnel locally, Korean large firms experienced that the aggressive recruitment of high caliber Korean-American scientists and engineers were a major source of building a tacit knowledge base. The automobile, electronics, and semiconductors industries as well as others have lured away some of the best Korean-American scientists and engineers, who earned PhD's at America's finest universities and rose through the ranks of leading concerns in the United States, such as IBM, Fairchild, Intel, and National Semiconductor. Well-financed Korean *chaebols* gave them challenging jobs and attractive compensation packages to crack new technologies (Kim, 1997a). Through the pivotal role played by these scientists and engineers, Korean firms were able to develop such state-of-the-art products as new automobile engines, semiconductor memory chips, electronic switching systems, multi-media electronics, etc.

4.1.3. In-house R&D

Firms in developing countries must gradually intensify their in-house R&D in order to build the knowledge base through "learning by research," as it becomes increasingly difficult to build the knowledge base through "learning by doing" or "learning by transfer." Facing the need to shift to higher value technology-intensive products, Korean industries have drastically raised their R&D investments over the recent decades.

Korea's growth rate was the highest in the world. For instance, the average annual growth rate of a nation's R&D investment per gross domestic product (GDP) over the period 1981-1991 was the highest in Korea (24.2 percent) compared to 22.3 percent in Singapore, 15.8 percent in Taiwan, 11.4 percent in Spain, and 7.4 percent in Japan. The average annual growth rate of business R&D per GDP was also the highest in Korea (31.6 percent) compared to 23.8 percent in Singapore, 16.5 percent in Taiwan, 14.0 percent in Spain, and 8.8 percent in Japan (DIST, 1994).

Other important indicators of Korea's rapid growth in industrial R&D are patent registrations in Korea and abroad. Patent activities in Korea have significantly jumped over the last two decades, increasing from a mere 48 percent in the first fourteen years (1965-1978), but nearly tripling over the next eleven years (1979-1989) and nearly tripling again over the next four years (1989-1993). This reflects the increasing importance of intellectual property rights in the face of the declining trend in reverse-engineering. The gap is still great when compared to advanced countries, but Korea is catching up rapidly. Furthermore, the share of Koreans in local patent registration also increased from 11.4 percent in 1980 to 39.7 percent in 1993, as a result of the rising R&D activities.

Patent registration in the United States is often used as a surrogate measure of international competitiveness. The number of patent registrations in the United States by Koreans is far below that of Taiwanese, let alone that in the advanced countries. The cumulative number of patents granted to Koreans by the United States between 1969 and 1992 is only 1,751 compared to 4,978 granted to Taiwanese. But Korea jumped from 35th in terms of the number of patents in the United States (among 36 countries listed in an NTIS report) with five patents in 1969 to eleventh with 538 patents in 1992, an average annual growth rate of 43.32 percent. This growth rate is the highest among countries in the report. This indicates once again that Korean firms have rapidly been gaining in international technology competitiveness (NTIS, 1993).

4.1.4. Globalization of R&D

When the needs of firms approach closer to the technical frontier, the globalization of R&D activities becomes increasingly important even for firms in developing countries. The Korean experience shows that facing rising reluctance from foreign technology suppliers, *chaebols* established a number of R&D outposts in the United States, Japan and Europe in order to monitor technological change and undertake frontier R&D. For instance, LG Electronics developed a network of R&D laboratories in Tokyo, Sunnyvale in California, Chicago, Germany, and Ireland. Samsung has R&D outposts in San Jose, Maryland, Boston, Tokyo, Osaka, Sendai in Japan, London, Frankfurt, and Moscow. Daewoo and Hyundai Electronics developed equally as extensive R&D outposts, too.

Korean firms are also globalizing R&D through mergers and acquisitions. Hyundai, for example, has been the most aggressive at acquiring equity stake in foreign firms as a way to gain access to cutting edge technologies. Hyundai acquired full ownership of Axil Computer in Santa Clara, California for computer development. It acquired significant stakes in Laserbyte Corp. in Sunnyvale, California to gain access to magneto optical disk drive technology; in Metaflow in La Jolla, California to develop SPARC compatible microprocessor, in Image Quest in San Jose, California to develop flat panel displays; and in Maxtor in San Jose, California to develop the Hard Disk Drive (HDD). In 1995, Samsung Electronics acquired the controlling share (40.25 percent) of AST research, one of the largest United States PC makers, for $378 million, placing Samsung among the five largest PC makers in the world. The acquisition gives Samsung access to over 190 AST patents and its strategic alliance with IBM, Apple, and Compaq. Samsung also acquired majority interest in Union Optical (Japan) and Rollei (Germany) to enhance its competitiveness in camera and optical equipment making.

4.2 Intensifying Effort

Deliberately constructed crises by top management may be a strategic means to intensify effort at the firm level. The Korean experience shows that a constructed crisis can be an even more effective tool than a naturally evoked crisis. Why?

A naturally evoked crisis creates a performance gap: a major discrepancy between how the firm performs now and what it ought to perform. But it faces denial to refuse a crisis as being real. This problem stems sometimes from different perception and interpretation of environmental changes or at other times from active resistance to maintain the status quo and inertia to adhere to existing norms and past practices. Consequently, the firm facing naturally evoked crises has to exert a significant portion of its energy in educating management coalition and organizational members to come to agreements on crises, mitigating resistance to change, and unlearning past practices. Different perception of crises and diverse opinions for prescription also attributes to making it difficult for the firm facing naturally evoked crises to direct energy for effective learning.

In contrast, constructed crises present an unclouded performance gap and an antidote to inertia. Unlike in naturally evoked crises, the top management, if necessary, can manipulate the performance gap in constructed crises so as to make them creative by keeping them from destructive end. Constructed crises also generate intense pressure to create mandates for change, enable management coalition to reach consensus on organizational goals and prompt members to accept them (Kim, 1997a).

Constructed crises also increase the intensity of effort both at the individual and organizational levels in searching for alternative courses of action to make crises creative. Mandating for a change generates the volume of efforts, while goal consensus and identification provide the direction for such efforts, making the intensity of effort clearly focused on expeditious learning for survival. The goal-focused, high intensity of effort to resolve crises also prompts members to actively search for information for new ways to respond to them and expedites knowledge conversion and accumulation at the individual level. This also intensifies interaction among those individuals and gives rise to knowledge conversion and accumulation at the organizational level.

In short, this section discussed strategic means that firms in developing countries can use to build their competitiveness. Means to build an existing knowledge base include technology transfer strategy, ways to acquire tacit knowledge, in-house R&D, and the globalization of R&D. The most effective way to intensify technological effort may be crisis construction.

5. Summary and Conclusion

Building industrial competitiveness is now critical for governments and firms in developing countries now facing increased market competition under the regime of the World Trade Organization. A major determinant of long-term industrial competitiveness is technological capability to make effective use of technological knowledge in production, investment, and innovation. Korea is one of a few countries that have transformed themselves from a subsistent agrarian economy to a newly industrialized one by rapidly accumulating technological capability over the past three decades. This paper first presented two analytical frameworks: one on technology policy and the other on technology strategy. It then discussed the implications of the Korean experience for formulating technology policy and strategy to build industrial competitiveness in other developing countries. The Korean

experience shows that both public technology policies and private technology strategies must evolve over time in response to changes in the market and technology environment.

Public policies should cover both the demand and supply sides of technology development and linking mechanisms. The demand side includes policies that create a competitive environment to facilitate technological learning by the private firms. Export promotion to bring in international competitive pressure on firms, trade liberalization to induce competition in the domestic market, a balanced industrial structure to develop effective dynamism between large and small firms, and antitrust regulation to ensure fair market competition are major measures that developing countries can use. The supply side includes the expansion and quality up-grade of education to supply well-trained human resources to the economy, a liberal brain-drain policy to reserve high caliber scientists and engineers to prepare for subsequent needs, technology transfer policy to meet the changing needs of industry, technology diffusion policy to maximize the effects of transferred foreign technologies, and indigenous R&D activities to assimilate and improve imported technologies and to generate own ideas. The linking mechanisms include preferential financing, tax concession, the venture capital industry, and entrepreneurship. It should be pointed out that all developing countries can neither do all of these things together nor with the similar results. Different sets of policies would be appropriate to countries at different levels of industrialization.

Nevertheless, the Korean experience shows that export promotion and education are the most effective policies over the different stages of industrialization. On the demand side, export promotion is the strongest competitive stimulus that creates needs for technology. Consequently, firms in export-oriented industries were forced to learn more significantly and more rapidly, and they grew faster than firms in the import-substituting industries. Likewise, countries with export-oriented industrialization (EOI) grew faster than those with import-substituting industrialization (ISI). For instance, the average annual economic growth rate for EOI countries was 9.5 and 7.7 percent, respectively, for the periods of 1963-1973 and 1973-1985, as compared to 4.1 and 2.5 percent for ISI countries. The real per capita income growth rate was 6.9 and 5.9 percent for the same periods for the former as compared to 1.6 and -0.1 for the latter, as the latter group had a higher population growth rate. It is for this reason that the EOI-oriented NICs in East Asia grew faster than their ISI-oriented counterparts in Latin America.

On the supply side, the expansion and upgrade of education at the all levels are the most fundamental and effective ways to create technological capability across an economy. Baumol, Blackman, and Wolff (1991) conclude that the quantity and quality of education in an economy are the major influential determinants of whether the economy is catching-up rapidly to narrow the gap with advanced countries. Developing countries achieved parity with advanced countries in terms of the percentage of children attending primary school. Provision of secondary and higher education explains differences in national wealth. Governments in developing countries should assume full responsibility for taking the necessary measures to provide quality secondary and tertiary education to their populace.

This paper also discussed various strategic means to build industrial competitiveness at the firm level. They include technology transfer strategy to maximize the benefit of foreign technology, the hiring of people to upgrade the tacit knowledge base, in-house R&D to enhance "learning by research," the globalization of R&D to tap advanced knowledge abroad, and crisis construction to expedite technological learning. How can these means work together to make a firm dynamic?

The Korean experience shows that dynamic firms have five characteristics. First, neither the firm that relied solely on foreign technological inputs, nor the one that relied exclusively on its own technological efforts was technologically most dynamic. However, it is the firm that combined both that is. Second, the dynamic firm vigorously monitored technological development in advanced countries. Short-term observation of foreign plants and exhibitions and R&D outposts in advanced countries are some of the main means to achieve this purpose. Third, a common characteristic of large firms was their commitment to training and developing their personnel. They formulated and implemented sound strategy from the outset to develop their human resources. Fourth, there was the presence of key technical champions in the dynamic firms, who provided critical tacit knowledge and major sources of ideas and ingenuity. They played pivotal roles in directing technological development. Fifth, crises construction has been a major means to opportunistic learning and a valuable facilitator of technological transformation at most Korean firms. Whenever dynamic firms were challenged by new technology, top management customarily created crises as a means to marshal organizational efforts and expedite technological learning.

Although all five characteristics were not necessarily present nor conspicuous to the same degree in all of the dynamic firms, most of these characteristics were clearly visible in every dynamic firm. That is, for firms to be dynamic, they should have multiple sources of foreign technologies, continually upgrade tacit knowledge embodied in human resources, continually invest in indigenous R&D efforts to work on imported technologies and monitor technological changes in advanced countries. They should also have an aggressive entrepreneur who orchestrates over all imitation and innovation activities, and construct and successfully manage crises. The absence of any of these factors is likely to retard the pace of technological learning (Kim, 1997a).

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Building Systemic Competitiveness: Concept and Case Studies on Mexico, Brazil, Paraguay, Republic of Korea and Thailand

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Preface

In this study case studies of policies for building industrial competitiveness in Mexico, Brazil, Paraguay, Republic of Korea and Thailand are presented. They are based on both desk and field research conducted over the last years by the authors, all of them senior research fellows with the Industry Division at the German Development Institute, Berlin.

These case studies are analyzed within the conceptual framework of "systemic competitiveness". This concept, summarized in Chapter I of this paper, has been developed by the authors and two other colleagues (Klaus Esser, Dirk Messner) over the last years.[1] It provides a heuristic framework to analyse the factors that stimulate or hinder dynamic industrial development. It can be applied to both industrialized and developing countries. The key assumption is that competitive advantages emerge only in part due to the invisible hand of the market, i.e. the activities of atomized economic agents, and are to a significant extent created by deliberate collective action. There are two elements which distinguish the concept of "systemic competitiveness" from other analytical frameworks concerning the factors that determine industrial competitiveness:

- It entails four different levels of analysis (the meta-, macro-, meso- and microlevels). In addition to the microlevel of firm activities and the macrolevel of national economic policy, the metalevel addresses such factors as the capacity of a society for social integration and its ability to formulate and implement strategies. The mesolevel concerns the supporting structures, including sector-specific policies which encourage, supplement, and increase the efforts at the company level.
- It brings together elements of industrial and innovation economics and industrial sociology with the discussion in political science on governance based on policy networks.

While the case studies are placed in the broad framework of "systemic competitiveness," all of them focus on the mesolevel, that is, on strengths and weaknesses of industrial policies in the countries concerned. Each study, however, highlights different aspects of industrial policy, namely:

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* German Development Institute, Berlin 1997

1 Esser et al. (1996).

- policies to link small-scale enterprises to large export companies (Mexico);
- the role of mesolevel policies and institutions below the central government level (Brazil);
- possible approaches to stimulating industrial development in a less advanced developing country (Paraguay);
- new governance patterns for industrial and technological targeting (Republic of Korea);
- strategies and policies of balancing economic and environmental performance (Thailand).

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The authors hope that the present paper will be of interest to both the scientific community and decision-makers in the public as well as the private sector.

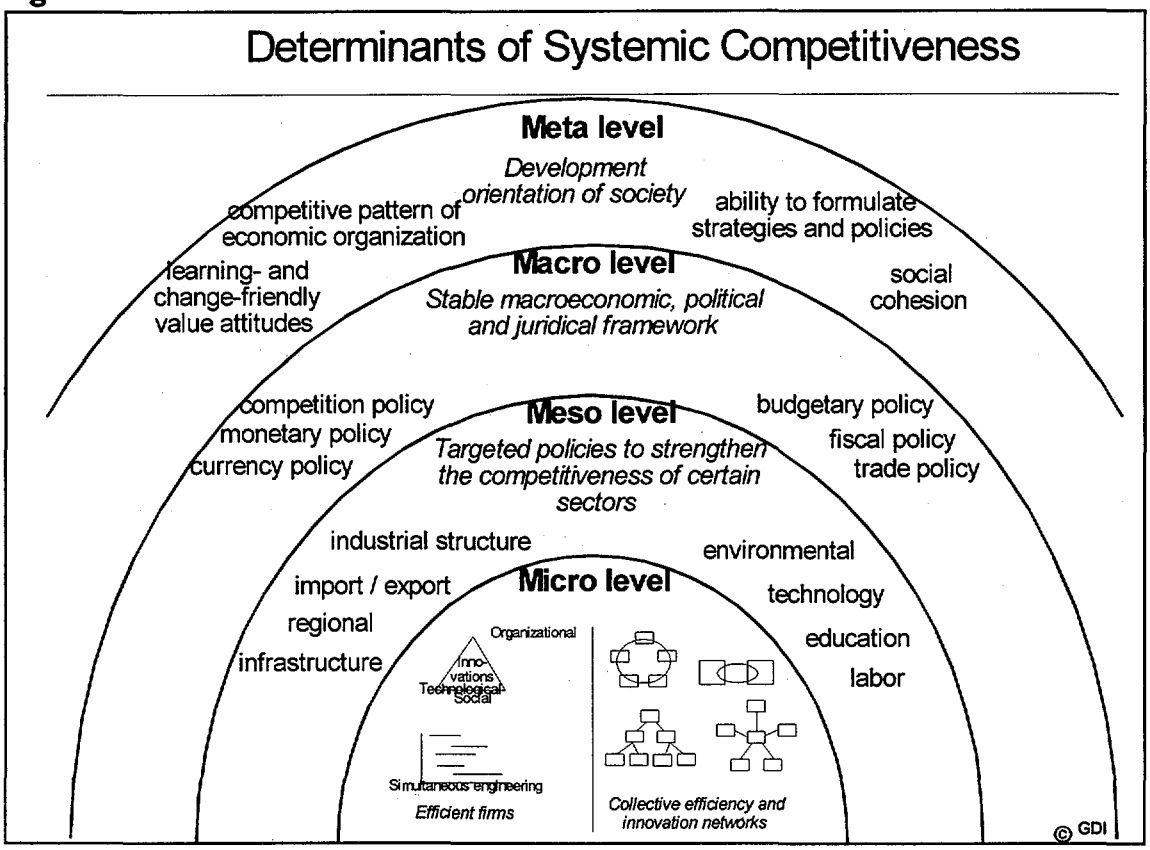
1. The Concept of Systemic Competitiveness

The concept of systemic competitiveness seeks to capture both the political and the economic determinants of successful industrial development. What is meant by systemic competitiveness is a pattern in which state and social actors create the conditions needed to develop systemic competitiveness. The concept distinguishes between four levels: The microlevel of the firm and inter-firm networks, the mesolevel of specific policies and institutions, the macrolevel of generic economic conditions, and the metalevel of slow variables like socio-cultural structures, the basic order and orientation of the economy, and the capacity of social actors to formulate strategies (Figure 1).

The key ingredients of successful industrial development are:

- at the *metalevel*: first, development-oriented cultural values shared by a large part of society; second, a basic consensus on the necessity of industrial development and a competitive integration into the world market; third, the ability of social actors to jointly formulate visions and strategies and to implement policies;
- at the *macrolevel*: a stable and predictable macroeconomic framework. This should include a realistic exchange-rate policy and a general foreign-trade policy that stimulates local industry;
- at the *mesolevel*: specific policies and institutions to create competitive advantages. What is meant here are specific, targeted policies aimed at shaping industries and their environment (technology institutes, training centres, export finance, etc.). Moreover, it is the world of local and regional industrial competitiveness initiatives to strengthen the business environment. Many of the institutions that act at the mesolevel are typically, or can in principle be, non-government entities, e.g. business associations, nonprofit entities, or firms;

Figure 1



- at the *microlevel*: capable firms and their continuous improvement, and networks of firms with pronounced externalities.

The analytical concept of systemic competitiveness has been developed in order to be able to assess, in a systematic and comprehensive way, the factors that contribute to successful industrial development. The concept is meant to lead beyond sterile discussions of the state vs. market type. Successful industrial development was based on strong states and strong markets in the past; and developing countries typically suffer from weak state structures and weak markets, i.e. both state and market failure. The secret of successful development is to find an appropriate balance between intervention, i.e. the formulation and implementation of targeted policies designed to stimulate and shape industrial development and market forces.

It is now well understood that the main objective of structural adjustment programs of the 1980s and early 1990s, namely to create a stable macroeconomic framework, is a necessary but not sufficient condition for successful industrial development. It is also obvious that the specific pattern of state-led industrialization, which was the basis of successful latecomer industrialization in East Asian NICs, is hardly a serious option for today's developing countries. This is so for two reasons. First, most governments have neither the technical competence nor the standing to formulate, let alone implement, grandiose industrialization strategies. Second, the other countries (and in particular those countries that have for decades pursued an import-substitution strategy) do not start from scratch, as Republic of Korea and Taiwan did in the 1950s. Rather, they already have an industrial structure. At the very least this consists of small- and medium-sized firms producing consumer non-durables for the domestic market, and medium and large state-owned firms in process industries like petroleum refining, steel, fertilizer, and cement. Any industry-

related policy will first aim at restructuring these sectors. This is why the experience of East Asian NICs does not provide a blueprint for countries which have in the past followed an import substitution-strategy.

Dynamic industrial development requires deliberate action by both government and social actors in order to stimulate and support firms in their effort to create competitive advantages. In other words, it is the outcome not only of the invisible hand of the market but also of governance. Regarding the term *governance*, we follow here the World Bank's rather broad definition as "... *the manner in which power is exercised in the management of a country's economic and social resources for development.*"[2] Like development in other sectors, governance of industrial development today has to be based on a participative model in which social actors interact with the state in defining strategies and policies. This kind of model has emerged spontaneously in the industrialized countries as a reaction to increasing social complexity and the limited success of state interventionism. It is emerging, though hesitantly, in the developing world, especially in those countries where democratization processes have opened some scope of action for civil society, and where the limited competence and inactivity of the state has created opportunities for non-governmental organizations.

1.1 Definition and Scope of the Concept

Definition of competitiveness: At the company level, competitiveness refers to the ability to sustain a market position. This ability requires the simultaneous achievement of several targets. The firm must supply products of adequate quality on time and at competitive prices. Moreover, it must as a rule be in a position to provide products sufficiently diversified to meet a differentiated demand, and it must respond quickly to changes in demand behaviour. Beyond this, success is contingent on a firm's innovative capacity, its ability to build up an effective marketing system, to establish a brand name, and so on.

The concept systemic competitiveness refers to nations, regions, industrial sectors or subsectors rather than individual companies. It should be noted that the notion of competitiveness applied to such aggregates is not synonymous with the concept of company competitiveness, as defined above, although nations (as well as other aggregates), like corporations have a more or less sustainable market position. Krugman rightly states that the competitiveness of companies has a clearly defined bottom line: "*if a corporation cannot afford to pay its workers, suppliers, and bondholders, it will go out of business. So when we say that a corporation is uncompetitive, ... it will cease to exist. Countries, on the other hand, do not go out of business ... they have no well-defined bottom line*".[3] Hence the measure for the competitiveness of nations is not sustainability in the market. Empirical evidence indicates that not even the trade balance is a reasonable indicator of a nations competitiveness, since trade surpluses can occur in phases of economic crisis and vice versa.

In the case of nations or regions, a loss of competitiveness leads not to elimination, as in the case of firms, but to deteriorating welfare conditions. Normative parameters, including socioeconomic and environmental issues, are therefore necessary to assess the competitiveness of such aggregates as nations. We define national competitiveness as *the degree to which a nation can, under free and fair market conditions, produce goods and services*

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[2] World Bank (1992), p. 1.

[3] Krugman (1994).

that meet the test of international markets, while simultaneously maintaining and expanding real incomes of its people over the long term. This long-term perspective implies the need to reduce ecological impacts and resource intensity to a level at least in line with the carrying capacity of the nation's ecosystems.[4]

Why "systemic"?: By using the term systemic, several factors should be pointed out. First, a firm will generally not become competitive on its own, that is, without a supporting environment of suppliers and production-oriented services as well as the competitive pressure of local competitors.[5] Microlevel competitiveness is based on interaction. Learning-by-interacting is a key element in firm-level innovation processes, and feedback loops between firms and supporting institutions are crucial in order to establish dynamic competitive advantages.

Second, an environment that sustains competitiveness is rooted in a national system of norms, rules and institutions that defines the incentives which shape the behaviour of firms.[6]

Third, it should be noted that the state has an important role to play in industrial development and restructuring. However, it is assumed that autocratic, hierarchical modes of governance are becoming obsolete. New forms of governance are emerging that are based on a new kind of interaction between state and social actors, typically in horizontal networks.[7] Here again, interaction and feedback loops have been found.

Scope of the concept: As the complexity of industrial organization increases, the systemic nature of competitiveness becomes more important. In particular, the most innovative industries build upon positive external economies, such as the existence of world-class suppliers of intermediary goods and machinery, demanding consumers, specialized business services and other factors that make up a supporting business environment. Nevertheless, certain industries can operate fairly well without such an environment. The systemic character of competitiveness is not equally important to all industries. Two exceptions are especially important with regard to the industrialization prospects of developing countries:

First, some mature production processes can be transferred to greenfields sites which lack most elements of a modern supporting business environment. This is obvious in the case of those light industries which are typical of Export Processing Zones (apparel, electronic assembly, toys, etc.). Basic infrastructure consisting of access to international airports and ports, electricity and minimal workforce education are sufficient conditions to attract such industries. Recently, even relatively complex state-of-the-art production processes including robots and modern management methods such as *kaizen* have been successfully transplanted to greenfields sites in developing countries. But it is important to note that all these examples refer to mature industries which can be built up by transplanting codified knowledge

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[4] This definition is based on the *Report of the US Presidential Commission on Industrial Competitiveness*, which was elaborated in 1985 (quoted from OECD 1992, p. 242), adding the target of ecological sustainability as defined by the World Business Council for Sustainable Development (quoted from Fussler 1994, p. 71).

[5] Cf. Porter.

[6] Cf. Nelson (1992).

[7] Cf. Mayntz (1991).d

embodied in blueprints, machines and operation manuals. These industries may be called *blueprint industries* since they do not depend on more tacit forms of knowledge that are not codified in blueprint form, and thus cannot be readily disseminated. These blueprint industries do not conduct any substantial R&D and will, as a rule, not produce much incremental technological change, either.

Second, despite the general trend toward tariff reduction, certain industries oriented toward the domestic markets of developing countries are not fully exposed to international competition. This is especially true for the low ends of product markets. Firms can, therefore, perform fairly well even if the supporting environment is weak. This is due to the fact that there are entry barriers to the domestic market which are not eliminated by trade liberalization. Examples are:

- high transportation costs;
- deficient communication systems;
- a market size too small to be interesting for potential foreign investors;
- underdeveloped marketing systems with large shares of demand served by street vendors or on the basis of informal credit arrangements;
- special local consumption patterns.[8]

1.2 The Roots of the Concept of Systemic Competitiveness

The concept of systemic competitiveness draws on different strands of the discussion in economics and social science. The contribution of the concept is primarily to address the complementarities of largely unrelated discussions in different disciplines. No claim is made that systemic competitiveness is a theory; it is more a heuristic framework to that can be used to overcome the limitations of isolated discourses in different disciplines.

In the field of economics, contributions mainly of four different schools have been drawn on: innovation economics and evolutionary economics, the post-structuralist school, some elements of institutional economics, and certain contributions from management science.

i) Innovation economists have done extensive research on the functional logic of innovation processes and innovation systems, to a certain degree continuing along lines established by Schumpeter.[9] In this view, innovation is not an event but a process that typically occurs along trajectories. Defining a path or trajectory implies a decision in favour of one and against other technological options. The decision typically reflects a specific historic constellation, including economic, political, technical, and other factors as well as coincidence. Once a trajectory has been established, the latitude for guiding technological development is limited (path dependence). The innovation process is based on continuous learning in the form of learning-by-doing, learning-by-using, and learning-by-interacting, between firms as well as between firms and research and technology institutes. Innovation patterns differ from country to country due to different institutional frameworks and different incentive structures; it is in this way that different national systems of innovation

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[8] Altenburg (1995), pp. 70 - 76.

[9] Dosi et al. (1988); Freeman (1987); OECD (1992).

emerge. Technological knowledge can never be fully codified, i.e. it is crucial to keep in mind the importance of tacit knowledge, which is not easily transferable and is for the most part person- and firm-specific. If it is to use a given technology, a firm must therefore undertake learning efforts to create the necessary tacit knowledge. Due to path dependence and the tacitness of knowledge, neoclassical views that suppose complete freedom to choose, transfer, and switch between technologies do not provide an adequate understanding. Accordingly, policy recommendations based on neoclassic thinking will often prove inadequate.

ii) A key issue in the post-structuralist discourse is the redefinition of the role of the state in processes of late industrialization.[10] Traditional structuralism pointed to the central role of the well-informed, powerful development state in guiding the industrialization process. The experience of the East Asian NICs has shown that this concept was not altogether wrong. However, it depended on a number of specific factors which had to be combined in a sophisticated way. Only few societies have succeeded in doing so. In other parts of the world, particularly in Latin America, a statist, market- and competition-unfriendly model of industrial development temporarily generated high growth rates. In the end, however, it led to mutually reinforcing blockade constellations and a deep economic and social crisis. The post-structuralist discussion still maintains that the state has to play an important role. At the same time it emphasizes the importance of economic incentive structures, especially the role of competitive pressure, in stimulating technological learning and upgrading.

iii) The new institutional economics seeks (essentially inside the framework of neoclassical economics) to identify those rules, conventions, norms, and structures which shape the behaviour of economic agents, especially firms.[11] Two elements are particularly important in this context. First, institutionalist economics emphasizes the importance of systems of rules, particularly property rights. Without well-established and enforceable property rights the conditions for entrepreneurship are severely restricted. Second, institutionalist economics points to the importance of transaction costs, i.e. the costs involved in the arrangement, supervision, and enforcement of contracts. High transaction costs, e.g. due to missing or badly organized information systems (for instance regarding the credit standing of firms), will often lead to suboptimal patterns of organization (e.g. extreme vertical integration as firms prefer not to deal with suppliers and subcontractors due to high transaction costs).

iv) In the view of management science there is no question that company competitive advantages do not emerge randomly but are created by strategic management. The discipline emphasizes that firms should concentrate on their core competencies, outsourcing other activities, and should also strive to create competitive advantages along the whole value chain. Apart from intra-firm features, management science has, over the last few years, increasingly dealt with aggregates of firms.[12] Going beyond this perspective, Porter has argued that the distinguishing element between more and less successful economies is the difference in the quality of industrial clusters (and not

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[10] Amsden (1989); Lall (1992); CEPAL (1990); Hillebrand (1991).

[11] Important authors are Williamson (1995) and North (1995). For an overview see Reuter (1994).

[12] The work of Porter (1990) has been particularly influential. For an overview see Messner / Meyer-Stamer (1993).

just individual firms). According to Porter, successful industrial development has to be created through deliberate action. Sustained industrial competitiveness is based on four factors: competent firms with a strategic vision, a demanding domestic market, highly capable supporting industries, and a well-developed environment of specific supporting institutions.

In the field of social science, the concept of systemic competitiveness relates mainly to four strands of the discussion: economic sociology, industrial sociology, economic geography and political science.

i) Economic sociology seeks to analyse structures and processes, as well as in particular power relations that shape economic transactions in the real world.[13] The discipline aims at explaining, outside the world of economic models, why economic agents behave in the way they do. Important insights include the observation of the crucial role of trust and relational contracting. Economic transactions, e.g. between a firm and its most important suppliers, are not anonymous market transactions but embedded in a complex social relationship pattern. This insight arose from observations of such different phenomena as long-term supplier relationships in the Japanese industrial system and dense networks with highly differentiated forms of communication and sanction mechanisms in Italian industrial districts.

ii) Industrial sociology has made important contributions to the understanding of the fundamental changes in firms that have occurred since the 1980s.[14] It identified "new production concepts" which differed profoundly from traditional Taylorist concepts. While management science prescribed new organizational concepts (lean production, flat hierarchies, teamwork, strongly reduced division of labour inside the firm), industrial sociology also analyzed the obstacles to their quick introduction, particularly the power structures inside firms.

iii) Economic geography received increasing attention as other disciplines began to realize the importance of spatial concentration of firms and supporting institutions.[15] Spatial concentration stimulates formal and informal communication, thus facilitating rapid diffusion of information and collective learning – and these are the factors that decide on success and failure in ever tougher competition based on continuous innovation. Traditional concepts of regional policy that aimed at dispersing industries have increasingly come in for criticism In this con-text.

iv) Political science has moved from optimism to pessimism and back again regarding the governability, i.e. actively and deliberately shaping the fate, of industrial societies.[16] The 1970s were, in many industrial countries, marked by attempts to restructure societies in a top-down manner, using hierarchical governance modes. The success of these efforts was limited, not only due to various sources of resistance but also due to the objective problems of governing across different levels of government and across different sectors, which created extremely entangled structures with mutually

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[13] Important authors include Granovetter (1992) and Platteau (1994a/b). For an overview see Smelser / Swedberg (1994). On the industrial district discussion, see the overview of Nadvi / Schmitz (1994).

[14] Path-breaking contributions were made by Kern / Schumann (1984). For an overview, see Sauer / Wittke (1994).

[15] Some of the most influential authors are Scott (1988); Storper / Walker (1989); Storper (1995).

[16] Important authors include Mayntz (1991); Scharpf (1991). For an overview see Messner (1997).

reinforcing blockades. The result was deep pessimism regarding the governability of industrial societies, which shaped the discussion in the 1980s. Pessimism was theoretically well-founded, but it was at least partially rejected based on the observation of new, network-like governance patterns in fields like research, health, and telecommunication policy. The main finding was that such sectors were no longer governed through hierarchical structures under the guidance of the state. Instead, there were horizontal, heterarchical structures that involved state and non-state actors alike. Policy networks in the shadow of hierarchy served to define problems and to find solutions. Involving social actors, it turned out, mobilized essential know-how and creativity and improved the perspectives for successful implementation. This pattern is supplanting the traditional pattern of political organization based on division of powers and is helping to overcome some of its deficits.

The common denominator of these different strands of theory is the concept of networks. The network feature is crucial for both the political and the economic dimension of systemic competitiveness. Firms that compete in globalized markets are not the atomized agents of textbook microeconomic theory. Rather, they are woven into dense networks that consist of other firms (suppliers, customers, and competitors) and of mesoinstitutions. Likewise, political actors that formulate industrial strategy are not the utility-maximizers of rational choice theory. Instead, they are also woven into networks, in this case policy networks that consist of agents from different public institutions and representatives of different organizations of the civil society. These policy networks complement the established, hierarchical governance patterns and democratic institutions. They are the place where joint definitions of problems are sought and concrete measures to solve them are formulated.

Creating the conditions for systemic competitiveness is profoundly different from the kind of state-led, guided, and interventionist industrial policy of the past. It is a market-friendly approach, as it acknowledges that a functioning market is the key prerequisite for industrial dynamism. It is also an approach that can be much less costly than the traditional, subsidy-based industrial policy, as it essentially involves stimulation, encouragement, and moderation, plus the creation of specific mesoinstitutions which will not emerge spontaneously due to an initially unfavourable cost-benefit-ratio or problems associated with free-riding.

1.3 The Four Levels of Systemic Competitiveness

Orthodox economics address two levels, namely the macro- and the microlevel. The analysis of successful industrialization processes has shown that a well-functioning mesolevel of specific policies and supporting institutions is a further important dimension. In addition, it is obvious that successful development depends highly on the cultural values, the social composition and the political system in a given country. In trying to understand how competitive industries are being built up it is therefore important to address features at the metalevel.

Macrolevel: Linking Economic Stabilization and Liberalization to the Capacity for Transformation

An enabling macroeconomic environment, i.e. well-functioning factor, commodity and capital markets, are crucial to ensuring the efficient allocation of resources. In view of the experience made in the 1970s it is now widely accepted that an unstable and highly biased macroeconomic framework (high inflation, persistent high budget and trade deficits and a

distinct anti-export bias in the economy resulting from an overvalued exchange rate as well as high protectionist barriers) considerably reduce the ability of these markets to function properly, with negative effects particularly on economic growth and exports.

Stabilization of the macroeconomic framework must in particular encompass a reform of fiscal, budgetary, monetary as well as currency and trade policies. The sequencing of such measures depends on the specific circumstances. When formulating and launching these reforms, policymakers must, however, take into account that there is a latent field of tension between the goals of creating a stable and unbiased macroeconomic framework and securing the basis for future growth and the capacity to compete in world markets. Stabilization and liberalization measures for the economy as a whole should therefore be linked as closely as possible to parallel, protracted structural reforms as well as a country's short- and medium-term transformation capacity. In very broad terms, tensions can be reduced if three main elements are taken into consideration:

First, combatting inflation mainly through restrictive budgetary policies will often lead to restrictions on not only consumption but also on investment and thus to a reduction of scopes for economic growth and more equitable distribution. Efforts to consolidate the budget deficit should therefore be closely linked to structurally oriented reforms of budgetary and fiscal policies.

When measures are taken to reduce state expenditures, the approach to curtailing state investment most simple in political terms – for example education, health and development of physical infrastructure – must be avoided. In order not to weaken the basis for future growth, consolidation measures must be used to cut expenditures for consumption, to remove privileges for interest groups, and to examine the extent of state activity. What becomes particularly necessary is to reduce military expenditure, to avoid overstaffing in the public sector, to cut subsidies by introducing fixed-term, degressive subsidies, to concentrate social policies on the poorest groups of the population, and to eliminate deficits in state enterprises by making use of the scopes available to privatize and commercialize state activities. Also, investment expenditure must be subject to careful scrutiny and must be concentrated in those areas which are particularly important for the development of the private sector and for social development. In this context, the potential of innovative extra-budget financing mechanisms such as build-operate-transfer schemes for infrastructure development should also be exploited.

On the income side, a thorough restructuring of the entire system of taxes and duties and a strengthening of the administrative competence of the tax authorities is normally required. The trend must be toward taxing consumption rather than production, to cover and tax progressively all the various kinds of income, to avoid a bias in the taxation of national and international transactions and to levy adequate cost-covering charges for state services.

Second, if inflation is to be held at a tolerable level, a fiscal and budgetary policy geared to stability must not be counteracted by an expansionary monetary policy. Stability-oriented monetary policy does, however, come up against very narrow limits under the conditions of underdeveloped and distorted money and capital markets characterized, among other things, by credit rationing, selective credit allocation and arbitrarily set interest rates. In order to guarantee sufficient availability of loans at tolerable interest rates while maintaining a sufficient monetary stability, the aims must be: first, to consolidate the competencies of the central bank to control the domestic money supply and foreign capital influx; second, to develop an efficient and diversified private financial sector; third, to provide for well-

functioning competition in the money and capital markets; and fourth, to reduce discretionary state intervention to influence interest rate development.

Third, persistently large balance-of-payments deficits narrow the scope for growth and destabilize the national economy. They normally signal an anti-export bias within the overall economic policy framework and can only be reduced under altered exchange-rate and foreign-trade policies.

The exchange rate is the strategic variable which decides whether a national economy is capable of creating the fundamental macroeconomic preconditions necessary for setting up internationally competitive industries. Countries which allow a long-term overvaluation of their currency create a double obstacle to the development of an efficient industrial production apparatus in two ways: exports made more expensive through the exchange rate lead to a situation where firms see no realistic chance of gearing their production to the world market. At the same time, artificially low import prices also imply that firms forfeit their competitiveness in the domestic market, with the consequence that money is then invested primarily in the area of non-tradeable goods or that capital is even exported.

Trade policy must also give clear signals to firms to cause them to gear their strategies to the world market. The timing and sequencing of policy reforms is important to ease the transition from an import substitution strategy to a concept of active world market integration. Generally speaking, the speed of reforms should consider the capacity of firms and institutions to adapt to the new framework conditions. If competitive pressure increases too rapidly, they will not be able to adapt to the new environment. On the other hand, policy reforms need to create sufficient pressure and challenge firms and institutions to modernize as quickly as possible. For the transition toward a more liberal trade regime, governments have two clearly distinct options available:

The first option, i.e. general import liberalization, aims at tariff rates which are low and uniform for all types of goods. It puts its trust in the validity of the principle of comparative advantage and accepts that only those industries will survive which derive their competitive strength from existing comparative advantages. This option usually involves high frictional costs, as it does not take into account the fact that different groups of industries need different periods of time for technological learning. It may therefore provoke deindustrialization in branches which have the potential to become competitive in the medium term, and it may inhibit technological upgrading. However, countries with little experience in actively shaping economic structures may have no other choice than to pursue a policy of nondiscretionary import liberalization.

Under the second option, i.e. selective import liberalization, the process of opening up the economy proceeds on the basis of a sectorally differentiated timetable founded upon an analysis of the actually foreseeable response potential of existing industries and the development requirements of the old and new industrial centres. In more advanced countries, trade policy can therefore become an important part of a policy of actively shaping competitive advantages.

Microlevel: Technological and Organizational Requirements

Firms are faced today with increasing challenges resulting from six different trends: First, globalization of competition in a rising number of product markets; second, an increase in the number of competitors on account of successful late industrialization processes and successful structural adjustment as well as export orientation; third, increasingly differentiated

demand patterns; fourth, shortening product innovation cycles; fifth, establishment of radical technological and organizational innovations; and sixth, upheavals in technological systems in which the boundaries between sectors are newly demarcated, for example overlaps between computer technology and telecommunications (telematics) or between mechanics and electronics (mechatronics).

Firms have to optimize four factors in order to be competitive: cost-efficiency, quality, variety, and responsiveness. The ability to offer a variety of products without sacrificing quality and efficiency is necessary to meet an increasingly differentiated demand. Responsiveness means the ability to react quickly to changes in demand and new opportunities.

If they are to meet the new demands, firms must reorganize extensively both internally and in conjunction with their immediate environments. Incremental changes as envisaged in the 1980s with far-reaching automation and interlinking in the field of information technology (cf. the "automation of Taylorism") are simply not enough. In order to increase efficiency, quality, variety, and responsiveness at the same time, profound changes are needed in three areas:

- *Organization of production:* The aims are a reduction of time-to-market and throughput times, for example by replacing traditional conveyor belts and transport systems with cellular manufacturing in order to be able to respond quickly to customer demands, and by reducing stocks toward the end of cutting the costs of current assets. Further aims are improvements in quality and quality costs (defect and rework ratios), which can be achieved by approaches like total quality management.
- *Organization of product development:* The strict division between development, production and marketing has not seldom led to product designs which resulted in too high production costs and/or failed to meet customer preferences. Parallel organization of various development stages and reintegration of development, production and marketing (simultaneous engineering) lead to drastically reduced development times and products which can be more efficiently produced and are easier to market.
- *Organization of the value chain:* Firms reduce vertical integration in order to be able to concentrate on their core competence. They reorganize their supply and subcontracting relations, especially by introducing just-in-time linkages. And they reorganize their supplier pyramids by reducing the number of direct suppliers by upgrading some of them to system suppliers and integrating them into the product development process.

In all three areas the key issue is the interaction between organizational, social and technical innovations. Reorganization is often what first creates the conditions for the use of new computerized hardware. Social innovations (reduction of hierarchical levels, a much wider scope for decision-making at the operational level) are prerequisites for the functioning of new organizational concepts.

A separate issue that has to be addressed at the microlevel is that of the structure of industry, and the appropriate framework for analysing it. A traditional view would be to distinguish consumer non-durables and durables, intermediate goods, and capital goods. Another view, addressing technological issues, is the distinction between supplier-driven,

scale-intensive, specialized supplier, and science-based industries.[17] Yet another view, addressing the interaction between profound changes in the macroeconomic framework and adjustment at the microlevel, is the distinction between resource-intensive, qualified labour-intensive, and R&D-intensive industries.[18] These concepts are often helpful in analysing specific circumstances. It is furthermore important to note that hardly any industry, or any firm, qualifies *a priori* for any of these classifications; the Finnish pulp and paper industry was probably much more R&D-intensive than the Brazilian computer industry. It is thus essential not to confuse empirical concepts (*How do I order a given reality?*) and normative concepts (*Which industry should I try to stimulate because it has a particularly positive impact on welfare?*)

Mesolevel: Supporting the Efforts of Firms

The increasing challenges to firms go hand in hand with increasing demands on their support structures. In the world economy it is therefore no longer only individual firms that compete with each other but industrial clusters, groups of firms organized in networks, whose dynamic development depends on the potential of a particular location. This potential is shaped by continuous and close contact with R&D facilities, technology formation and dissemination institutions, universities, training institutions, financial institutions, export information institutions, and many other entities. Due to increasing global competitive pressure the demands at the local, regional and national levels to create and support the business environment are increasing; this applies for demands on business associations and other non-governmental actors as well as to demands on the state at all these levels.

There are two different ways of addressing the mesolevel. First, there are mesoinstitutions which offer specific services to industrial firms. Second, there are mesopolicies, i.e. selective, targeted policies to shape sector-specific regulatory and other conditions and to create mesolevel institutions.

Mesoinstitutions:

A well-developed industrial location hosts a broad set of institutions which offer services and support to firms (Figure 2). This set of institutions is as a rule the outcome of a lengthy learning and upgrading process on the part of individual firms and institutions and the interaction among them. Porter's distinction between basic and advanced factors and generalized and specialized factors is useful in addressing a typical development sequence of a set of mesoinstitutions at a given location:

> "*Basic factors* include natural resources, climate, location, unskilled and semiskilled labour, and debt capital. *Advanced factors* include modern digital data communications infrastructure, highly educated personnel such as graduate engineers and computer scientists, and university research institutes in sophisticated disciplines. (...) *Generalized* factors include the highway system, a supply of debt capital, or a pool of well motivated employees with college educations. They can be employed in a wide range of industries. *Specialized* factors involve narrowly skilled personnel,

[17] Cf. Pavitt (1984).

[18] Cf. Katz (1996).

infrastructure with specific properties, knowledge bases in particular fields, and other factors with relevance to a limited range or even to just a single industry."[19]

Figure 2

In the early stages industrial development in a given location will be based mostly on basic and generalized factors. Only after a certain period of time will advanced and specialized factors be created, partially through private enterprise (e.g. provision of venture capital or specialized business consultancy), partially through the activities of business associations (e.g. technology information), and partially through government activities (e.g. university research and education). As a matter of fact, a closer look at the elements mentioned in Figure 2 reveals that most factors at the mesolevel can be provided through the private sector, either by specialized individual firms or by business associations. It is thus important to note that shaping the mesolevel does not necessarily, indeed not even predominantly, involve government activities.

Mesopolicies:

Mesopolicies keyed to creating systemic competitiveness consist of three main elements:

- Regulatory policy: Based on the "Washington consensus," one might argue that there should be no mesolevel regulatory policies, i.e. there should be a uniform macrolevel regulatory framework that applies to all branches and sectors of industry. However, there is still a justification for selective regulatory policies. As far as import policies are concerned, there is still a case to be made for infant industry protection, albeit on a fixed-term and performance-related basis. Regarding environmental policies, it can make sense to target different industrial branches in a differentiated way.

[19] Porter (1990), pp. 77 f.

- Financial instruments: These are useful in fields like R&D support and export promotion where market failure is likely. Tax incentives and direct subsidies can stimulate intra-firm R&D which – due to external effects and limited appropriability – would otherwise not materialize on the scale that is desirable in a macroeconomic perspective. Export credit and insurance is often provided by state agencies, or reinsured by government, because factors like political risk lead to private-sector under-involvement in this field.
- Government activities aimed at creating and upgrading mesolevel institutions: These are justified in the case of market failure or if collective action by the private sector fails to emerge. Market failure is very likely in R&D and training, certain areas of infrastructure and environment. In the particular case of less advanced developing countries, it may also occur in the field of finance due to the small size of the market, high risk, and high transaction costs.

It is difficult to strike an adequate balance between supply- and demand-driven measures in creating mesolevel institutions; this is something that SME support and regional policies in advanced countries as well as national development policies in and technical assistance to developing countries are constantly struggling with. Supply-driven measures, i.e. measures that anticipate potential or future demand of firms for support by mesolevel institutions, are often not successful. This applies especially to early phases of industrial development when firms are small, are showing deficits in most business functions, and have for precisely these reasons no obvious receiving structure for support by mesolevel institutions.

The work of mesolevel institutions becomes much easier once firms have become highly competent and a culture of micro-meso interaction has been established. It is, however, also risky to rely exclusively on demand-driven measures. Mesoinstitutions like technology demonstration centres are by definition supposed to generate changes in behaviour rather than waiting for them to happen. One way of resolving this dilemma is to establish close communication between government, business, and other actors active in the area of mesoinstitutions who should be able to articulate existing and anticipate foreseeable demand.

Competitiveness-oriented mesopolicies should not be confused with certain traditional variants of industrial policy. Mesopolicies aimed at creating systemic competitiveness are about stimulating competition and supporting firms to make the best of a highly competitive environment. Traditional industrial policy often was the exact opposite, for instance, protecting domestic industries against foreign competitors or even stifling domestic competition by encouraging the emergence of national champions. Regulatory policies (e.g. import and local content regulations or licensing procedures) and financial instruments (e.g. direct subsidies) were the main instruments of such traditional industrial policies. Both are still important instruments, but in a different way. A further traditional instrument, state ownership, has currently fallen out of favour, as state enterprises have tended to show unsatisfactory performance.

The interrelationship between the regional and the national level:

The *locus* of industry-related policymaking is changing. Traditionally, industrial policy, technology policy, and other specific policies that shaped industrial development were prerogatives of central governments. The situation has changed. As firms come under increasing pressure due to globalization, their demands on their local environment increase.

Consequently, mesopolicies increasingly have to be formulated at the regional and local level. In some countries, regional or local governments are in any case responsible for key mesopolicies, e.g. for education.

One crucial aim of mesopolicies is to create specific locational advantages. These are, by definition, highly localized. Decentralization of mesopolicies is therefore desirable; it makes little sense for central government to start to define dozens, if not hundreds, of policies for different regions. A local policy should be formulated by local actors, tailoring it to the strengths and weaknesses of the given region. It will often be easier to mobilize locally the know-how needed to diagnose strengths and weaknesses of firms and their environment and to formulate measures to strengthen strengths and overcome weaknesses.

Yet central government can play an important role in stimulating local and regional policy formulation:

- It should check on subsidies offered by regional and local governments, thus inhibiting subsidy races between regions and stimulating creativity races instead.
- It can introduce creative local strategy formulation as a condition for the allocation of subsidies (like regional development funds), thus introducing a performance incentive in this field.

Apart from that, certain mesolevel tasks remain with the national government. These include, for instance, large-scale technology initiatives and the formulation of an overall long-term strategy.

Metalevel: Governance for Industrial Competitiveness

Demands at the metalevel:

At the metalevel, one important aspect concerns the existence of development-oriented cultural values which are shared by a large part of society. Such values include e.g. social recognition of economic success, general acceptance of the idea that predatory behaviour and free-riding jeopardize social development, a priority for long-term investment in education and training and a high propensity to save. If such values are not rooted in society, it is very hard to stimulate them through macro- or mesopolicies. This explains why similar instruments designed to promote, for instance, entrepreneurship, interfirm cooperation, or savings cooperatives perform very differently across countries.

A second crucial precondition for competitiveness is the existence of a basic consensus on the necessity of industrial development and a competitive integration into the world market. Taking into account the increasing internationalization of the economy, societies cannot simply choose development paths at will. The key actors have to accept the world market as a framework. This does not necessarily imply a high export ratio. It instead means that firms should aim to come close to international quality and efficiency standards, since even in their open domestic markets they compete with imported goods. As long as there is fundamental disagreement on these issues, macro- and mesopolicies will be erratic, and firms will develop a defensive posture in order to be able to respond quickly to changes in the rules of the game.

The third basic element at the metalevel is the ability of social actors to jointly formulate visions and strategies and to implement policies. This implies a vision shared by a relevant group of social actors about which position should be targeted in the international

division of labour, which comparative advantages should be developed in the long run, how profits and costs of market integration should be distributed among social groups, etc. Such a shared vision is important to concentrate resources. Moreover, long- and medium-term orientations are important for asserting future interests against current interests and for generating stable expectations. The construction of such a basic consensus is a complex political process and places great demands on social actors: entrepreneurs, workers and other concerned members of civil society have to be prepared to become involved in institutions and commit themselves to achieving common goals.[20] In addition, they must be willing to compromise with other interest groups. This is the difference between democratic and corporatist cultures, in that the latter excludes relevant social groups from strategy formulation.

The metalevel in developing countries:

Cultural values are obviously very heterogeneous across countries and go some way toward explaining the differences in their economic performance. On the other hand, some characteristics of the metalevel are widespread among developing countries. In what follows, we will point out some of these common features.

Until recently most developing (as well as socialist) countries were characterized by centralized political decision-making processes and a bureaucratic, inefficient government apparatus. Often this was even overlaid with rentist-corporatist structures which allowed privileged groups to effectively gain their particular interests.[21] These power structures corresponded with forms of social disintegration and fragmentation which were characterized by the exclusion of broad segments of the population as well as by political and social polarization. All this established obstacles to successful industrial development at several levels. Firms did not cooperate, since mistrust and predatory behaviour was pervasive. Workers and labour unions resisted modernization efforts. Disparities in income distribution led to low savings rates and accordingly low levels of capital formation. Social unrest and political instability favoured stop-and-go policies which compromised firms' efforts to come to terms with the day-to-day struggle for survival.

The economic crisis of the 1980s showed the limited viability of inward-oriented development patterns and created a growing consensus on the necessity to integrate into the world market. Structural adjustment programs strengthened the market mechanism and partly eliminated incentives for rent-seeking behaviour and clientelist relationships. Moreover, institutional reforms introduced more transparency in institutional decision-making. On the other hand, structural adjustment programs failed to recognize that in most developing countries markets are not fully developed and civil society is weak. Under these circumstances, deregulation and the downsizing of public administration are obviously not sufficient to create a competitive economy and guarantee social development. Social disintegration may even be further exacerbated if macroeconomic reforms fail to establish regulatory and governance capacities (government reform, formation of complex linkages between strategic actors) and the requisite social structures.

As systemic competitiveness cannot emerge without social integration, its creation implies a social transformation venture that goes far beyond correcting macroeconomic framework conditions. For one thing, it requires fundamental restructuring of business

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[20] This willingness has been termed "social capital" by Coleman (1988).

[21] Kaufman (1990); Cavarozzi (1992).

associations and labour unions as well as other key organizations of civil society. The process of restructuring organizations and creating new intermediary institutions follow three complementary logics. First, these organizations and institutions need to be restructured internally; second, they must strengthen their ability to represent their interests vis-à-vis government or other social actors; third, they must shape their own environments through cooperation and networking with public or private institutions.

Major groups in society must learn that safeguarding government from influential, privileged groups may establish a positive-sum game. Only a relatively autonomous government is able to gear its activities toward overall social and economic interests. Transparency and accountability are crucial. Autonomous functional subsystems are based on a clear-cut division of responsibilities between government, industry, and social actors. They may then be further developed by intrinsic learning processes, flexibility and responsiveness, and by dialogue and efforts to search cooperatively for optimal solutions involving government and social actors. This may occur at the national as well as the regional and local levels.

The need for heterarchical governance patterns:

Although the dogma that government is obliged to assume a strictly subsidiary role vis-à-vis market processes is inadequate, the neoliberal critique of the traditional means of government intervention is basically correct. The idea that government alone, as a kind of central control centre of a society, can selectively direct technological and economic processes presupposes that government bureaucrats are more capable and better informed than other actors in society, including firms. This may have been the case in some latecomer countries, most impressively in East Asia,[22] although even there it is important to note that the pattern also involved strategic action on the part of the private sector and close interaction between the public and private sectors. In any case, as societies grow ever more differentiated and firms as well as other actors undergo learning processes, the ability to formulate and implement joint strategies moves from the public to the private sector. The necessary know-how and the implementation capacities are distributed across a variety of governmental, private, and intermediary agencies. One-dimensional, statist and centralist patterns of governance are therefore unsuitable for the development and support of complex entrepreneurial networks and specialized institutional landscapes – in OECD countries as well as in industrially advanced developing countries.[23]

Still, the conclusion that the state has no role to play at all is not well founded, since this proposition ignores the indisputable fact that new forms of governance have emerged, initially in a number of OECD countries where government policy no longer follows the pattern of a traditional interventionist state. Instead, government acts as a coordinator, moderator and communicator in policy networks with firms and their associations, science, intermediary institutions, and labour unions. It aims at collecting and disseminating relevant information and working out joint medium- and long-term visions that can serve as points of reference for government mesopolicies as well as private initiatives. This makes it possible to relieve government's burden by shifting decision-making processes into intermediary arenas, to ensure a higher degree of information availability, to heighten the legitimacy of government decisions, and to mobilize the creativity available among social actors by involving

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22 Cf. Cumings (1984).

23 Cf. Best (1990).

them and their respective problem-solving capacities in a strategic fashion. Policy networks do, however, presuppose on the part of social actors a capacity to compromise, to perform and learn, and to accept transformation.[24]

Thus, aside from the forms of governance already prevalent in societies organized along the lines of market economies – hierarchic coordination and steering in firms and public institutions, market-like coordination among firms, and hierarchic governance of society by government – network-like forms of organization are emerging.[25] This is occurring in particular at the mesolevel, where the emerging forms are characterized neither by simple market allocation (competition and price) nor by centralist governance mechanisms (hierarchic control and state interventionism).

The market vs. government discussion that dominated the 1980s on overlooked these innovative forms that were involved in the shaping of social structures. They are based on a combination of market, government and a variety of forms of self-coordination these operating in the shadow of the market, the shadow of hierarchies, and in self-organizing networks. This view of increasingly differentiated forms of social organization and governance surmounts the classical dichotomies of market versus government and of total autonomy of decentral actors (liberalism) versus totally integrated society (socialism).

Successful policy networks are based on six core elements:[26]

- autonomous collective actors capable of internal conflict resolution;
- trust and commitment to fair exchange;
- orientation toward a substantial outcome (problem-solving, beyond minimum consensus);
- joint decision-making based on information-sharing;
- reciprocity, or a just distribution of the costs and benefits of a joint decision (or a given solution); and
- voluntary restraint of each actor's freedom of action because it is accepted that each actor has a legitimate claim that his interests be respected.

Policy networks differ from traditional corporatism in that the role of the state has changed: rather than the state's organizing private interest and arbitrating between corporatist groups which hardly interact among each other, representatives of associations interact with each other and with state bureaucrats on an equal basis. Policy networks are also different from the 1970s brand of European neocorporatism which basically involved the central state government and the top-level organizations of capital and labour. Yet it is difficult to find a profound difference between 'mesocorporatism' and policy networks: both terms describe arrangements that were once marked by a certain level of institutional (albeit often informal) stability and a set of (albeit often tacit) rules that govern the interaction process.

Policy networks tend to be organized on a sectoral basis and deal with fields like science policy, technology policy, or health policy; and they tend to be embedded in political structures in which there is some higher level that may intervene in case a policy network goes astray. The state can, for instance, stimulate the buildup of local or regional policy

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[24] Cf. Scharpf (1991); Mayntz (1991); Héritier (1993); Atkinson / Coleman (1989).

[25] Cf. Powell (1990).

[26] Cf. Mayntz (1991), p. 16.

networks that set out to formulate an industrial strategy. It can make sense to support such efforts financially as long as this support is linked to performance criteria. At other levels, for instance a network for technology policy on the national level, the threat that the state might unilaterally devise measures that run counter to the interests of the parties involved is an important stimulus for the proper functioning of policy networks.

2 Linking Small and Medium-Sized Enterprises to Large Export Companies in Mexico

2.1 Stagnant Inward-Oriented SMEs vs. Dynamic Large-Scale Exporters

In the postwar period, Mexico's industrial policy pursued a strategy of import substitution which allowed the country to achieve high growth rates in the manufacturing sector. This period, nevertheless, was associated with a lack of competition, few incentives to upgrade performance and high levels of bureaucracy, all of which favoured rent-seeking behaviour. Consequently, Mexico failed to create a dynamic and internationally competitive industrial sector. Following the debt crisis of 1982, the country started to open and deregulate its economy. These reforms were accelerated in 1986, when Mexico entered the GATT and embarked on an orthodox structural adjustment program which included the liberalization of external trade and investment flows, deregulation of administrative procedures and privatization. In 1994, the establishment of the North American Free Trade Association (NAFTA) further reinforced the opening-up of the Mexican economy. This lead to far-reaching structural change in the manufacturing sector.

On the one hand, the opening of the economy imposed a heavy burden on inward-oriented industries, especially small and medium-sized enterprises (SME). The reduction of import tariffs exposed these firms to strong foreign competition, especially from industrialized and East Asian countries. At the same time, domestic demand heavily declined due to tight monetary control. Real wages today are just at 61 per cent of their 1980 level.[27] In addition, the sharp rise in interest rates following the peso crisis of December 1994 aggravated the financial problems of many highly indebted firms. As a result, many firms disappeared and manufacturing output fell sharply in several industrial sectors, such as footwear, textiles, and most capital goods.

On the other hand, manufactured exports have been the driving force of economic activity, growing at an impressive rate of 20 per cent per year since 1985.[28] However, this growth is almost exclusively generated by a small number of large, often transnational, firms. Only a few Mexican SMEs are competitive in price as well as product quality and have sufficient marketing experience to access foreign markets. What is more, SMEs do not even play a major role as suppliers to the export industries. Much of Mexico's exports are in fact intrafirm trade by corporations that operate NAFTA-wide, relocating certain labour-intensive parts of the production chain to Mexico. Generally, large corporations either import almost all their required inputs or are vertically integrated. In some branches, for instance the automobile and television industries, transnational manufacturers urge their established international suppliers to follow them to Mexico, thus giving rise to the formation of clusters of transnational firms. These clusters employ world-class technologies, but to a large extent

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[27] Ruíz Durán / Dussel Peters / Taniura (1997), p. 105.

[28] INEGI database.

exclude Mexican companies from production. Technology transfer from large corporations to domestic small firms is therefore very limited. Linkages with Mexican SMEs are especially weak in the case of in-bond industries (*maquiladoras*), which source less than 2 per cent of their required inputs locally.

The lack of linkages between large and small firms contrasts sharply with industrial structures in most OECD and some newly industrializing countries (NICs). In those countries, large firms build upon highly diversified networks of SMEs, thus taking advantage of reduced overhead costs, lower wages, and greater flexibility to respond to changing markets and take advantage of gains from specialization. Instead of competing in the same product markets (as most Mexican SMEs do), industrialized country SMEs tend to specialize in areas complementary to large-scale production, offering a wide range of inputs and special services. According to Porter, the existence of a dense fabric of competing, cooperating and supporting firms is an important prerequisite for competitiveness, especially in high-end markets.[29] This is even true for transnational corporations.

2.2 Reorientation at the Macrolevel – Neglect of the Mesolevel

Mexico's industrial policy does not adequately address the problem of insufficient large and small firm linkages. Since the early 1980s, a macroeconomic approach aimed at "getting prices right" had dominated the policy agenda. Industrial policy was subordinated to short-term stabilization targets and largely limited to measures fostering "passive" integration into the world market. Examples include the relaxation of regulations concerning foreign investment, tax holidays, and exemptions from import duties. The government expected incentives at the macrolevel to be sufficient for the modernization of the microlevel. Therefore no comprehensive policy approach was adopted to facilitate the transition of domestic firms to the new market conditions.

In 1996, the Ministry of Trade and Industrial Promotion published a new "Program of Industrial Policy and International Trade."[30] The underlying philosophy of this program marks a considerable shift in government attitude toward the manufacturing industry. The program recognizes the necessity for the government to play a more active role in building industrial competitiveness, and it targets specific sectors and groups of firms. Among other things, it identifies as priorities the integration of production chains, the strengthening of the technological infrastructure, selective export promotion, SME promotion and the formation of clusters. Yet the program has several major shortcomings. First, it is full of good intentions but lacks concrete proposals and clear statements about the financial volume of programs. This is due to the fact that the program has not been sufficiently coordinated with other important agencies, especially the Ministry of Finance. Some analysts thus anticipate that major parts of the program will not be implemented.[31] Second, while the program rightly focuses on exports and integration of production chains, strategic options for the huge number of inward-oriented SMEs remain unclear.

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29 Porter (1990), pp. 100 ff.

30 SECOFI (1996).

31 Dussel Peters (1996), pp. 19 - 20.

2.3 Towards Dynamic Comparative Advantages and SME Integration

A systemic approach to the creation of a more complete and competitive industrial structure is based on a long-term assessment of development options. This assessment must take into account factors such as the direction of technological change, regional trends, country-specific comparative advantages in a dynamic perspective, and, last but not least, social targets.

In the current situation, perspectives for industrial growth in Mexico are closely related to exports to the North American market. The domestic market is unlikely to expand dramatically in the next few years. On the other hand, given the difference in factor endowments between Mexico and the United States and Canada, there is considerable scope for intensified inter- and intra-industry trade with these economies. Integration into North American production chains is consequently a promising option for many Mexican firms. In the short run, this will as a rule have to be done on the basis of labour-cost advantages only. However, cheap and unskilled labour with low absorptive capabilities is not a sound basis for sustainable competitiveness, since modern competition is no longer based on costs alone, but rather on a combination of costs and product quality, differentiation and innovation. The objective should therefore be to gradually upgrade domestic industries toward technologically more complex, higher value-added activities.

Taking into account that there is little scope for growth in the domestic market, an additional target should be to integrate inward-oriented industries, especially SMEs, into export activities. One possibility is to implement a comprehensive policy package aimed at promoting direct exports of these firms. Another is to link SMEs as indirect exporters to large outward-oriented corporations. The latter is especially important in Mexico, where the export growth of large corporations is highly dynamic, while only a few SMEs have been able to gain access to export markets on their own.

Integration of SMEs into export networks may have three major benefits:

- The inclusion of more firms in export activities enlarges the entrepreneurial base and facilitates the diversification of cluster-supporting services. Well-developed forward and backward linkages favour interactive learning as described by Porter. The result is creation of industry-wide external economies.
- A more balanced industrial structure has positive employment effects, since SMEs use relatively more labour per unit of output.
- Domestic supplier relations efficiently (i.e. without the detrimental effects of long-term state intervention) substitute imports, increase the value-added content of exports and improve the trade balance. Until now, manufactured exports have been highly dependent on imported inputs, so that even in periods of high export growth, Mexico has maintained a trade deficit with respect to manufactured goods.

2.4 Supplier Relations as Part of a "High Road" Strategy

The most common linkage between small and large firms consists in supplier relations. However, not all of these relations contribute equally to the development of a competitive SME sector. Some are based exclusively on low wages and labour standards or the externalization of environmental costs. These linkages are not desirable from the social and ecological points of view, and furthermore rarely create a basis for sustained competitiveness, since they do not foster technological learning and productivity growth. Sengenberger and

Pyke have termed this the "low road to competitiveness".[32] To embark on a "high road" strategy, it is therefore necessary to assess the long-term development effects of different supplier relationships. Promotion should then be selectively targeted to supplier relations which favour the transfer of technology and skills as well as mutual learning of suppliers and customers, thus enhancing productivity and innovation.

- If the underlying rationale of the customer is to make use of **technological specialization** and/ or economies of scale, the supplier has a relatively high level of autonomy as regards product design and will be responsible for improvements. Since the supplier produces a specialized complementary input for the customer, the latter cannot easily play one supplier off against another. This gives the smaller partner a certain bargaining power. The most privileged suppliers are those who achieve technological leadership in their field and therefore may negotiate high prices (innovation rents) for their products. In addition, the specialized supplier gains access to a reliable market, assuming the customer remains viable. Intra-industry linkages based on mutual specialization usually go beyond arms-length transactions, including the coordination of delivery times, product standardization, joint research, and so on. These agreements guarantee a long-term commitment on the part of the customer. They sometimes include substantial transfers of product as well as process technologies, such as the implementation of total quality management, *kaizen* and eco-efficient production methods.
- If the customer establishes a relationship with a supplier only to cut **wage costs**, the terms are usually far less beneficial for the supplier. In this case, the supplier can only survive if he achieves leadership on a cost basis. Given that the production process is standardized and the necessary technology is available to a great number of competitors, price competition is usually fierce, forcing firms to continuously cut costs. Except for some cases where firms achieve extraordinary increases in productivity, suppliers are obliged to reduce profits, wages, and labour standards.
- Equally, the occasional subcontracting due to demand peaks with the aim of **smoothing production** does not provide a sound basis for SME development. There is little stability and security for the supplier, who can easily lose his investments if the customer does not receive orders in excess of his own capacity. As a result, neither the customer nor the management of the supplier will show a long-term commitment to invest in machinery or the skills of the workforce. Jobs in these firms will be extremely insecure.
- Sometimes supplier relations are established to **externalize environmental costs**, because small subcontractors can more easily evade environmental regulations. This is another type of interfirm linkage which is not consistent with long-term growth, since it endangers ecological sustainability of the industry as a whole.

[32] Sengenberger / Pyke (1992), p. 11.

2.5 A Systemic Approach to the Promotion of Small and Large Firm Linkages[33]

In what follows we will develop some guidelines and policy recommendations for the promotion of small and large firm linkages in Mexico. The focus will be on supplier relations which contribute toward embarking on a "high road to competitiveness".

In the past decades, the main instrument used to develop such linkages was local content requirements. In some industries, these induced substantial linkages with domestic suppliers, but such suppliers usually failed to achieve the same performance levels as their international competitors. Obligatory cooperation with inefficient suppliers reduced the competitiveness of their clients and raised costs for consumers. Following liberalization, the importance of local-content requirements has decreased strongly. This is due not only to the inherent inefficiencies of such measures but also to international agreements (especially WTO and NAFTA), which leave little scope to impose conditions on investments. As a result, future promotion of linkages between small and large firms has to be based upon "soft" incentives rather than "hard" requirements.

Mexico recently introduced a number of instruments to promote supplier relationships, the most important being subcontracting fairs, preferential credit and credit guarantee schemes for suppliers, and databases providing information about potential partners for subcontracting. However, the results of these instruments have not been satisfactory. This is basically due to the following shortcomings.

First, there is **no clearly defined strategy** for the promotion of interfirm linkages. No medium- or long-term vision exists as to which activities to promote, which positions in the international market should be targeted, which firms have the potential to achieve these positions, and what type of linkage with what kind of partner is likely to achieve the envisaged target. What needs to be done hence is:

- to define **targets**, for example whether or not it is feasible to develop endogenous capabilities as first-tier suppliers for the automotive and electronics industries. In Mexico, both industries are relevant and highly dynamic exporters, but almost exclusively dominated by transnational corporations. The supply of most complex components and systems is also increasingly concentrated on a few global players, and barriers to entry are high. On the other hand, there is much space to at least develop second- and third-tier suppliers in Mexico. Policymakers should try to identify in which areas it is possible for Mexican firms to *enter* supplier relationships and what specific support is necessary to *upgrade* these suppliers, aiming at the first level of system suppliers and R&D partners for transnational corporations. As yet no such strategic outlook has been formulated, and therefore criteria for the promotion of supplier relations remain unclear;
- to define **target groups**. Promotion should selectively foster firms with a realistic potential. Modern large corporations are very demanding as regards their suppliers. Trying to push very inefficient firms into partnerships with these enterprises is therefore a lost cause. This is the main reason why subcontracting fairs and databases have found little acceptance on the part of large firms. Public policy should rather provide specific support to help overcome certain bottlenecks in firms which are otherwise generally efficient. Identifying such "good candidates" and determining

[33] For an overview of policies see Altenburg (1997); for the special case of Mexico see Altenburg et al. (1998).

where their bottlenecks lie often quite easy for the potential private-sector customers, since they are the ones who establish the performance criteria for their suppliers. Policymakers should therefore involve these customers in the process of defining target groups and policy packages. This can greatly increase the efficiency of public-support programs. On the other hand, policymakers should obviously not just execute private-sector recommendations. A careful assessment is needed to avoid free-riding on the part of firms which have access to all relevant factors of production. In Mexico, some support mechanisms are targeted toward transnational suppliers of the automotive industry;

- to define **which types of interfirm linkages** are conducive to sustainable competitiveness and socially desirable. Until now, promotion schemes have not been selective with regard to the development impact of each specific type of supplier relationship. Outsourcing motivated by evasion of social security payments or environmental regulations receives the same benefits as interfirm cooperation that implies a high degree of technology transfer. It is therefore recommended to foster exclusively those interfirm arrangements which enable suppliers to upgrade their performance. This is not only important for social and ecological reasons. Stable relationships based upon mutual specialization promote cooperative technological learning and are conducive to innovation.

Second, there is a **lack of governance capacity** in the sense of involving key social actors in a collective strategy. Although the industrial policy program emphasizes the need for a "joint effort of workers, businesses and government", public-sector initiatives are mostly implemented in a top-down manner, and private-sector involvement in the formulation, implementation and evaluation of policies is minimal. Mexico's political system has a long corporatist tradition, and government authorities usually consult only those private sector organizations which are linked to the ruling *Partido Revolucionario Institucional*. Numerous recent split-offs from the official business associations and labour unions have revealed discontent with organizations which primarily serve to control their members instead of independently representing entrepreneur and worker interests. Business associations provide only very few services, and except for the auto parts industry, there are no powerful associations representing the specific interests of supplier firms. Likewise, the labour unions do not have a clearly defined position with regard to outsourcing and supplier relations.

In fact, it is necessary to break up the prevailing corporatist structures and create a culture of dialogue and cooperation both between and *within* the public and private sectors. Active participation of a wide range of social actors is crucial, including business associations, labour unions, individual large corporations and business consultancies as representatives of private-sector interests, and different ministries, technology institutions, SME promotion agencies and development banks, among others, on the side of the public sector. All these parties should already be involved in the early stages of strategic planning and policy design.

Public-private partnerships can also be an effective means of facilitating technology transfer to SMEs. A key to the success of some Asian NICs has been to involve large corporations in supplier development programs, with the governments applying a policy of "carrots and sticks".[34] In Mexico, as in most Latin American countries, supplier promotion was almost exclusively confined to local content requirements, thus neglecting the potential of large firms to transfer know-how to SMEs. The Singaporean *Local Industry Upgrading Program*

[34] See for example Meyanathan (1994).

shows how large corporations can be involved effectively in supplier development programs. Under this program, experienced engineers from transnational corporations are seconded to the government's Economic Development Board to identify potential SME suppliers as well as areas for focused assistance to these firms. The Board assumes the full remuneration of these engineers and coordinates the necessary SME support.[35] In a survey of Mexican subcontracting, a considerable number of large corporations expressed their interest in similar public-private partnerships.[36]

The design of a collective strategy to strengthen linkages between large and small firms should also assign an important role to business associations. These can foster cooperation among their members, promoting the idea of specialization for mutual benefit and offering consultancy services, for example concerning the arrangement of contract terms. Since relationships between suppliers and clients are often hierarchical and therefore conflicting, business associations can be an important arena for establishing dialogue, negotiating codes of conduct and settling conflicts between both parties.

Labour unions should also participate in the formulation and implementation of strategies to promote small and large firm linkages. Unions are often opposed to outsourcing plans of large corporations, alleging that these are often aimed at cutting wages and restricting workers rights. While this is often true and union opposition is therefore absolutely legitimate, a more flexible interfirm division of labour may be necessary to maintain competitiveness of an industry as a whole. This is why it is imperative to find a balance between workers rights and the requirements of a competitive industrial structure. Unions should help to define this balance rather than obstructing structural change. In fact, the argument of maintaining adequate labour standards is a good one, since the importance of price competition is constantly diminishing, while factors such as product quality, good services, quick market response and innovation are becoming crucial. Under these circumstances, the success of firms increasingly depends on skilled and motivated workers.

Third, as a result of unspecified targets and a lack of interaction, Mexican **policies aimed at strengthening interfirm linkages are not coherent** and thus have little impact. For example, Mexico applies several instruments to match supply and demand in the manufacturing industry. These include databases, fairs and other forums where entrepreneurs can meet. None of these instruments has led to the establishment of a substantial number of new supplier agreements. This is mainly due to constraints on the supply side: SMEs usually do not come up to the standards required by the participating potential customers. The existing matching instruments might be very helpful if they were used to define, with the help of the participating large-firm customers, to assess the capacity of interested SMEs and define their specific need for assistance. This assistance should then be offered by a specialized SME promotion agency, or even better, incentives might be given to large firms willing to develop efficient SME suppliers. In practice, however, the matching instruments are not linked to other SME promotion programs and do not receive any follow-up. On the whole, it is unlikely that Mexico will succeed in strengthening linkages between large and small-scale enterprises without more differentiated mesolevel and modern governance patterns.

Figure 3 sums up some central elements that should be taken into account for a new, more comprehensive approach to promoting linkages between small and large firm:

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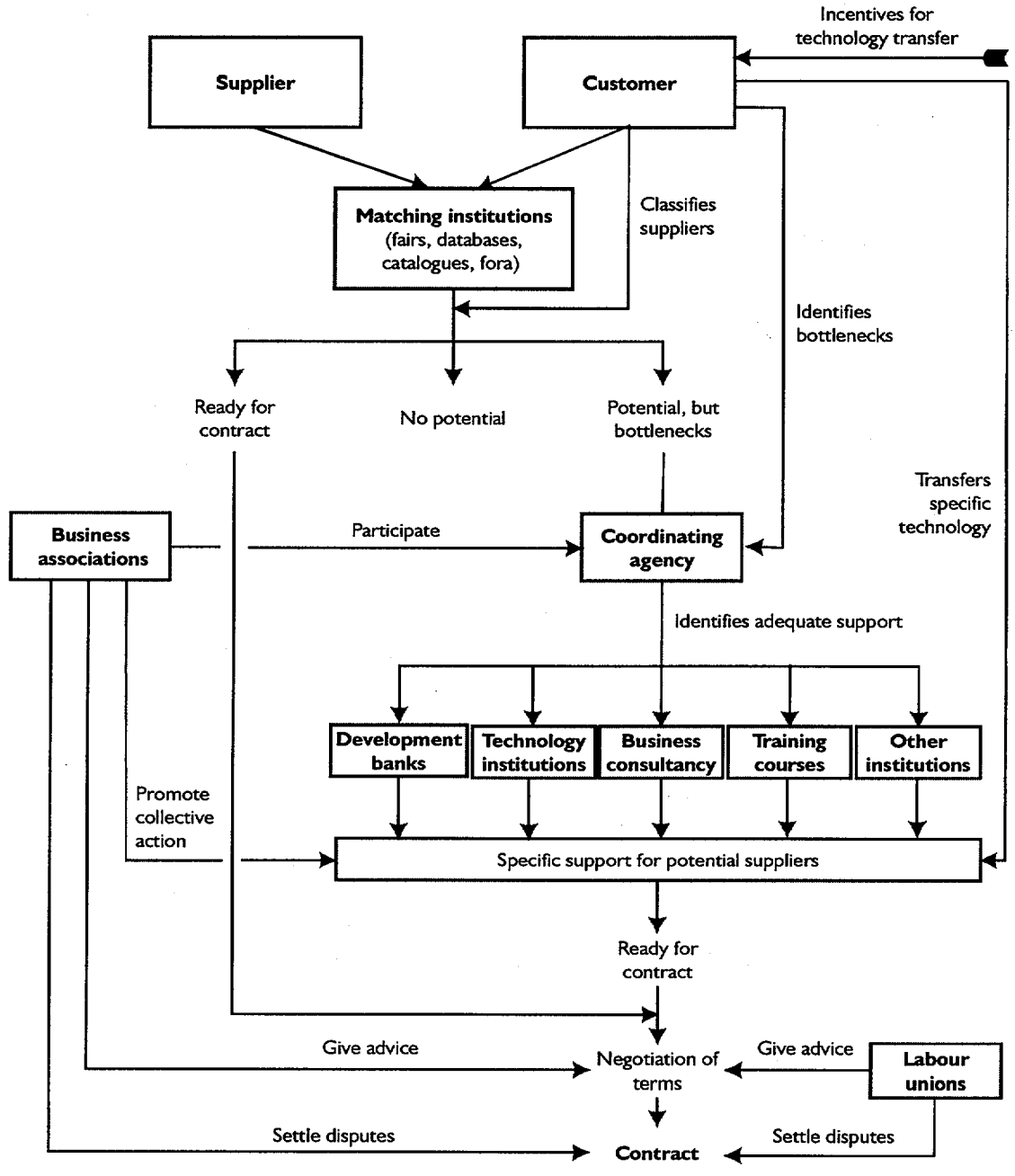
35 Soon (1994), p. 82.

36 Altenburg et al. (1998).

– Matching events and institutions are used to classify potential SME suppliers and identify the main deficiencies that prevent potential customers from signing contracts with them. Potential (large-scale) customers are actively involved in this evaluation task;

Figure 3

Figure 3. A Systemic Approach to the Pro,motion of Small and Large Firm Linkages



Source: Altenburg et al. (1998)

- A coordinating agency is established which receives information about the deficiencies detected and identifies adequate support measures. This coordinating agency should be unbureaucratic and close to the private sector; it may even be set up directly by business associations. It should channel services of existing specialized agencies toward SMEs rather than trying to offer these services by itself.
- Potential customers receive incentives for transferring technology to their suppliers.

Business associations and labour unions are actively involved in the promotion of linkages. They can give advice to firms and settle disputes between suppliers and customers. In addition, business associations can promote collective action of suppliers, i.e. by coordinating the procurement of inputs, making joint offers or increasing their bargaining power vis-à-vis powerful large-scale customers.

3. The Complicated Path from Centralized Industrial Policy to Decentralized Locational Policies: Experiences from Brazil

Brazil has a long tradition of industrial policy. It played a crucial role in establishing the two leading industrial sectors, i.e. passenger car manufacturing and the petrochemical industry, as well as several others. However, while Brazilian industrial policy was not at all bad at creating certain industries, it was not at all good at managing the transition from a sheltered market to the exigencies of globalized markets and competition. Key policymakers in the current administration abstain from industrial policy. They see it as something that was part and parcel of the import-substitution model of the past but does not really have an important place in today's world, with its open economy. In their view, stabilizing the macroeconomic framework and removing regulatory and other obstacles to entrepreneurial activity suffice to create a favourable environment for dynamic industrial development.

What probably has added to the skepticism is the experience of the late 1980s and early 1990s, when various attempts to formulate industrial policy mainly added more turbulence to an already extremely unstable environment.[37] The Sarney government tried in 1988/89 to formulate an industrial policy to prepare domestic firms for a more competitive environment. However, this policy was never really implemented. The Collor government (1990 - 1992) did something that had a much stronger impact than any specific industrial policy measures had in years: In 1990 it engineered a fundamental turnaround in the overall economic framework by opening the economy up gradually (within 3 years) to the world market and removing all types of regulatory obstacles. Trying to add a carrot to the stick, it formulated a number of ambitious industrial policy programs which, however, had a limited impact. This was mainly due to one reason, i.e. the fact that the government did not succeed in stabilizing the economy by reducing the high level of inflation. Industrial policy had little credibility with firms that had to deal with an extremely unstable macroeconomic framework, frequent changes in the rules of the game due to government stabilization plans, and increasing competitive pressure. It was only in 1994 that the Franco government (1992 - 1994) succeeded in bringing down inflation and thus stabilizing the economy. The economic team which took office with the move of Fernando Henrique Cardoso into the ministry of finance in 1993 largely remained in place when Cardoso was elected president in late 1994. It was largely hostile toward the notion of sectoral industrial policy, with just one exception: It has tried to stimulate foreign direct investment in the passenger car industry. The industrial

[37] Cf. Meyer-Stamer (1997).

policy concept that was launched in late 1995[38] was not really worth its name, as it remained vague except for two areas, namely the reform of the basic technology infrastructure (especially in the field of measurement, standards, testing, and quality) and export promotion. The attempt to operationalize this concept still remained vague;[39] the respective document, which was published in July 1997, contains proposals for a set of 18 different branches of industry and addresses immediate bottlenecks rather than outline a medium-term strategy for sustained competitiveness.

The fact that industrial policy hardly exists at the level of central government may be understandable, and yet it is a serious shortcoming. True, the key challenge in Brazil these days is not so much to formulate grand strategies for various industrial sectors but rather to support firms that are struggling to survive in competitive markets. This can be done as well, if not better, at the regional and local levels, i.e. by state governments and municipalities. These levels of government have played only a modest role in past industrial policies. They may be out of their depth when it comes to allocating financial resources to support industrial restructuring. However, they do have potential when it comes to creating competitive structures at the mesolevel. The preconditions are not at all bad, as a federal structure is in place, states and municipalities have their own sources of income, and important institutions like the vocational training system (SENAI and SENAC) and the SME support organization (SEBRAE) are organized state-wise. But there still is latitude for policies geared to industrial competitiveness at the central level, and there is a need for action.

In the following sections I will document concrete attempts to support competitiveness at the regional and local levels. At the end of the section, I will come back to the role the central government might play.

3.1 Locational Policies for Increased Competitiveness: Cases from Santa Catarina[40]

The southern state of Santa Catarina provides examples for the latitude available to formulate locational policies, but also for the obstacles this faces. Santa Catarina is an interesting case for several reasons. First, the local industrial structure is different from other industrialized states in Brazil, as there are hardly foreign firms, no big state-owned firms, and the local firms are concentrated in a few sectors and heavily clustered. Second, here industrial performance was better than the Brazilian average in the 1980s, for instance in terms of export performance, so that creating an environment that meets the demands of globalized locational competition is an option as necessary as it is realistic. In the following section, I will look at two clusters, namely the ceramic tile cluster in the region of Criciúma and the textile industry cluster in the Vale do Itajaí region (around the cities of Blumenau and Brusque).

Adjustment in the Textile Industry

In the textile industry competitive pressure started to increase substantially between 1993 and 1995. Initially, the gradual opening-up of the market did not have much impact on consumer non-durables like garments. Things changed in 1993 at the end of the gradual

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38 "Política Industrial, Tecnológica e de Comércio Exterior. Reestruturação e Expansão Competitivas do Sistema Industrial Brasileiro. Governo Fernando Henrique Cardoso. 1995 - 1999".

39 http://www.mict.gov.br/spi/asac/asac0000.htm.

40 For a detailed account see Meyer-Stamer et al. (1996).

reduction of tariff protection, and again after the government launched the Plano Real stabilization program in July 1994, which successfully fought inflation. One of the results was a boom in consumption, fuelled in part by increased confidence, partly by the reintroduction of consumer credit. The local industry did not have the capacities to meet the increased demand, and moreover Brazil all of a sudden looked like a very interesting market for foreign suppliers. One of the results was a substantial increase in textiles imports. The situation changed again at the end of 1994 and in 1995 when the government decided that the economy was overheated and the Mexico crisis made itself felt. Curbs on consumer credit and higher interest rates had a markedly cooling effect. However, foreign suppliers had their sales channels established by then and were determined not to give them up. The result was sharply heightened competition, basically over prices, in the local market.

On the whole, firms in the textiles/clothing industry initially stuck closely to the established development path in their adjustment strategies – a high degree of vertical integration, little inter-firm interaction (particularly low in terms of information exchange), and little demand for the services offered by mesoinstitutions. Increased subcontracting by some Blumenau garment firms is, thus far, the only discernible adjustment strategy that has broken away from the established development path. Apart from that, changes in the firms were largely incremental. This meant that rather than asking themselves fundamental questions about the way they do business, firms took it for granted that they could simply go on the basis of incremental adaptations to the new conditions. For them, adaptation mostly meant cutting costs.

The first thing firms noted was that foreign competitors sold their own products at lower prices. By cutting their own costs, which they tried to achieve first and foremost by investing in new, more productive equipment and through cuts in personnel, firms hoped to catch up with their competitors and thus win back a strong market position. They mostly failed to notice that competitors were often much more agile, flexible, and customer-oriented. To match them on these factors would imply a radical change in the way local firms do business. Based on re-engineering, they would have to introduce new patterns of internal organization (flat hierarchies, employee empowerment, customer-driven organization) and external relations (deverticalization, concentration on core competencies, introduction of just-in-time delivery and cooperation with suppliers in engineering). Moreover, they would have to intensify inter-firm collaboration and cooperation with supporting institutions in order to stimulate rapid collective learning processes. These are some of the preconditions needed to move up-market, which is inevitable, as local production costs are simply too high to compete with low-price imports from East Asia.[41] Other conditions include a greater effort in fashion design and changes in sales channels.

It was only recently that adjustment efforts started to go beyond intra-firm activities. This was mainly due to the commitment of the president of the largest and oldest firm in Blumenau, a firm that in several respects has always played a pivotal role, e.g. when it came to introducing new types of equipment or new management techniques. The president took the initiative of organizing a visit of local owners and managers of textile firms to Italy in order to learn about best practice, particularly in terms of inter-firm relationship and a highly

[41] In particular, the cost of labour is relatively high. A seamstress in Blumenau will typically earn about $380 - 450 per month. The effective cost to the firm is twice that amount due to social charges and other indirect labour costs (cf. World Bank 1996).

developed supporting meso-environment. This visit gave rise to an ongoing dialogue among a number of large and medium-sized firms on measures to create collective efficiency, especially by improving information flows among firms (e.g. on credit standing of customers and prices of key supplies), by stimulating the emergence of new training courses at vocational schools, by creating a quality brand for products from the region, and by studying the feasibility of setting up a technology centre. These activities were to a certain extent formalized in that this person was elected president of the Chamber of Commerce and Industry in Blumenau.

The interaction between the business sector and the political sphere has, so far, followed the traditional pattern: The textiles industry bargained for, and in the end received, fiscal incentives at the state level. This reflects the current practice in Brazil: Locational strategies at the state and local levels rarely amount to more than fiscal incentives, particularly for new investors, and provision of real estate. Creative policies that seek, for instance, to shape the mesolevel are thus far rare exceptions. Firms and business associations have only very recently started to articulate their demand in this respect vis-à-vis state and local governments.

Adjustment in the Ceramic Tile Industry

The ceramic tile firms were the first to come under serious pressure. This was initially not due to the opening of the market but because the country was on the verge to hyperinflation in 1989/1990, and the economy was stagnating due to macroeconomic stabilization efforts. This led to the collapse of the construction market, and the sales of the firms decreased accordingly. At the same time, real interest rates went up, penalizing those firms which had pursued debt-financed expansion and modernization strategies in the previous years. The largest firm filed for the Brazilian equivalent of Chapter 11 in 1991 (*concordata*), and some other firms were on the brink of financial collapse. Yet in the end all survived due to vigorous adjustment efforts.

The experience of the ceramic tile industry has differed from that of other industries over the last years, in terms both of intra-firm adaptation and cooperation among firms. The firms claim to be close to leading Italian and Spanish competitors in terms of production technology, and they have introduced new management techniques more broadly than firms in other industries. They have made a strong effort in training at all levels; in one large firm, all employees will have completed primary education by 1997, which is quite unusual among industrial firms in Brazil; and in one medium-sized firm 98 per cent of the employees have completed secondary education and 39 per cent have completed or are attending courses in higher education. Firms are cooperating informally with each other, business associations play a very active role, and the industry has been active in shaping its supporting environment.

It seems that in the ceramic tile cluster there is at least some 'information in the air'. Substantial amounts of informal information is exchanged between professionals from tile producers; unlike in other branches, it is perfectly normal for them to visit competitors' factories. What is behind this is, first, the notion that local firms should stick together to maintain their positions vis-à-vis domestic competitors, especially from one region in the state of São Paulo. Second, firms' engineers claim that production technology is on the whole standardized, so that there is little risk of losing crucial secrets; competitive advantages instead lie in specific design and in logistics, i.e. the ability to deliver quickly without having to keep huge stocks. Suppliers of inputs and vendors of equipment are other agents who stimulate exchange among firms. For instance, if a vendor has set up a given piece of

equipment in one of the firms, he will use this as a showcase for other firms, and unlike in other industries, it seems that tile producers actually permit executives from competitors to enter their factories.

Business associations play a more active role in the ceramic tile industry, and firms from SC actually maintain close contacts with their associations. First, there is the local branch association (*sindicato patronal*) of the tile industry, which has played a leading role in stimulating exchange among firms. Second, there is Anfacer, the National Association of Tile Manufacturers. Anfacer plays an important role in stimulating technological exchange among firms, among other things, by organizing an annual congress of the industry and by maintaining a separate institute, founded in 1993, the Brazilian Ceramic Centre, which is active in training, research, and consumer information. Unlike other branches of industry, firms from SC play a very active role in Anfacer.

Local firms and the *sindicato* also play an important role in shaping the supporting environment, a field in which the region of Criciúma has fared outstandingly well by Brazilian standards. One of the two largest firms long ago set up its own technical school and opened it for students from competing firms in 1991. Together with the state's Federation of Industries (FIESC), in cooperation with the Federal University of SC, and with some financial support from the state, the firms founded the Centre for Ceramics Technology, modelled after a similar institution in Spain. Moreover, firms have pressed the local university to offer a special course for technicians in ceramics technology and lobbied the state to authorize this course much faster than would be allowed under the usual bureaucratic requirements.

Two factors appear to be most important to explaining this divergent. First, fierce rivalry and non-cooperation has led some firms to the brink of bankruptcy and compromised the competitiveness of the cluster as a whole: experiences that pointed toward an unsustainability of traditional behaviour. The two largest firms were involved in a race to become the largest tile producer in the 1980s, investing in new factories and taking over smaller firms. When sales decreased dramatically after 1989/90, both were extremely vulnerable. Smaller firms report that the two large firms have been hostile to any kind of cooperation in the past. Moreover, smaller firms may have sought to keep some distance from the two largest companies, for fear of being taken over themselves as well. All this changed after the crisis of the late 1980s/early 1990s – out of necessity (i.e. the need to consolidate), due to the interventions of creditors (which forced the family out of the management of one of the large firms), and due to the moderation of actors from local associations, which brought the large firms together to settle their dispute.

Second, this industry found a role model in Italy's tile-manufacturing industrial districts in the 1980s. Local firms started to develop close links with firms in Italy, in particular with equipment suppliers and manufacturers of inputs, but also with their Italian competitors. Italian representatives and technicians frequently visit the region, and their behaviour indicates their attitude, i.e. that firms, even competitors, cooperate. Moreover, managers and employees of local firms pay frequent visits to Italy and have in this way started to develop an idea of what things are like in industrial districts in Italy.

The Changing Role of Business Associations: Embarking on a New Path

In recent years the role of business associations has begun to change profoundly, with some starting to provide various services to their members and support the emergence of competitiveness, i.e. are taking an active role in shaping the mesolevel.

For the firms, membership in the industry association (*sindicato patronal*) is mandatory. They are organized by branch at the municipal level. The main role of the industry associations consists in collective bargaining. Yet some of them have recently begun to broaden their profile. For instance, the textiles industry *sindicato* in Blumenau has explored sourcing alternatives abroad, e.g. in Argentina. It also has adopted an active role as a political lobbyist for the industry. The ceramics industry *sindicato* in Criciúma has played an important role in lobbying for the construction of a pipeline to provide the local industry with natural gas.

The Federation of Industries of Santa Catarina (FIESC) is the umbrella organization of the *sindicatos*. Owing to the initiative of a new president, who assumed office in 1992, i.e. basically due to an individual initiative, FIESC has played an active role in recent years in preparing firms for globalization and heightened competition. It organized has journeys of groups of local businesspeople to international exhibitions, e.g. the Hannover fair. It has invested in publicity campaigns for the state of Santa Catarina abroad. It has set up a well-equipped centre for foreign trade information. It plays an important role in informing local firms about the necessities implied by the introduction of the ISO 14000 system of eco-audit norms. It has organized the creation of a venture capital fund. All this, however, has been accompanied only to a limited extent by organizational development, in particular by professionalization of an agency which has always tended to be quite politicized, so that FIESC's future performance will again depend on the initiative and effort of the future president.

Apart from the *sindicatos*, there also exist at the municipal level Associations of Commerce and Industry (ACI) with voluntary membership ; there is also an umbrella organization (Federation of ACIs, FACISC) which is, however, only influential if its president is an important person with well-established links to politicians. Traditionally, they have resembled clubs of local businesspeople.[42] Their basic tasks were to administer the register of firms and to provide their members with legal advice. Many of them had no professional staff at all, and even the larger ones employed no more than a handful of people. In the northeastern part of the state the impetus for change came through a German technical cooperation project, which established a partnership between around ten ACIs and the Munich Chamber of Craft and Trade. Essentially, it was the result of a German initiative to get German private business more actively involved in development cooperation, and as the northeastern part of the state had been an area colonized by Germans, local actors liked the idea of this partnership, although they failed to see the profoundness of the change it would induce. In fact, the visits to their German partner provoked a serious shock among representatives of the ACIs as they noted the impressive size, the large number of employees, and the broad spectrum of services provided by the Chamber in Munich. After these experiences, the directors of ACIs were much more open-minded about the changes proposed by the project staff. These changes, which took about five years to materialize, resulted essentially in three things. First, and most importantly, the role definition of the ACIs changed as they increasingly developed services geared to the demands of their members, and tried to attract new members. Second, there was an increase in the number of employees as ACIs began employing consultants to look after the needs of their members. Third, sectoral working groups were formed in the ACIs which brought together representatives from firms of one sector or were organized around a given problem, e.g.

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[42] Cf. Müller-Glodde (1993).

environmental protection. In many cases, the sectoral working groups established for the first time a forum for the exchange of business-related information between local firms.

The Persistent Failure of the State

Thus far there has been little change when it comes to the role of the state and business-government relationships. Officials in the state apparatus think that it would be appropriate if the state could pursue a traditional hierarchical developmentalist policy model. At the same time, they concede that today the state is not really in the position to do this because, first, it is financially straitened and, second, it has no real planning and implementation capacity in the field of industrial development. The notion that in such a situation new, heterarchic types of governance might offer a way out is only slowly emerging.

Business people have always preferred to see business and the state as totally different spheres. A rhetoric that denounces the state as something that benefits from the successes of private businesses without contributing to them, and that indicates that business dynamism is exclusively due to individual achievement, is not uncommon. It reflects a notion widely shared in the business community, although it is historically not correct. The federal government has for a long time played a pivotal role in the industrialization process, and the state government stimulated industrial development during the 1970s. At the same time, there is little doubt that since the 1980s the mode of activity of the state at both the federal and the state levels has at best not been helpful. Since the early 1980s the state has failed to create a business-friendly environment. Private businesses regard the state mostly as the creator of turbulence and as an entity that has failed even to provide for basic necessities like physical and social infrastructure. Yet it is interesting to note that businesspeople use the failure of the state to present their achievements in a more glowing light. One might instead expect them to put pressure on the state, in particular at the local and state levels, to deliver – to build infrastructure, to introduce transparent and responsible budget practices, and to create stable framework conditions. This, however, is hardly happening. Many businesspeople whom we interviewed in March 1996 complained at length about the state. But we did not find that firms or their associations were systematically putting pressure on the state to perform.

The prevailing political pattern used to be one of clear separation between business and government. This is due to traditional structures of the polity, i.e. within the political parties (personalism), within the executive (preference for hierarchic governance), between legislative and executive branches (clientelism), and between the political-administrative system and business associations (no clear articulation of business interests). Some firms may be heading for world-class manufacturing, inter-firm relations may develop, but the state-business relationship is archaic, and when industrial promotion measures are discussed, the discussions follow a traditional pattern. In other words, path dependence is more deeply entrenched in the political arena than anywhere else. This has a lot to do with the 'mental model' of most of the key actors, who can hardly imagine a different *modus operandi* of politics. Two possible factors come to mind to explain this. First, the traditional model of clientelist politics has a long tradition in Brazil, and has never been challenged seriously. On the contrary, it was cast in the form of a rigid corporatist system in the 1930s, and this system still exists and serves many interests; for instance, it is of course convenient for the *sindicatos* that membership is mandatory. Second, this opens promising career opportunities, especially for business leaders who succeed in being coopted into the political class. Alienating political

actors by pursuing an explicit, outspoken strategy of interest articulation may therefore appear as a personally unattractive option to business leaders.

Other places in Brazil have shown that the traditional political system need not be taken for granted. In the northeastern state of Ceará, the local business community organized itself politically in the mid-1980s in order to offer an alternative to the established political class, which had run the state into bankruptcy. Members of the business-backed reformist coalition have ruled the state since 1987. This model seems to be emerging, albeit timidly, in some places in Santa Catarina as well. As an outcome of the reorganization process the ACIs have started to play a more active political role at the local level, and in some places ACI leaders who presented themselves as a credible alternative to established members of the political class have had themselves elected as town mayors. In other places, leading persons of the ACI were integrated in local government in the field of economic development. In Joinville, the largest city in Santa Catarina, this has led to first steps toward the formulation of a locational strategy.

What are the lessons to be learned from this experience against the background of the concept of systemic competitiveness? First, local firms displayed good performance in the import-substitution era despite a hostile macro framework and wide gaps at the mesolevel. This, however, makes it difficult for them to adapt to the radically different environment of an open economy, since they hope that incremental upgrading will be sufficient to thrive in the new competitive environment. There is, in other words, a strong element of path dependence in their adjustment pattern. Second, simply introducing new offers at the mesolevel would not make much sense in this situation. Firms are not very familiar with the concept of close interaction with mesoinstitutions. The demand for new offers would be therefore limited. There is one kind of mesoinstitution that can play a crucial role in the current situation, i.e. business associations which can stimulate information exchange between firms and collective learning. They may be able to stimulate the kind of awareness-building that is the precondition for increased openness and orientation toward cooperation between firms. Third, experience from Santa Catarina illustrates that there is also something like a regional metalevel. The local business culture and political culture are extremely unfriendly for the kind of cooperative approach to creating competitive advantages that is desirable with an eye to the concept of systemic competitiveness. Even with dramatic changes at the national meta- and macrolevels the metalevel conditions at the regional level are slow and reluctant to change.

3.2 The Role of the Central State in an Open Economy

Recent occurrences in Brazil have underlined the notion that explicitly refraining from industrial policy does not mean no industrial policy but ad hoc industrial policy. There is an obvious political economy in this area. Industry is often clustered. Structural change often affects entire branches of industry, which means entire clusters, and this in turn means, in the case of regionally concentrated clusters, entire regions. If a region thus enters into structural crisis, strong pressure will emerge from inside the region to support local firms in order to minimize job losses and secure the economic viability of the region. Under democratic conditions, a central government will find it hard to resist such pressures and to stick to its *No industrial policy* approach. Rather, it will have to give in to political pressure and to formulate ad hoc measures. This is precisely what happened in Brazil over the last years, particularly with respect to sectors like textiles, clothing, footwear, and toys.

There are two negative aspects of ad hoc industrial policy. First, there is as good as no learning curve and little means of systematic monitoring and evaluation. Second, ad hoc industrial policy creates an image of instability and unpredictability, as it implies, for instance, dramatic changes in import taxes. This is an effect that is particularly severe in the case of Brazil. In the view of firms, the question is not so much whether the environment is import substitution or an open economy but rather whether it is unstable and predictable (a lesson learned during the 1980s) or unstable and unpredictable. As the framework was unstable and unpredictable since the early 1980s, firms sought to adjust to this situation, particularly by trying to keep liquidity high, to keep debts low, to prefer investment with a very short payback periods, and to avoid longer-term strategies. Unfortunately, this is not the kind of strategy that leads to longer-term competitiveness, which is as a rule built on a well-defined strategy. Therefore, by trying to avoid industrial policy, policymakers involuntarily create an environment which is detrimental to sustained competitiveness.

Under the new conditions, industrial policy at the central level should have at least three main components. First, it should accompany structural change stemming from transition from import substitution to an open economy. This would require systematic observation of branches of industry, preferably by creating an early-warning system to identify sectors that are heading toward crisis. As this is quite often due to insufficient learning capacity and disposition to change on the part of management, a carrot-and-stick approach is necessary, not only to support but also to put pressure on such industries.

Second, central government should stimulate and supervise local and regional industrial policy. Key instruments would be to seek to establish a joint learning process between states and municipalities, to allocate funds on the basis of a competitive system (i.e. to allocate them to those regions which come up with reasonable, widely shared strategy proposals), and to inhibit the incentive competition that is currently underway between states, e.g. by establishing ceilings for subsidies to private firms and by setting up a supervision mechanism similar to the one which works quite well in the EU.

Third, there should be a minimum of activities in terms of promotion of new technologies and industries and an overall strategy for future industrial development. It is not only that most advanced countries and NICs have deliberate concepts for the transition to a knowledge-intensive development model ("information economy"), something necessary in that it will often not occur spontaneously due to network externalities and path dependence. It is also that Brazil has signed the Agenda 21, a document that has wide-ranging implications for structural change in industry.

4. Obstacles to Systemic Competitiveness in Paraguay

We have included a case study on Paraguay in this paper because this case shows that the concept of systemic competitiveness is also useful in analysing, and defining policy interventions in industrially less-advanced countries. Paraguay belongs to the category, since its economy has until now rested on two pillars: agriculture and transit trade. The most important export crops are cotton and soybeans. The most important component of the transit trade is "tourist trade" with Brazil and, to a lesser extent, Argentina.

The increasing interest of Paraguayan policymakers in industrial development reflects the fact that both pillars have begun to crumble or may begin to crumble in the coming years. In the agricultural sector the times of easy growth are over, as most of the arable land in the fertile eastern part of the country is now under cultivation, and is suffering from declining

productivity. Maintaining current agricultural output levels, to say nothing of growth, will require changes in production practices.

In the trade sector the conditions are supposed to have changed profoundly with the opening-up of Brazil and Argentina to the world market and Paraguay's accession to Mercosur. Paraguay used to sell imported products that were not available in Brazil's closed market of and readily available in Argentina. Tourist trade, that is, sales to Brazilian tourists as well as informal salespeople who come to Ciudad del Este exclusively to buy merchandise, continues on a large scale as products still tend to be cheaper in Paraguay; official sources put the value of exports at $3 billion, other sources speak of $10 billion or more, i.e. about the size of Paraguay's official GDP. This trade may decrease in the future as, in particular, the Brazilian market becomes more competitive and the price differential decreases.

4.1 Structure and Importance of Industry

Paraguay's industrial history differs from that of its neighbouring countries in that it has never experienced a period of deepened import substitution. Local industry consists mainly of small and medium-sized firms which produce consumer non-durables for the domestic market. Reliable data on the precise composition of the industrial sector are difficult to come by.[43] The available data indicate the following:

In a speech given in late 1996,[44] the secretary of industry and commerce claims that industry contributed about 16 per cent to GDP in each of the last ten years, and that 30,000 firms employ 187,000 persons, a bit more than 11 per cent economically active population. He states that the most important branches are food processing (33.5 per cent), wood processing (15.2 per cent), beverages (10.3 per cent), and textiles (probably including garments, 6.3 per cent).

The authors of a report prepared for IDB, write that "*some knowledgeable individuals maintain that the industrial component of GDP is in the 20 - 25 per cent range rather than in the 15 - 17 per cent range, as currently indicated, and that GDP is much higher, a few would insist, of the order of 50 per cent higher*".[45] "*The ten leading industries at the three digit ISIC level are, in descending order: Foodstuffs (311), Wood Products (331), Beverages (313), Textiles (321), Graphics (342), Non-Metallic Minerals (369), Petroleum Derivatives (353), Leather Goods (323), Plastic Products (356) and Diverse Foodstuffs (312)*".[46] They note that the highest growth rates between 1989 and 1995 to have occurred in leather goods (133 per cent), plastic products (86 per cent), and graphics (77 per cent). Growth in the three leading sectors is put at between 40 and 43 per cent.

Another report, prepared for ALADI, shows that the revealed comparative advantage of Paraguayan exports lies in agriculture-based products,[47] which is not surprising in a basically

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[43] The "Anuario Estadístico del Paraguay 1995", published by the Secretaría de Planificación in October 1996, contains only one page with data on industry where absolute production volumes (in kg and litres) are indicated.

[44] Cf. Scavone (1996).

[45] Schwartz / Codas (1996), p. 3.

[46] Ibid, p. 4.

[47] Cf. Macadar (1996).

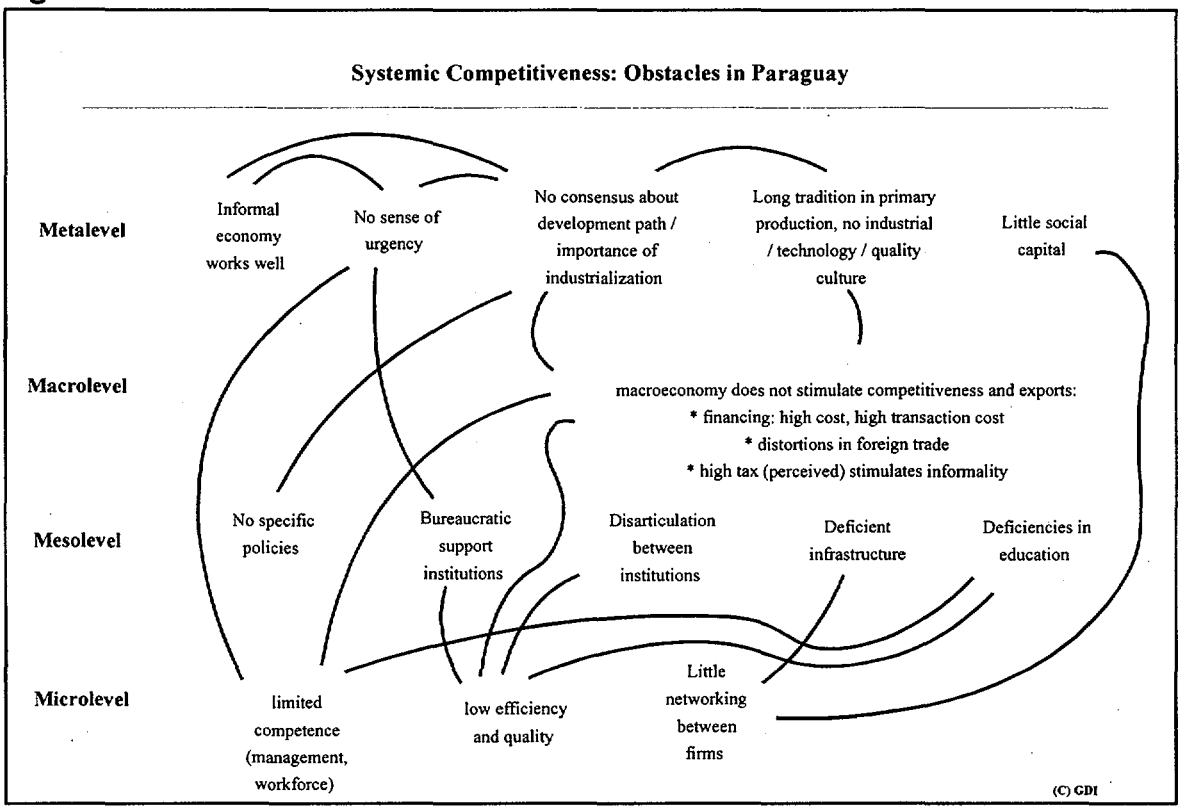
agricultural country that has never experienced much of a policy aimed at creating competitive advantages in industry.

4.2 Obstacles to Industrial Development in Paraguay: An Overview

Existing studies show that firms see a number of problems at the macro- and mesolevels that inhibit their growth. A survey conducted by the World Bank identified lack of skilled labour as the most important problem, followed by access to credit. Further important problems are political instability, functioning of the judicial system, lack of technical/managerial staff, and high taxes.[48] A seminar organized by the Ministry of Industry and Commerce (MIC) resulted in a long list of problems in the fields of financing, taxation, inputs, labour, technology, customs and ports, environmental protection, unfair competition, and technical norms. A series of workshops organized as part of a MIC/GTZ-project indicated a similar set of problems.

Based on the available reports plus a limited number of interviews with government officials and private sector representatives, it is possible to outline tentatively the obstacles to industrial development in Paraguay. Addressing this question using the framework of systemic competitiveness, we can identify factors on each of the four levels that reinforce each other (Figure 4).

Figure 4



As the tourist trade business still functions reasonably well and there is no immediate crisis, there is no sense of urgency among key political actors. This, as well as the lack of an industrial tradition, accounts for the lack of an industrial strategy. The latter two factors may

[48] Cf. World Bank (1996), p. iv.

also explain the fact that the macroeconomic framework is not as industrialization-friendly as it might be. The fact that there is no sense of urgency may also explain why attempts to develop mesolevel institutions have not been as successful as hoped, and why firms are slow to adapt to a changing environment, in particular to increasing competition from the neighbouring MERCOSUR countries. A further metalevel factor, the lack of social capital, which reflects a long history of a repressive military dictatorship, may be important in understanding the low degree of cooperation among firms.

4.2.1 Meta- and Macrolevel Factors

For a closer look at the factors it would be best to start with the metalevel. The fact that the informal economy, especially the informal export sector ("tourist trade"), continues to thrive is an observation as surprising as it is important. Attempts to stimulate industrial development in Paraguay have been based on the assumption that this sector will suffer as the liberalization of trade within Mercosur continues; and should this fail to occur, no sense of urgency (the lack of which has been pointed out particularly by Schwartz / Codas [1996]) emerges. One can only speculate about the perspectives of the informal export sector; its future may in fact not be so bleak, as shopping tours to Ciudad del Este, the main location of the tourist trade, are often part of a larger package that includes visits to the Iguaçú waterfalls and the Itaipú dam. Moreover, as sales taxes are lower in Paraguay than in Brazil, it is possible that merchandise will remain so much cheaper in relative terms as to compensate for cost of transportation to Brazilian metropolitan areas. Prices may even decline further if investment projects by East Asian firms (who are the main suppliers of electronics, toys, and other products) for assembly plants close to Ciudad del Este actually materialize.

Consequently, a national consensus about the necessity of a massive industrialization effort (with all the costs and suffering this normally entails) is not likely to develop in the near future. The economic, and with it political, weight of industry will only slowly increase as a result of efforts to upgrade local firms and to attract foreign investment. This in turn implies that the macroeconomic conditions will not be altered dramatically in favour of industry anytime soon.

In fact, the macroeconomic framework is not altogether unfriendly to industry. The framework is relatively stable, inflation has been relatively low for years, the foreign debt is not critical, and there are fiscal incentives for industrial investment (Law 60/90). However, three specific factors discriminate against industry:

- Industry has problems in finding external sources of financing. Private banks offer credit at high interest rates (i.e. above 20 per cent per year in real terms), which is apparently acceptable for trading firms but not for industrial corporations. Foreign donors have tried to remedy this problem by setting up special credit lines for industry, which are administrated by the Fondo de Desarrollo Industrial (FDI). However, FDI deals not directly with firms but via banks, and the banks are free to add a service charge to the interest demanded by FDI. Moreover, firms complain that access to FDI funds involves preparing voluminous applications and that the time FDI takes in deciding on applications is too long. FDI counters by pointing at the educational effect of forcing firms to elaborate a business plan or a project proposal that includes serious amortization calculations if they apply for funding, something they would otherwise not do.
- There are certain distortions in foreign trade. For instance, local garments manufacturers complain that they suffer unfair competition from imports of used

garments that are charged lower taxes than the local product. Exporters complain that they are charged VAT.

- The across-the-board 30 per cent tax rate on corporate income appears to make informality an attractive option, especially for micro and small firms.

It would, however, be wrong to assume that the macroeconomic framework is the major obstacle to industrial development in Paraguay. Brazilian businessmen would rejoice if they faced the same conditions in their country, and yet industrial dynamism in Brazil is much greater than in Paraguay. Accordingly, it is unlikely that profound changes in Paraguay's macroeconomic framework would bring about any major dynamism in local industry.

4.2.2 *Mesolevel Factors*

In recent years a number of initiatives have been started to develop an industry-related mesospace. In the early 1990s, only two institutions existed, namely SNPP for vocational training and INTN for norms and standards. In 1992 an export- and investment-promotion agency was created, Proparaguay, modelled after Chile's successful Prochile. More recently, a number of SME-support institutions for were created, often encouraged and supported by foreign donors; these are attached to the Ministry of Industry and Commerce (MIC).

It is as yet difficult to assess the effectiveness of these organizations. According to its own evaluation, Proparaguay seems to work reasonably well, and its organizational structure appears to be adequate to fulfill its mission. SNPP and INTN are frequently criticized for their lack of responsiveness and capacity. The institutions attached to MIC have been created in a top-down manner, i.e. without close consultation with the target group, and it is thus to be expected that it will take some time for them to convince clients that cooperation is useful. It is an encouraging sign that a BID-financed program to distribute to micro- and small-firm owners vouchers to attend commercially organized training courses has found a very good response.

Apart from state-sponsored activities, business associations are also active in this field. The union of industries (UIP) offers services like training courses to member firms. The association of SMEs (APyME) is, among other activities, in the process of setting up a financing fund for its member firms.

The key mesolevel obstacles appear to exist in areas other than technology and training (which are a main focus of foreign assistance). There are serious deficiencies in physical infrastructure. Only a few main roads are paved. The telecommunications system is reportedly unreliable and of bad quality. Thus Paraguayan industrial firms do not only not enjoy a competitive infrastructure that leverages their intra-firm advantages but also suffer from deficiencies in the provision of basic of infrastructure.

4.2.3 *Microlevel Factors*

When asked about development obstacles, Paraguayan firm owners point to all sorts of factors except their own incapacity and lack of dynamism. There are, however, indications that these are precisely the key obstacles to dynamic industrial development.[49]

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[49] Cf. Schwartz / Codas (1996); Rabellotti (1997).

Schwartz and Codas[50] found that Paraguayan entrepreneurs have insufficient access to reliable information, and that they use the available information inadequately. They claim that this adds to a high level of path-dependent behaviour. "*Rules of thumb are used throughout the world in the decision making process, of course, but competitive pressure and learning from experience tend to nudge those rules of thumb a little closer to what works best, or at least there is increasing recognition of the biases that result from continued reliance on certain rough-and-ready rules of thumb. Such tendencies are visible in Paraguay as well, but perhaps more can be done to accelerate their development – which, together with traditional instruction of an optimizing character, probably would bring about significant changes in apparent cooperative and joint ventures, entrepreneurial spirit, enterprise restructuring and export orientation*".[51]

Industry is dominated by micro, small, and medium firms, and it seems reasonable to assume that the vast majority of them, including medium-sized firms, are rather handicraft than industrial ventures. This reflects the fact that, in the past, they have produced for a limited local market that provided for economies of scale only in few branches, like garments. Examples such as one of the larger furniture firms (80 employees) that produces on demand an enormous range of almost every imaginable kind of furniture are probably the rule rather than the exception.

Experiences from other small Latin American countries show that even in the face of an opening to the world market (which has actually occurred in Paraguay) this kind of firm can survive.[52] This is due to the fact that they do not really compete with imported products because they cater either to the low-price/low-quality segment or specific local tastes in higher ends of the market. It is, however, unlikely that such firms will grow into exports without massive persuasion and technical assistance.

4.3 Systemic Competitiveness in Paraguay: Elements of an Industrial Strategy

Looking at Paraguay through the lens of systemic competitiveness leads to the conclusion that conditions are particularly favourable neither for dynamic industrial development nor for industrial strategy formulation. It would be unrealistic to propose formulating a grand design; observers like those[53] who tend to propose this are neglecting the incentives and restrictions faced by policymakers in the country. In particular, it would be inappropriate to formulate a strategy that aims mainly at meta- and macrofactors. In other words, trying to create a widely shared sense of urgency and a consensus among key political actors on the necessity of an increased industrialization effort as a first step would not be a promising approach.

This is not to say that key actors should not formulate a vision to guide industry-related policymaking. Quite the contrary: In order to be able to create synergies between existing institutions, and if contributions from development assistance are not to be neutralize one another, it is essential that a shared vision of the development path of Paraguayan industry should exist.

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50 Schwartz / Codas (1996), pp. 2 - 8.

51 Ibid (1996).

52 Cf. Altenburg (1995).

53 Cf. Moon (1996).

What, then, are the options? It is useful to look, first of all, at what there is in terms of strengths, weaknesses, opportunities, and threats to industrial development, and industry-related policymaking, in Paraguay (Table 1).

Looking at this brief and undoubtedly superficial SWOT analysis, one can rule out certain options. First, Paraguay will find it difficult to attract medium- or high-technology industries which demand a higher-qualified workforce and a well-developed supporting environment of firms and mesoinstitutions, let alone create them on its own. Second, Paraguay will find it difficult to attract large investments from abroad in capital-intensive sectors like the passenger car industry, since it is not in a position to take part in the multimillion-dollar subsidy and fiscal incentive race underway in Brazil and Argentina.

Table 1. A Swot Analysis of Industrial Development in Paraguay

Strengths: stable macroeconomic framework investment incentives low wages agricultural base	Opportunities: Strategic location in Mercosur Easy access to Mercosur markets
Weaknesses: few internationally competitive firms low qualification of labour force no national innovation system limited credit for industrial firms limited government funds ⇒ comprehensive absence of systemic competitiveness	Threats: Competition from Mercosur countries and elsewhere Lack of vision in industry-related policymaking Mutually neutralizing support from donor agencies

What is left then is the set of industries that has already been identified by pro-Paraguay as the main focus of support and encouragement: textiles and garments, leather and shoes, wood products, and food processing. There may also be a potential in small niches in other industries where currently isolated but competitive firms are operating. These industries meet the criteria that can be derived from the SWOT-analysis:

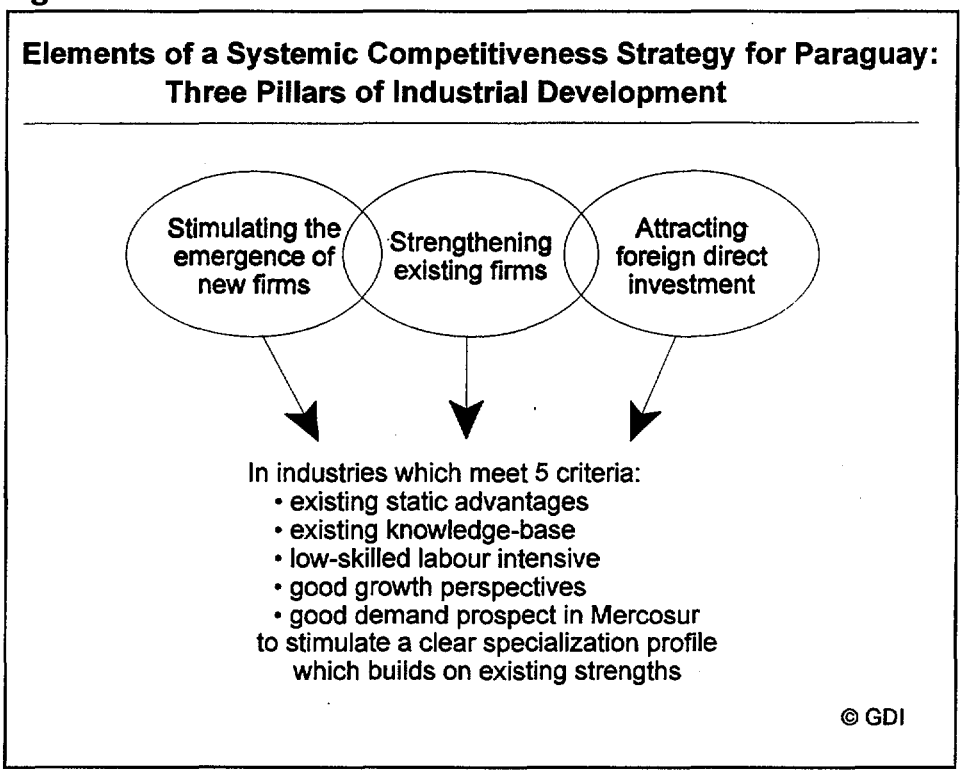
- there are static advantages, especially locally available inputs;
- there is a minimum knowledge-base in the country, as far as management capability as well as tacit knowledge of workers are concerned;
- they are low-skilled labour-intensive;
- they have growth perspectives;
- there is perceptible demand in Mercosur.

The vision for an industrial strategy for Paraguay could be the following: To *create competitive advantages in dynamic resource-based, labour-intensive industries, which have a certain tradition in the country, like garments, leather and shoes, wood and furniture, and food processing, by (1) strengthening the existing firms, (2) stimulating the emergence of new firms in these sectors, and (3) attracting foreign direct investment*; to *establish new governance patterns to make the best possible use of existing knowledge and creativity potentials; to define jointly problem definitions and policy measures; and to increase the probability that these measures will be implemented successfully.*

The three elements in Figure 5 - strengthening existing firms, stimulating the emergence of new firms, and attracting foreign direct investment - should reinforce each other. Both the creation of new firms and foreign direct investment should particularly be encouraged in those branches where it seems possible to create a competitive advantage, and where it is possible to stimulate the emergence of clusters or networks of firms. Possible instruments include:

- formulation of upgrading programs with those existing firms which are already experiencing increased competitive pressure and thus have a "sense of urgency",
- joint formulation (by existing medium and large firms and SME support institutions) of supplier and subcontractor development programs,
- attraction of foreign investors (like Brazilian garment and shoe manufacturers or Argentinean food-processing firms) willing and able to engage in upgrading local suppliers and subcontractors.

Figure 5

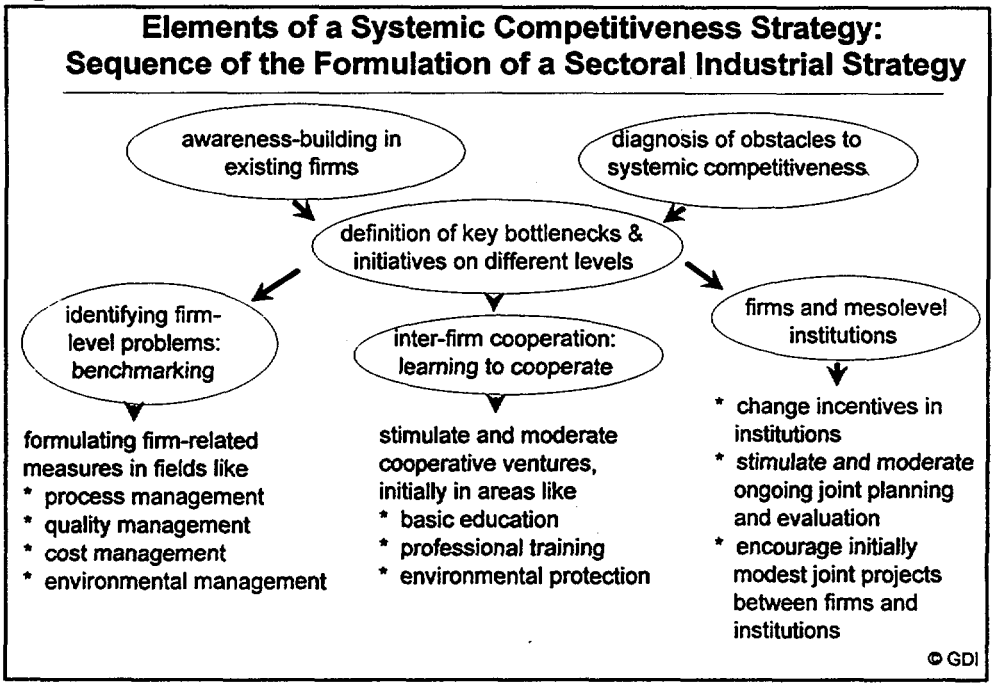


In planning concrete activities, policymakers should pursue two paths: first, stimulate, initiate, and continue to support measures aimed at increasing company competitiveness (micro-/mesolevel), and second, starting to create a culture of ongoing dialogue between government and the private sector in order to stimulate the emergence of new governance patterns more conducive to mobilizing joint definitions of problems and formulations of strategy (meso-/macro-/metalevel).

4.3.1 Stimulating Firm-Level Competitiveness

Regarding the first point, it is paramount to pursue a bottom-up, demand-driven approach. It is a waste of money to offer training courses, export promotion, or technological information to firms that do not see any profound reason to improve their competitiveness and feel that everything else has to change except themselves. The point of departure should instead be to identify, within the framework previously identified, firms that feel the necessity to upgrade, or at least firms which, in the eyes of existing mesoinstitutions, are open to a new awareness of the challenges Paraguayan industry will have to confront in the future. It would also be useful to pursue the proposal made by Schwartz / Codas[54] to start awareness-building programs, e.g. by inviting entrepreneurs from other Mercosur countries to Paraguay or by having the country's political leaders repeatedly stress the importance of increased industrial dynamism. Parallel to this awareness-building, it is important to identify the obstacles to increased competitiveness, using the framework of systemic competitiveness (Figure 6). The next step, then, is to define, in a joint exercise, the major deficiencies in terms of firm-level competitiveness and ways to overcome them. Here it is important to use methodologies that help the actors find out which bottlenecks are more easily targeted than others.

Figure 6



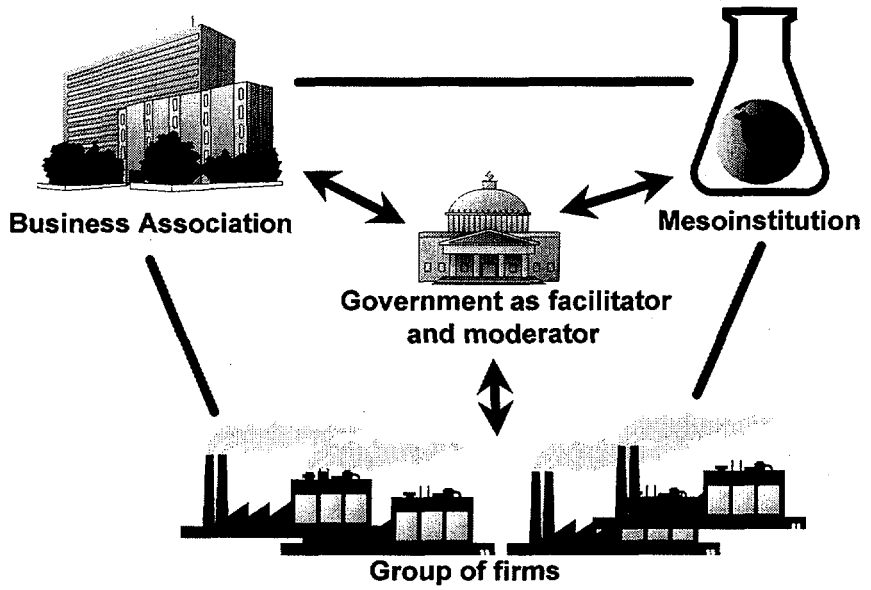
This kind of exercise should take place, at least initially, in a triangular structure involving firms, a business association, and just one mesoinstitution (to limit complexity), with the government coordinating and moderating the exercise (Figure 7). It should involve a group of firms, preferably from the same branch of industry, because collective learning among firms, i.e. learning from each other's experience, is a crucial element in creating competitiveness; in advanced countries this is by far the most important element in technological learning processes that go beyond the boundaries of the firm. A group-oriented approach is preferable, since support should not target just one individual firm in that

[54] Cf. Moon (1996).

assistance should encourage rather than distort domestic competition; firms must learn to compete and cooperate at the same time. The exercise should involve a business association because business associations generally play a crucial role in a competitiveness-oriented environment, both by assisting member firms and by articulating their member firms' demands on the government and other actors. It should involve a mesoinstitution in order to create a culture of cooperation between firms and supporting institutions, and to initiate as early as possible joint learning processes, since not only firms but also mesoinstitutions have to upgrade and learn to cooperate. The next step will then be implementing concrete measures in three different areas, namely within firms, between firms, and between firms and mesoinstitutions.

Figure 7

Elements of a Systemic Competitiveness Strategy for Paraguay: Structure of Pilot Projects to Increase Firms' Competitiveness



Within firms, it may be helpful to use benchmarking methods to identify the major deficiencies. It may also be helpful to take firm owners on visits to firms abroad, be it in other Latin American countries (which is preferable, but sometimes may be difficult, as firms abroad may be unwilling to open their doors) or elsewhere. *Between firms*, issues like education or environmental protection may be addressed. Often, it will be only after some time of joint activities, and trust and confidence building, that firms will be willing to expand their cooperation to more critical fields like technology or quality management. *Between firms and mesoinstitutions*, it is crucial to start with not-too-ambitious projects. More often than not, neither firms nor mesoinstitutions have much experience in cooperation. As they have different logics, incentives, and reward schemes, it is very likely that there will be misunderstandings and conflicts. External conflict resolution and mediation by an independent entity respected by both sides may be essential.

It is important to devise this strategy as an open process, i.e. not to define a priori the main fields of activity, or to define them based on academic analyses, without participation

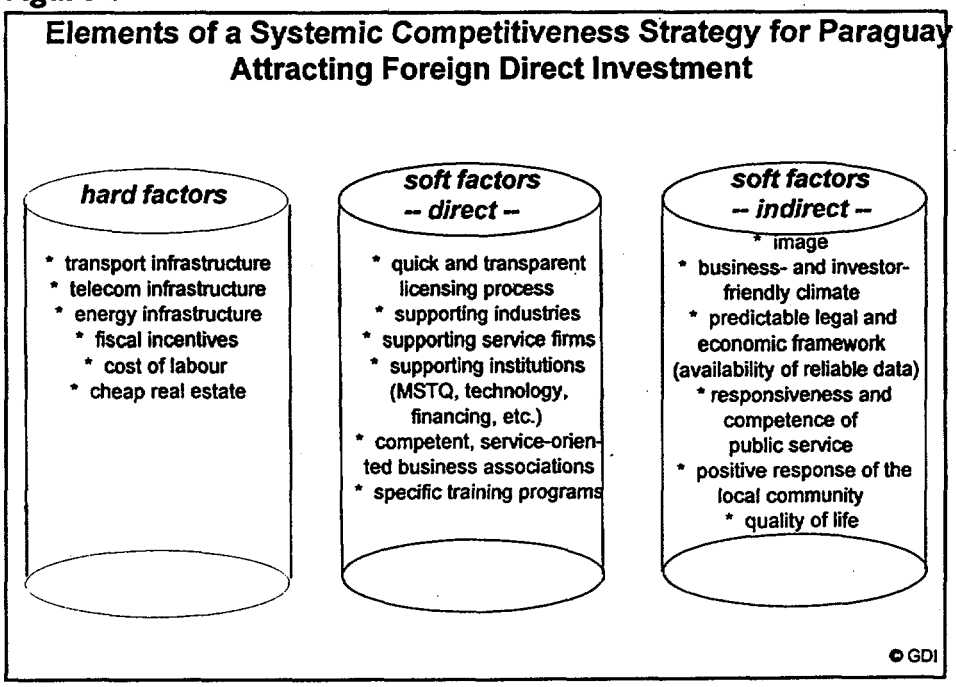
of the firms. Nevertheless, it is predictable what kind of projects to increase competitiveness will emerge; likely candidates are training courses for managers and workers, quality programs, and projects that combine increased efficiency with reduced environmental damage (eco-efficiency).

Regarding support for the creation of new firms, it is important to point out two aspects. First, support of the creation of new firms should not be limited to a too small number of sectors. The central aim is to create an environment that is favourable to the setup of new firms. The choice of the sectors and markets should be left to entrepreneurs; it is likely that they have a good sense of market opportunities. Only if it becomes apparent that sectors in which Paraguay has obvious potential are not thriving should the state try to encourage the creation of new firms in specific sectors.

Second, there are a number of methodologies available that have proved helpful in this context; CEFE (GTZ) and EMPRETEC (UN) are examples. In other words, there are alternatives to betting on macroeconomic conditions and just throwing money at might-be entrepreneurs.

As far as foreign direct investment is concerned, it is important to note that there are three sets of factors that make a given place interesting for foreign investors, provided that the more important factor, namely a market, exists and the question is where exactly, in a country or a region, to locate a factory (Figure 8). First, there are hard factors like the availability and cost of infrastructure, the availability and price of labour and real estate, and fiscal incentives. Second, there are soft factors which are directly relevant to the investment. These include the supporting environment at the micro- and mesolevel as well as the licensing process. Third, there are soft factors which are indirectly relevant. These include the macro- and meta-framework conditions as well as the "feeling at home" factor. Moreover, it should be noted that in several industries, for instance the car industry, the subsidies needed to attract foreign direct investment can be extremely costly ;these may amount to more than $100,000 per direct job created. Thorough cost-benefit-analysis is therefore crucial before attracting this kind of investment is contemplated.

Figure 8



4.3.2 *Stimulating New Governance Patterns*

Regarding the second point, i.e. creating a culture of ongoing dialogue between government and the private sector, it is first of all necessary to cut the traditional links between the state, a few business groups, and corporatist employers' associations and labour unions.[55] Only afterwards will it be possible to build a new kind of relationship between autonomous actors. It may then be useful to set up working groups which are organized on a topical or sectoral basis and which consist of government officials, perhaps not just from the ministry of industry but also from other agencies, which define certain rules of the game for industry or create obstacles to their dynamic development, and representatives of business associations. These working groups should not just identify meso- and macrolevel obstacles that hinder firms; this has been done repeatedly, and thus far with limited effect in terms of change. The working groups should try to identify the deeper reasons for existing obstacles, their resilience, and possible means of overcoming them. In order to sustain this process and to develop a larger credibility of government, it is essential that the government actually act on the proposals developed in working groups.

Obstacles are more apt to be due to specific partial interests than other factors like neglect or incompetence. These interests may be those of certain sectors of industry. In such cases it may be useful to initiate a negotiation process that includes the interested parties from industry rather than leaving it to the government to come up with a compromise.

Both processes – strengthening firms and establishing new governance patterns – are intertwined in several ways. The first process addresses the micro- and mesolevels, the second the meso- and macrolevels. Both will lead to changes at the metalevel over the course of time. Moreover, the establishment of new governance patterns to resolve concrete problems at the meso- and macrolevels gives legitimacy to government support measures that aim directly at firms. Firm owners typically believe that things at the firm level are their business, and the macro economy is the government's business. It would not be credible if the government tried to influence the firm-level without addressing meso- and macroeconomic obstacles, which are a constant source of frustration for firm owners.

4.4 Conclusion

In developing an industrial competitiveness strategy for Paraguay, it is important to acknowledge a number of don'ts:

- Do not believe that the state can direct and order an industrialization process. Nor that the market alone will stimulate a strong industrialization drive.
- Do not have unrealistic aims regarding the kind of industrial branch that might be the backbone of industrial development and job creation in Paraguay.
- Do not put all your bets on foreign direct investment.
- Do not give in to firms' demands for protection, subsidies, or other specific support. Competitive firms will only emerge as the result of competition. Protected firms engage in rent-seeking rather than trying to improve their competitiveness.

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[55] Cf. Esser (1997), p. 26.

- Do not believe that firms will demand the services of mesoinstitutions just because they are there, and for free.
- Do not forget that successful industrial development is based on networks, that working together in networks is apt to generate conflicts, and that it is crucial to commit one's self to conflict resolution. It is crucial to make sure that networks are sufficiently open, and in to particular make sure that they are not captured by corporatist interests.

If these mistakes are avoided, it is possible that Paraguay can develop a much stronger industrial profile over the course of several years. A first step in this direction should be to set up a small number of pilot projects with modest goals and immediate benefits that involve a limited number of firms, and to publicize widely the positive experiences which emerge. The effort of the key actors (MIC and its affiliated bodies, business associations, and firms) should be guided by a vision that encompasses the long-term goal of systemic competitiveness and a clear understanding of the specialization profile that Paraguay should strive for.

5. Retreat of the Development State? New Directions in Korean Industrial and Technology Policymaking

In 1996 the Korean economy entered a downturn in its business cycle. The 1996 economic slowdown has been viewed by many observers as an indication of a deep-rooted structural crisis calling for a fundamental adjustment of corporate management and overall economic management. In particular, the weakening of the economy is seen to have been caused by the inability of the Korean economy to keep up with the worldwide trend toward liberalization and globalization. Even quite a few statements of Korean policymakers over the last few years create the impression that the country's approach to industrial and technology policymaking was a wrong one, and that it is high time for a major reform of existing governance patterns focusing on deregulation and liberalization. This view is largely supported by main-stream economists and the business community. At the same time, however, another school of thought persists in maintaining that future challenges can only be met if the state continues to assume an active role in shaping socioeconomic structures. A closer look reveals, indeed, that the Republic of Korea – while redefining the roles of government, the business community and other stakeholders – still relies on a multidimensional governance pattern with the State acting as regulator, initiator, coordinator, promoter and catalyst, and taking the lead in formulating long-term visions for the society as a whole and for techno-industrial development in particular. At the same time, however, in view of the growing complexity and internationalization of the economy, the general approach to managing the implementation of long- and medium-term strategies for techno-industrial development has changed over the last years, with more emphasis being placed on strengthening market forces, decentralized economic decision-making and participatory planning procedures. In this paper it is argued that this approach to coping with industrial and technological change in a turbulent international environment and a globalizing world economy is still a sound concept. In particular, it should not be made responsible for the country's debt and currency crisis, which came rather as a result of a fundamental weakness of the financial system and its poor regulatory framework. Countries seeking a new best practice in the making of industrial and technology policy should therefore continue to carefully study the Korean approach in these areas.

5.1 The Challenges to Korean Industry and Policymakers Ahead

With a current account deficit of about $24 billion in 1996 – the second largest deficit world-wide after the United States –, an external debt of around $140 billion, the 1997 GDP growth rate down to 6 per cent from 9 per cent in 1995, drastically reduced profit margins in Korean industry, spectacular bankruptcies (Hanbo, Sammi Steel), and Kia – the eighth largest *chaebol* – placed under a government-orchestrated protection scheme, the Republic of Korea was generally seen to have lost its international competitiveness and to be in a major structural crisis well before the turmoil in currency and equity markets in Southeast Asia – that had started in Thailand in early July 1997 – reached the country in November 1997. The way out of this crisis will be not be easy and will require far-reaching reforms on a broad front at the micro-, meso- and macrolevels.

Challenges at the Macrolevel

Until recently, the Republic of Korea had generally received high scores for its good macroeconomic management. Prudent fiscal and monetary policies have kept inflationary pressures low and created a macroeconomic environment that encouraged high savings and investment rates. Also, gradual adjustments of the exchange rate enabled the country to avoid any persistent overvaluation of its currency and emergence of an anti-export bias in the overall system of incentives, although it is generally accepted that better fine-tuning of exchange rate management would have been needed to improve the overall trade balance. For example, since early 1995, exchange rate management allowed the Korean currency to appreciate against the yen by around 17 per cent until April 1997. As a 10 per cent rise in the won's value against the yen translates into an estimated loss of some $4 billion in Korean exports over a two-year period, the country's potential to raise exports was negatively affected.

However, the foreign exchange crisis in late 1997 when the won depreciated against the United States currency by nearly 100 per cent was basically not triggered by Korea's too rigid currency regime and insufficient fine-tuning of exchange rate management, but rather a result of the long-criticized fundamental defects of the financial system. In particular, poor financial supervision of state-owned and commercial banks, lax lending policies of the financial institutions, widespread cross-financing and cross guarantees among companies, and easy access for the larger companies to international markets for short-term credits resulted in a highly unsound debt structure with drastic increases in short-term debt over the last three years, amounting to some $70 billion in 1997. So, when it became clear that Korean banks and companies would not be able to repay some $30 billion in foreign-currency loans before the end of the year, and another $30 billion in mid-1998, the country had to turn to the IMF and became the third Asian nation after Thailand and Indonesia since July 1997 to seek a rescue package from the Fund. As a result of the negotiations with the IMF over a $55 billion aid package, the country now will have to implement macroeconomic and structural reforms that are long overdue. In particular, the government agreed to strengthen the role of the central bank, to set up a powerful supervisory institution to oversee the financial markets, to restructure the banking sector, to open up capital markets, and to pressure the *chaebols* to improve their debt ratio and to phase out cross subsidies and cross guarantees among their subsidiaries. Moreover, the government will have to tighten monetary and fiscal policies, to liberalize labour laws and the trade regime. In the new macroeconomic environment financial and economic restructuring will not be smooth, and companies will have to improve their

productivity and strengthen their competitiveness under the condition of a low-growth or even no-growth economy over the next few years.

Challenges at the Microlevel

With a monthly wage rate of around $1,500 for a skilled worker, the Republic of Korea now has the second highest wage level in Asia after Japan. More importantly, the country is seen as having become a "high-cost, low-efficiency location:" Between 1990 and 1995 unit labour costs increased by around 14 per cent p.a. as opposed Taiwan's only 10 per cent and Japan's only 2.4 per cent. At the same time productivity increased by only 9 per cent p.a. Accordingly, in order to compete successfully on increasingly competitive domestic and international markets, companies need to negotiate more modest wage increases and improve productivity by moving to comprehensive strategies for technological modernization, i.e. a combination of best practice technology and best practice of organization. However, despite serious efforts since the early 1980s, in particular on the part of the largest *chaebols* such as Samsung, Hyundai, Daewoo and Lucky Goldstar to expand their technological capabilities and to introduce modern management concepts,[56] large parts of Korean manufacturing industries are lagging behind in acquiring technological competence and adopting state-of-the-art management concepts. While this holds particularly true for perhaps 85 to 90 per cent of the some 70,000 small and medium-sized enterprises,[57] the technologically most advanced *chaebol* must also strive hard to achieve and maintain international efficiency standards. For example, while Hyundai needs 26 worker hours to assemble a car, it takes only 16 hours for the best Japanese companies. In ship building, where the Republic of Korea has established itself as the world's second largest producer, Korean shipyards are also seen as lagging behind their Japanese competitors in terms of level of automation and productivity, having placed too much emphasis in the past on capacity expansion while neglecting technological and organizational innovations.

Overall, it is clear that Korean industries are at an important juncture in their development which indeed resembles a "sandwich situation." On the one hand, Korean industries are facing considerable "pressure from below," as they have more or less lost their traditional competitive edge derived from low labour costs to the second generation of newly industrializing countries, China included, and other emerging economies in Asia such as Indonesia and Vietnam. On the other hand, Korean industries are under heavy "pressure from above," as industries in OECD countries are striving hard to sharpen their competitive edge through a combined strategy of restoring their cost-competitiveness and strengthening their technological competitiveness, thus making it difficult for Korean industries to gaining ground on higher-end markets in both OECD and overseas countries. In this context it is interesting to note that in 1996 the trade balance with developing countries showed a surplus in the order of $20 billion while the trade deficit with OECD countries reached a record high of around $40 billion. This dual structure might be taken as an indication that Korean industries have successfully established themselves in the middle of the market, i.e. in product groups of medium technology intensity, while they are still fairly weak in higher- to high-technology product markets. Accordingly, the real challenge Korean industry is facing today seems to be caused more by "pressures from above" rather than by "pressures from below," a

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56 Cf. Hillebrand (1996), Part II, Chapter 4.

57 Cf. Hillebrand (1992).

constellation which underlines the need for Korean industry to move to broadly based and offensive technology strategies.

Challenges at the Mesolevel

The current economic crisis is often taken as proof of the ineffectiveness of the country's selective industrial and technology policies, which have targeted specific industries and technologies, favoured the growth of large enterprises at the expense of small and medium-sized companies (SMEs), and protected the industry via a host of tariff and non-tariff barriers. These policies, together with a misdirected credit policy, are seen as having led to an inefficient allocation of resources on a large scale, hampered the emergence of a competitive industrial sector and slowed down the country's move to a concept of productivity- and technology-based growth. Here it is interesting to note that the Republic of Korea Examiners' Report produced in the context of the 1996 OECD review of Korea's national science and technology policy[58] concluded that the Korean R&D system still presents features typical of developing countries in terms both of structure and level of effort.[59] In particular, the Korean examiners maintain that Korea's indigenous technological base is too narrow, with the other weak points being:

- the overly reliance on technology imports and a negligible contribution to world science;
- a science and technology policy that has tended and continues to emphasize a technology-push approach rather than a demand-driven approach and that is at the same time too mission-oriented and not sufficiently diffusion-oriented;
- a set of poorly linked policy measures, i.e. the different strategic national R&D projects, which appear to lack a certain coherence, not least as a result of the lack of coordination and related ministerial rivalries;
- insufficient S&T-based actions in favour of local and regional development, and often not well developed interaction between industry and the scientific infrastructure, which is also true for Daeduck Science Town, established since the mid-1970s, with its some 10,000 scientists (in about 40 R&D centres);
- too low a research intensity of Korean industry in general, which translates into an insufficient techno-industrial base in such sectors as measurement instruments, machinery, mechanical and electrical equipment and semiconductors; and
- an insufficient number of innovative small and medium-sized enterprises.

Whether these weaknesses – alleged or real – can really be used as an argument against active and selective industrial and technology policies, has to be doubted, however. Establishing internationally competitive industries has become an ever more demanding task and a moving target, as this process has to be managed in an era of radical technological and organizational change and increased globalization of the world economy, resulting in ever tighter competition in world markets. Against this background, a more positive interpretation of what has been achieved in the Republic of Korea over the last decades seems justified:

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[58] Cf. OECD (1996).

[59] Cf. MOST (1996a) p. 4.

First, it should not be overlooked that the Republic of Korea has succeeded in establishing the world's fourth largest electronics industry, the second largest shipbuilding industry, and the fifth largest automotive industry. It is hard to see that these developments would have been achieved without selective policy interventions. For example, a recent study on the performance of Asian NICs, including the Republic of Korea, in information and communications industries concludes[60] that the success of Asian NICs in this sector is, in part, due to strategic and selective support to information technology.

Second, the Republic of Korea has also clearly made impressive strides in deepening its industrial base: for example, expenditures on R&D increased from a mere $300 million in 1980 to around $4.5 billion in 1990 or from only 0.7 per cent of GDP to 2.1 per cent. Today, R&D expenditures are approaching the 10 billion mark (2.4 per cent of GDP in 1995), of which some 70 per cent are spent on the advancement of industrial technologies. For the end of this decade the overall target is to increase the relative R&D intensity of the economy (expenditure on R&D as a proportion of GDP) to 4 per cent.

Third, as regards the R&D intensity of the manufacturing sector, Korean industries are actually devoting some 2.4 per cent of total turnover to R&D, which is no longer far from the average OECD figure of around 3.5 per cent. And the number of R&D departments or centres in the manufacturing sector, the first of which was first established by Lucky Goldstar in 1975, increased to around 1,500 in the year 1993.

Fourth, due to well targeted manpower policies, considerable success has also been achieved in the field of human resource development. Public spending on education (all levels), which averaged already about 4 per cent of GDP in the early 1980s, has increased to 6.5 per cent of GDP since the mid-1980s. When private spending is added, education is likely to account for more than 10 per cent of GDP, placing the country among the top performers worldwide. And, more specifically, since the early 1990s, the number of graduates from the engineering and natural sciences with a technician's, bachelor's or master's degree entering the labour market each year has increased to around 60,000 some 1,200 of whom hold a PhD Also, it should not be overlooked that with its roughly 46 scientists and engineers per 10,000 working population in 1993, the Republic of Korea is no longer far from the OECD average of 50, although it should be kept in mind that the share of researchers with a master's or PhD degree is still much lower compared to the share of the OECD countries.

Finally, while the Republic of Korea has invested heavily in developing an indigenous R&D capability and human resource base, it has complemented these efforts over the last 15 years by importing best practice technologies on a large scale (in the order of about 10 per cent of GDP p.a.), namely via imports of capital goods, licensing agreements, consultancy services, and from around the second half of the 1980s, increasingly also via foreign direct investment.

Taking all the indicators together, it seems to be justified to conclude that the Republic of Korea, from the early 1980s, has achieved remarkable success in deepening its industrial base, matched by a few other emerging economies only, i.e. Taiwan and Singapore. The contention that Korea's R&D system has still the typical feature of a developing country, thus does not seem to do justice to what has been achieved over the last two decades.

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[60] Cf. Hanna et al. (1996).

5.2 Toward Effective Forms of Selective Industrial and Technology Policies

While the Republic of Korea needs to accelerate the pace of liberalization and deregulation, the question whether the Republic of Korea should abandon its approach of selectively intervening in and guiding the market remains a controversial issue. In fact, a closer look reveals that the Republic of Korea continues to actively shape the development of its industrial and technological base with a view to building an advanced industrial society by around 2015. The overall long-term visions are

- to prepare for the era of globalization by opening up the economy and internationalizing society by adopting new ways of thinking (*segyehwa*),
- to establish the Republic of Korea – now the world's 11th largest economy, with a per capita income of around $10,000 – as the seventh world economic and technological power by 2005,
- to create a science-based and learning and information society by around 2015, and
- to move to a concept of sustainable development by around 2005.

To these ends, the Republic of Korea continues to rely on a governance pattern for industrial and technological development that shows that a stronger reliance on market forces is not necessarily at variance with the practice of industrial and technological targeting as long as selective interventions are based on participatory planning procedures and the creation of policy networks involving all relevant actors, i.e. central and local government, academia, business groupings, and companies. In what follows, three examples illustrating this basic approach to industrial and technology policymaking – the HAN Project, the strategic national R&D project "Biotech 2000," and the strategy to build an information society – will be briefly presented and analyzed. It is important to note, however, that the brief description is based on desk research only. A fuller and more balanced account of the ongoing initiatives would have required intensive discussions with the different stakeholders concerned. Most likely, such a broader approach – beyond the scope of the present paper – would reveal that the way from participatory design of strategic blueprints to their actual implementation is a long and conflict-ridden one.

Targeting the Development of Core Industrial Technologies – The Highly Advanced National Project 1992 – 2001 (HAN-Project)

The first national R&D program, initiated by the Ministry of Science and Technology (MOST) in 1982, was entirely government-initiated and -funded. The second national R&D program, implemented by the Ministry of Trade and Industry since 1987, deviated from the MOST approach in that it emphasized a co-funding mechanism to involve both government and participating industries.

As compared to these earlier initiatives, the process from project identification to implementation adopted by the HAN-Project, launched in 1992, has undergone substantial changes. The main features of the overall management approach to implementing the HAN Project, which aims at turning the Republic of Korea into one of the top seven technologically advanced countries by the year 2001, can be summarized as follows:

- **technological targeting based on participatory planning and informed decision-making:** in line with and part of the general approach adopted for the preparation of the seventh five-year plan, 1992 - 1997, which emphasized openness, transparency and

consensus-building efforts by integrating the views from different social strata, the process of identification of a select number of core technologies involved experts from government, public and private research institutes and the business community. It was based on a systematic survey of key technology areas at world level with a view to identifying those fields of generic technologies where the Republic of Korea was seen to have a potential capacity to compete with the advanced countries based on Korea's existing industrial foundation. As a result, 11 core technologies were initially selected, the number of which was increased to 17 (Table 2) after a review at the beginning of the second phase of the HAN Project starting in 1995. Within these 17 fields several hundred sub-projects are set to be promoted.

Table 2. Highly Advanced National Projects

Category	R&D Projects	Period	Target Technologies	Investment[a]
Product Technology	1. New drugs and new agro-chemicals	1992-1997	To develop 2-3 new antibiotics & germicidal agents	246
	2. B-Integrated Service and Digital Network (ISDN)	1992-2001	To produce prototype products of 10 giga-ATM	856
	3. Next-generation vehicle technology	1992-1996	To develop an electric car of 120 km/h speed	563
	4. Development of ASIC Technology	1995-1998	To develop ASIC design technology for digital HDTV	128
	5. Development of advanced technologies for flat panel displays	1995-2001	To develop large-size (40" - 55"), full colour, plasma display panels	228
	6. Development for 1995 - 2001 Biomedical Engineering	1995-2001	To develop biomedical technologies for the diagnosis, rehabilitation, and prevention of diseases	217
	7. Development of micro machining technologies and micro-machines	1995-2001	To develop micro-machining technologies to make micro-parts or micro machines	103
Fundamental Technology	8. Next-generation semiconductors	1993-1997	To develop basic & core technologies for making a super integrated semiconductor	244
	9. Advanced material for information, electronic and energy	1992-2001	To develop 30 kinds of new advanced materials	240
	10. Advanced manufacturing systems	1992-2001	To develop FIM, CIM & IMS	549
	11. New functional biomaterials	1992-2001	To develop process technology of bioactive, new material for commercialization	483
	12. Environmental technology	1992-2001	To develop core technologies	289
	13. New energy technology	1992-2001	To develop fuel cell systems	357
	14. Next-generation nuclear reactor	1992-2001	To develop concept and basic design	297
	15. Development of Advanced Super conduction Tokamak	1995-2001	To develop compact, steady-state-capable, advanced superconduction tokamak	188
	16. Development of human sensibility ergonomics technology	1995-2001	To develop quantitative measurement and evaluation techniques for understanding human responses to comfort and subject feeling	81
	17. Development of Satellite image Data Processing Technology	1996-2001	In the planning stage	-
Total	17 Projects			5 069

[a] (US $ mill.)

Source: Ministry of Science and Technology (1996b)

- **joint implementation and financing:** Building on earlier efforts, as manifested by a number of laws, i.e. the Industrial Technology Research Consortium Act of 1986 and the Cooperative R&D Promotion Law of 1993, enacted to encourage tight cooperation among government-supported research institutes, academia and private industries, the HAN Project research particularly emphasized cooperation throughout the project cycle from planning, managing and evaluation. At the same time, industry is expected to make serious efforts to match government funds with its own resources, on the order of 30 to 50 per cent of project costs, in particular if the stages of commercialization and diffusion are reached. If projects succeed, industry will have to refund government subsidies and firms will receive licensing fees prorated according to their contributions.
- **international cooperation:** Rather than relying on its indigenous R&D potentials only, joint research activities among domestic and foreign researchers will also be encouraged, though on a selected basis.
- **monitoring and evaluation:** In order to decide whether the different projects merit further efforts, all projects will constantly be monitored and reviewed.

Although it is still too early to say whether the HAN initiative will meet its highly ambitious overall objectives, the general approach adopted to technological and industrial targeting, with its emphasis on participatory planning rather than a top-down approach to technological decision-making, seems to be well in line with the practices followed in OECD countries and close to the emerging best practice in formulating and implementing active and anticipatory technology and industrial policies.

Managing Technological Capacity-Building in Strategic Industries – Example: "Biotech 2000 Program"

Recognizing that the 21st century will be an era of information and biotechnology, the Kim Young Sam government identified biotechnology as one of the strategic national R&D projects, the other ones being computer software, aerospace technology, nuclear energy, and marine technology. Building on earlier efforts, namely the 1983 - 1991 biotechnology development plan, the "Biotech 2000 Program" aims to bring Korean scientific and technological capabilities to the levels of the world's leading countries. Under the 14-year development plan (1994 - 2007) a total of 10 strategic projects – including relevant projects of the HAN initiative – in six core areas (bio-materials, health care, agriculture and foods, bio safety, alternative energy and basic life sciences) involving an investment of $20 billion are to be promoted.[61]

As is clearly reflected in the government's activity calendar (Box 1), the overall approach to program identification and formulation, has – as in the case of the HAN initiative – sought from the very beginning to intensively involve all relevant actors in the process of program identification and formulation and seems to have contributed to the emergence of a highly interactive biotechnology policy network. In order to ensure its efficient functioning and to secure the efficient implementation of the "Biotech 2000 Program," a total of 10 implementation action plans specifying, among others things, the roles and responsibilities of the different actors have been formulated. Among the organizing principles – which come very close to those of the HAN Project – the following stand out:

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[61] Hanna et al. (1996).

Box 1: Government Activity Calendar for Formulation of "Biotech 2000" Program

Dec. 1983 - Nov. 1991
The "Genetic Engineering Promotion Law" was legislated (83.12).
A meeting of the "National Steering Committee for Genetic Engineering Research" was held (85.11) and discussed the "Basic Plan for Genetic Engineering Promotion".
No follow-up has been made.

Dec. 1992
A Feasibility Study was made for establishing a national strategic plan for biotechnology development by the Genetic Engineering Research Institute (GERI).

Jan. - Aug. 1993
A draft of the National Biotechnology Development Program ("Biotech 2000") was proposed based on the GERI's feasibility study.
"The First MOST Plan" outlined after the review by an evaluation of panel members representing academia, industries and government research institutes.

Aug. 18, 1993
"The National Policy Council for Genetic Engineering Research" and the "National Steering Committee for Genetic Engineering Research" were organized based on Chapters 6 - 8 of the "Genetic Engineering Promotion Law".
"The Advisory Council for Biotechnology Policy" was formed as an advisory body for the Minister of the Ministry of Science and Technology.

Sept. - Nov. 1993
An overall evaluation of the draft of "Biotech 2000".
"The Second MOST Plan" proposed.

Nov. 21, 1993
Reviews on "The Second MOST Plan" of "Biotech 2000" were made by related government ministries including the Economic Planning Board (EPB), Ministry of Trade, Industry and Energy, Ministry of Agriculture, Forestry and Fisheries, Ministry of Health and Social Affairs, Ministry of Education, Ministry of Finance, and Ministry of Environment.

Dec. 3, 1993
A meeting of "The National Steering Committee for Genetic Engineering Research" was held, and it was decided to submit the "Biotech 2000 Program" for a review by the "National Policy Council for Genetic Engineering Research".

Dec. 13, 1993
A meeting of the "National Policy Council for Genetic Engineering Research" was held and finally approved the "Biotech 2000 Program" as a national program.

Source: Ministry of Science and Technology (1996c)

Government:

The government will assume a role as a regulator, initiator, coordinator, promoter and catalyst. To prepare for its role as a **regulator**, for example, a Committee for Reformation of Institutional Systems for the Promotion of Biotechnology was formed in 1994, with specialists from universities, research institutes and government officials. The suggestions put forward by the committee will be reviewed by the Advisory Council for Biotechnology Policy. If approved by the National Policy Council for Biotechnology Research, a government agency, the proposals will be used as a basis to amend existing legislation or introduce new legislation. As regards the government's role as an **initiator, coordinator, promoter and catalyst**, each of the participating eight ministries will prepare its own action plan and, in this process, involve relevant

government agencies, research institutes and bioindustries, and appropriate counterparts throughout the world, namely from the United States, Japan, the EU and developing countries such as China, Malaysia, Thailand and Brazil.

Business:

The bioindustries participating in the program, most of them grouped in voluntary sectoral associations, i.e. the Korean Genetic Engineering Research Association, created in 1984 (19 members), and the Bioindustry Association of the Republic of Korea, established in 1992 (56 members), are not only expected to actively engage in the joint formulation and implementation of the different R&D projects but also to engage in financing the different projects, in particular those focusing on applied research. For the first phase of the program from 1994 to 1997 the expected volume of matching public investment with funds from the industrial sector was in the order of $1.3 billion, although this target is not likely to have been met in reality.

Strategic Management to Prepare for the Learning and Information Society

In the Republic of Korea the electronics industry has been considered as a strategic industry since the mid-1960s, with the Electronics Industry Promotion Act of 1969 being the first major step to a systematic approach to building technological capabilities in electronic, information and communications industries. While the government initially concentrated on fostering a select number of *chaebols* to spearhead the country's entry into information and communication industries (ICTs), in particular in consumer electronics and semiconductors, it soon started to design a strategy to create a diversified and technologically advanced ICT sector, and to view ICTs as a generic technology offering a broad spectrum of externalities for downstream industries and the development of a national information infrastructure. As a result of around 30 years of highly focused efforts, the Republic of Korea has become one of the most informatized societies in the industrializing world,[62] and is in the process of implementing one of the world's most ambitious strategies to build an advanced information society.[63]

Discussions in the Republic of Korea on the concept of an information society as a relevant long-term vision for the country started already in the early 1980s. After a series of preparatory steps since the mid-1980s, the Korean government, in April 1994, announced a major initiative aimed at advancing the Korean Information Infrastructure (KII) as a cornerstone to build an information society. In March 1995, an action plan for the KII prepared by the Republic of Korea Information Infrastructure Task Force was presented. The main goal of the KII Plan is to connect every home, school, library, hospital, governmental agencies by the year 2015 through an information superhighway exchanging a variety of information in various forms (voice, data, picture, etc.) at high speed. In another major initiative toward the information society, the National Assembly passed in August 1995 "The Basic Law for Promotion of Informatization" and enacted it in January 1996. The purpose of the Law is to promote informatization of society, to nurture the multimedia industry, and to develop an advanced information infrastructure. The implementation of the KII Plan spans 20 years, from 1995 to 2015, with expected total expenditures of $60 billion, of which more than 95 per cent will be provided by the private sector.

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[62] Cf. Hanna et al. (1996), p. 112.

[63] Cf. Oh (1996), the major source of the following sections.

In this context, it is important to note that – as in the case of the "Biotech 2000 Program" – another task-specific though broadly-based policy network has been created with a view to pooling the country's resources. To orchestrate its move toward an information society, the Korean government first organized the Policy Committee for the KII to systematically and effectively implement the building of KII. It is headed by the Prime Minister and consists of the all ministers concerned. The Executive Committee, chaired by the Minister of Finance and Economy, is organized under the Policy Committee. Second, the implementation of the KII Plan will be coordinated by the Republic of Korea Information Infrastructure Task Force (KIITF), which is a part of the Ministry of Information and Communication (MIC) and has established close links with all relevant stakeholders in the public and private sectors and the science community. As an initial step, the KIITF has established four basic principles for the KII structure. First, the private sector should assume a leading role in KII. Second, the government should actively reform rules, regulations and policies in order to promote innovations and fair competition in the ICT sector. Third, information on the importance of ICTs and the concept of an information society should be made available to every citizen. Fourth, the harmonious relationship between the private sector and government should be promoted. In addition to that, in March 1995 the KIITF released a detailed phased strategy for implementing the KII comprising five major action plans, i.e. construction of the New Republic of Korea Net-Government and New Republic of Korea Net-Public, development of key technologies, establishment of testbeds and promotion of pilot projects.

Overall, taking all the ICT and information-society-related initiatives together, it becomes clear that Korea's strategy for moving to a learning and information society here too goes well beyond the orthodox philosophy of economic management according to which government should focus on its role as a regulator and arbitrator and restrict public action to creating a market-friendly business environment. As in the case of the HAN initiative and the "Biotech 2000 Program," the Korean government has clearly opted for a broader role to support technological capacity-building in ICTs and to advance the concept of an information-society by acting as a regulator, initiator, coordinator, promoter and catalyst. Looking at the ongoing and far-reaching information society-related initiatives in OECD countries such as the United States, Japan, and also Germany, it becomes clear that the Korean approach to actively shaping the country's transition to an information society is by no means a unique one but has rather been modelled along the lines of the emerging new best practice in OECD countries. It is also well in line with the strategy of building a national information infrastructure as proposed by international agencies and bodies.[64]

6. Balancing Economic and Environmental Performance – Prospects for Eco-efficient Industrialization in Thailand

Over the past 25 years Thai industry has grown at impressive rates. It has increasingly become more diversified and export-oriented. Future industrial growth will critically depend on the industry's ability to move to a concept of technology- and productivity-based growth.

At the same time, due to three reasons there is an urgent need for Thai industry to improve its environmental performance.[65] First, the environmental load resulting from manufacturing has reached unsustainable levels. Second, export-oriented companies which are

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[64] Cf. UN Commission (1997); Mansell / Wehn (1998).

[65] Cf. TDRI (1990).

not moving to cleaner production concepts are likely to face enormous difficulties in surviving in export markets. Third, Thailand needs to meet its obligations under Agenda 21.

Whether the process of introducing cleaner production methods in Thai industry has started already, is a controversial issue. To be sure, the number of companies moving to cleaner production is still very small. Even so, there is an emerging group of environmentally proactive larger- and medium-sized companies. In the medium-term, market pressures, in particular in export markets, and growing public awareness are likely to put pressure on more companies to green their business. However, the real problem seems to rest with the some 70,000 smaller and medium industries which are not exposed to these pressures and which do not have the potentials and management skills necessary to introducing cleaner production concepts. Also, in view of the many constraints, namely a weakening economy, an exaggerated focus of most Thai entrepreneurs on improving their cost competitiveness, weak public and private mesolevel support structures, and a persistent command- and control-oriented regulatory framework, the process of introducing cleaner production concepts on a broader scale will be a fairly slow one. In order to speed up this process, an integrated approach to environmental capacity building will become necessary.[66] A closer look at the ongoing initiatives at the meta-, macro-, meso- and microlevels reveals both strengths and weaknesses of the country's approach to moving to a concept of eco-efficient industrialization.

6.1 Moves to Cleaner Production in Thai Industry – Optimist and Pessimist Views

The question whether there is a trend in the Thai manufacturing industry to introducing cleaner production concepts is subject to a substantial controversy among managers and industry experts. Two schools of thought might be distinguished, a pessimist and an optimist one:

The main arguments of the "pessimists" seem to be the following: a) Thai industry is under heavy competitive pressure. Accordingly, companies cannot mobilize sufficient funds to green their business; b) The awareness of Thai industry of the need to move to cleaner production concepts is not sufficiently developed. Environmental management is totally new to Thai Industry; and c) The regulatory framework, i.e. government policy, does not send sufficiently clear signals to the local and international business community to green their business. Government largely relies on command and control instruments. At the same time, the capacity to enforce existing rules and regulations is very weak.

The "optimists" seem to largely share the arguments of the "pessimists" but come to different conclusions. According to the views of the "optimists" Thai industry has already come under heavy pressure to move to cleaner production concepts. The main pressures are on the important group of export-oriented companies. They stem from the ever stricter legislation of overseas clients in OECD countries, international codes of conduct, and an increase in importance of sector-specific voluntary guidelines. Moreover, at least the large export-oriented companies as well as quite a few larger companies oriented to the domestic market are seen as anticipating already both an increase of awareness of the general public in Thailand as well as a changing regulatory regime over the next few years, with more emphasis being placed on market-based instruments.

On balance, it seems that the various pressures have already led to the emergence of a fairly important group of proactive companies, a group which is likely to become larger in the

[66] Hillebrand et al. (1998)

medium term. The real problem with regard to the greening of Thai industry seems to rest with the some 70,000 smaller and medium-sized companies which so far are not exposed to the same pressures as the export-oriented and larger companies and which do not have the resources and potentials to introduce cleaner technologies.

6.2 Challenges for and Responses of Proactive Companies

In order to shed some light on the ongoing controversy, to better understand the processes in the Thai manufacturing sector with regard to the introduction of cleaner production concepts, a company survey was carried out by a joint GDI/TDRI research team in March 1996. The survey aimed in particular at the group of proactive companies, i.e. companies which – according to the views of industry specialists – were seen to have undertaken a number of steps toward greening their business.[67]

On balance, it seems that within the group of proactive companies the introduction of cleaner production methods is well under way. Also, the barriers to initiating the move to cleaner production are astonishingly low for these companies. The picture is, however, likely to change substantially when smaller companies with little or no experience in the field of international enterprise cooperation are considered. This group, which is the largest group in terms of numbers, faces different starting conditions. They cannot draw on the resources of parent or overseas' companies, have more difficulties in general to obtain credit, and are not used to accept pack-back periods for "green investments" longer than, say, a year.

Overall Approach to Environmental Management of Surveyed Companies

Environmental management (EM) should basically be viewed as part of the overall management approach of a company, and it includes the organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the company's environmental policy.[68] On balance, the company survey revealed the following trends:

- Lack of comprehensive approach: The surveyed companies – except one company, i.e. a producer of electrical components – have in fact started introducing cleaner production concepts. Around half of the companies are moving to an EM concept which emphasizes the precautionary principle, i.e. a policy that invests in pollution prevention rather than clean-up. However, EM is not yet based on a comprehensive concept along the lines of schemes such as "life-cycle-assessment" or ISO 14000. Written statements on EM for internal use exist in four companies and two companies only publish an environmental report (on an irregular basis) and conduct an internal environmental audit.
- Positive impact on competitiveness: Seven of the companies felt that the impact of environment-related expenditures on their competitiveness is a rather positive one as the higher costs had largely been compensated by cost savings, namely through reduced costs for energy, water and waste disposal. Higher productivity resulting from improved work

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[67] The survey included 12 larger and medium-sized export-oriented American, Japanese, German and Thai companies in the fields of textile/clothing/dying, agro industry, electrical/electronics industries and chemicals/pharmaceuticals, and one large US-American trading company specializing in turn trade. See Hillebrand et al. (1998), Chapter II.

[68] Cf. Tibor / Feldman (1996), p. 47.

ethics and corporate identity, and a positive impact on sales were also mentioned but were clearly of lesser importance. Two companies took a neutral stance, stating a negligible impact on their competitiveness while three companies stated that the impact of environment-related expenditures on competitiveness was negative or very negative.

- costs/expenditures: When asked for an educated guess, three companies stated that they had spent less than 1 per cent of their annual turnover on environment-related expenditures. Five companies estimated that the ratio would be in the order of 2 per cent or more.
- payback periods: The length of payback periods for environment-related major investments depends very much on the fields and nature of investments. Energy- and water-saving-related investments are generally those with the shortest payback periods. In case of high front-end investments for installing cleaner production lines the payback periods are certainly much longer, easily exceeding five years. According to the survey, the minimum payback period was two years, which is already very long under Thai conditions. In five companies the estimated back-back period was five years or more.

- Process innovations: The introduction of cleaner **process** technologies does not focus any longer on end-of-pipe solutions. Companies rather adopt a balanced strategy combining the precautionary principle with pollution-control measures at the final production stages. In addition, energy-saving measures also receive high priority. Five companies stated that process-related RD&E takes or will take into account environmental aspects.

  The focus of introducing cleaner production concepts is clearly on cleaner production processes **within** the companies; only a few companies are already giving preference to "green" suppliers. Therefore, the spill-over effects on other industries via backward linkages are still very weak or negligible, although some companies stated that this aspect of EM is likely to become more important in the medium term. Overall, it is clear, however, that the companies have hardly started to formulate business and purchasing policies that favour green suppliers or to support suppliers who are environmentally conscious.

- Product innovations: As compared to the companies' efforts at improving the environmental friendliness of their production process the measures aimed at moving to the production of cleaner products are less pronounced. This is largely due to the fact that although products are partly adjusted to local conditions, the products produced are standard OECD products in terms of environmental norms, and product development is still done by the parent companies. Accordingly, environment-related product standards are the same for both the domestic and export markets. Even so, the move to environmentally more friendly products seems to be under way in nearly half of the surveyed companies. Some five companies have started to increasingly use recycled or biodegradable materials. Design for disassembly, which will become very important in sectors such as electronics/electrical industries might be considered by the parent company of one of the two companies producing electrical goods. Four companies stated that product-related RD&E carried out in Thailand explicitly takes into account environmental aspects. However, none of the surveyed companies intends to introduce an eco-label for its products within the next three years.

- Sources of technology: The move to cleaner production is largely based on proven technologies close to the OECD best practice. However, technology transfer and

cooperation has so far mainly strengthened the **operational** capabilities of the companies. Environment-related RD&E is still in its infancy, hence adaptive abilities and innovative capabilities hardly exist. Even so, most of the larger companies, including two of the larger wholly Thai-owned companies, seem to have started to develop an in-house engineering capability aimed at reducing energy and water consumption and industrial wastes.

- Other companies in Thailand (Thai, foreign) do not play a significant role as suppliers of cleaner technology, although in some cases local companies supplied air treatment technology, filters and measuring and control equipment. Companies from Asian NICs such as the Republic of Korea, Singapore and Taiwan also played a marginal role as sources for cleaner technologies. However, there were some indications that Asian NICs might emerge as suppliers of water-consumption-related and waste treatment technologies.

Motives for Moving to Cleaner Production Concepts

The most important motives for moving to cleaner production turned out to be in order of importance a) to secure the company's long-term competitive position in both export and domestic markets, b) a general commitment to cleaner production, c) to anticipate increasing costs for energy, water supply and waste treatment, d) to respond to the demand of customers for cleaner products and processes and e) to anticipate the increasing pressures from the environmental movement in both the export and domestic markets. As compared to these motives and driving forces, other motives, including a) to increase the profitability of the companies in the long term, b) to prepare to meet voluntary guidelines, and c) to respond to the tightening of the environmental legislation in the export and domestic markets, received lower scores.

Constraints to Cleaner Production

At first sight, the main conclusion that followed from the company survey was somewhat surprising: In general it can be said that regarding the group of proactive companies the barriers to **initiating** the move to cleaner production concepts under Thai conditions are astonishingly low. At present, there do not seem to be major constraints that hamper the companies' move to cleaner production. Neither costs nor inadequate availability of finance or access to information and technology were viewed as major constraints by most companies. However, this picture is likely to change even for the proactive group of companies if more systematic and ambitious approaches to cleaner production are to be implemented.

- Costs: Of the 12 companies only three (two of the three textile producers; one of the three companies in agro industry) considered the costs associated with investments for the "greening" of products, and/or cleaner production technologies to be an important or very important problem/ constraint. The main reason why the proactive companies do not view the costs for investing in green technologies as a major constraint seems to lie in the fact that the export-oriented companies have no choice but to green their business in order to stay in the market. As most of the competitors have more or less to shoulder the same financial burden, higher costs are not a major competitive disadvantage. Moreover, in a dynamic context new investments embodying new environmental efficiency standards have to be financed in any case. For example, as part of its regular investment program one textile company plans to purchase a new $20 million dying shop

to replace the outdated and highly polluting facility. Last but not least, to a certain extent, new investments in green technologies can also lead to cost savings. Accordingly, the net costs for a company are lower. Furthermore, expenditures on high front-end investments for greening business are not just costs but have to be viewed rather as regular investments which often pay themselves back within a period of two to five years.

- Financing: Inadequate availability of finance was mentioned as an important or very important constraint by two companies only. Overall, the responses of the companies suggest that lack of own funds, inadequate supply or high costs of credit and lack of subsidies are not important obstacles to invest in cleaner technologies.
- Information: Access to information on domestic or foreign sources of cleaner technology was also not seen as a problem. Of the many potential sources of information on cleaner technologies it is the information provided by the parent companies, companies in other OECD countries, companies in Thailand, and trade fairs both in Thailand and abroad which are the most important information sources. Overseas suppliers of plant equipment and machinery are very active in Thailand, hence the market for environmental technologies is a very competitive one. Compared to these sources the business associations in Thailand are less relevant, although in some cases the Federation of Thai Industries and the bilateral chambers of commerce were also mentioned as important sources of information. R&D institutes in Thailand and abroad as well as professional journals were seen as being of lesser importance. So far, there are two companies only which are using in-house facilities to tap electronic data-bases.
- Technology: According to the survey, the range of existing cleaner technologies, including pollution control and waste treatment technologies, seems to be well in line with the companies' needs. Looking at the two groups of companies, i.e. companies which are wholly owned by Thai entrepreneurs and companies with a foreign involvement, it seems that ownership has so far not been a decisive factor influencing the technological behaviour of the companies concerned. As expected, both groups rely on product and process technology mainly from OECD-countries. Concerning the companies with a prominent foreign involvement, nearly all of the product and process technology is supplied by the parent company. In one case used plant equipment was imported. While representing only "90 per cent" of the OECD environmental standard the plant is still a very modern one in the Thai context.
- Human Resources: Of the six problem areas, the human resource constraint seems to be the most important bottleneck to implementing more ambitious approaches to cleaner production. In this context four companies stated a shortage of skilled trainers for environment-related in-house training, and five companies pointed to weak support structures for environment-related training activities, namely for technical personnel such as technicians and engineers.
- RD&E: So far, most environment-related RD&E activities are confined to marginal adaptations of processes and products, and are mostly part of the regular engineering activities. Weak local R&D structures were mentioned as a constraint by four companies, but more in the sense that more support would be useful in the future.

6.3 Toward a Systemic Approach to Eco-efficient Industrialization in Thailand

The World Business Council for Sustainable Development (WBCSD) coined the term eco-efficient industrialization (EEI), which is defined as being "reached by the delivery of

competitively priced goods and services that satisfy human needs and bring quality of life while progressively reducing ecological impacts and resource intensity, through the life cycle, to a level at least in line with the earth's estimated carrying capacity".[69] With its reference to "competitiveness" it goes beyond both UNEP's concept of clean production (CP) of 1989 which is defined as the "continuous application of an integrated preventive environmental strategy to processes and products to reduce risks to humans and the environment", and UNIDO's concept of ecologically sustainable industrial development (ESID) as a pattern of industrialization "that enhance(s) the contribution of industry to economic and social benefits for present and future generations without impairing basic ecological processes".[70]

It seems, however, that in recent discussions the differences among the various concepts have narrowed down.[71] In particular, all concepts are now closely linked to UNDP's Capacity 21 approach with its emphasis on strengthening endogenous environmental technological capacities at the level of individual countries. Moreover, the concept of eco-efficient industrialization can also be linked to the concept of "systemic competitiveness" which, however, needs to be extended to include a broader definition of competitiveness along the lines of the WBCSD's concept. What follows is an assessment of the action taken in Thailand at the meta-, macro- and mesolevels to balance economic and eco-efficiency on the country's way to moving on a broad front to an industrialization strategy which could be termed eco-efficient industrialization.

Metalevel

Despite high political instability, socio-economic development in Thailand has always been based on some kind of strategic orientation, notably in the form of five-year social and economic development plans starting in 1962. Within theses plans, protection of the environment has become an important issue since the early 1990s, i.e. under the seventh and eighth plan. So far, however, the five-year development plans have tended to be "stand-alone plans" not sufficiently backed by more specific action at the level of individual sectors.

Even so, as compared to the early 1990s, environmental concerns definitely rank higher on today's political agenda. First, a discussion has started stating that improved overall environmental management must involve all relevant social groups. Not only NGOs, the media and the science community call for a participatory approach, but also the government itself has recognized this need, as is clearly reflected in the revised Enhancement and Conservation of National Environmental Quality Act of 1992. Second, for key economic sectors such as agriculture and industry long-term visions and master plans that include environmental concerns have recently been formulated. Third, higher environmental awareness has begun to translate into action at the macro-and mesolevels.

Macrolevel – Adjustments of the Regulatory Framework

Thailand's past macro policies, especially its budgetary, monetary and trade policies are widely seen to have created a conducive and fairly stable general business environment and, in particular, encouraged the export orientation of Thai industry. The recent baht crisis of July 1997 which came as a surprise to most observers has revealed, however, a fundamental weakness of

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[69] Fussler (1994), p. 71.

[70] UNIDO (1991).

[71] Cf. UNEP / WBCSD (1996).

the financial sector and the financial management as well as the country's currency regime. This led not only to a substantial overvaluation of the baht over the last few years but also encouraged the inflow of short-term capital on a large scale.

Given the enormous amount of nonperforming or bad short-term debt in the order of some $30 billion, restoring the macroeconomic fundamentals will be no easy task. Macroeconomic reforms under an IMF-initiated $17 billion rescue package include in particular the strengthening of the financial system, tighter supervision of state-owned and private banks, the introduction of a more flexible exchange-rate system, and tighter fiscal and monetary policies.

Macroeconomic reforms cannot, however, be directed only at supporting the stabilization of the economy and improving economic efficiency. What is needed is a new regulatory framework that also encourages the restructuring of Thai industry toward eco-efficiency. Thus far the existing regulatory framework is clearly command- and control-oriented and tends to promote end-of-pipe solutions rather than to support production-integrated approaches, and therefore needs drastic overhaul. Indeed, in keeping with the general trends in OECD countries, Thailand has recently embarked upon a process of a far-reaching adjustment of the regulatory framework, focusing on the application of economic instruments. In this process the country will introduce both the polluter-pays-principle and the even more forward-looking pollution-prevention-pays principle. While the first concept basically seeks to internalize environmental costs, the second concept aims at a system of incentives that makes investments in environmentally friendly products and processes economically attractive to enterprises. In the latter context, fiscal incentives that include tax breaks for eco-efficient enterprises, subsidies to R&D, and reduction of import duties for green technologies are under discussion. Technically, the adjustment of the regulatory framework is a highly complex task. While the introduction of the polluter-pays principle requires the definition of sector-specific environmental standards that are in line with the carrying capacity of the Thai eco-system and that can realistically be met by Thai enterprises, the prevention-pays principle needs to be brought in line with the overall fiscal and budgetary policies. On balance, it will take at least some five years or so from now before the emerging new regulatory framework will really have a broader impact on environmental restructuring processes at the company level.

Mesolevel

At the mesolevel, most of the efforts aimed at creating a specific business environment in support of eco-efficient industrialization have been initiated from the early 1990s. Rather than setting-up many new public and private mesolevel institutions it is first and foremost necessary to reorient existing institutions and to treat environment as a cross-cutting issue in economic decision-making. This process is, however, still in its infancy, although both private business groupings and the government have stepped up their efforts to respond to environmental concerns.

- Environment in the 1996 Industrial Master Plan: The Master Plan for Industrial Development released in 1996 aims at generating a clear framework of strategies and measures for industrial development until the year 2012. Its overall objective is to assure that Thai industry will follow an efficient and sustainable development path. In particular, the plan calls for a productivity- and technology-based growth concept and a deepening and widening of the industrial base. In this context, measures to support more sustainable forms of industrial development practices, namely measures to implement the polluter-pays principle by means of legal, economic and social mechanisms, to introduce the

prevention-pays principle and increase the participation of the private sector and the community in monitoring environmental quality will receive high priority.

- Initiatives of business groupings: One of the earliest initiatives to promote awareness among industrialists of industrial environmental problems and appropriate environmental management concepts dates back to 1990, when the Federation of Thai Industries (FTI) launched its Environmental Management Program (IEM). Supported by USAID and, from 1995, by DANCED, activities under the program have focused on projects demonstrating the application of cleaner technology under Thai conditions in a broad range of sectors such as textiles, electroplating, pulp and paper, food and leather tanning industries. In addition, workshops and training courses on environmental auditing and ISO 14000 addressing both large and smaller companies are being organized.

  Given its limited resources, the IEM program certainly cannot already claim to have a larger impact on the greening of Thai industries. Even so, with its more than 3,000 members representing around 80 per cent of the industrial value added, its 26 industrial and 19 provincial clubs, the FTI is about to emerge as an important business organization to promote the introduction of cleaner production concepts on a broader scale. In this process, other business groupings such as the Thai Business Council for Sustainable Development, founded in 1993 and comprising some 70 large enterprises in different sectors (industry, services) or proactive sectoral associations such as the Thai Food Producers' Association and the Thai Tanning Association, are also likely to play an important role.

- Reorienting public and private institutions for human resource development and R&D: Lack of skilled labour and weak technological capabilities are notorious bottlenecks that hamper the transition of Thai industry toward a concept of productivity- and technology-based growth. Therefore, under the current eighth five-year economic and social development plan, human resource development has received highest priority. It is, however, not sufficient to only develop the technical and managerial skills which are necessary to master more complex technologies. Relevant curricula must also seek to boost the capabilities of the work force in such fields as environmental engineering and management. So far, however, very few initiatives along these lines have been implemented. Even the members of professional organizations such the Thailand Association of Environmental Engineers are not seen as having a sufficiently advanced know-how in cleaner production technology.

- Conclusion: While environmental awareness has markedly increased in Thailand since the early 1990s, the transition to an eco-efficient industrialization pattern is still in its infancy. Even so, the emerging group of environmentally proactive companies, the ongoing reforms of the regulatory framework aimed at encouraging the adoption of integrated cleaner production concepts, and a select number of initiatives to "greening" private and public mesolevel institutions can be viewed as encouraging signs that political will is building up to adjust the country's growth pattern along the lines of eco-efficient development.

Abbreviations

ACI	Association of Commerce and Industry
ALADI	Asociación Latinoamericana de Integración
APyME	Asociación de la Pequeña y Mediana Industria
ASIC	Application specific integrated circuits
CEFE	Competency-based Formation of Entrepreneurs
CEPAL	Comisión Económica para América Latina y el Caribe
CIM	Computer-integrated manufacturing
CP	Clean production
DANCED	Danish Cooperation for Environment and Development
EEI	Eco-efficient industrialization
EM	Environmental management
EPB	Economic Planning Board
ESID	Ecologically sustainable industrial development
EST	Environmentally sound technologies
EU	European Union
FACISC	Federação de Apóio á Pesquisa e Extensão Universitária de Santa Catarina
FDI	Fondo de Desarrollo Industrial
FIESC	Federação das Industrias do Estado de Santa Catarina
FTI	Federation of Thai Industries
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GERI	Genetic Engineering Research Institute
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HAN Project	Highly Advanced National Project
HDTV	High definiton television
ICT	Information and communication industry
IEM	Industrial Environmental Management Program
IMF	International Monetary Fund
IMS	Integrated manufacturing system
INEGI	Instituto Nacional de Estadística, Geografía e Informática
ISDN	Integrated service and digital network
ISO	International Standards Organization
KII	Korean Information Infrastructure
KIITF	Korean Information Infrastructure Task Force
MERCOSUR	Mercado Común del Sur
MIC	Ministry of Industry and Commerce
MOST	Ministry of Science and Technology
MSTQ	Measuring, standards, testing, and quality assurance
NAFTA	North American Free Trade Association
NIC	Newly industrializing country
OECD	Organization for Economic Cooperation and Development
R&D	Research and development
RD&E	Research, development and engineering

SEBRAE	Serviço Brasileiro de Apoio à Pequena e Média Empresa
SECOFI	Secretaría de Comercio y Fomento Industrial
ENAC	Serviço Nacional de Aprendizagem Comercial
SENAI	Serviço Nacional de Aprendizagem Industrial
SME	Small and medium-sized enterprise
SWOT	Analysis of strengths, weaknesses, opportunities and threats
TDRI	Thailand Development Research Institute
UIP	Unión Industrial del Paraguay
UNEP	United Nations Environmental Program
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
VAT	Value-added tax
WBCSD	World Business Council for Sustainable Development
WTO	World Trade Organization

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Impact of Changes in Industrial Structure and Integration on SME Clusters

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1. Introduction: The Role of SMEs in the Changing Economy

Small- and medium-scale enterprises (SMEs) played a crucial role in the development of larger regions throughout developed countries and they have assumed an increasing role in the emerging and transition-market economies. The recent G8 Group (the seven most industrialized countries plus Russia) meeting in Denver has formally recognized the contribution of SMEs to employment and economic dynamism in the most industrialized countries and has stressed that the best practices experienced by the SMEs in these countries can be used as positive examples for rapid development of the emerging economies (G8 Denver Summit of the Eight, Communique, June 22, 1997).

The G8 examined this issue by broadly confronting global economic and financial challenges. The evident paradox is that the most influential heads of state stress the need for an effective globalization of the world economy after the collapse of Communist regimes, and the general adoption of market economy, but they argue for policies to promote sustainable growth and create jobs, in the conviction that a market economy *per se* is not able to solve the economic and social problems linked with rapid market opening and liberalization.

Nevertheless, the globalization process is something different from the international economy we have known in the past. Several authors stress that globalization involves a deep structural change in the world economy (Amin and Thrift, 1994, Stubbs and Underhill, 1994, Hirst and Thompson, 1997).

The major difference is that in the past the entire production organization was established within a nation-state; nowadays economic forces are emerging which operate throughout the entire world, overcoming context specificity and affecting the sovereignty of the state. We can say that globalization is an evolutionary pathway, characterized by a rapid change in the geopolitical order of the world.

Six factors have recently changed the world scenario:

a) The collapse of the state planned economies, ending the fragmentation of the world economy into three distinct types: market economies, planned economies, and the residual economies, considered underdeveloped;

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b) the entry in the competitive arena of emerging countries, such as the Far East countries, having factors and price conditions not comparable with the developed world, but producing final products which are directly competitive with those from developed countries;

c) the progressive opening of national economies and their integration into wider regional trade agreements;

d) the progressive loss of sovereignty of the nation-state with respect to supranational groupings on the one hand, and local authorities on the other;

e) the pervasive role of finance in the world economy that is to say the increasing volumes of finance that are moving throughout the world at any given moment;

f) the rapid diffusion of the information society technology, which is able to network people and activities, reducing the time and space constraints of interconnection.

In the past, international trade economy defined flows of exchanges of goods, capital and manpower among nation-states, generating relative adjustments, but leaving the sovereignty of the state over its production organization unaltered. Market operators identified their own interests with the interests of the state.

The emergence of manufacturing capitalism coincided with the affirmation of the modern state based on national identity. The modern state emerged because the productive, urban classes identified themselves as the forces of social and economic change with respect to a previous order based on feudal rights and monopolistic rents to professional guilds and crown companies. The emerging bourgeoisie demanded an economy freed of the previous feudal constraints and a state based on new individual rights.

The nation-state dismantled the local autonomies, centralized bureaucracy, conformed languages and rules on a national basis. Hobsbawn demonstrated how artificial the construction of the national identity has been for most of the European countries. Since the middle of last century, the economic organization and the industrial structure in particular and its regulatory framework were redesigned on nation-state basis, and progressively insulated from other nation-based economies.

National governments designed and implemented policies to strengthen their industrial apparatus in the conviction that national companies defended national interests in an economic conflict, which was a political confrontation among states. On the other side protectionism was the reaction to international competition, when economic pressure by the most developed countries challenged the survival of national companies.

According to this view, the traditional industrial policy derived from the French experience sponsored the creation of national champions, which were considered to be able to compete internationally, and protect the domestic market for services and for those companies which were considered unable to survive in an open context.

Within this context, policies for SMEs were usually addressed to save the very local market for small companies, which were considered economically inefficient and marginal, but socially relevant because of diffused employment.

Since the end of the Second World War, the national economies were pushed to become integrated. Nevertheless, for decades the world economy has been fragmented in three separated circuits: market economies, planned economies and the residual ones. The market economy area was also fragmented in national economies having developed different government

approaches to industrial growth and different corporate and social governance models. Not only were the regulatory frameworks different, but the basic organization of economic life evolved in each country along different paths.

The collapse of Communist regimes and the new entries of emerging economies in the world economy created the premises for a globalization of the economy, but, in the meantime, also made clear that different national pathways pressing for global integration exist. Different governance models still affect the economic performances of countries. Governance, or social norms, more than government policies emerged as the cement defining the resilience of an economic structure to global pressure. In such a context opening the economy appeared a very complex process.

Today we are still in a transitional period, where aspects of rapid integration of local economies within a global context and the progressive reduction of tariff protection coexist, making evident the differences in the institutional - both government and governance - framework identifying different local communities. The progressive tariff rebate stimulates a comparison among national institutions, and as soon as these tend to be converge, local governance structures emerge as relevant for growth.

We can now outline some concepts related to government and governance in an open context: the emerging role of SMEs; the risks connected with a rapid process of opening the market; and, finally, a general framework for policy-making in a global environment.

2. SMEs: A New Model for Industrial Development in a Global Environment

A major change was signalled by the emergence of new industrial techniques, which overcome the traditional Fordistic approach based on scale efficiency. Scale is not the only relevant variable to identify the strategic position of firms. In a rigid Tayloristic mode of production, efficiency was a direct variable of production scale, because it was assumed that the product was homogeneous, the technology given, and the demand stable or steadily expanding.

Where demand is unstable, or technology is changing rapidly, the efficiency provided by scale can be transformed into a rigid constraint for the firms. Because scale efficiency is linked to the asset specificity of the plant, the decreasing unitary costs of production involve increasing the sunk costs of fixed investment. Thus, small firms can be more efficient in all those stages characterized by fluctuating demand or technological turbulence.

The European experiences, recalled by the G8, show that SMEs can be competitive actors if:

- they focus their technological competences and marketing knowledge on specific productive functions, achieving cost advantages and mastering product innovation;
- they operate in a cooperative network, making sure to find other firms having complementary specializations, with which they can jointly offer complex products;
- there are positive local externalities, which favour the cohesion of the cluster, and sustain the growth and the innovation capacity of the group;
- there is a strong cluster identity as a productive community, allowing the entrance of new firms, but avoiding free-riding.

In other words, SMEs can be competitive if they recuperate as an agglomeration the advantages of economies of specialization which they do not have individually because of small size.

In fact, in the last ten years, two parallel, but inverse, phenomena have occurred:

- on one hand, large firms reorganized their own activities around the world into networks of interconnected activities;
- on the other hand, successful small firms aggregated networks around the world, thereby networking local clusters.

In both cases, the nature of firm changed and assumed the effective role of a nexus of treaties. In both cases a crucial division of labour has emerged within the networks. Individual companies are responsible for different stages of production. The core company manages the logistics of the system, finance, advertising, innovation, that is to say the services which activate the production process and allow it to enter the market.

Several large firms reorganized their own activities according to a new model, that is different with respect to the product life-cycle managed by traditional multinationals. According to the traditional theory of multinationals, a company started production in its original country, and when demand in the domestic market was expanding the company started to export to new countries; when the domestic market was almost mature, production was moved to an emerging country, where the production was repeated having the same organization; finally when the production in the second country was expanding, production was reimported to the first one, where internal demand was declining.

The basic assumptions of this model were:

- the process was given and rigidly organized according to the product;
- the product was homogeneous;
- the world market was segmented into national markets, having different stages of maturity of demand for that specific good.

For instance, in the 1960s FIAT produced a very successful model of low cost, family car. That plant was established in Turin to serve the Italian market; when domestic market expanded FIAT started to serve the Spanish market from Italy; afterwards, the plant was transferred to Barcelona to serve the Spanish domestic market, and then also the Italian market. In the meantime FIAT introduced a new model in the Italian domestic market produced at a new plant. When the Spanish market was also saturated, the Spanish plant was transferred to India, and the cycle was supposed to follow.

The present transnational organization of firms is different because firms have to simultaneously manage differentiated products, at different plants, to be offered at the same time in different markets.

This means that the company has to implement different strategies at the same time; it has to be the aggressive incumbent in some markets, for some goods, accommodating incumbent in others, aggressive entrant for some products in some markets, and accommodating entrant for others.

In other words the modern transnational company is not only a multi product producer, but also a multi market and, therefore, a multi strategy company. The firm has to manage a very complex system, taking seriously the fact that a size advantage is emerging, linked to the possibility

of playing different games at the same time, but this is also a very risky task, especially if the company loses control of the system.

Therefore a general tendency is to decentralized production of the specific products or components, while centralizing those functions which are crucial for maintaining the control of the production system and of the market, such as finance, innovation, internal logistics, advertising, and distribution network control.

This redefinition of corporate functions was developed by several large companies in various sectors: strategic market functions are concentrated in the corporate company; production can be managed either by controlled companies, or through joint ventures working on licenses, or subcontractors operating under strict control.

In several sectors, new leaders emerged inside local clusters, originated spontaneously in areas where positive externalities favoured the agglomeration of SMEs. The district leader progressively abandoned the production function and developed the corporate strategic activity.

For instance Benetton is now a service centre, controlling design and sample-books, advertising of new products, the logistics among subcontractors, grouping of different products and redistributing them to a network of about 5,000 franchised shops around the world. Benetton also controls the entire financing of the system.

A new cluster in eye-wear production was born in the North East area of Italy. The leader company, Luxottica owned and run by Mr Del Vecchio, has recently acquired a chain of stores in the United States in order to guarantee market control for products, that are also produced by its subcontractors.

Finally, in an emerging cluster in Southern Italy - a modern sofa producer in Basilicata - has been managed by a leader, Mr. Natuzzi, who has listed his company on the New York Stock Exchange and has organized a network of franchised shops selling fashion sofas by installments.

Thus, when we analyse the variety of firms, we can use the nature of the production and market relations framing the context in which the individual company operates as indicators.

We have to stress that under the general term "SMEs" we can group a large variety of industrial and trade organizations, having a wide range of efficiency and competitiveness.

For instance, under the general label of SMEs we can list:

- Rural enterprises, operating for the self-sustaining of family economies;
- Subcontractors, operating at different stages of production under the indirect command of a larger company;
- Small independent producers, working in isolation to offer products for a very local market;
- Specialized firms operating inside networks of complementary operators;
- Medium-sized firms, directly operating on the international market, by offering niche products.

Thus, scale *per se* is neither useful nor sufficient to identify the competitive capacity of firms; it is necessary to identify its environment - both the social and the production - market environment.

Starting from the production - social environment, we can consider that SMEs can produce according to a network of relations that is totally local, that is to say limited to a very

restricted area given by direct, personal exchanges, or may interlace production relations within the country, or be a part of an international network of production, providing parts or components to other companies, having a similar, or much larger, scale. The extent of the productive relation network, where the company is inserted, can be identifies as:

production network → local, national, international

The company can serve the very local market, local customers having a personal relationship with the entrepreneur, or national markets, or international ones.

market network → local, national, international

Thus, we have a variety of positions that identify a company's historic strategy and therefore help formulate suggestions for policy- making.

	Market		
Production	Local	Domestic	International
Local	A1	B1	C1
Domestic	A2	B2	C2
International	A3	B3	C3

A3 identifies firms having a local network of productive relations and selling its product locally. C3, on the other side, is a company inserted in an international production and market network. B2 identifies firms producing and selling within national relational networks.

The typical industrial district (or cluster), well known in the literature, is positioned in C1, having a local network of production, but distributing its product on the international market through an international distribution network.

In the history of developed countries firms moved quite slowly along the line from local-local to international-international. Most of the SMEs are still very local, especially those offering services. In several cases it is possible to jump from local to international. For instance, in several cases in the former Socialist countries, the collapse of national state companies, created local networks of firms, which then worked as subcontractors for international firms. In other cases, in the Far East, local producers sell directly to international companies without offering the product on the domestic market. On the other hand, the domestic market is supplied by international competitors.

The case of industrial districts illustrates local production clusters moving from local to international market networks; a few of them, usually led by a service company also become international in the production side by decentralizing production from the original district to emerging countries.

In most of the emerging countries we have local-local firms as well as international-international, or multinational companies, which have decentralized production to export the final production on the international market; traditionally there are no bridges between the very local and the international.

3. Transnational Cooperation among SME Networks

Successful firms work within well-established institutional contexts, which are framed by national institutions of education, training, research and the diffusion of technical progress. Thus, the capabilities of firms are strongly affected by local externalities and by national contexts.

The policy approach proclaimed in this paper is therefore based on the capacity to favour the convergence of national systems of innovation of the individual country in order to make the local environment of the SMEs compatible with the context provided by the most industrialized countries.

In other words, the educational system, the research network, the training support, the technical and market information assistance, the support of national and local authorities for networking firms, both at local and transnational levels, become the drivers of endogenous growth.

Various instruments have to be consistently used in a structural intervention devoted to developing a less-favoured region or an industrial declining area, having clearly in mind that we are operating to create an appropriate institutional and social context, to create the framework for stimulating the collective process of growth.

This means stressing the variety of relations which frame a system of "firms and local institutions" within which interventions can be aimed at encouraging cooperation and giving direction to the process of reciprocal specialization of those involved in production.

This idea is clearly based on an evolutionary view of economic dynamics: because interaction among people creates norms for collective action, which induce subjects, who are rooted in different institutional contexts, to come together to work on specific projects.

The central focus is that the national innovation systems are deeply rooted in the national history and therefore it would be wrong to try to homogenize them by cancelling the historic differences. The national differences cannot be driven to converge in the sense of to "becoming the same," but it is possible to promote compatibility among different countries, and in the meantime, to induce institutions and firms to cooperate on specific initiatives.

These considerations enlarge the normative relevance of this new approach, based on the possibilities of addressing the institutional framework and intervening on the social externalities. Inducing firms and institutions which are involved in local networks to work together on innovation means intervening in both industrial relations and the specific competencies of the different agents.

Creating transnational linkages between local leaders means encouraging compatibility within and among local networks and thereby increasing the possibility of redefining the division of labour and the specialization process in a wider context.

In any case, the goal of these policy actions is the acceleration of innovation processes, without breaking existing national and local networks, but, rather, integrating them in a wider context: to allow the openness of the local systems without the dispersion of the accumulated knowledge.

In fact, this industrial policy leads to systemic adjustments which necessitate the integration of existing firms and local institutions with firms and institutions which have traditionally been outside the cultural and territorial area covered by the district.

In the end these actions will also change the national systems of innovation. This approach induces an integration process which moves from the bottom-up: it creates linkages between local leaders, who have to change their traditional procedures of interaction within their own national framework. The cooperation programme has to establish new procedures of relations between firms and public institutions, which are compatible with the new approach to industrial strategy.

Public policy cannot be action merely aimed at encouraging technical innovation. It must also be directed at guiding the collective action needed to effectively handle and incorporate change which occurs on the local level. In this way policies encouraging endogenous growth may be implemented.

4. The Risk of Creating Non-communicating Groups

In the majority of cases the main means of investment support, including that for SMEs, has been the creation of Free Zones or "new urban communities", which offer simplified administrative mechanisms, numerous tax exemptions and easier access to banking services.

A few examples of these free zones will be mentioned. Tunisia has adopted a strategy of economic free zones and free administrative areas for some time. However, these have recently been called into question because this type of strategy tends to generate production relationships that are essentially directed towards foreign markets, separated from local companies, and therefore do not affect the efficiency, productivity and innovation of the local production system.

Although these include about 1500 companies, accounting for almost 15per cent of the country's industries, the initiatives themselves still do not manage to influence modernisation or to boost national industry, but remain isolated cases absorbing mainly the feminine work force, without subcontracting to local firms and, therefore, without fully becoming part of the local context.

Algeria has set up an intense policy for the promotion of free zones, with the elimination of restrictions on importing the goods and services necessary for production. In this case, production is essentially aimed at re-export.

Six free zones have also been set up in Syria, managed through the General Establishment of Free Zones and a seventh has been established as a joint venture with Jordan. Nearly 500 companies operate in these zones, both foreign and local companies selling abroad, and duty-free shops authorised to sell imported goods to visitors or members of international organisations.

Despite tax reductions and exemptions, it seems clear that the creation of "islands" within national contexts lacking adequate infrastructure and networks of local relationships to guarantee adequate services and supplies, is certainly an important step, but is not sufficient in itself to create the needed catalysts for the general development of the country.

The Egyptian situation is slightly different since law 230/89 encourages the creation of both private and public free zones and it reinforces law 59/1979, which promoted the creation of new urban communities to offer space to new industrial initiatives.

The cases of India's 6th of October City, which currently is home to approximately 1000 companies, and of 10th of Ramadan City, which contains about 500 firms, demonstrate that it is possible to create large production zones in relatively brief time periods, encouraging green-field investments.

This last case reveals that it is often easier to create new sites for new companies, rather than trying to modernise existing structures in cities that have grown too fast and that are therefore overpopulated, congested and chaotic. However, the new industrial areas have to be able to welcome local enterprises that are strongly directed towards exports, but also directed towards the local and regional markets, providing an opportunity to develop contacts with foreign companies. These contacts may include subcontracting and the acquisition of technology.

Moreover, the creation of new industrial zones undoubtedly reactivates the advantages of agglomeration, allowing for the development of specialisation and complementarity among enterprises, while requiring a minimum size for the new urban area.

However, it is evident that production is, above all, a collection of contractual relationships, based not only on the formal norms regulating trade but also on the relationships of trust that are at the basis of the economic and social development of the country. In many situations it is clearly easier to set up new aggregations rather than change existing ones.

However, these experiences can effectively act as catalysts for national development only if these industrial zones, managed in a regime of free zones or simply as special cases, can, over reasonably short periods, permeate the rest of the country with new work techniques, international relations, and company procedures activated in special circumstances.

Otherwise, they risk perpetuating a kind of double regime that separates the companies first referred to as "international" from those indicated as "local", with the risk of creating a separation that is not easily resolved in the long term.

Similar cases, experimented in other parts of the world such as in China and Mexico, demonstrate that the creation of zones, and therefore of companies functioning under a special regime, can be catalysts for development only if they become the nodes of development networks that extend throughout the country, acting as areas of practical experimentation which is then generalised to companies throughout the country.

Where this does not occur, these industrial zones may become isolated "islands" that soon lose their attraction, even for highly subsidised foreign investment.

In fact, investment by foreign companies in the Mediterranean is becoming stagnant, since there is much competition from free zones and industrial areas that are highly subsidised by national governments of countries in the Far East, Eastern Europe and Latin America. At the same time, the process of industrial delocalisation is increasingly valid as a node for global production networks in which enterprises decentralise their production processes to sell to the world market.

In this case it is not enough to reduce start-up costs and fixed costs while benefiting from low labour costs. Reliability in all aspects of production is required. Local enterprises must be able to satisfy international quality standards and must operate in a context of public and private services which make production reliable. On the other hand, decentralised production, not directed towards the local market implies an efficient network of transport and communications to avoid storage costs, to reduce time wastage and the uncertainty in the communications network.

The most advantageous direct foreign investments help transfer technologies and organisational capacities - and therefore not only licences but also skills - and encourage the development of companies which operate on the national market with qualitative standards and methodologies at international levels. Therefore, once well-established at a local level, this

investment boosts the modernisation and growth of the production sector, leading to the re-export of goods on the part of local producers.

In this case joint venture proposals should be the object of more careful policies on the part of national governments, having as their main aim the bringing together of the two types of companies indicated above.

5. A General Framework for Policy-making for SMEs in a Global Economy

Within this perspective, we believe that an industrial strategy to develop SMEs, through the creation of industrial networks, has a crucial role for the economic and social development of a country, because:

- it allows new companies to compete in the internal market, to break away from localistic closure, and to move toward market liberalization;
- it increases the number and the variety of economic actors;
- it increases the specialization range and therefore the attitude of the local firms toward innovation;
- it allows the emergence of new leaders;
- it reinforces social stability by creating solid productive relations among complementary companies.

According to the European, and especially the Italian, experience analysed by many authors, the success of many small firms in Europe has been based on their insertion in agglomerations of individually specialized firms working in contexts of complementarity, so that the clusters themselves are the collective subject taking part in the competitive game.

The nature of such clusters is quite different according to its social history, the institutional framework, basic technology employed, and market profile. Clusters could be characterized by quasi-market relations in an institutional context which supports social stability and economic dynamics, with much inter-firm interaction, but framed within a collective consensus, capable of punishing potential free riders.

Alternatively, in a weak institutional context, firms could internalize the inter-firm relations to avoid the risks of market interaction, by creating either vertically integrated structures or quasi-hierarchy organizations based on highly structured subcontracting.

From a policy point of view, the main question concerns the possibility of stimulating the creation and growth of these clusters of small, specialized and complementary firms, in order to compete within the regional trade agreement areas and - in a short period of time - in the fully global market.

A new industrial policy approach has to be explicitly oriented to supporting the creation of networks of innovators which can lead the opening process through an industrial reorganization of firms redefining their own specializations within a cooperative productive context.

This strategy is applied to the territorial level to favour the endogenous growth of the less-favoured area; it is used for innovation policy and human resource development in education and research policy; it is adopted for developing small and medium-sized firm clusters.

A comprehensive policy for SME growth calls for a clear distinction among the different typologies of small enterprises. As an example there is a strong difference between the treatment of small rural enterprises, having the duty of providing subsistence to a wide local population, and enterprises, which - even if small - are committed to high-tech production to be offered on the open market. There is substantial difference between an isolated craftsman and a small firm working as a subcontractor to a large firm.

We can stress that a special duty of policy makers is to recognize these differences and to try to diffuse innovative routines throughout the different groups of firms.

It is clear that a large number of SMEs remain confined to the very local economy, and that they survive by managing a mix of local commerce and simple crafting, nevertheless, a number of SMEs must be competitive in the open economy, in order to support the process of trade liberalization of the country, to start up new private activities, and also to diffuse new practices which can improve the efficiency of the entire economy.

In a number of examples around the world, the positive externalities which allow for cluster cohesion are the result of a historic process, characterized by the sharing a common culture and language, a basic technical knowledge, and a strong sense of belonging to the local community. From a policy perspective a strategy for SME clusters should be oriented to recreating this common framework in order to sustain a dynamic aggregation of firms, which in turn will favour innovation and efficiency.

The aim of public interventions can be seen as the attempt to recreate a social and institutional context favouring industrial cooperation, without the risks of market collusion.

Since the success of a policy strategy for SME development implies the reinforcement of relationships within firms, among firms, and between the firms' system and the institutional environment, the design and implementation of economic policy concerning small and medium-sized firms require a clarification of the role of the state in the specific context of the normative and regulatory system which regulates social and economic life.

In brief, in a context of market opening, the role of the state needs to be strengthened in order to stimulate market forces and especially local potential, but at the same time, the state has to be deeply reformed in order to pursue this aim.

Thus, there are two relevant levels of policy design and implementation:

- The macro level defines the legal and regulatory environment which governs the behaviour of all actors, and sanctions free-riders.
- The micro level establishes the instruments to strengthen the capabilities of the actors, which take part in relational networks, which means not only local firms, but also both private and public educational, training, research, and service organizations.

Together, policies on both levels must be integrated to create the positive externalities needed for growth, in order to avoid the formation of groups resistant to change.

6. Institution Building Policy for SME Development

It becomes clear that the environment surrounding SMEs is fundamental to their potential success. Policy for SME development must incorporate increased attention to creating and reinforcing a supportive institutional context.

Such policy actions can be made by various authorities operating at different levels and having different responsibilities.

The policies must be based on four factors:

(i) Opening and liberalizing the market. The experience shows that the creation of regional trade area can help the process, by regulating the timing of internal reorganization of production structure. This means creating an internal market within the trade area, such as the European Union, but also means converging institutional frameworks to allow firms to reorganize themselves within an effective enlarged market. This also means driving the process of opening the trade area to external competition and cooperation;

(ii) Regulating market power; this not only implies the establishment of antitrust and public utilities regulations, in order to avoid that opening the market means simply to monopolize the internal market by international leaders or by the newly privatized companies, but also controlling state aid schemes to avoid market distortion during the transition period, and privatization mechanism to avoid unfair competition, mainly against the smaller firms;

(iii) Developing a more advanced and efficient organization of production; this is based on a wide variety of actions devoted to favouring the reorganization of firms, but also to redefining the national and local systems of innovation to reinforce innovative production and territorial development; this also implies actions to favour new entry and the creation of new firms, especially in those sectors which are able to drive innovation and to catalyse the development of local forces but having no roots in the local traditions, such as advanced services to production; and

(iv) Establishing knowledge-based externalities; this involves the capacity to frame firm activity in a local context capable of stimulating economic and social change, but also to connect specific interests with national and global networks of universities and research centres.

The first two aspects are clearly macro-policies aimed at redefining the institutional framework in an opening economy. They are devoted to the creation of a positive working context. It is necessary to develop complementarities among firms and to sustain a process of relative specialization of the SMEs.

This is clearly a bottom-up approach, because it is necessary to identify a group of firms (either by sectoral or technological affinities) and to work to establish a condition of reciprocal trust to allow the individual firms to feel themselves as part of a common body. This process of networking can be sustained by a national task force, having the role of stimulating the self identification of local economic interests, creating the initial connections between local authorities and firms, and of teaching the procedures for establishing networks.

A crucial aspect of this policy approach is the promotion of new firms. Regarding the start-up of new firms, the traditional policy approach held that the principal entrance barriers were related to the lack of capital. This assumption was reasonable in a context of mass-production of homogeneous goods. It is not as important in a context of quality competition based on specialization.

Recent experiences in different countries have shown that a positive approach to the creation of new firms is based on the capacity to provide relations, services and research connections. In this view the principal barrier to entry is the difficulty of properly identifying a business idea and of transforming it into an organizational reality.

The crucial issue is that policy making in an evolutionary context has to be based on a continuous process of institutional adjustment between top-down and bottom-up interventions, creating the conditions for an effective integration of market forces beyond the national context.

Crucial to the success of this policy approach is the ability to create new firms, to reinforce cooperation and to assist relationships between firms and the educational and research system thereby encouraging the presence of a multiplicity of actors in the productive system.

All these efforts require experiments and learning from these experiences in order to generalize the results. This is a cumulative process and therefore the national government has to stimulate local experiences, but also create connections among them, and therefore to adjust national legislation, redefine the relationships between national, regional and local authorities, and outline a realistic time frame for international integration and opening.

Policy-making in an opening context is an evolutionary process, which requires a continuous readjustment of top-down interventions to define the institutional environment for firm reorganization and of bottom-up actions to test local experiences of industrial reorganization, and thus, to define the next steps of integration.

7. Final Considerations

The impact of changes in industrial structure, clusters and integration on SMEs can be very different. In several cases a too rapid opening the economy created an uneven competitive condition between external multinational companies, used to working at the global level, and local firms, used to working in a protected local environment. In many cases, such as in Argentina, many small firms collapsed because they had no time to learn and adjust their own productive capacity.

In the perspective of complete globalization of the economy, new opportunities can be offered to SMEs but they have to be ready to identify and catch these opportunities. Experience teaches that this process is not an individual one but a collective process of learning.

Thus, the first step of policy-making is making a correct analysis of the state, not only of the structures, but also of the relations among economic actors, firms and institutions. The second step is positioning the existing clusters in the organization of production /extent of the market matrix of relations defining pathways of development of firms is the third step.

In most emerging countries, in the stage of opening the economy, two separate clusters of firms may be created within the same country:

- one for enterprises that are concentrated in local production and localised market relationships but that provide the majority of jobs (companies located at A1 position);
- one for enterprises that are part of a network of international relationships, that do not create a relevant number of jobs, but which develop product innovations, and introduce innovations in technical and organisational process of production (the C3 box companies).

The risk is that the two groups of enterprises do not communicate with each other. The possibility of creating a bridge between the two groups of enterprises is based on programs devoted to encouraging the "international" companies to become involved with the local context, and pushing the "local" companies to work closely with the former and could be established with the assistance of international organization such as UNIDO.

In this perspective, specific programs can be promoted to qualify and improve subcontracting supply throughout the countries. This could be a step towards the spread of technical and organisational innovation, extending the growth area of SMEs.

The presence of intermediate institutional actors, which link the central government to local institutions and enterprises, is extremely important to creating the local consensus for boosting the linkage process among firms. Local administrations, entrepreneurial associations and social organizations can make a decisive contribution to improving the local environment.

Creating a favourable environmental for SME growth means not only:

a) realising local infrastructure; b) making credit accessible; c) facilitating and encouraging access to the market; d) providing basic services; e) simplifying relations with national and local administrations; f) favouring the acquisition and development of technical know-how;

but also involves; g) re-creating communities of reliable partners; h) contributing to re-establishing the sense of identity of the local community, and therefore the sense of belonging to a community; i) re-establishing the sense of trustful cooperation within the community, and therefore the possibility to punish the free riders; and j) favouring the selection and emergence of new economic and social leaders.

To pursue these aims, "pilot cases" can be launched, but these must then be extended and generalised throughout the whole network of intermediate actors that, as previously discussed, constitute not only the government not but also the governance of a country. A major role for international institutions like UNIDO is to identify, select, support these pilot cases and to network them within a transnational network of experiences.

The possibility of creating transnational networks is given by the design and implementation of integrated transnational programs. From the European experience we can learn that acting within the context of transnational networks has also favoured internal communication within the country between firms and institutions that generally do not maintain sufficient contacts with each other.

Dialogue between the various experiences involved in an integrated program must become regular. This dialogue requires mutual respect for each individual country's historical background and for differing political and religious convictions. Globalization cannot mean denying historical, cultural and social differences, but their integration in a context of trustful co-operation.

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SME Responses to Global Challenges: Case Studies of Private and Public Initiatives

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1. Introduction

Agencies which seek to support small and medium enterprises (SMEs) have a common concern: what is their role in the current process of globalization and liberalisation of product markets? In order to answer this question they need to pose a prior question: do small and medium sized enterprises have a chance to compete in liberalised internal markets and abroad? If they are not viable, what is the point of supporting them?

Such big questions rarely have simple answers. One of the main lessons of the last twenty years is that it is difficult to make generalisations concerning the viability of SMEs. The first obvious but key distinction to be made is between tradable and non-tradable. In the latter, SMEs tend to have much better prospects than the former. However, in this paper we are concerned with tradable. Indeed the concerns stirred by the twin forces of globalization and liberalisation mainly apply to the traded goods sector.

Also within tradeables it is also hard to generalise on SME viability, except perhaps in one respect. Recent success stories of SME based industrialisation seem to have one common feature: connectiveness. There is mounting evidence that clustering and networking help SMEs to compete. The most impressive case is that of Taiwan whose export-oriented growth is based on local SMEs. In 1991, SMEs accounted for 60per cent of Taiwan's total manufacturing exports (Kishimoto, 1997:2). Attempts to explain the competitiveness of Taiwan's SMEs have stressed that "the cooperative relationship among firms ... produce externalities" (Bielschowsky, 1995:30). Close and cooperative business networks, both within vertical supply chains and horizontal ties with other producers, help firms to rapidly capitalise on new orders, respond to market fluctuations, and ensure that they do not lose capacity on on-going orders.

While the specifics of inter-firm networks are under-explored in the Taiwanese case, there is agreement in the recent literature that analysing such relationships is the key to understanding why SMEs prosper in some cases and not others. And such consensus is not restricted to developing countries. Evidence from small firms in the United States, cited by Shapira et. al. (1995:75), suggests that networking aids groups of small firms "through information sharing, solving common problems (such as training) and cooperating in design, production and marketing ... [thereby] overcoming the scale problem".

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But are networking advantages limited to the ability of SMEs to access economies of scale? We would argue not. This paper suggests that networking, connectiveness and cooperation are also key to SMEs' ability to cope with the new challenges posed by liberalisation and globalization. Furthermore, we argue that the way SMEs relate to each other can be influenced by outside intervention.

Economic liberalisation and the rapid pace of globalization of production and consumption is changing the ways in which firms produce and sell goods and services. In an increasing number of product markets the new challenge for manufacturers is to: (a) raise quality, (b) deliver with greater speed, and (c) produce in small batches. Best (1990) has summed this up in the term "The New Competition". This has serious implications for manufacturers, and especially SMEs. A failure to respond to new global challenges can have severe consequences. Maillat et al (1996), for example, document how SMEs in the French watch industry collapsed because of their inability to respond rapidly to changing technologies and new demand pressures. In part, this was an outcome of operating in protected market, where openness to changing demand trends was limited. Nevertheless, in failing to react, French watch producers were by the mid 1980s either out of business, or had become adjuncts of the Japanese and Swiss watch industry.

SMEs, given their scale are often seen as being better positioned to respond to changing market conditions, showing greater flexibility in their ability to alter existing production systems to ones that favour rapid response, higher quality and shorter turn around time. But SMEs also need to focus on core competence and build closer ties with other agents, both within vertical supply chains and horizontally with other producers. SMEs when located in sector specialised geographical clusters, or as part of a geographically dispersed production networks, may well be better placed to capitalise on the new competitive pressures. Connectivity and networks matter. And as we state above, interventions can make a difference.

But first a caveat. Not all markets are the same. The ability of SMEs, in clusters and networks, to respond to competitive challenges are clearly conditioned by the nature of markets in which they operate. Sectoral and product specifics account for much of the complexity of the real world. Thus, the reader should be warned that the discussion which follows is not equally relevant for all product markets. This paper is concerned with private and public responses to the "new competition". It is less relevant for sectors in which scale economies and low price are the overriding criteria for success.

In order to demonstrate more closely what the competition means and explore how private and public actors respond we draw on a number of cases, in particular on the shoe producing cluster of Sinos Valley in Brazil and the surgical instrument cluster of Sialkot in Pakistan. Both provide powerful insights of local responses to global challenges.

The surgical instrument industry of Sialkot in the Punjab of Pakistan consists of over 300 manufacturers who produce surgical instruments from stainless steel and farm out work to some 1,500 small enterprises specialising in particular stages of the production process. Alongside these manufacturers and their subcontractors, there are an estimated 200 suppliers of inputs and over 800 units providing various types of services. There is intense competition in all stages of the local value added chain but there is also cooperation both of the vertical and horizontal kind. Over 90 per cent of Sialkot's output is exported and around 90 per cent of these exports go to Europe and North America. This cluster is estimated to account for over 20 per cent of world exports, making Pakistan the second largest exporter of surgical instruments after Germany (Nadvi 1996).

Shoe manufacturing in the Sinos Valley (state of Rio Grande do Sul) developed over two and a half decades from a cluster of small enterprises producing only for the internal market to a cluster with enterprises of all sizes exporting around 70 per cent of their output (Schmitz,

1995a). Their growth and competitiveness cannot be understood by analysing enterprises individually. The 500 shoe manufacturers draw on over 1,000 suppliers of specialised inputs and services and on a range of self-help institutions. However, there is not just complementarity and cooperation but also fierce local rivalry confirming that the two do not exclude each other. The Sinos Valley is not the only shoe producing cluster in Brazil but it is largely responsible for the country's export performance. Between 1970 and 1990, Brazil raised its share of world exports in *leather* shoes from 0.5 to 12.3 per cent. The current challenges confronted by these two clusters will be discussed later on.

In order to explain the growth that has occurred in the past, our work has stressed that clustering opens up efficiency and flexibility gains which individual enterprises can rarely attain. These gains are captured in the concept of collective efficiency, defined as the competitive advantage derived from local external economies and joint action. The former are incidental and the latter is consciously pursued; in other words, there is passive and active collective efficiency. We have shown elsewhere how and why these mattered for past growth (see Nadvi 1996 and Schmitz 1995b).

The questions on which we focus in this paper is how these clusters respond to the new challenges which arise in the current wave of globalization. Our proposition is that coping with this challenge successfully requires a step up in active collective efficiency, in other words, more inter-firm cooperation. Section 2 shows whether and how enterprises have stepped up their *vertical cooperation*, both in their supply chains as well as in their ties to buyers. Section 3 concentrates on *horizontal cooperation* and the role of business associations in confronting new challenges. Section 4 discusses the role of public policy. Here we broaden the focus from the case material on Pakistan and Brazil, drawing on evidence of private and public initiatives from other countries. The final section draws together the main policy conclusions and identifies issues for further research. The latter is important because research on policy responses which help local producers to minimise the losses and maximise the gains from globalization is still in its infancy.

2. The Challenge of Upgrading Vertical Ties

How do clusters respond to the challenges presented by the new competition? Elsewhere we have argued that turning a crisis into an opportunity requires a shift in gear on the part of clustered producers, moving from the passive to a greater reliance on the active dimension collective efficiency (Schmitz 1995b, Nadvi 1996). External economies of clustering are important to growth but are not sufficient to ride out major changes in product or factor markets: that requires joint action. It is clear that, in the face of exogenous pressures, not all firms in a given cluster will enter into strategies of cooperation; equally where it does happen the focus, form and intensity of cooperation are likely to vary with the challenge. What is of interest here is whether there is evidence of greater joint action by some local clustered producers in response to challenges of the new competition? Does this result in upgrading? Who are the key agents who initiate local joint action? What is the nature of such cooperation? What policy lessons are to be drawn from this?

This section uses recent case evidence from the Brazilian shoe cluster in Sinos Valley and the surgical instrument cluster of Sialkot, Pakistan to respond to these concerns. Both clusters have faced new challenges arising from the process of liberalisation and globalization. These question the ability of local firms within these clusters to survive and remain competitive in an ever more demand driven and quality conscious global market. For Sinos Valley's shoe firms holding, or extending, their position in the international market depends on their ability to produce better

shoes faster and in smaller batches. China's aggressive penetration into the United States market for cheap, standardised leather shoes severely squeezed Brazilian exports from its main market segment. After 20 years of fast export-led growth, the Sinos Valley began to stagnate in 1988. This, so-called, 'Chinese shock' also coincided with the 'discovery of inventory cost' on the part of the overseas, especially United States, retailers. Buyers stipulated that the time between order and delivery be reduced to a third or a quarter of what it used to be. And instead of keeping large stocks in their warehouses, they changed to placing small orders which were then repeated in line with sales. Buyers in the internal (Brazilian) market, which absorbs about a third of the output of the Sinos Valley, followed the international trend and place orders closer to the point of sale. Consequently, in order to survive and grow, producers have recognised that they need to reorganise production, improve efficiency, raise quality and move up market.

The pressure to raise quality is even more acute in Sialkot's surgical instrument cluster. Its producers need to meet internationally accepted quality assurance criteria for continued access in the advanced country markets. In May 1994 the Food and Drug Administration (FDA) of the United States, which amongst other things monitors quality standards of health equipment and medicaments, issued an "import alert" restricting Pakistani-made surgical instruments from entering the United States on the grounds that they failed to meet internationally accepted quality assurance standards. As a consequence of this effective embargo, export consignments from Sialkot were stranded midway, orders were cancelled, and many firms in Sialkot ceased operation. By early 1997, however, just over two years after the event, sales of Sialkot-made surgical instruments were above the 1992-93 levels, overall quality had improved, seventy five of the 300 manufacturers within the cluster were certified as conforming with internationally accepted Good Manufacturing Practices (GMP) standards, and one firm had become certified as meeting the ISO 9002 quality assurance requirements.

There is evidence from both clusters that SMEs have been able to respond to global challenges. Nevertheless, not all firms have done well, and there is greater differentiation within the two clusters.[1] Production relations have also been altered. In the discussion that follows, we observe how vertical production ties have changed in the two clusters, specifically ties with suppliers and subcontractors and ties with buyers. The key concerns is: has their been greater joint action as a result of these pressures?

In both Sialkot and the Sinos Valley the responses to the exogenous crisis was not immediate. Restructuring occurred with a delay. When it did happen, it involved changes in production ties in both clusters. While it is too early to provide conclusive evidence of the dominant trends, case studies of supplier networks of large firms and SMEs give some indication of how vertical ties have changed. What emerges is that large firms and SMEs have often responded differently. Furthermore, what is clear from our analysis is that large firms matter. They not only provide some evidence of improving ties with smaller local producers, their responses also give some indication to local SMEs of how to confront the new challenges. In this sense large firms often set the pace and direction of change. It is important, however, to remember that the firms which are large today were small a decade or two ago. To elaborate on this we compare case studies of production networks of large firms and SMEs across the two clusters.

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[1] In Sinos Valley, for example, some parts of the industry never managed to overcome the new competition and died. According to dos Santos (1992:134), 12 of the 100 largest shoe firms closed down during 1988-92.

Ties with Suppliers and Subcontractors

Two large firms, JW in Sinos Valley and AS in Sialkot, give some indication of the common and different response of large producers, and the ways in which their links with their suppliers and subcontractors have changed.[2] JW employs just under 1,000 workers, and produces 1.6 million pairs of shoe a year, amounting to $20 million in 1995. The bulk of this is exported to the UK. The firm has been facing growing pressure from its buyers for higher quality, faster delivery and smaller batches. As a consequence, since the early 1990s, JW has reorganised its system of production, bringing turnaround time, between order and despatch (ex factory), down from 12 weeks in 1992 to 4.5 weeks in 1996. This has required changes in JW's relationship with its suppliers. As a first step JW, during the course of 1992-93, invited selected groups of suppliers (often competing firms) to its premises to discuss the transition to a 'new regime'. The purpose of these meetings were to help suppliers understand that the 'new competition' had a cascading effect. JW promised suppliers greater collaboration in the programming of production and in technical matters, and a continuity of the relationship. In return, the suppliers had to deliver faster, more frequently (just-in-time) and more punctually.

Putting these ideas into practice required getting to know each other better: such as learning how the supplier (or conversely JW) organised production, and learning how the technical processes worked. JW's staff observed the difficulties suppliers faced in complying with the new delivery standards, and made suggestions for improvement based on knowing both sides of the operation. Suppliers were asked to do the same in JW's factory. In addition to such learning-by-interaction, cooperation in the programming of production was essential to the new relationship. This meant that JW had to give advance notice of changes in order levels, and pass on precise order specifications more promptly. Given the tighter delivery schedules, greater synchronisation was required. Rather than forcing this onto suppliers, JW opted to achieve it by transparency, learning-by-interaction and cooperation. Suppliers did not thereby escape competition. JW used more than one supplier for each input and used the cost comparisons in its negotiations. It would not, however, switch suppliers at short notice in order to take advantage of lower prices. JW committed itself to a continuous relationship and to seek joint solutions to problems where problems occurred.

Interviews carried out with a range of JW's suppliers support the view that JW invested in its relationship with its suppliers and reorganised internally to make the changed arrangements work. For suppliers, their relationship with customers such as JW were characterised in terms of 'playing with open cards' on costs and scheduling, mutual visits (for more than just collection or delivery of inputs), knowing each other's technical and organisational possibilities and limitations, helping each other to improve, not taking advantage of each other at difficult moments. The aspect which was stressed more than any other concerned cooperation in logistics, particularly in the planning and utilisation of capacity in order to make just-in-time practices work. In the words of one supplier: "They want us to be an extension of their factory, that takes a lot of communication".[3] There was agreement that such customer-supplier relationships had become more common but had not yet become typical. But there were interesting differences as well. The oldest supplier (in terms of years of dealing with each other)

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[2] The Sinos Valley case study is based on fieldwork carried out by Hubert Schmitz, jointly with Luiza Bazan, over several visits in 1992, 1993 and 1996. The Sialkot case is based on fieldwork by Khalid Nadvi in 1993-94 and in 1997.

[3] It became clear even a relatively advanced firm like JW at times faltered and put in last minute orders or challenges. However, there was the commitment to find a solution whether it concerned organisational technical or financial matters.

was the most sluggish and the youngest the most advanced in terms of willingness and ability to cooperate. Two suppliers seemed to be ahead of JW in this respect, the other four seemed to be pulled along. Nevertheless, behind the heterogeneity, there was a common aim of solving the common problem through a strategy of "voice" rather than "exit". This was a significant change from the 1980s.

The JW story suggests that within the cluster context liberalisation and the demands of the new competition can help forge greater vertical cooperation with the building of more interactive, obligational (as opposed to arms length), relationships within vertical supply chains. But this is not the only response. Case studies of large firm networks in Sialkot point to a somewhat different approach. Here there has been a trend towards greater internalisation of production by large firms in order to offset the transaction costs associated with meeting quality assurance requirements. This, however, has not necessarily meant that cooperative ties with all subcontractors have declined. Take the case of AS, a large firm employing over 125 persons in 1994 with sales, mainly to the United States, exceeding $1 million. While clearly affected by the quality assurance crisis in 1994 the firm has continued to grow. Sales in 1997 were well above 1994 levels, production capacity had been expanded, the overall quality standards of its instruments were felt to have risen significantly, it had become GMP certified, and had initiated the process for obtaining an ISO 9000 certification.

In bringing about these improvements AS made important changes to its vertical ties with its suppliers and subcontractors. Its main raw material is locally produced, scrap-based, stainless steel. One of the key worries expressed by the FDA had been that the quality of such steel was uneven and that there were inadequate quality assurances provided about the origins and standards of Pakistani-made scrap-based stainless steel. Instead of turning to imported metals, AS strengthened its ties with its local steel suppliers. It entered into a detailed technical dialogue with its supplier and reinforced the relationship by placing large orders. Consequently, it was able to force its steel supplier to adopt international quality assurance practices and improve quality. AS has been able to ensure that the steel it now uses is not only properly metals tested, but also comes with the required traceability records to meet the quality assurance requirements of its United States buyers.

While this practice indicates greater cooperation with its key supplier, AS has adopted a different approach with many of its subcontractors. It used to subcontract-out various labour intensive tasks (particularly polishing and filing) to a pool of some 50 independent subcontracting units, some of whom worked exclusively for AS. As a result of the quality crisis, AS internalised many activities that were previously contracted-out. It foresees reducing its reliance on external subcontractors even further and in future plans to undertake all processes internally. However, it also intends to continue using some of its current subcontractors, especially for skill intensive filing. This move, towards an internalised form of subcontracting, will involve subcontractors locating within the perimeter of a new manufacturing facility which AS is building in the industrial export zone being developed on Sialkot's outskirts. The logic for this changed way of organising ties with subcontractors is simple. As the firm's head explains: "it costs us a lot of time and effort to monitor that the subcontractors follow the correct quality assurance procedures. By having these subcontractors located within our larger compound we are able to make sure that they prioritise our work and we can ensure that they are following the correct quality procedures. Also it become easier for us to do the documentation which will come with the ISO 9000" (S. Amir, 21/1/97).

But the gains for AS are not only to be found in the lowering of quality related monitoring costs. It will continue to benefit from the labour flexibility that comes with a subcontractor who

remains responsible for its own labour, while also having guaranteed access to a pool of highly skilled labour. The subcontractors for their part, while losing the freedom to work for others, get rent-free work space and electricity as well as a regular stream of work. This change in subcontracting patterns, which was becoming visible in 1994, appears to be the preferred production arrangement that large firms in the Sialkot cluster wish to adopt.

How have SMEs responded to the pressures of liberalisation, greater quality requirements and new competitive pressures? The evidence is less conclusive, or indicative, here. Nevertheless, case studies of supplier networks of SMEs in both the Sinos Valley and Sialkot give some indication of the ways in which their vertical ties are changing. Despite the segmentation of markets SMEs face similar competitive pressures as large firms. All SMEs in Sialkot are export oriented. In Sinos Valley, while small firms tend to be geared to the internal market, this does not mean that they escape the demands of the new competition. Local retailers in Brazil demand higher quality and faster delivery from shoe manufacturers. In line with international practice, retailers have cut down stocks and try to place orders as close as possible to the point of sale. Thus, traders and producers who used to think in terms of months now count in terms of days with ever smaller orders and shorter delivery times.

Do SMEs internalise functions previously subcontracted out, as in the case of the large firm AS in Sialkot, or do they establish closer links with key suppliers and subcontractors, as seen in the case of the large firm JW in the Sinos Valley? Take the case of PL, a small shoe firm employing 40 workers in the Sinos Valley. It relies heavily on buying in inputs and services. In this sense its operation mirrors that of most local small shoe firms. The changes observed in PL's relationship with its suppliers as a result of the 'Chinese squeeze' are: first, the amount of time dedicated to ties with input suppliers has increased, visits are more frequent, and the mutual knowledge exchanged is better. However, interpreting this as a sign of improving relationships is only partly correct. Some of the time invested in external ties is about gaining a slot at the right time in the supplier's production schedule (in this sector, most inputs are made to order). Second, the findings on the relationships with subcontracted outworkers are not conclusive. According to PL, relationships had become more stable and transparent, advance notice was given about increases or decreases in workload, and technical assistance was provided on a regular basis. The outworkers' own accounts did not confirm this and this requires further investigation.

In Sialkot, an equally patchy story emerges. Take the case of Unimed, a small firm with a workforce of 31 (including six members of the owners' family), which sold roughly $350,000 of surgical instruments in 1994. Its leading market is Germany. What distinguished Unimed from other similarly sized firms was its adherence to high quality standards and its ability to manufacture higher value instruments which at that time were the preserve of larger producers. In 1994 the firm's prospects looked good. Its owner was keen to seek new markets, new buyers and to attend international trade fairs as part of a more aggressive marketing strategy. In reality, however, Unimed has struggled since 1994. Sales are down from the 1994 levels and half the paid labour force has been laid off. The devaluation of the Pakistani Rupee has pushed up prices of the imported stainless steel it used in its higher quality instruments. In addition, the firm's investment on marketing trips and visits to foreign trade fairs brought little returns. In fact, it has less buyers, and a smaller order book, now than it did in 1994. The most important fallout of the quality assurance crisis for Unimed is that it has had to compete with a larger number of local producers trying to sell in Europe rather than in the United States. Instrument prices have fallen in the relatively more stable and more quality driven German market. Unimed lost orders with some of its long-standing buyers who were able to source more cheaply from within the cluster.

The firm decided to seek GMP certification and was one of the earlier producers to be certified. A factor motivating Unimed to go through the GMP process was that it would improve its sales in the European market. In addition, the technical training required to meet GMP quality assurance was being provided free through a state subsidised programme (discussed in the next section). This required changes in practices with subcontractors. To meet the quality assurance needs, finished and semi-finished instruments were now kept in clearly demarcated batch lots, process cards were prepared for each stage to record defects and consignment flows and travel cards detailed the movements of batch lots between the firm and its subcontractors.

Although the firm has not seen higher sales, learning about the needs of quality assurance has had a significant benefit. It has made this SME, and its subcontractors, aware of the kind of changes they will have to bring about in order to obtain an ISO 9000 certification. ISO certification will be necessary for Unimed to continue operating in the European market after mid-1998. In 1994 the firm had not heard of the ISO standards. It now has a growing file on the subject and has been approached by consultants, both local and foreign, offering training and ISO certification.

Unimed relies extensively on specialist subcontractors. Yet, despite upgrading its quality assurance system, Unimed has found that the extent and depth of cooperation in its vertical ties with its suppliers and subcontractors has not improved dramatically since 1994. It used to have close ties with its subcontractors and it continues to do so. Being quality assured meant more in-depth discussion with subcontractors on documenting process flows and on being aware of quality at each stage. However, this need for greater documentation often met with resistance by subcontractors who found the record keeping tasks cumbersome. Given that the firm has as yet found no commercial advantage from being GMP certified it has taken a lax approach to ensuring that its subcontractors keep to the quality assurance requirements. In part, this also reflects the fact that Unimed's declining sales has meant that it has had to reduce the volume of work put-out to many subcontractors. In response, some subcontractors have sought closer ties with larger firms, which are more likely to provide a continued, and potentially larger, volume of work.

Ties with Buyers

While ties with suppliers and subcontractors have changed in an uneven fashion in the two clusters, with larger firms generally engaging in greater technical collaboration within their production networks and SMEs experiencing a more mixed change in their backward production ties, ties with buyers have also changed in a similar fashion. While many firms have found that they now need to be more closely connected with their external buyers, others, such as the Sialkot SME Unimed, report that ties with buyers have weakened.

Liberalisation and the increasingly rapid pace of globalization, is not only changing forward ties that local clustered producers have with external clients, it is also generally strengthening the role of external buyers. This is seen both in Sinos Valley and in Sialkot. In the latter, foreign buyers were the primary source of technical know-how on issues regarding quality standards and product development. Three quarters of the sample of 57 firms interviewed in 1994 reported that they faced pressures on quality control from their clients, and that information on quality assurance requirements came from buyers. Links with foreign buyers were critical to the ability of local producers to acquire the knowledge needed to pass the new quality assurance standards.

In light of the quality assurance crisis there had been a varied set of responses in the relationships that local producer have with external buyers. For many large firms this meant closer ties with their leading buyers. Take the case of AS. The firm's leading buyer in the United

States in 1994, at the time of the FDA import alert, accounted for 60 per cent of AS' total output. The buyer offered to assist AS by selling AS's instruments under its own brand name and providing its own quality guarantees. "Basically they said they were willing to put their quality reputation on the line for us and to vouchsafe our product. They [the United States buyer], themselves, were GMP certified. This way we were able to get around the FDA barriers and to continue production at a time when most of the industry in Sialkot was not being able to enter the United States market" (S. Amir, 21/1/97). But this arrangement came at a cost. The United States buyer demanded that, in return for its support, AS would exclusively supply it, and no other United States buyer, in the American market. While the agreement initially helped AS, it is now seen as being disadvantageous. "My US buyer sells a smaller and more standardised range of instruments than I used to manufacture before. So there are a number of items which were very profitable which I am no longer producing. In terms of prices I am also tied." (S. Amir, 21/1/97)

Closer ties with lead buyers has also led to a significant transfer of technology to the benefit of many large firms in Sialkot. This is particularly so for those large firms who have entered into joint venture partnerships with leading international producers. In such arrangements the technical responsibility of obtaining ISO 9000 certification, and thus of providing the required technical know-how and training, rests with the foreign partner.

For SMEs, the experience is more mixed as buyers become more selective. According to the owner of Unimed "ties with buyers have not improved since 1994. They [the buyers] just want higher quality and lower prices" (Rashid, 22/1/97), with some of Unimed's regular European buyers turning to lower priced local competitors. The new competition has shown to local producers the extent of their dependency on key foreign buyers, both to sell products and to acquire know-how. Buyers, for their part, have begun to adjust their relationships in order to improve their position vis-à-vis the cluster. There are two ways in which this has happened. First, is the type of experience that has come about with AS, where the weak position of the producer allowed a monopsonistic buyer to negotiate better terms. The relationship between specific buyers and producers are sustained, but the terms of trade shift in the former's favour. Second, buyers have begun to shop around much more than before. Thus, as with Unimed, long standing buyers have sought out cheaper alternative sources. This has been the case in the European market, where the FDA's action had a knock-on effect by increasing the supply of instruments from Sialkot, as well as in the United States market where price competition among US-based Pakistani agents and by the foreign marketing outlets of many leading Sialkoti firms has pushed unit prices of surgical instruments down. This despite the fact that, unlike in 1994, all instruments being sold in the United States now carry quality assurance certification.

In fact, as a consequence of the fact that a significant number of local producers have become GMP certified and that prices have fallen, technical ties that buyers had with Sialkoti producers often weakened. This is illustrated, for example, in the case of a leading American buyer- Ameritrade, which purchases large quantities of disposable instruments from Sialkot. Prior to the 1994 crisis, Ameritrade maintained a local office in Sialkot to monitor the production quality of its dozen large suppliers. Frequent and regular on-site inspections were carried out and where needed technical assistance provided directly at the shop floor to resolve quality related problems. In this process Ameritrade's local representative became a technical knowledge bank for the Sialkoti firms that traded with Ameritrade. Many local producers considered this a key relationship and Ameritrade, as well, benefited from it. One important gain arising from this relationship was the substantial decline in reject rates, from as much as 50per cent of consignments reaching the United States before Ameritrade had set up a local office to a low of 2per cent in 1994. For Ameritrade the costs incurred in undertaking quality control in the United

States far outweighed the costs of maintaining an office in Sialkot, and the technical assistance that it provided to its suppliers further assisted it in keeping quality-related costs low.

In accordance with the importance that Ameritrade attached to its technical assistance role within the cluster, its Sialkot office began to assist its local suppliers soon after the FDA crisis. It helped them develop statistical process control packages and design documentation for quality assurance systems. At the same time, Ameritrade's representative was very clear in stating that the cluster had a short period of time to move towards adopting quality assurance requirements or else lose key buyers. To some extent this has happened. Ameritrade has down-sized its Sialkot operation. It continues to purchase large quantities of Sialkot-made instruments, almost at the same level as in 1994, but it no longer does so directly from Sialkot. Instead, for the past eighteen months Ameritrade has been purchasing instruments from (largely Pakistani) suppliers in the United States and from the United States sales offices of leading Pakistani (Sialkoti) firms. The logic for this shift is simple, the much lower price currently prevailing in the United States market. Ameritrade's Sialkot representative remains to provide Ameritrade with intelligence on the cluster as a whole, on local firms from whom purchases are being made and on the progress these firms, and the cluster at large, have made on quality assurance. Given that all instruments now being sold in the United States are GMP certified much of the quality-related transaction costs that Ameritrade previously had to bear are now much reduced. Moreover, this reduction in quality-related transaction costs has been achieved without Ameritrade's intervention. Its initial technical support to its local suppliers notwithstanding, "Ameritrade, and other buyers like it, realised that once the Pakistani government got interested into the quality assurance issue and were keen to provide assistance to the cluster, the FDA problem could be solved without them [Ameritrade] having to invest further in raising the quality standards of the firms they were dealing with. That is why we have almost stopped our earlier quality control programme here." (N. Rahim, Ameritrade, 21/1/97)

The case studies from Sialkot and the Sinos Valley are at best only suggestive of what may be happening in SME clusters in the face of new competition arising from the process of liberalisation. They do not purport to represent the full range of responses on the part of local producers. Nevertheless, they provide some indications of the ways in which vertical ties in such cluster are changing in the face of new competitive challenges.

Our argument has been that for clusters and networks of SMEs to successfully confront pressures arising from the new global competition they need to engage in greater joint action. The limited available evidence suggests that responses are uneven. Clearly, large firms have improved their links with key suppliers, resulting in a higher quality, just-in-time delivery, and improved quality assurance. As far as ties with subcontractors are concerned, the higher costs of monitoring quality has encouraged some larger firms to internalise more activities and 'bring subcontractors into the premises'. The extent to which this practice of internalisation will spread across the cluster is unclear. If it did it would go against the wisdom of the current international management literature which stresses the need for enterprises to focus on their core competence and externalise the rest. Importantly, the implications of such a practice for SMEs are uncertain. Forward ties to foreign buyers appear to have become a little weaker in some cases, and in others somewhat more closer and dependent. In all cases, buyers have been able to shift terms of trade in their favour. It is also apparent that external buyers and large firms are increasingly important to defining the way in which a cluster responds to global challenges. SMEs, however, appear to particularly benefit from greater cooperation in horizontal ties, especially through the action of local industry associations. These experiences of local horizontal cooperation are discussed in Section 3, followed by Section 4 which focuses on the possibilities of fostering cooperation by public agencies.

3. Horizontal Cooperation

The case evidence cited above suggests that in response to the pressures of trade liberalisation and new competitive demands there are signs of upgrading in vertical ties and particularly of greater collaboration between some producers and their suppliers and buyers. The extent of enhanced joint action varies. Large firms appear to have been more proactive than SMEs in upgrading supplier ties and building closer technical cooperation with first tier subcontractors. Yet, in both the Sinos Valley and Sialkot, SMEs benefited from various levels of multilateral horizontal joint action, particularly through the trade associations and from greater public-private collaboration.

Trade bodies played an important role in recent events in both clusters. They managed to raise awareness of the need for greater cooperation and upgrading in the two clusters. It is also clear, however, that horizontal joint action takes time to take shape and that differentiation within the cluster, both according to firms and by sub-sectors, can undermine attempts to build collaborative arrangements that help local producers face new competitive challenges. To elicit this, and to draw out policy lessons, this section looks at recent evidence of collective responses in the two clusters.

Historically, business associations have been important in the development of the Sinos Valley. For example, the local Business Association (ACI) joined forces with a professional trade fair organisation (FENAC) to bring foreign buyers to the Sinos Valley and take local manufacturers to fairs abroad during the late 1960s/early 1970s. This proved to be a key intervention, opening up the Sinos Valley cluster to demanding buyers in distant markets, and playing a major role in the development of the cluster as an export centre (Schmitz 1995a). However, as the cluster grew, especially within export markets, differentiation within it led to the emergence of separate associations to cater to the distinct segments of the cluster- including separate associations formed by tanners, synthetic component producers, machinery suppliers, export agents and large shoe manufacturers. Consequently, there ceased to be a concern for the cluster as a whole. The new associations were more concerned with defending the interests of their sub-sectors than with common problems. This occurred partly because conflicts amongst the sub-sectors were real and partly because each association sought to project itself. Let us elaborate on the progress and setbacks in overcoming these divisions.

In response to the Chinese squeeze, that began to be felt from 1988, some entrepreneurs and association officials tried in 1991 to set up an Industrial Chamber (camara) which would bring the separate associations together. This failed. In 1992, the Federal Government provided a concrete opportunity for collaboration amongst all involved institutions. The Government launched a 'Quality and Productivity Programme' in which all the above mentioned sectoral institutions were expected to play a role. They produced a joint terms of reference which specified a range of activities and identified lead agents, but there was little follow up. In 1993, the Brazilian Association of Shoe Producers (ABICALÇADOS) organised a seminar entitled 'Partnership in the Footwear Supply Chain', that brought together some of the most influential industrialists of the supply chain.

The seminar was mainly concerned with ways of improving relationships between enterprises and between associations. The common thread running through the presentations and discussions was that raising quality required more constructive relationships between all levels of the supply chain. Significantly, all relevant associations were represented, reported on obstacles they confronted and made proposals for cooperation. This seminar helped to prepare the ground for the 'Programa Calçado do Brasil' (Programme Shoes from Brazil) which was launched in 1994.

This initiative was formally endorsed and actively supported by *all* the relevant associations. It proceeded by setting up six working groups each with a brief to diagnose, make proposals for action in specific areas such as marketing in foreign markets, marketing in the internal market, reorganisation at the firm level, relationships within the supply chain. All working groups reported back to a joint seminar in December 1994. But more important than what these reports said was how they were put together. They were the joint product of groups which consisted of shoe manufacturers, suppliers, association officials and consultants from the university. Precisely because the main stake holders participated in the diagnosis and prescription, there was a good basis for proceeding to the next stage of implementing some of the ideas put forward.

After a year of inaction, this alliance across the value chain was reactivated in 1996. Why the delay? Why the *slow* process? The main reason is that an influential section of the local shoe industry is no longer interested in collective efficiency and a collective response. It consists of some of the largest enterprises who have integrated vertically and thus reduced their dependence on the cluster.

In view of the divisions amongst shoe manufacturers it is perhaps not accidental that the supplier industry became the driving force behind the next round of cluster wide initiatives. The impetus came from the Association of Component Producers (ASSINTECAL) led by some of the large suppliers of chemical inputs (glues, dyes, synthetic soles, etc.). Between them, they had the entire shoe industry as their customers and were concerned about the threat to their clients from foreign competition and over-valued exchange rates. These suppliers played a critical role in the re-launch of the 'Programa Calçado do Brasil' in 1996. This took the form of four workshops. These events were widely publicised in the press, on radio and TV in terms of: there is a global challenge - how do we respond locally? Being presented as a joint initiative of all associations (which it was) also helped.

Underneath these manifestations of cluster-wide cooperation, there were, however, deep seated conflicts. In particular, the conflict between the exporters of leather and the shoe manufacturers. Leather exports from Brazil were increasing fast infuriating shoe manufacturers because (a) local raw material prices rose; (b) the best leather was exported, especially in the specifications needed for high quality shoes, and (c) most of this leather went to Brazil's main competitors in the international footwear market, especially Italy and Hong Kong (for re-export to other Asian countries). Some shoe manufacturers, however, did not suffer. Some of the largest shoe firms had integrated vertically and established their own tanneries. In addition, some of them were trading in leather beyond the needs of their own shoe factories or tanneries. And these large shoe producers were one of the obstacles to finding a negotiated settlement. Significantly these large shoe producers were absent from these discussions, a fact which was locally noted.

In Sialkot, the local trade association, the Surgical Instrument Manufacturers Association (SIMA), played an even more concerted role in developing that cluster's response to the quality assurance crisis. In fact, collective action through SIMA was probably the key factor in bringing about a quality turn-around in the cluster.

Before detailing the nature of such joint action, it is worth first reflecting on how the association was locally perceived prior to the quality assurance crisis. SIMA is a well established body, with a history stretching almost five decades, all manufacturing and exporting firms in the cluster are members, and annual elections for office bearers are hotly contested. Despite its large membership and representative character, SIMA was seen as a rather inactive body. It is meant to provide information on markets, trade policy, products, technology and other relevant issues to its members. It is supposed to assist them in resolving their technical difficulties and in their

dealings with the State and other regulatory bodies. It is also mandated to regulate business practices within the cluster. In reality, however, its primary function was effectively limited to lobbying government on behalf of the cluster. Our 1994 survey found a widespread consensus that SIMA was ill-informed about marketing developments within the sector, was unable to provide technical guidance to its members and was usually an ineffective 'leader' or 'voice' of the cluster's collective interests. There was also a strong perception, especially among SMEs, that it was dominated by the cluster's large firms (Nadvi 1996).

Given this background, it is all the more surprising to see how proactive SIMA has been since May 1994. It began mobilising member firms, and formulating a collective response within a month of the FDA's 'import alert'. The aim of the joint response was to obviate the effects of the crisis and obtain state support to help the cluster upgrade. As a first step in developing the collective response, the association organised a delegation of local producers, led by its then Chairman, to visit Washington and negotiate, on behalf of the cluster, directly with the FDA. Second, it lobbied the Pakistan government for financial and technical support. As a result of SIMA's efforts state assistance, channelled through the Export Promotion Bureau, was provided to the cluster in its negotiations with the United States authorities. The government also agreed to cover the costs (approximately $2 million) of hiring an FDA recognised American quality assurance consultancy to train and upgrade 200 local firms to the FDA's GMP certification level. In addition, federal support was obtained to finance, at a cost of $1.6 million, a SIMA-managed metal testing laboratory and technical training facility for Sialkot. The new facility was to be internationally recognised and to replace the existing Metal Industries Development Centre (MIDC), operated by the provincial government, whose testing credentials and facilities lacked international credibility. Finally, SIMA acquired for its members a state financed revolving credit line, of approximately $2.5 million, to provide soft term loans to local manufacturers.

Of the steps initiated by SIMA, the most important was clearly the seeking of technical knowledge and advice regarding quality management. Acquiring the know-how, via an external consultant, to adopt record keeping and documentation procedures necessary for quality assurance certification became the critical factor in setting in motion the cluster's possible turn-around.

Implementing quality management procedures into each and every stage of the production processes is in many ways more difficult than the acquisition of hard technologies. It requires quality training, new management practices and the inculcation of quality driven values. While a few large firms obtained such know-how privately through their foreign buyers or by hiring individual consultants, SIMA's action in bringing in a quality consultant for the cluster as a whole is what transformed the situation, making such know-how available to most SMEs in the cluster.

The mandate given to MQS, the quality consultant hired by the government on behalf of the cluster, was to train to two hundred local producers, helping them develop the requisite management practices, documentation, and quality assurance record keeping needed for GMP certification. By January 1997, MQS had, in the course of operating for just over a year in Sialkot, managed to get 75 firms up to the FDA's GMP standards. Among these were small, medium and large enterprises. Most of the cluster's large firms are now GMP certified. For SMEs the fact that the MQS' services was available free meant that they were able to acquire the technical expertise at a little or no costs.

The State's support to the cluster is unlikely to have occurred without the intervention of SIMA. But how did SIMA transform from its earlier, ineffective, self? In part, the answer lies in changes that have taken place within SIMA since 1994. In 1994 there was a widespread view

that large firms dominated the association. One sign of this was that since 1980 nine of the eleven individuals who had been elected as chairmen of SIMA had been owners of large firms. Although the bias towards the large firms is difficult to substantiate, the continuing 'dominance' of larger producers within the working of the trade body was brought into question by the FDA action.

As its initial response, the delegation formed by SIMA to negotiate with the United States authorities was almost wholly made up of representatives of large firms. This was in the immediate advantage of large firms who had large orders, and shipments, of instruments tied up as a result of the FDA alert. The predominance of representatives of large firms was also considered an advantage by some local SMEs. As the owner of one medium-sized firm explained in 1994: "Owners of large firms have better contacts, they have clout. Ministers in Islamabad will listen to them, they wouldn't give small firm owners like me even an appointment. Also large firms have good contacts abroad, they can speak better English, they can negotiate far better on our behalf than we could. That is why I will wait to see how they resolve this FDA problem. There is nothing I can do" (P. Ahmed, 14/07/94, cited in Nadvi 1996:193). SMEs stood to benefit from a large-firm led initiative. Nevertheless it was the large firms that had the most at stake in terms of export volumes.

SIMA's subsequent effort in getting state funding for GMP training for 200 firms, however, provided a benefit that was particularly critical to local SMEs. Large firms could obtain the required know-how and training needed for GMP certification either by directly engaging external consultants or through their ties with their foreign buyers (as the United States buyer Ameritrade had begun to do with the large manufacturers it dealt with in Sialkot in 1994). SMEs were in a much weaker position. The cluster-wide consultancy service, financed by the State and organised through SIMA, made it possible for some SMEs to obtain GMP certification and continue competing with their larger local rivals.

While the Sinos Valley story suggests that the differentiation of the cluster according to its various subsectors (shoe producers, suppliers, tanners, etc.) can limit the effective collective organisation of the cluster in response to exogenous pressures, the Sialkot example shows that the interests and concerns of large firms and SMEs can, and often do, diverge. In effect, there appears to have been a discernible shift in power within SIMA since 1994. At the time of the crisis the association was led by a chairman whose interests were tied to some of the larger firms within the cluster. In 1995, only five firms (all large units) had managed to get through the GMP hurdles set by the FDA. Moreover, it had taken the association a full year to get an agreement with the foreign consultant to obtain quality management training for the cluster. In the annual elections held in 1995, the frustration felt by SMEs at the slow pace of progress came to a head. A new panel of office bearers was voted in representing the interests of some large firms and the more dynamic SMEs. This panel, which was re-elected in 1996, is credited with making technical advice on quality assurance available o a cluster-wide basis. Thus, as one SME owner reported "SIMA is now more active as a consequence of the GMP and FDA issue. Before the big firms would hinder the activity of SIMA and of smaller firms. Now, through SIMA, all firms in the cluster, big and small, can get the help they need to get through this [quality assurance] problem" (Rashid, 21/01/97).

To conclude, we started with the proposition that responding to the challenges of the new competition requires an increase in cooperation. In this section we focused on horizontal cooperation, in particular business association. We observed that in both cases there was increasing awareness amongst entrepreneurs that joint responses were needed. However, we also observed delays, in one case so prolonged that effective joint action did not materialise. This shows that future research and policy discussion needs to concern itself with the internal

structures of business associations. While it is the SME that particularly need the business associations, the latter are often dominated by large firms. Their interests may coincide with those of SMEs but sometimes they do not. Thus the procedures for selecting the chairmen assume importance. Equally important is whether the executive secretaries of associations have some autonomy. Their role is critical for the follow-up of joint resolutions. Where they can be hired and fired at the whims of the chairman, an effective secretariat is unlikely to emerge. In short, research and policy must give more consideration to the question of relative powers and rules governing the associations.

4. What Kind of a Role can Public Intervention Play?

Is there a role for public policy? Elsewhere we have cited examples from a number of case studies to show that public interventions can influence the ability of SME clusters and networks to compete (Humphrey and Schmitz 1995, Nadvi 1995). Our purpose here is not to repeat those arguments, but to add to this discussion by highlighting a few examples of public interventions that suggest that local cooperation can be supported. While we draw on evidence from one of the case studies discussed above, our focus here is on a wider set of examples of public-private intervention aimed at fostering local networking and helping SMEs face global competition.

We cite examples, from New Zealand, Brazil, Taiwan, and Indonesia as well as touching briefly on UNIDO initiatives from sub-Saharan Africa and Central America. The evidence presented is clearly mixed and uneven. However, what is important, and common, across these case stories is that they are about collective as opposed to individual responses. They recognise that public intervention has to be focused and strategic. That, to be effective the intervention has to be shaped around the needs of the sector, or cluster, as a whole. That cooperation can be fostered and can lead to mutual benefits for local producers. And, finally, that interventions need to be channelled through local, representative, self-help bodies such as industry associations.

A remarkable example of an attempt by a public sector agency to encourage inter-firm networking comes from New Zealand. As part of an agenda to raise the country's export base, particularly in manufacturing, the state's Trade Development Board (TRADENZ) actively fostered the formation of sector-specific Joint Action Groups (JAGs).[4] The purpose of the JAGs is to improve the ability of local producers to raise their competitiveness in, and share of, export markets. This is done through active cooperation by JAG members around a common programme with shared goals and initiatives, and supported by TRADENZ. There are currently 26 JAGs in operation, accounting for over half of New Zealand's total exports (Perry 1995). They are to be found in sectors as varied as textiles, wine, engineering and consultancy, and higher education, and are usually organised through industry associations. Although there is no clear indication that the cooperation brought about through the JAGs has led to a rise in export volumes, the benefits of such networking appear to be significant.

The JAGs are essentially a collective response to common problems. TRADENZ encourages industry bodies to confer with their members to devise a strategic and long-term strategy that can raise their sector's (and thus the individual firm's) export profile over a three to five year period. TRADENZ bears up to 50per cent of the costs of selected JAG initiatives as well as the initial administrative expenditures, and provides the JAGs with dedicated specialist staff to

[4] The discussion on the New Zealand's joint action groups is based on Perry (1995).

support the programme. Usually TRADENZ's contribution to the funding and organisation of the JAGs declines over time with the private sector taking over responsibility.

JAG programmes are flexible. As Perry (1995:216) notes "particular industry structures give rise to different bases for cooperation". Thus in some sectors JAGs are geared towards the development of new markets, for example, through the organisation of trade fairs and missions. In others they regulate the quality of the sector's product (e.g. in the wine sector JAG seeks to limit exports of low value wine), or control the entry of new firms. Thus some JAGs bring firms together around collective projects, others provide services (Perry 1995:210). While the structure of the sector, and the market it faces, clearly influences the JAGs' operations, the cooperation brought about through the JAGs can have significant gains. Firms are able to promote, and protect, their industry, develop new markets (especially so in the Pacific rim), acquire market-related information and improve their potential, and ability, to export. Through JAG cooperation, members are also able to access economies of scope, to share resources collectively (such as through the joint hiring of marketing agents), and to develop a common or joint marketing strategy that projects the sector as much as it does the individual firm.

There have been JAG failures, not all JAGs are dynamic and some have ceased functioning. There are also points of conflict between the industry and TRADENZ about control over the direction that a particular JAG takes. Despite this there are important signs of successful collaboration. Firms, many of which are SMEs, recognise that common problems can best be confronted through collective action, that mutual support can provide useful advantages, that it is often easier "to venture into a new overseas market as part of a team rather than in isolation" (Perry 1995:214), and that a networking approach is a feasible way for local producers to upgrade and confront common challenges in a globally competitive market environment. What the New Zealand experience also underlines is that there is a role for strategic public-private intervention aimed at raising sector level joint action. For such collaborative networking to succeed, however, it needs to be flexible, to be sector specific and organised through representative industry associations, to have commitments by firms and to be driven by their agenda.

The New Zealand experiment indicates how horizontal cooperation can be fostered. But what about vertical cooperation? While there is some evidence from the Sinos Valley case study that large firms have strengthened collaboration with their suppliers (of all sizes), there is little evidence of small enterprises imitating such change in their vertical relationships. To some extent this is not surprising because they do not have the muscle to bring about such change. Thus while small firms are unlikely to be the leaders in the process, their conviction and ability to become followers depends on whether awareness of the need for closer cooperation is diffused in the cluster. Public agencies can play an important role here, especially if they act jointly with Business Associations. Sabel (1992) has shown for a case in the United States how a public agency helped firms to realise how interdependence between them was increasing and making cooperation both feasible and necessary. Seeing and learning about successful examples of cooperation from other regions or sectors can also be very effective. Organising such 'learning -by-visiting' is one way public agencies can contribute. As Lorenz (1993:321) observes "actors in public or quasi-public institutions can play an entrepreneurial role in bringing about new forms of cooperation not so much by acting to enforce obligations but through their ability to persuade and disseminate information about successful innovations".

A more direct way of influencing vertical relationships has been explored by the Brazilian Small and Medium Enterprise Service, SEBRAE, which recognised that while relationships between large firms and large suppliers were improving as a result of the new requirements of product quality and speedy delivery, small suppliers of products and services were in danger of

losing out. As a response it launched a 'Programme to Upgrade Small Suppliers', aimed at raising their quality and delivery standards. To do so it hooks into existing supply chains, using large firms as the entry point through whom contact is established with the small suppliers. The upgrading work itself includes training for both the client firm and the small suppliers. Issues covered are both technical and behavioural, since the envisaged improvements can only be achieved if contractor and supplier see and treat each other as partners. The cost of the programme is shared between SEBRAE which pays approximately half, and the participating enterprises. The local business association (ACI/NH) and the Technology Centre (CTCCA) help in the implementation.

While the effectiveness of this recent initiative has yet to be assessed, some general observations on its relevance can be made. First, it might be argued that this kind of intervention is unnecessary: raising the quality and delivery standards of small suppliers could be left entirely to the large firms which use them. As observed above, some large shoe manufacturers in the Sinos Valley have started to do so, but the SEBRAE initiative has helped to put the upgrading of small suppliers on the agenda of local industrialists. Second, public support for such a programme is more than a subsidy to the selected firms. After all, the small firms included are not only suppliers to the large firm through which that programme is organised, they also supply to other firms who will in turn benefit but also be challenged. Such cumulative effects help to raise the collective efficiency of local producers. Third, such schemes involve large firms in the technical problems of small firms, which brings new resources to bear. Larger customers will know what they need from their suppliers and they will be better informed of the latest developments in their field. Once a new kind of relationship has been established small suppliers will be in a better position to obtain future support from their large customers.

State intervention can also be critical in supporting the ability of SMEs to face new technological challenges, and compete in high technology sectors. Possibly the best example of this is the case of Taiwan. Public sector intervention has been critical to the ability of Taiwan's electronics and computer industries to compete in, and conquer, global markets. Two public sector institutions, the Industrial Technology Research Institute (ITRI), and the Institute for Information Industry (III), particularly stand out for the way in which they have guided the technical development of much of Taiwan's electronics based industries. The III, for example, provides technical support, marketing information and know-how to Taiwan's computer software industry, as well as encouraging the use of computing technologies within the economy at large. Its efforts are effectively seen as supporting "activities that are under supplied...[thereby making] up for disadvantages resulting from the economies of scale that prohibit SMEs from conducting such activities" (Hou and Gee 1993:397).

The ITRI, which was set up in 1973, has been especially influential in the computer and electronics sector, training engineers, providing access to technical know-how, encouraging technology transfers (often by licensing new designs), and negotiating with foreign manufacturers on behalf of local firms (Hou and Gee 1993, Hobday 1995, Mathews and Poon 1995). ITRI also helped form over 30 SME consortia across a range of high-tech products, aimed at developing new products, improving the ability of local SMEs to master new technologies, and encouraging 'innovation alliances'. As a consequence of such direct collaboration with industry, and especially through the training and technology transfer provided by ITRI's Electronic Research and Service Organisation (ERSO), "ITRI incubated several companies which eventually formed the nucleus of the domestic chip manufacturing industry" (Hobday 1995:98).

One example of such public-private collaboration resulting in a leading edge 'innovation alliance' is to be found in the computer sector. Taiwan is already the world's major largest

manufacturer of computer components (Mathews and Poon 1995). These are produced by a range of specialist SMEs. ITRI's Computer and Communications Research Laboratories (CCL) took a lead role in the upgrading of Taiwan's computer industry. Thanks to its intervention a consortium of Taiwan's leading computer firms are directly collaborating with IBM and other leading United States manufacturers to develop the next generation of personal computers- the PowerPC's. In 1993 CCL set up the Taiwan NewPC Consortium (TNPC) with leading local computer firms. Financed by the consortium's 32 member firms, the TNPC is organised around four working groups, each dealing with a particular aspect of the architecture of the Power PC. TNPC thus brings together a "vertical alliance" of PC manufacturers, component and peripheral suppliers, as well as software producers. Members collaborate in ways that not only raises their knowledge of particular aspects of the new computer, but also "enhance the competitive edge of the future product" - the Power PC and its associated range of ancillary products (Mathews and Poon 1995). Such in-depth technical cooperation by consortium members is feasible in that they are not directly competing with each other. Their complementary activities provides for the possibility for joint research and product development. Moreover, firms also recognise that one important benefit of such collaboration is "that today's partner may well become tomorrow's customer" (Mathews and Poon 1995:55).

Thanks to the intervention of agencies like ITRI, Taiwan's high-tech "small and medium-size businesses are able to collectively develop the innovation 'economies of scale' that are normally enjoyed by only much larger firms" (Mathews and Poon 1995:45). The Taiwanese story may appear to be unique in that it deals with high technology, leading edge, industries. We would argue, however, that there are generalized lessons to be learned. Taiwan's electronics-based SMEs would probably not have achieved their global position without the intervention and support of public sector intermediaries. Such support was directly coordinated with the various sectors. Thus local SMEs through their joint efforts were able to acquire technologies and know-how needed to engage in new product development and technological innovation. As individual, and isolated, firms they would have been unable to do so. What is more, the Taiwanese high tech firms operate in a sector where global competition is not driven solely by price concerns. This is a large and growing global market. High quality, reliability, service, and sustained technological innovation are necessary to be able to compete within it. Without the public-private cooperation and the support of the governments technology institutes Taiwanese SMEs would not be in a position to compete in such world markets.

Indonesia provides a contrasting story from that of Taiwan, at least in terms of technological development of local SMEs. At the same though, recent evidence from Indonesia of the effect of public intervention in support of small and micro cluster-based enterprises supports the view that a targeted approach, focusing on clusters as opposed to individual firms and encouraging networking arrangements results in upgrading.

Sandee (1997) reports evidence from a survey of six sectors in rural Central Java which have been supported in various ways by a state-run technical training initiative known as BIPIK. Started in the late 1970s, the BIPIK programme uses extension workers to provide training to local producers, introduce them to new technologies and encourage simple innovations that can raise the quality of the final product or improve the production process. Sandee observed that the programme tends to work with clusters, as opposed to individual firms. The most obvious reason for this is that "extension workers are aware that trickling down effects are most likely to occur in clusters: producers may benefit from programmes, even when they do not participate directly" Sandee (1997:4). The key finding from this study, however, is that interventions appear to be more successful where they are geared towards dynamic sectors, such as metal castings and furniture. These sectors, which are relatively demand driven, where buyers and other market

agents collaborate with producers in product upgrading development, appear to be the ones where the specialised training and technology support provided by the BIPIK programme has the greatest return. Moreover, within these dynamic sectors, firms that participated in the BIPIK programme did far better (in terms of employment growth) than those that had not. Sandee makes another interesting observation that helping a relatively stagnant clusters of SMEs become more dynamic requires helping them network with key external players. He cites a case of producers from a stagnant roof tiles cluster being taken on a visit to a more dynamic cluster of roof tiles makers who had significantly upgraded their manufacturing technologies. "This visit convinced producers of the stagnant clusters that upgrading technology was technically within their reach. Their trip included a visit to a supplier of the upgraded equipment. The latter was willing to offer the new equipment on favourable terms which made it also economically possible for the producers to adopt. Presently, the previously stagnant cluster is highly dynamic with complex interactions among and between producers, buyers and suppliers" (Sandee 1997:8).

What does this Indonesian experience suggest? It indicates, first that interventions can work and generate results - in the case of the BIPIK programme the end objective being sustained employment generation. Second, where they do work, and work best, is within sectors that are relatively demand driven. That is the nature of the market influences the effectiveness of attempts of public sector bodies in encouraging local networking and inter-firm cooperation. Third, before technical or financial intervention programme can succeed, local producers must be assisted in building networks both locally and with key external agents such a buyers and suppliers. As Sandee (1997:8) notes "visits to other production sites, markets, and exhibitions may play an important role in the establishment of such networks".

The collective approach has also been tested in Africa. UNIDO's support for the leather and footwear industry of Southern and Eastern Africa is entirely channelled through the national associations which participate in the programme. Two features of this programme are particularly worth mentioning. While most donor funded industrial promotion is supply-driven, this programme starts from the demand side. This is most visible in the support which UNIDO provides to African manufacturers to participate in international trade fairs. Trade fairs provide an excellent opportunity for firms to market their produce, learn about customer needs, and eye up the competition. But for small firms the cost of exhibiting, particularly in international fairs can be prohibitive. Such fairs can also be very intimidating. Joining forces helps overcome these barriers. A shared stand allows producers to attract more attention and face the world's buyers and competitors with greater confidence. UNIDO's programme for the Eastern and Southern African leather and footwear industries provides financial and technical support for participating in the main international shoe fairs of Bologna and Düsseldorf.[5]

A further important feature of this UNIDO programme is that the participating national associations were brought together in the Eastern and Southern Africa Leather Industries Association. ESALIA has proved to be an effective funnel for outside assistance and a forum for regular exchange of experiences amongst associations with similar problems. The crucial test is whether it will continue to function after UNIDO's eventual withdrawal.[6]

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[5] The German agency GTZ has a similar programme (PROTRADE) which gives financial and technical assistance to groups of firms, enabling them to share a stall at European trade fairs.

[6] The above is based on UNIDO and ESALIA documents, on discussions with representatives of participating associations and enterprises, and with UNIDO officials at a trade fair in March 1997 and a ESALIA meeting in Kenya in June 1997.

Other initiatives aimed at encouraging inter-firm networking by UNIDO are reported by Rabellotti (1996) who reviewed UNIDO programmes in Latin America and the Caribbean. Although many of these programmes have only recently been set up, there are signs of cooperative networks forming as a result of targeted intervention. These initiatives work with existing clusters and institutions, encouraging local producers to cooperate. Thus in Honduras seven networks, involving a total of 60 SMEs, had begun to collaborate around common programmes. These included "the joint purchase of raw materials, the participation in trade fairs as a group, the sharing of large orders and the collective training of the workforce" (Rabellotti 1996:6). In one programme in Jamaica supported by UNIDO Rabellotti observed that networked producers of jams and marmalades had begun exporting under a common brand name with standardised quality control. Workshops held under the aegis of the various UNIDO programmes raised awareness among local producers of how other firms operated, thereby helping them improve product quality and production practices. In some sectors (such as a Jamaican garment network) UNIDO intervention helped expose local firms to international trade fairs. Such initiatives improved learning within the networks, facilitated a cross-fertilisation of ideas, and allowed local producers to form network ties with global actors.

While it is still early days for such programmes and evaluations of their effectiveness at this stage need to be treated with some caution, it is clear that calls for adopting a network and demand driven approach in fostering SMEs have been both well understood by leading donors and policy agents and are beginning to be implemented in their programmes (see, for example, UNIDO 1995).

To conclude: the overview of case experiences suggests that public intervention in support of SME networking can have a positive effect. That this can generate results in a variety of situations, ranging from the high-tech electronics based sectors of Taiwan to the rural industry clusters of Indonesia. A number of earlier studies provide useful lessons regarding SME promotion (Levy et. al. 1994, Pyke 1994, Semlinger 1995). Levy (1994:39), for example, reminds us that such interventions work best where they adopt a 'light touch', and where they "support, rather than supplant, the private marketplace". Similarly, Humphrey and Schmitz (1995) underline the importance of following a buyer driven approach in their argument on the Triple C - of a customer oriented, collective and cumulative programme aimed at promoting SMEs, raising their efficiency, assisting their learning process and helping them respond to changes in the market. This emphasis on the nature of markets is clearly critical.

There are, however, a number of gaps in our understanding of how policy interventions in support of SMEs, and geared in particular at raising their ability to confront the challenges of the new competition, work. What little material there is, including the material that we have cited above, tends to be descriptive. This obviously calls for caution in drawing out common threads. There is clearly a need for a more thorough and a systematic evaluation of interventions, and a proper comparison of how SMEs that are networked and cooperate with each other fare in contrast with those that are not.

The few comparative studies that do exist, such as Rabellotti's work (1997) on the Mexican and Italian shoe districts, Scott's (1995) comparison of the gem and jewellery sectors in Bangkok and Los Angeles, and Nadvi's (1996) study of the inward oriented electrical fan cluster and the outward oriented surgical instrument sector in Pakistan, suggest that the dynamic SMEs (and clusters) are much more likely to be engaged in explicit cooperation for specific purposes with key local and external agents than their less dynamic counterparts. Moreover, the greater dynamism of some clusters over other, non dynamic ones, is often marked by what Scott (1995:261) calls "remarkable collective activism" whereby local SMEs, government agencies and

other stakeholders seek to "leverage the industry into a developmental pathway characterised by rising skills and product quality".

What emerges further from the brief review above is that the possibilities of interventions meeting with success is enhanced where they are truly public-private in nature, where local stakeholders are equally committed to the programme, actively participate in the design and execution of the programme, and where such programmes seek to make strategic interventions that improve the ability of local actors to network with key players.

5. Conclusion

In the past, most public initiatives to foster SMEs assumed that the key problems were: (a) deficiencies within the firms, especially lack of skills and capital, hence the stress on the provision of training and credit, and/or (b) distortions in the macro environment, especially the policy and legal framework, hence the frequent stress on de-regulation. What is new about some of the more recent initiatives is that they stress neither the micro nor the macro but the in-between: the relationships between enterprises, learning by interaction and local self-help organisations. This stress on the mesolevel comes from two sources. First, policy approaches focused on the micro or the macro have shown their limitation. Meso- level organisations are essential funnels for outside assistance and essential partners in policy dialogue. Second, irrespective of whether public agencies are involved, inter-firm cooperation seems to be critical for competitiveness. While inter-firm relationships which are arms-length or coercive might be effective where price decides success, inter-firm cooperation seems to matter in the "new competition" based on quality, speed and innovation.

The case studies on surgical instruments and footwear underlined both the relevance of inter-firm cooperation and the difficulty of achieving it. We examined both vertical and horizontal cooperation and found that it came into effect in a delayed and uneven way. The critical question for policy is whether and how policy can foster such cooperation. We discussed initiatives taking place in a range of countries providing insights into how such intervention takes place. However, the number of cases one can draw on remains relatively small, the number of proven examples even smaller. Yet policy-makers and practitioners world-wide are searching for new ways of helping local firms to respond to pressures and opportunities of globalized product markets. Further experimentation and evaluation are needed.

This is where the resources of foreign technical assistance can play a useful role. In some cases it already does, but little is known about new initiatives. The usual rushed and one-off monitoring is unlikely to unravel success and failure. Less emphasis on monitoring and more on learning lessons would help.

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New Trends and Challenges in Industrial Policy with Special Reference to Sub-Saharan Africa

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1. Introduction

Two inter-related features of recent economic development underscore the challenge to policymakers in the 21st century:

i) the shift of industrial and manufacturing activity to East and South-East Asia, including China; and

ii) the degree to which the least developed countries, and especially those in Sub-Saharan Africa, are being bypassed - marginalised - by globalization.

In the world's least developed countries (LDCs) the share of manufacturing in gross domestic product (GDP) fell from 11 per cent in 1980 to 9 per cent in 1994, with industry growing at only 2 per cent annually in the 1980s, while manufacturing value added (MVA) declined 0.2 per cent a year between 1990 and 1994.[1]

Sub-Saharan Africa, along with the LDCs as a whole, suffered a reduction in its market share of global MVA which halved between 1970 and 1995 to a tiny 0.3 per cent - this at a time when developing countries as a group raised their share by more than 64 per cent to 19.7 per cent. (Table 1).

Table 1. Regional shares in global manufacturing production, 1970, 1980, 1990 and 1995
(Percentage)

Region	1970	1980	1990	1995
Developed countries	88.0	82.8	84.2	80.3
Developing countries (including China)	12.0	17.2	15.8	19.7
Latin America	4.7	6.5	4.6	4.6
Sub-Saharan Africa	0.6	0.5	0.4	0.3
North Africa & Western Asia	0.9	1.6	1.8	1.9
South Asia	1.2	1.2	1.3	1.5
East & SE Asia (including China)	4.2	6.8	7.4	11.1

Source: UNIDO Global Database

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[1] UNCTAD: The Least Developed Countries 1996 Report, Table A-10.

Over the ten years to 2005, the region's share is forecast to remain at these low levels while developing countries as a whole - primarily in East and South East Asia - continue to build market share strongly. (Table 2)

Table 2. MVA growth rates and percentage shares, 1990-2005

Region	1990-1995	1995-2000	2000-2005
Growth rates of MVA			
Developed market economies	1.5	2.0	2.0
Eastern Europe and CIS	-9.6	1.3	1.9
Developing countries	6.5	6.9	7.8
Latin America	2.0	2.7	2.8
Tropical Africa	0.1	3.3	3.5
North Africa and Western Asia	3.2	5.4	5.7
Indian Subcontinent	4.5	4.8	5.0
East & SE Asia (incl. China)	10.7	9.2	9.9
World	1.9	3.0	3.4
Percentage shares in global MVA	**1995**	**2000**	**2005**
Developed countries	77.5	73.7	68.5
Eastern Europe and CIS	2.8	2.6	2.4
Developing countries	19.7	23.7	29.1
Latin America	4.6	4.6	4.4
Tropical Africa	0.3	0.3	0.3
North Africa and Western Asia	1.9	2.2	2.4
Indian Subcontinent	1.5	1.6	1.7
East & SE Asia (incl. China)	11.1	14.8	20.0
Percentage shares of MVA in GDP	**1995**	**2000**	**2005**
Developed countries	22.5	22.2	21.6
Eastern Europe and CIS	34.0	33.6	33.5
Developing countries	23.6	25.7	28.3
Latin America	22.0	21.8	21.6
Tropical Africa	9.5	10.1	10.8
North Africa and West Asia	14.2	15.7	17.6
Indian subcontinent	15.5	15.7	15.9
East & SE Asia incl China	31.7	34.3	36.9
World	22.9	23.1	23.4

Source: UNIDO Global Database

Industrial growth has been extremely uneven with the developed economies losing market share almost exclusively to the newly industrialising economies (NIEs) of East and South-East Asia, including China, whose market share more than doubled over the period to 11 per cent from 4.2 per cent.

2. Explaining Africa's Weak Performance

The weak performance of manufacturing in Africa's least developed economies reflects a number of different influences:

(i) deindustrialization - the decline in manufacturing's share in GDP - in many economies, including the least developed countries as a whole. Manufacturing's share in Sub-Saharan GDP is estimated to have fallen from 10.1 per cent in 1990 and 12.5 per cent in 1970 to 9.8 per cent in 1995 (Table 3);

(ii) the increased intensity of global competition flowing in part from trade liberalisation and globalization that has made it more difficult for "late-starter" LDCs to develop and expand their industrial base;

Table 3. Share of manufacturing value added in GDP by region, 1960, 1970, 1980 & 1990
(current prices and dollar exchange rates)

Region	1960	1970	1980	1990
World	29.0	28.3	28.5	23.0
Developed market economies	28.7	27.9	25.1	22.7
Developing countries	20.3	20.2	20.9	21.9
North America	27.9	24.8	21.5	18.5
Western Europe	29.8	30.5	27.1	23.9
Eastern Europe & former USSR	42.3	41.3	43.9	36.6
Japan	34.6	36.0	29.2	29.1
Latin America	20.9	23.7	24.6	23.1
Tropical Africa	7.0	10.3	10.1	9.5
North Africa & Western Asia	10.1	12.5	8.2	13.1
Indian Subcontinent	12.0	12.7	14.8	15.4
E & SE Asia (excluding China)	14.4	19.1	22.9	26.6
China	..	..	..	31.5

Source: UNIDO Global Database

(iii) the rapidity of technical progress and the rising entry fee in terms of technology, finance and skills necessary to compete in export markets as well as with low cost imports;

(iv) the absence - most marked in Sub-Saharan Africa - from structural adjustment programmes of an industrial strategy;

(v) the fact that, as a group, LDCs have comparative advantage primarily in those industries and sectors where demand is growing slowly - in some cases stagnating - relative to MVA as a whole.

3. Globalization

The second, related, trend concerns the failure of the least developed economies to benefit from globalization by achieving convergence - narrowing the per capita income gap with the industrial countries and the Asian newly industrialising economies. While developing countries as a group - excluding the Asian NIEs - more than doubled their real per capita incomes between 1965 and 1995, most developing economies failed to narrow the gap between their living standards and those of the first world.

IMF says Asia is the only major region to have registered "significant relative progress" in achieving significant convergence towards industrial country living standards. On the other hand, the per capita income gap has widened in Africa where the average per capita income level fell in relative terms from 14 per cent of the industrial country level in 1965 to only 7 per cent in 1995.[2]

IMF notes a sharp decline in the upward mobility of developing countries within the international distribution of incomes. Of 108 developing countries for which data are available:

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[2] International Monetary Fund: World Economic Outlook, May 1997 page 77.

- 78 per cent (84) either remained in the lowest quintiles between 1965 and 1995 or fell into that quintiles from a relatively higher position;
- the number in the lowest quintiles increased from 52 in 1965 to 84 thirty years later;
- the number of developing countries ranked as middle income states declined from 49 in the second and third income quintiles in 1965 to only 21 by 1995.

There is, the IMF says, "an increasing tendency for countries to become polarised into high-and low-income clusters"; the tendency for income convergence evident in the 1965-1975 period has weakened as the upward mobility of developing countries declines.[3]

Impact of globalization

Significantly, regional developments in relative income performance appear to mirror patterns of economic integration, as measured by shares in world trade, thereby underlining the links between globalization and convergence.

The success of the East and South East Asian economies in exploiting globalization as a vehicle for industrialisation and income convergence has encouraged policymakers to believe that LDCs should seek to emulate the Asian role model. This is simplistic, not just because there is no single, unique Asian model of industrial growth, but also because conditions have changed, and are changing, so rapidly that strategies appropriate for the 1970s and 1980s may have limited relevance in the 21st century.

Not only that, but differences in prior conditions - even between the second tier of Asian Tigers (Indonesia, Malaysia, Thailand) and African LDCs are considerable. There can be no guarantee that strategies that succeeded in Malaysia in the 1980s and early 1990s will apply to Cote d'Ivoire or Kenya in the early years of 21st century.

With both international trade and foreign direct investment (FDI) flows growing faster than global GDP, the world's fastest-growing economies have been those which have succeeded in expanding exports and attracting inward investment. Invariably the two go together.

Integration with the global economy has opened the way for small, low-income countries to industrialise in a manner that was not possible when inward industrialisation policies were in vogue in the 1960s and 1970s. At the same time, the close correlation between export expansion, inflows of foreign investment, and industrial and economic growth implies that countries that have been unable to integrate - such as those in sub-Saharan Africa - will be left behind.

Fast integrators have been those countries in which manufactured exports became the engine of economic growth. This pattern of growth, characterised by a growing share of manufacturing value-added (MVA) in GDP and a rising ratio of exports - and specifically exports of manufactures - to GDP, marks the first phase of globalization of developing countries.

Not only have fast integrators outperformed those in the slow-lane, but they also enjoy greater macroeconomic stability than countries that pursue inward-focussed growth paths. The linkages run in both directions. The discipline imposed by integration with the world economy forces policymakers to implement appropriate macroeconomic strategies. At the same time, business-friendly policies generate increased FDI inflows and boost exports. Fast integrators

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[3] IMF: World Economic Outlook May 1997, pages 77/78.

experienced lower inflation, more stable exchange rates and smaller budget deficits than developing countries as a whole.

The speed of integration index uses four indicators: (i) the ratio of real trade to GDP; (ii) the ratio of FDI to GDP; (iii) the share of manufactures in total exports; and (iv) *Institutional Investor* credit ratings.

Table 4 shows that regions with a high proportion of fast and moderate integrators achieved higher rates of economic and export growth in the first half of 1990s, explained partly by high ratios of private foreign investment to GDP.

Table 4. Growth and integration, 1991-95

Region	Percentage of fast moderate integrators	Real GDP per capita 1991-95	Export growth per capita 1991-95	FDI inflows as a share of GDP	Other private capital flows as a share of GDP 93-95
East Asia	100	8.0	14.1	3.1	2.5
South Asia	100	2.2	8.4	0.3	1.2
Latin America & the Caribbean	48	1.1	7.2	1.1	2.0
Middle-East and North Africa	46	-0.2	0.4	0.4	0.3
Sub-Saharan Africa	33	-1.5	-1.6	0.9	0.1
Europe/Central Asia	78	-7.7	1.0	1.4	2.1

Source: World Bank. Global Economic Prospects and the Developing Countries, 1996.

Openness

Sub-Saharan Africa's speed of integration index was negative between 1961 and 1990, since when it has averaged 0.7 annually compared with 6.0 annually for low and middle income regions as a whole (Table 5).

The region's poor globalization record is reflected both in (i) a diminishing share of global trade. Africa's share of world exports declined to 2.1 per cent in 1995 from 5.9 per cent in 1980. Underlying this was the fall in the share of primary products, including fuel, in global exports from over 35 per cent of world trade in 1985 to 22 per cent ten years later; (ii) the fall in the region's share of the developing world's stock of inward foreign direct investment to 2.7 per cent in 1995 from 7.7 per cent in 1980.

The lesson to be learned from the low ratios for most African countries is that there is considerable opportunity for the region to step up its involvement in global business.

Table 5. African Economies: Openness Rankings

Country	Percentage	Global ranking
Botswana	64.1	16
Swaziland	62.5	17
Seychelles	61.9	19
Gabon	61.8	20
Mauritius	40.2	37
Cote d'Ivoire	39.5	38
The Gambia	36.3	42
Equatorial Guinea	35.8	43
Liberia	33.0	45
Congo	31.7	47
Zambia	31.0	49
Guinea	30.0	51
Mauritania	28.4	54
Tunisia	27.7	55
Togo	26.7	57
Senegal	20.9	67
Zimbabwe	20.8	68
Comoros	20.1	69
Cameroon	18.4	72
South Africa	17.7	78
Lesotho	16.9	81
Sao Tome and Principe	16.9	82
Morocco	16.2	84
Chad	15.8	86
Mali	15.7	88
Burkina Faso	15.3	89
Algeria	14.1	93
Malawi	13.9	94
Niger	13.2	97
Nigeria	12.6	101
Kenya	11.6	103
Central African Republic	11.0	105
Guinea-Bissau	10.9	106
Egypt	10.9	107
Tanzania	10.9	108
Madagascar	9.9	110
Zaire	9.6	111
Ghana	8.9	112
Burundi	8.5	113
Uganda	8.3	114
Sierra Leone	7.8	116
Ethiopia	7.8	118
Rwanda	7.6	119
Somalia	5.7	126
Sudan	4.5	129

The openness rankings are compiled using real (1987 US$) values of exports and imports of merchandise for the period 1990-1992 and calculating the trade ratio as a percentage of GDP evaluated using IMF purchasing power parity (PPP) scales for 130 countries covering the same period.
Source: Shigeru Otsubo: Globalization - A new Role for Developing Countries in an Integrating World. (World Bank Policy Research Working Paper, 1628), July 1996.

Foreign Trade as an Engine of Growth

Post-1975 developing country success stories have, without exception, been export driven. From the mid-1950s to 1990, Sub-Saharan Africa's share of global exports declined more than 60 per cent from 3.1 per cent to 1.2 per cent. As a result, the region "lost" foreign currency earnings equivalent to some $65 billion at 1990 prices.

The striking features of Sub-Saharan trade patterns are: (i) heavy dependence on commodity and raw material exports; manufactures account for only 19 per cent of total exports compared with 54 per cent for all developing countries; (ii) by contrast, imports are dominated by manufactured goods accounting for more than 70 per cent of the total; (iii) high export concentration, with approximately three quarters of total exports being sold to developed economies, especially the European Union (52.6 per cent in 1995). Other industrialised economies account for a further 23 per cent of which 14.5 per cent go to North America and 4 per cent to Japan; (iv) very low levels of intra-regional trade (Table 6) in striking contrast with the situation in Asia; (v) concentration of both exports and imports within a handful of countries. Two countries, South Africa (40 per cent) and Nigeria (15 per cent) account for 55 per cent of Sub-Saharan exports, while exports from 32 African LDCs in 1994 totalled only $10.5 billion (17 per cent). Imports worth $65 billion were similarly dominated by South Africa (36 per cent) and Nigeria (10 per cent) while the 32 Sub-Saharan LDCs accounted for a quarter of the regional import bill.

Table 6. Intra-regional trade percentage share of region's merchandise exports 1995

Region	Percentage
North America	36.0
Latin America	20.8
Western Europe	68.9
Countries in Transition	18.9
Africa	10.0
Middle East	8.0
Asia	40.9

Source: World Trade Organisation, Annual Report, 1996 table III.3

Two conclusions stand out: (i) there is enormous potential for developing intra-regional trade, especially of manufactured goods; and (ii) there is considerable scope too for import replacement, both within LDCs themselves and by enhanced regional trade with other LDCs.

Few Trade Barriers to Commodity Exports

The structure of Africa's exports is crucial because raw materials typically face low or zero tariffs with relatively few Non-tariff-barriers, except for food and agricultural products. The region's four largest exports to the OECD, accounting for two-thirds of sales to industrialised countries (crude petroleum, precious stones, cocoa and coffee) are not subjected to non-tariff measures in the EU, Japan or the United States, though Japan does apply quantitative restrictions to some refined petroleum products. Most of the items enter OECD markets duty free, though the EU does impose tariffs of 8 per cent to 16 per cent on some coffee extracts and coffee products above the roasted bean stage of processing.

Policy Change Needed

Africa's sluggish export performance cannot be explained by protectionism in developed export markets. Pre-Uruguay Round tariffs facing African exports to the TRIAD regions of the EU, the United States and Japan averaged 0.75 per cent (about 18 percentage points lower than those facing the Asian NIEs when they embarked on their highly successful export-led growth strategy. Furthermore, Lome preferences give African exporters an edge over their non-ACP competitors.[4]

Nor can OECD non-tariff barriers (NTBs) be held responsible, since the share of African exports subject to non-tariff barriers (11 per cent) is less than half that for other developing countries. As a result of Uruguay Round tariff reductions, the NTB coverage ratio for sub-Saharan Africa's non-fuel exports will fall from 11 per cent to around 3 per cent.

Most of Africa's exports to the EU are concentrated in relatively few tariff lines and EU trade preferences cover a substantial share of these items. Preferences result in at least 97 per cent of each Sub-Saharan country's exports entering the EU duty-free.

Sub-Saharan clothing exporters to the EU benefit in two main respects: (i) clothing exports are *not* subjected to quantitative restrictions; and (ii) under the Lome Convention they are exempt from tariffs, provided the garments qualify as originating products.

The fact that Sub-Saharan Africa is currently exempt from QRs offers a window of opportunity for developing clothing and textile exports, especially to the EU, over the next ten years. But the eventual abolition of the Multi fibre Agreement (MFA) (in 2004/5) means that African exporters have only seven years to take advantage of this.[5]

The phase-out of MFA could have far-reaching consequences for Africa, removing the existing incentive for multinational companies to source products from quota-free countries in the region. In the past, such quantitative restrictions (QRs) on clothing imports have led TNCs to seek new sources of supply, mostly in Eastern Europe and North Africa. The only sizeable sub-Saharan exporter of garments to the EU is Mauritius with exports of $500 million to Europe in 1993. Over 60 per cent of these exports were in product categories currently covered by quotas, but as a Lome' signatory, Mauritius is exempt from such quantitative restrictions.

However, the United States does not provide any preferences for clothing and textiles - even for LDCs. As a result, African countries could face post-URA tariffs on textiles and clothing in excess of 25 per cent.[6] Furthermore, restrictions covering clothing and textile exports could remain in place until the end of the ten-year URA phase-out period (see Box 1).

The overriding policy conclusion - and one that applies to many other aspects of African development - is that the Uruguay Round will create future opportunities for those countries that undertake the necessary domestic economic and trade reforms. The ability of African countries to develop and maintain viable textile and clothing exporters will depend on their improving their cost competitiveness while also enhancing quality, style, design and delivery.

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[4] Azita Amjadi, Ulrich Reinke and Alexander Yeats: Did External Barriers Cause the Marginalization of Sub-Saharan Africa in World Trade? World bank Policy Research Working Paper 1586 (March 1986).

[5] Tyler Biggs, Margaret Miller, Caroline Otto, and Gerald Tyler: Africa Can Compete! World Bank Discussion papers (300). June 1996.

[6] Amjadi/Reinke.Yeats op. cit. page 19.

BOX 1: Implications of the Uruguay Round

The Uruguay Round Agreements are unlikely to have a major impact on sub-Saharan Africa, either in terms of lost preferences or of major increases in demand for the region's traditional exports. Africa's gains will be indirect - the spinoff of increased trade with other beneficiaries.

Africa already has favourable access to TRIAD markets, especially in the EU and Japan. A recent analysis by the World Bank concludes:

- that any loss of preferences as a result of the Uruguay Round Agreements is unlikely to be great and "may well be compensated by gains in other markets through trade creation". The only measurable losses are likely to be in the EU, but these will be "more than compensated" by trade creation gains in other markets. However, the net gain is likely to be " so small as to be unnoticeable in comparison with other factors influencing exports and development in Africa"
- that average tariffs faced by African countries after the round will be "very small indeed" and that least developed countries will enjoy essentially duty-free market entry.
- that the coverage of non-tariff barriers will be reduced very considerably from around 11 per cent before the Round to 3 per cent afterwards.
- that the extent of the threat of higher food bills "appears overstated"
- that the conversion of NTBs to tariffs for agricultural imports should both increase export opportunities for African countries while substantially reducing the level of price instability in global markets for agricultural goods
- that tariffs do not appear to have been a major constraint on the further processing and export of African commodities. "Tariff escalation" is a not a general problem though it does apply to some value-adding activities.
- that the demands placed on African countries in terms of their own commitments under the Round are "very modest" and should not pose serious transitional difficulties.
- that African countries have chosen to bind their tariffs at "very high levels" and well in excess of actual tariffs, with many above 100 per cent.

Source: Peter Harrold, The Impact of the Uruguay Round on Africa. World Bank Discussion papers, No 311. 1995

4. Trade Liberalisation

Trade reform in African LDCs has been uneven, partly because most countries rely heavily on tariff revenue for budgetary purposes, while the weakness of the trading infrastructure - mirrored in the low level of globalization - has constrained the benefits achieved from the opening up of economies. African countries made relatively few tariff bindings in the Uruguay Round and, in many instances, tariff structures "remain escalator and protective of inefficient industries"[7]

Deindustrialization has been blamed on trade liberalisation, but there is contradictory evidence from strong liberalisers like Ghana where industry output grew 4.4 per cent annually in the first half of the 1990s and Uganda where industrial expansion of 11 per cent a year was achieved. Even where QRs have been abolished and tariffs lowered, manufacturers producing for the domestic market often have a competitive edge over imports due to the combination of high transport costs and currency depreciation as well as import tariffs and taxes which remain relatively high by global standards.

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[7] World Trade Organisation, Annual Report 1996, Volume 1, page 37.

5. Determinants of Industrialization

Historically, industrialisation has been a function of:

i) *Market size* - countries with large populations and/or high income per head have industrialised earlier and faster than small, poor nations reflecting the importance of scale and scope economies, market opportunities and, especially recently, foreign direct investment, which is itself a function of market size (Box 7).

ii) *Prior conditions* - industrialisation proceeds more rapidly where a platform for industry already exists underlining the importance of linkage and cluster effects

iii) *Geography* - the East and South-East Asian experience points to the contribution of regional cluster effects - specifically the investment by Japan and other newly industrialising Asian economies in other countries within the regional cluster

iv) *Resource endowment* - though its role is ambiguous. Resource-poor countries have no option but to industrialise and/or develop services like tourism. In contrast, manufacturing tends to be a lagging sector in resource rich states because investment flows into high yielding resource-based industries - oil in Nigeria, tobacco in Zimbabwe, copper in Zambia, diamonds in Botswana. However, this is only a partial explanation since rapid primary sector growth creates a market for manufactures - both inputs into the primary sector and the processing of the primary sector's outputs.

v) *State of the agricultural sector* - Agriculture can play a significant role - countries with a strong agricultural sector (Zimbabwe, Mauritius and Kenya) have performed better than Zambia, Tanzania or Mozambique.

Thresholds

Growth in manufacturing value added is correlated with increases in per capita income. Syrquin and Chenery estimated that 75 to 80 per cent of structural transformation in a developing economy occurred between per capita income levels of between $300 and $4,000 (at 1980 dollars). In their model, manufacturing's share in GDP increases from 10 per cent where per capita incomes were below $300 per head to an actual level of 28 per cent of GDP at a per capita income of $4,000.[8]

If the Syrquin/Chenery figures are adjusted for United States inflation and exchange rate changes, the structural transformation range of per capita incomes in 1995 is from $620 to $8,200. This calculation makes gloomy reading for low income countries whose average per capita income level in 1995 was $430 or $290 if China and India are excluded.[9]

The only Sub-Saharan economies that lay above the $620 threshold in 1995 were Cameroon, Cote d'Ivoire, Congo, Lesotho, Namibia, Botswana, South Africa, Swaziland, Seychelles, Mauritius and Gabon. Accordingly, it is hardly surprising that LDC industrial growth has been disappointing.

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[8] Moses Syrquin and Hollis B Chenery : Three Decades of Industrialization. World Bank Economic Review, may 1989 page 151.

[9] World Bank: World Development Report, 1997 Table 1.

The policy implication of the Syrquin/Chenery model is that MVA growth must either be export-led, as the domestic market is too small, or that it will be contingent upon a country pursuing a resource-based industrialisation path, whereby increased output and incomes in agriculture, mining, oil and gas, stimulate domestic demand for manufactured goods.

Table 7. Industry in Africa

Country	*Manufacturing value added*			*MVA per capita*	
	1970	**1994**	**Growth**	**1970**	**1994**
	($ millions in 1990 prices)		**1984-1994** (Percentage)	$ in 1990	$ in 1990
Angola	2 365	326	-9.2	423	31
Benin	122	180	5.8	45	34
Botswana	25	175	6.5	39	121
Burkina Faso	155	287	2.0	28	29
Burundi	40	167	2.4	11	27
Cameroon	444	1 437	1.0	67	125
Central African Rep	94	166	-4.2	26	27
Congo	112	200	-2.3	89	87
Côte d'Ivoire	677	1 141	-3.0	123	84
Ethiopia	178	385	2.3	6	7
Gabon	286	722	-0.1	566	517
Ghana	644	582	5.4	74	34
Guinea	47	122	7.3	12	18
Kenya	208	976	4.6	18	36
Lesotho	8	95	10.6	8	44
Liberia	50	61	-2.8	36	21
Madagascar	278	268	1.4	41	19
Malawi	89	267	1.2	19	25
Mali	58	227	4.0	11	22
Mauritania	45	160	6.9	36	69
Mauritius	105	667	9.9	127	604
Mozambique	606	477	4.7	65	27
Namibia	109	142	1.4	137	95
Niger	109	184	3.4	26	21
Nigeria	457	1559	2.7	8	16
Reunion	102	313	4.0	221	486
Rwanda	153	132	-7.0	41	17
Senegal	374	766	2.1	90	95
Sierra Leone	43	85	2.7	16	19
Somalia	27	42	3.4	6	5
South Africa	13 511	22 657	-0.1	602	559
Sudan	408	453	-0.5	30	17
Tanzania	76	107	2.2	6	4
Togo	159	87	-3.3	79	21
Uganda	276	259	9.0	28	13
Zaire	70	35	-4.3	4	0.8
Zambia	508	856	1.9	121	93
Zimbabwe	644	1 313	2.6	122	119
TOTAL (including others)	23 563	39 106	2.0*	39*	32*

* Excluding South Africa

Source: UNIDO Database

BOX 2: Commodity-driven growth

While policies that inhibit globalization may constrain manufacturing development in the more industrialised developing countries, unbridled globalization in LDCs poses the threat of reliance on commodity-driven development, with all its limitations. Indeed, recent research is being cited to justify the view that commodity dependence does not necessarily slow development. "Commodity dependence is often a symptom of low economic growth, not a cause".[10]

The claim is made that countries that follow appropriate economic policies - "get prices right" - can "alleviate the adverse effects of commodity dependence".[11] A World Bank paper notes that by implementing appropriate policies, Malaysia increased its share of global palm oil production from 7 per cent in 1961 to 51 per cent in 1983, while Indonesia's share rose from 10 per cent to 24 per cent over the same period.

But the data cited in this research paper needs to be seen in the context of the radically-changed pattern of exports in Indonesia and Malaysia. While primary exports played a major role in the 1960s and 1970s, the share of manufactured exports in total exports rose from 6 per cent or less in 1965 to 41 per cent in Indonesia and 61 per cent in Malaysia by 1992. In Africa, the manufacturing share of total exports over the same period rose from 7 to 8 per cent.[12]

6. Problems Facing Late Industrialisers

- The industries in which they are able to develop comparative advantage - processed foods, beverages and tobacco, clothing and textiles, footwear and some intermediate products - account for no more than one-quarter of world MVA. These are industry branches where demand growth is slowest and where international competition, especially from low-cost Asian suppliers is increasingly intense. Developing countries as a whole have made most progress in textiles, clothing and footwear, where MVA growth rates have been below average in recent decades. In footwear, where developing countries account for 39 per cent of global production, output declined by 1.4 per cent a year during the 1980s, and by 1.2 per cent annually during the 1990-93 period. In textiles, where developing countries control 40.6 per cent of global production, output was flat during the 1980s, falling 1.1 per cent a year between 1990 and 1993.
- Late-starting LDCs are disadvantaged because the fastest growing sectors of manufacturing in the 1980s and 1990s have been skill- and technology-intensive industries, such as scientific goods and plastics. Other relatively fast-growth - often capital-intensive - industries (electrical and non-electrical machinery, transport equipment, and chemicals) - are dominated by industrialised and newly industrialising countries and account for more than 40 per cent of global output. Among developing countries, only East and SE Asia have increased their market share in capital- and technology-intensive activities.
- their comparative advantage lies chiefly in lowcost labour (and sometimes also relatively low cost raw materials and energy costs). Not only is such "lower order" comparative

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[10] World Bank" DEC Notes Research Findings No 20 April 1997. Nanae Yabuki and Takmasa Akiyama: Does Commodity dependence slow economic development"?

[11] Yabuki and Akiyama 1997 op cit, page 2.

[12] Peter Harrold, Malathi Jayawickrama and Deepak Bhattaseli: Practical Lessons for Africa from East Asia in Industrial and Trade Policies. World Bank Discussion Paper no 310 (Africa Technical Dept Series) 1996.

advantage increasingly less important in global competition but it is also easier for newcomers to replicate than "higher order" advantage such as technology.

- the technological terms of trade have moved against later starters as the admission fee for the acquisition of new technology has risen both in money terms and, more importantly, in terms of the skills needed by operators, technicians and managers;
- the increasing importance of labour *quality* in the attraction of FDI counts against LDCs when TNCs consider offshore investment in manufacturing (Box 8)
- the region has become unhealthily - and unsustainably - reliant on foreign aid, including foreign technical assistance and expatriate skills.

In African LDCs such obstacles to late industrialisation are compounded by:

- small, low-income populations resulting in tiny fragmented markets;
- low and declining levels of public sector investment in human capital and physical infrastructure, and
- political instability is greater in Africa than elsewhere.
- African countries are not part of any cluster; there is no Japan, Hong Kong or Singapore to undertake FDI on the scale witnessed in East and Southeast Asia;
- they are at a serious disadvantage in respect of infrastructural costs, but especially transport;
- they are at the bottom of the global league in terms of industrial sophistication and technology.
- the private sector is very weak in Africa, dominated by a relatively small number of major multinationals at one extreme and by a mass of small and micro-enterprises at the other, The "middle" - medium-scale indigenous firms - is missing.
- over 40 per cent of sub-Saharan production consists of food manufacturing, beverages and tobacco products. Textiles, with 8.4 per cent, is the region's third largest industrial branch after foodstuffs and beverages. The data highlight the need - and the opportunity - for industrial diversification into higher value-added, higher-tech activities. Its capital- and human-capital intensive industries, such as chemicals and transport equipment, have only a negligible share of global MVA and have lost ground accounting for 0.1 per cent each of MVA in 1995.
- since 1985, the region's share in global exports of manufactures to industrialised countries has failed to grow, remaining unchanged at a tiny 0.3 per cent. Even where it has potential comparative advantage in labour intensive products, sub-Saharan Africa has failed to penetrate global markets. Of five industries assessed by UNIDO, the region gained market share only in clothing where its export share doubled from 0.4 per cent to 0.9 per cent. In the 10 years to 1995, sub-Saharan Africa's share in global production of clothing increased only marginally from 0.4 per cent to 0.6 per cent.

Implications for Industrial Growth

In least developed sub-Saharan economies with tiny markets, weak infrastructures and a poor skills and technology base, the role of manufacturing industry has been largely confined to the production of simple, consumer goods for domestic market possibly supplemented by the

production of some inputs for agriculture. Given their small markets, their prospects for attracting major FDI inflows (other than into natural resource industries) are poor.

To improve this unsatisfactory situation, four different - in some instances overlapping - growth paths could be pursued to foster manufacturing. The paths are not mutually exclusive.

- One group of countries with a strong primary resource base - Angola (oil), Democratic Republic of Congo (formerly Zaire) (copper, cobalt, diamonds) and Zambia (copper) - has greater potential for domestically-driven manufacturing growth than most others among the African LDCs.
- A second group, comprising those who are members of embryonic customs or free trade unions and/or which are attracting resource-specific investments from within the economic union, may also manage to expand their manufacturing sectors more rapidly than in the past. An obvious case is Mozambique (Box 3), while Lesotho has benefited from the relocation of some foreign factories in the clothing industry from South Africa, Malawi and Madagascar have both attracted relocated factories from South Africa and Mauritius respectively. In the longer-term, Tanzania and Uganda - and eventually possibly also Ethiopia - stand to gain from the revival of the East African Community
- A third group, for whom the spinoff effects of cluster-style links with neighbours and or metals or energy resource-driven industrialisation are limited will have to rely primarily either on an agriculture-demand-led-industrialisation (ADLI) strategy. This will depend on the country's comparative advantage in agriculture - in terms of availability of arable lands and climatic conditions - with growth prospects enhanced in large population states - Ethiopia (57 million people), Democratic Republic of Congo (46 million) and Tanzania 30 million people. Zambia with vastly under-utilized agricultural resources, lower production costs and the potential to export food to South Africa and other regional markets, fits into this category also.
- While the most attractive growth path - drawing on East Asian and Mauritian experience - would be export-led industrialisation, which no Sub-Saharan economy, with the exception of Mauritius, has managed, the obstacles are formidable. The chief constraints are infrastructure, technology, skills, and an undeveloped private sector.

Beware of Generalisations

Efforts to categorise growth paths in this way are open to criticism on several counts. Generalisations are misleading. Diverse conditions within a single economy - Angola, Democratic Republic of Congo, Ethiopia, Mozambique - and the dynamic nature of comparative advantage counsel against putting countries into boxes and assuming that because Angola is a substantial oil exporter, it is locked into an energy-driven manufacturing growth path. At any stage in a country's development, there will investment opportunities in different sectors and a strategy that seeks to prioritise import-substitution or ADLI could militate against profitable export or mining-driven projects.

Whatever the strategy, unless governments are prepared to protect domestic manufacturing - and agricultural - industries, only internationally competitive enterprises will survive. In LDCs, not only is the case against protection a strong one, but foreign investors - whose participation will become increasingly crucial as aid inflows recede - donors and lenders are unlikely to support such protectionism, other than where a large domestic market is available.

In the mid-1990s, the 48 LDCs with a population of 555 million had a per capita income of $320 - a total market size of less than $180 billion and an average market size of under $4 billion.

BOX 3: Mozambique - FDI drives resource-based industrialization

Foreign investment is driving the resource-based industrialization process in the world's poorest economy with a per capita income of just $80 a year, Mozambique. In the 12 years since Mozambique began to reform and liberalize its investment code, the investment promotion centre (CPI) has approved almost $2.1 billion of new projects. Some 21 projects, worth $316 million have been cancelled leaving 742 "ongoing" projects involving $1.77 billion of which $364 million represents foreign direct investment. Because the centre reports approvals, rather than implementation, there is no accurate count of how much investment really is talking place.

The rate of investment approvals accelerated markedly in the last few years - from $200 million in the second half of the 1980s to $1.25 billion during the 1994-96 period and a further $171 million in the first quarter of 1997. Industrial project approvals make up the largest single group- $550 million or just over 30 per cent of current projects. Almost half the foreign investment has come from Portugal followed by South Africa and the UK.

Officials have high hopes too for the export processing zones planned for the three ports of Maputo, Beira and Nacala. Malaysian investors are showing an interest in constructing the zones which will house firms that export 85 per cent of their production.

Despite these impressive achievements, there is a long way to go to establish an investment-friendly environment. A report for the World Bank - Administrative Barriers to Investment (The Red Tape Analysis) says:. "Many areas of industry, commerce and services are now open to the private sector" the report says "but investment has failed to materialize". Regulations - some dating back to the late 1800s - are too rigid, prescribing too much "hand-written minutiae" for a modern economy. In contrast, there are literally no regulations covering the protection of intellectual property rights, which has deterred investors. On the whole, the regulatory framework has failed to keep pace with the economic reform.

A foreign firm entering Mozambique for the first time, without the right contacts, can spend six months and up to 10 per cent initial investment merely getting itself incorporated. In contrast, incorporating a company in Delaware in the United States costs $140 and takes no more than 24 hours.
The report identifies as many as 145 different steps, many of them duplicative, must be fulfilled to set up a new company in Mozambique.

The heart of the problem is that institutions - people and systems - lag well behind policy change. The report urges the government to reduce the number of licensing requirements, eliminate duplicate steps, and cut the monetary cost of investment approvals. Recent efforts to improve the business environment include lowering import tariffs by some 8 percentage points to an average of 10.8 per cent and adopting a "time-bound plan" to remove unnecessary administrative barriers to investment, including simplified procedures for company registration and importing and exporting.

Major projects on the table
Industrial development will change the face of the economy if the portfolio of mega projects, valued at over $8 billion, mooted by foreign and local investors, goes ahead.

Project	Sponsors	Value ($ billions)*
Mepanda Uncua Hydro-electric Dam	Mozambique Govt	2.0
Moatize coking coal	JCI/CVRD (Brazil)	1.5
Aluminium Smelter	Alusaf/Gencor (SA)	1.2
Pande Gas	Enron Corp (US)	1.0
Maputo Elephant Park	US developer	0.8
Maputo Corridor road	Mozambique/SA	0.8
Iron Briquette plant	JCI (SA)	0.55
Tigen Mineral Sands	Gencor (SA)	0.55
Cahora-Bassa Transmission Line upgrade	Portugal	0.175

* Values are no more than indicative
Source: Financial Times, May 15, 1997

Virtually none of the LDCs - Myanmar with a market of close on $90 billion and possibly Bangladesh with $30 billion - have markets large enough to attract inward-oriented industrial investment. Thus the case for protection in LDCs rests on the shaky assumption - for which there is very little past evidence - that an import-substitution regime in a tiny domestic market, unable to exploit scale and experience effects, and unlikely to attract material inflows of FDI, will manage to become a globally competitive exporter of manufactures.

Agriculture-led Growth

A strong case can be made for an Agriculture demand-led Industrialization strategy (ADLI) in Africa since not only does the region has comparative advantage in several agro-based industries but such industries are relatively labour-intensive as well as relatively low-tech.

There are three main links between agricultural and industrial growth:

- Manufacturing output rises as larger volumes of farm production are processed and also as the value-added element increases,
- farm demand for manufactured inputs - fertilizer, chemicals, pesticides, implements, fuel, vehicles, building materials - increases domestic demand, and
- there is a high income elasticity of demand for manufactured goods; increased agricultural output generates consumer demand for manufactures as a result of increased employment, productivity and real wages.

The poor performance of Africa's agricultural sector in recent years has contributed to deindustrialization. During the 1970s, manufacturing output grew twice as fast as agricultural production -3.6 per cent annually as against 1.7 per cent - but the post-1980 slowdown in agricultural growth had a severe impact on manufacturing. Agricultural growth slowed from 1.8 per cent annually between 1970 and 1990 to 0.7 per cent in the 1990-1994 period, while food availability per capita also fell. It is no coincidence that Africa's industrial growth rate slowed - and turned negative - over the same period. De-agrarianization contributed to de-industrialization.[13]

Industry in African economies with a strong farming sector - Kenya, Mauritius, Zimbabwe - has outperformed those where agriculture has stagnated. In 1989, it was estimated that food production needed to increase 4 per cent annually to prevent a decline in food availability per capita. Growth of this magnitude in farm output was forecast to stimulate domestic demand-driven industry growth of 6 per cent a year.[14]

Agriculture-led industrialization has particular appeal to low income countries. Given the difficulties encountered in seeking to develop an export-platform from an existing state of low industrialization - with MVA accounting for only 9 per cent of GDP as in LDCs as a whole - and the very severe limitations to import-substitution industrialization in small economies, the driving force for industrialization will have to the spinoff from the exploitation of natural resources. Hitherto, industrial growth has been largely resource-based - diamonds in Botswana, oil in Nigeria, Gabon and Cameroon, sugar in Mauritius, tobacco in Malawi and Zimbabwe and coffee and tea in Kenya.

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[13] UNIDO: Agro-Related Industrial Development in Africa. Draft paper for the Alliance for Africa's Industrialization, May 1997.

[14] UNIDO op cit page 1.

BOX 4: Africa's Comparative Advantage

Industry branches in which most African countries have positive comparative cost advantages

- food processing
- footwear and leather products
- furniture and wood products

- International competitiveness has improved in the leather, wood and furniture industries since the mid-1970s, but has declined in beverages, tobacco and textiles.
- While RCA values for clothing rose sharply between 1986 and 1990s, only four sub-Saharan countries (two of them LDCs) - Madagascar, Mauritius, Namibia and Zambia had positive RCA values.
- The performance of African countries in both clothing and footwear has been disappointing and very few countries have developed competitiveness, while in the case of footwear competitiveness declined between 1976 and 1994.

Source: UNIDO: Agro-Related Industrial Development in Africa. Draft paper for the Alliance for Africa's Industrialization, May 1997.

The scope for manufactured value-added is underlined by a UNIDO estimate that the share of processed to total agricultural production in most African countries is between 10 and 15 per cent, while in the developed economies, the ratio is typically above 80 per cent. Industry in developed countries adds a value of $184 to each tonne of agricultural raw materials, whereas in developing countries, it adds only $40.[15]

UNIDO finds a number of agro-industry branches in which many African countries have international comparative advantage (a Revealed Comparative Advantage of over 100 per cent) and in which their competitiveness is improving, singling out leather and wood products along with many foodstuffs, while competitiveness has also increased, though only for a small number of countries, in clothing. Other agro-related branches with potential include various inputs to agriculture as well as the construction industry.

"Highest priority" should be given to the processing of coarse grains (especially maize), while the oil seeds industry, fish-processing and animal feeds production have potential. UNIDO is gloomy about export prospects for textiles in the "vast majority" of African countries, but sees opportunities in markets given the fact that per capita consumption levels of clothing and textiles in Africa are the lowest in the world.

Given low income levels, production for the domestic market should be price rather than quality driven with manufacturers seeking to keep prices competitive with imports, especially second-hand clothing which has secured a substantial foothold in the African market. UNIDO also sees opportunity for some African countries to manufacture textile machinery.

Exports of clothing are not ruled out, however, but strategic alliances advocated with retail chain in importer countries. Export strategy should be product specific and exporters could target markets vacated by Asian manufacturers whose costs - and exchange rates - have forced them to move upmarket into higher price segments.

The leather industry has significant unrealized potential because Africa has by far the lowest per capita shoe consumption in the world. Demand is highly income-elastic and will rise strongly with per capita incomes.

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[15] UNIDO, Agro-Based Industries Branch. Food for All, Food Programmes in the Next Biennium, 1996.

7. Industrial Policy

In LDCs, the growth of manufacturing industry is a necessary, though not a sufficient, condition for sustained economic development. Historical and cross-country studies show that rapid growth of manufacturing industry is closely correlated with the expansion of GDP, and in the Asian case, exports.

Typically, "early" industrialisation is job-intensive, productivity growth is faster than in primary industry, especially the small-scale agriculture that dominates the majority of Sub-Saharan LDCs, while learning effects, scale and scope economies and technological progress are greater in secondary and tertiary activities.

While industrial policy means different things to different people it refers normally to a coherent and integrated package of measures designed to foster MVA growth. The World Bank, distinguishing between trade policy and industrial policies defines the latter as ".. government efforts to alter industrial structure to promote productivity-based growth."[16] According to the Bank, all the successful high-performing Asian economies[17], except Hong Kong, employed industrial policies so defined. Japan and Korea had the most systematic industrial policy programmes, while in Taiwan Province such interventions were less systematic but still widespread. Singapore's industrial policy specifically targeted technological upgrading through foreign direct investment, while the second wave of newly industrialising Asian economies - Indonesia, Malaysia and Thailand - also adopted industrial policies, though again less systematically than either Japan or Korea.

In sub-Saharan Africa, where most countries have small, backward and undeveloped industrial sectors, efforts to distinguish between industry policy and broader development policies are essentially artificial. Arguably, industrialisation is best kick started by adopting a resource-driven strategy, that boosts agricultural, energy or mining development, where economies have comparative advantage in such primary activities rather than by seeking to adopt sophisticated interventions that may have worked - under very different national and global circumstances and often at more advanced stages of development - in Asia.

A Central Role for Competitiveness

Given the 1990s emphasis on globalization and competitiveness, a more appropriate - and meaningful - description of industrial policy might be "strategic government intervention in the economy to build national competitiveness"[18]. Such a definition is preferred because it refers to strategic, economy-wide measures that do not necessarily focus on the industrial sector alone, but also because competitiveness at national level is targeted.

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[16] World Bank" The East Asian Miracle, 1993 page 304.

[17] The high performing Asian economies comprise Japan, Hong Kong, the Republic of Korea, Singapore, Taiwan Province of China, and the three newly industrializing economies of South-East Asia, Indonesia, Malaysia and Thailand.

[18] Kevin P Phillips: US Industrial Policy: Inevitable and Ineffective" Harvard Business review July-August 1992, page 104.

A Two-tier Concept

Competitiveness is a two-tier concept - a combination of comparative advantage at national level and enterprise-driven, strategic, or competitive, advantage. The well-documented case of Japanese automobile transplants in the United States outperforming their United States counterparts in the late 1980s, while subject to the same comparative advantage conditions, illustrates the crucial contribution of strategic, or firm-level, advantage to performance.

Ultimately, it is enterprises - not countries or governments - that compete with one another for orders and markets, but it is enormously difficult for even the most efficient firms to be globally competitive in an uncompetitive national economic environment that is characterised by high taxes, rampant inflation, high real interest rates, an overvalued exchange rate, and weak infrastructure and institutions.

Comparative advantage is the source of national competitiveness while competitive advantage refers to enterprise-level competitiveness. In this dichotomy, the primary role of the state - of national industrial policy - should be to create the appropriate enabling environment within which enterprise managers in the industrial sector can build competitive advantage.

Both types of advantage - comparative and competitive - are dynamic and change over time. Countries move up and down the World Economic Forum's league table of competitiveness reflecting the success and failure of governments in enhancing their national competitiveness. Economic success stories among the developing economies have been those which "created" comparative advantage at national level rather than relying on resource-driven growth which exploits inherited advantage in form of mineral or oil deposits, the combination of favourable climatic conditions and arable land and/or plentiful low-wage, though not necessarily low-cost, labour.

Michael Porter has argued that comparative advantage is created when an economy progresses from the factor-driven or resource-driven stage of economic development to the investment-driven, and subsequently innovation-driven stages[19]. No African country - let alone least developed African country - has yet attained Porter's investment-driven stage, though Mauritius and to a lesser extent South Africa, and possibly Zimbabwe, are progressing in that direction.

Four Stages of National Competitive Development

	ADVANCE			*DECLINE*
FACTOR DRIVEN	→ **INVESTMENT DRIVEN**	→ **INNOVATION DRIVEN**	→→	**WEALTH DRIVEN**

Source: The Competitive Advantage of Nations, Michael E Porter, The MacMillan Press Ltd, 1990

Competitive Advantage

Unlike countries, enterprises seldom inherit competitive advantage, but must create it. Where the "home base" matters, advantage is location-specific so that the competitive advantage achieved by the firm is dependent primarily upon the comparative advantage of the country.

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[19] Michael Porter: The Competitive Advantage of Nations. Macmillan, 1990, page 546.

- A firm may exploit "pure comparative advantage" when it locates in a country where factor costs are low - the proposed Mozal aluminium smelter in Mozambique is an example, where the aim is to exploit low energy costs. Export Processing Zones (EPZs) are established chiefly to exploit low wage costs.
- Where labour costs between nations are similar, as is often the case in LDCs in Africa - other influences may account for the advantage enjoyed by firms. Labour may be more productive because it is better educated, or the infrastructure may be superior so that operating costs are lower. In such cases too, advantage arises at the national level - better infrastructure or more educated workers.

  A comparison between the two African countries - neither of them LDCs - listed in the World Economic Forum's 1997 Global Competitiveness Report and Asian NIEs illustrates how countries secure superior advantage, (Table 8)
- "Pure" competitive advantage arises where an economic activity is footloose - where the enterprise is able to build market share without the benefit of a higher level of national competitiveness or comparative advantage - the Japanese vehicle transplants in the EU and United States in the 1980s.

Table 8. World Competitiveness Report 1997: Sub-factor rankings

Country's	China	Malaysia	Indonesia	South Africa	Zimbabwe
Overall Rankings	29	9	15	44	51
Openness	48	16	5	49	52
Government	12	6	5	28	45
Finance	16	6	25	32	42
Infrastructure	40	8	22	26	53
Technology	37	23	29	34	47
Management	43	20	32	37	47
Labour	8	20	6	52	4
Institutions	24	26	37	50	41

Source: World Economic Forum, Global Repetitiveness Report, 1997.

Lessons from Asia

The distinction between comparative advantage and competitive advantage highlights the challenge to policymakers. It is common cause that the state should foster national competitiveness (comparative advantage) through the creation of a business- and investment-friendly enabling environment. How much further - if at all - the state should go in targeting selective interventions designed to foster particular industrial activities is highly controversial, especially in African LDCs where the capacity to intervene is thinly spread.

In the light of the major structural differences between the first generation East Asian Tigers and LDCs as a whole, arguably policymakers can learn more from the recent experiences of the second tier NIEs - Indonesia, Malaysia and Thailand - though this must be qualified because:

- global business conditions have changed radically since the "take-off" of the second-tier NIEs;

BOX 5: What Drives Competitiveness?

The World Economic Forum (WEF) defines competitiveness as a country's ability to achieve sustained high rates of growth in per capita real income - a yardstick that is highly appropriate for LDCs. The 1996 Global Competitiveness Report identifies eight factors that drive national competitiveness:

- The openness of the economy to international trade and finance - the assumption being that open economies outperform closed ones.
- the role of the government budget and regulation measures the impact of high levels of public spending and regulation with the assumption being that countries with lower levels of state intervention, including public spending and taxation will perform better than those with large public sectors
- Financial market development - the more highly developed are banking and capital markets, the faster the economy will grow
- Infrastructure - a well-developed, well-maintained physical infrastructure is crucial to sustained growth
- Technology - a country's capacity in basic and applied sciences - an enhanced scientific capability adds "immeasurably" to future output growth
- Management measures the capacity of business to respond to market opportunity ":in a creative and flexible manner"
- Labour markets measure the extent of government restrictions on labour flexibility - the hiring and firing of labour, the quality of industrial relations, the impact of taxes on work incentives. The more flexible the labour market, the faster the economy's underlying growth capacity.
- Judicial and political institutions measure the extent to which legal and political systems provide for low transaction costs in terms of property rights, legal contracts. An honest and efficient judicial system, and a political system that respects property rights are important factors underlying the performance of the economy.

The index is compiled using both quantitative and survey data, with openness, government, finance and labour being 75 per cent quantitative data and 25 per cent survey data, while infrastructure and technology are 25 per cent quantitative and 75 per cent survey. Management and institutions are 100 per cent survey data. The relationship between this competitiveness index and the growth of economies is "unmistakably positive" - a high competitive score is strongly correlated with rapid economic growth and the relationship is both statistically and economically significant. The statistical relationship in the 1996 report suggests that the difference in medium-term growth due to the gap in competitiveness between the highest and lowest ranked countries (Singapore and Russia) was of the order of 9.3 percentage points per year.

Source: Why Competitiveness Counts. Jeffrey Sachs in The Global Competitiveness Report 1996

- at least in the medium-term, few - if any - African LDCs seem unlikely to attract the huge inflows of FDI enjoyed by the three Asian economies; and
- in the medium term too, African countries are unlikely to benefit from the positive spillovers of the "cluster" effect which enhanced industrial growth in East and South-East Asia.

These differences notwithstanding, the three Asian NIEs with their strong natural resource base and weak (early) human capital base have more in common with late-starting LDC industrialisers, especially, but not only, in Africa. Their growth experience is potentially more appropriate - and relevant - for LDCs than that of the individualistic first generation Tigers.

Rapid industrialisation in these three countries had its origins in:

- appropriate macroeconomic policies;
- an outward orientation;
- the attraction of foreign direct investment; and (d) effective selective interventions.

Two further prerequisites must be satisfied for such an industrialisation strategy to take root:

(i) The institutional capacity, crucial to maintaining appropriate economic policies, undertaking selective interventions and attracting FDI, must be created or strengthened;

(ii) sustained economic growth is impossible without an efficient infrastructure.

Macroeconomic Stability

The five pillars of macroeconomic stability were:

- pro-savings policies;
- maintenance of sustainable fiscal positions;
- low inflation;
- competitive exchange rates, and
- rapid corrective responses to macroeconomic problems.

To this list must be added policies that

- liberalise trade and investment - foster globalization; and
- eliminate price distortions (Box 6)

BOX 6: Price distortions in African agriculture undermine growth

The weak performance of African agriculture illustrates how price distortions can slow economic development. Agriculture accounts for 70 per cent of employment, over a third of GDP and 40 per cent of exports. But high explicit taxation of agriculture - mainly on farm exports - as well as high levels of industrial protection that forced farmers to buy costly, and often poor quality, agricultural inputs along with overvalued exchange rates squeezed the profitability of agriculture with the result that agricultural growth slowed from over 2 per cent annually in the 1965-1973 period to 0.6 per cent a year in the first half of the 1980s. The situation has since improved with the advent of structural reform programmes, the switch to competitive exchange rate strategies in many countries and the commercialisation, privatisation and deregulation of agricultural marketing.

Source: World Bank: World Development Report, 1997 Chapter 3

Implications for Competitiveness

That there is much more to creating an enabling business environment than "getting prices right" in the sense of appropriate macroeconomic policies is acknowledged, albeit belatedly, in the World Bank's 1997 World Development Report: "Many countries in sub-Saharan Africa are suffering from a crisis of statehood - a crisis of capability. An urgent priority is to rebuild state effectiveness through the overhaul of public institutions, reassertion of the rule of law and credible checks on the abuse of state power"[20].

Rebuilding and refocusing the state implies increased public investment in the hardware of physical infrastructure, as well as an emphasis on software - investment in human capital, in Research and Development, and in capacity-building. In the 21st century, the immediate priorities for the African state will have to be:

- to build - or rebuild - capacity and institutions;
- to refocus the state, confining it to its core business; and
- to invest as heavily as possible in infrastructure development.

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[20] World Bank: World Development Report, 1997 page 14.

Given the budgetary constraints on the African state, few governments will be able to fund these activities to the extent necessary, with the result that the state will be forced to continue to downsize its non-core activities, while a growing proportion of infrastructure investment will have to be privately funded and/or owned.

Two lessons flow from this: (i) given the low levels of domestic savings in the typical LDC economy, foreign capital - not just foreign direct and foreign portfolio investment but also aid and foreign borrowing - will have to play a central role; and (ii) it is unrealistic to expect weak states to develop effective and efficient instruments and mechanisms for selective intervention in the economy to secure industrial development goals.

Thus, however strong the case for targeted selective interventions, the immediate priority for African industrial policy is that of seeking to build competitiveness at national level - comparative advantage - of which rebuilding and refocusing the state is an essential element. Only when the major obstacles to business development, to FDI inflows, to foreign trade expansion, have been eliminated by virtue of :

- policy reform;
- investment in infrastructure;
- investment in capacity building; and
- investment in institution building

will the typical African LDC have created the capability and the "space" to be able to broaden its activities to selective interventions.

The Role of Foreign Investment

LDCs as a group have been marginalized in the fierce competition for private foreign direct investment. In 1995, the inward direct investment stock of the 48 countries was estimated at $13.4 billion or 2 per cent of the total for the developing world. The bulk of this - $9.7 billion - was in Sub-Saharan Africa, where two countries accounted for more than half. Angola's inward stock was $3 billion and Liberia's $2.6 billion.

FDI inflows to LDCs have doubled from, $533 million annually in the second half of the 1980s to $1.1 billion in 1995 - just over one per cent of the total inflow to developing economies and less than 0.3 per cent of global FDI.

The reasons for this marginalization are analysed in boxes 7 and 8 with the chief explanations being market size and expected growth rates, the scarcity of skilled workers and adverse perceptions amongst foreign investors of economy-wide competitiveness.

The three surveys cited are disconcerting for African LDCs on several counts:

a) their markets are small;

b) growth rates have been well below those for developing economies as a whole;

c) the infrastructure is weak; and

d) skills are scarce.

BOX 7: Market size and growth rates dominate FDI decisions

According to the 1997 World Economic Forum's global executive survey, the five most important influences determining foreign direct investment in a country are:

i) Size of the national market in the target country

ii) Expected market growth rate in the target economy

iii) Ability to repatriate capital and profits

iv) Productivity and work habits of workers, and

v) Infrastructure

Significantly, often-advocated industrial policy interventions such as reduced corporate tax rates for specific activities, subsidised loans, tax holidays and other investment incentives appear to have little impact on FDI decisions.

Upstream government activities, such as public investment in education and infrastructure that "crowd in" private sector investment by reducing costs, and raising productive efficiency are shown to attract FDI.

The Forum finds too that most foreign investors are market servers - targeting large, fast growth domestic markets. In making their investment decision such market-serving businesses are willing to compromise on country characteristics such as labour costs, investment incentives and contract enforcement, in order to secure a toehold in a large, fast-growth market.

But where FDI is inspired by the desire to create and exploit an export platform (Export Processing Zones) low-cost production sites and investor protection are critical since the investment is far more "footloose".

Again the crucial importance of competitiveness is highlighted - - export-driven FDI is closely correlated with a country's competitiveness. The Forum's survey finds that:

- the higher a country's competitive index (box 4), the more likely is it to be considered as an appropriate location for FDI by an exporting firm;
- the less corruption in a country, the more FDI it is likely to attract, and
- the lower the corporate tax rate, the higher the level of foreign investment

Recognition that the important benefits of FDI - such as technology transfer and access to global marketing networks - stretch well beyond the actual finance it brings into a country, is a partial explanation of the intensity of competition for such inward investment. This is particularly so where export platform investment is concerned. Exporters do not need to establish themselves in large markets, but can shop around for the most competitive and profitable location.

Source: World Economic Forum: Global Competitiveness Report 1997

8. Priorities

Cognizant of the two-tier nature of competitiveness, and the financial and budgetary constraints on the African state, it has been argued that African LDCs should concentrate their limited resources on implementing broad development strategies that go beyond industrial policy as is usually conceived. In the light of the drastic deterioration in the institutional capacity of the African state (Box 9), priority should be accorded to rebuilding and refocusing the state, whilst simultaneously maintaining appropriate macroeconomic policies.

Even where LDCs have the resources - human and financial - to implement them, which is questionable, many of the East Asian interventions are inappropriate for the late 1990s, largely because the world trade and investment order has changed substantially but also the nature of sources of industrial growth are different.

BOX 8: Labour quality matters

A survey by international business and financial advisory group, Ernst and Young, while also citing "large market potential" as the most important reason for offshore investment by 94 per cent of the 230 of its global client companies surveyed[21], also emphasises, the *quality*, rather than the *cost* of labour.

The survey found that neither access to raw materials nor plentiful supplies of lowcost labour were "high priority drivers". Labour *quality*, rather than *low-cost labour*, had become the major determinant of inward investment. For foreign investors, the local availability of highly qualified personnel is of crucial importance, without whom there is little justification for locating an industrial operation.

A study by the Deloitte and Touche Consulting Group reaches a similar conclusion, finding that 76 per cent of investment in the ten foreign locations most favoured by United States multinationals was in *high wage* economies, led by Sweden. Fifty-five per cent of United States manufacturing FDI targeted European locations followed by Asia and the Pacific (16 per cent), Latin America (13 per cent) and Canada (11 per cent). Central America accounted for three per cent and Africa and the Middle East one per cent each.

Brazil was the second largest destination after Sweden with the United Kingdom in third place. The decreasing importance of low wage costs is reducing the appeal of many developing countries to foreign investors. "A country's ability to meet worldwide best-practice standards is more critical for competing in the global market than accessing cheap labour". Manufacturing industries require flexibility and a developed world skill level to ensure that product quality satisfies world standards.[22]

Ernst and Young noted three other decisive influences noted were:

- expected returns (78 per cent)
- the need for a strategic business location (67 per cent)
- pre-empting competition (52 per cent)

Source: Ernst and Young 1994: Investment in Emerging Markets - A survey of the strategic investments of 1 000 global companies, and Deloitte and Touche 1996: Institute for Manufacturing Research.

BOX 9: Institutional Capacity

The World Bank's 1997 survey of institutional obstacles to doing business globally includes responses from 1 288 sub-Saharan firms. The most important problems identified by African businesspeople are:

1. Corruption
2. Tax regulations and/or high taxes
3. Inadequate infrastructure
4. Inflation
5. Crime and theft, and
6. Financing

Table 9 compares the African responses with those of the developing economies as a whole.

The rankings from the African survey and those for developing economies as a group are strikingly similar, though surprisingly financing is seen as a less of an obstacle in Africa, while infrastructural shortcomings are significantly more serious, as is inflation.

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[21] Ernst and Young (1994):Investment in Emerging Markets - A Survey of the strategic investments of 1 000 Global companies.

[22] Deloitte and Touche Institute for Manufacturing Research. 1996.

Table 9. Regional rankings of obstacles for doing business
(1 = the most important obstacle, 15 = the least important obstacle)

	World	Developing Countries	Sub Saharan Africa
a) Regulations for starting business/new operations	12	13	13
b) Price controls	14	14	14
c) Regulations on foreign trade (exports, imports)	10	9	9
d) Financing	3	3	6
e) Labour regulations	9	10	11
f) Foreign currency regulations	13	11	10
g) Tax regulations and/or high taxes	1	1	2
h) Inadequate supply of infrastructure	4	5	3
i) Policy instability	8	7	8
j) Safety or environmental regulations	11	12	12
k) Inflation	6	6	4
l) General uncertainty on cost of regulations	7	8	7
m) Crime and theft	5	4	5
n) Corruption	2	2	1
o) Terrorism	15	15	15

Source: World Bank Policy Research Working Paper 1759

Sequencing

In this situation, LDCs are best advised to focus on the basics of development policy, rather than the specifics of selected industrial policy interventions. This is not to argue that selective interventions are necessarily inappropriate but that, when it comes to prioritising, the net benefits are likely to be greater where economy-wide functional intervention is chosen.

"The bottom line" argue Harrold, Jayawickrama and Bhattasali in their study of practical lessons of East Asia's experience for African industrialisation is that "countries in Sub-Saharan Africa are unlikely to do well with targeted industrial policies. None of the countries can meet two necessary prerequisites:

- the capability to properly manage the macro economy, and
- competence of the economic bureaucracy."

Their conclusion is that African countries should "stay away" from industrial policies. "Far from encouraging the greater involvement of the state in Africa in directing economic activity, the opposite is true in many African countries". African governments, they say, should develop more trust in private industry, focusing on removing barriers to its success rather than on what the state thinks private industry should do".[23]

Generic Strategies

Professor Michael Porter's classification of generic strategies[24] used by enterprises to derive competitive advantage can be extended to the industries and even countries. According to Porter, firms build competitive advantage on an industry-wide basis either by being cost-leaders or differentiators - producing different, better, unique goods and services for which consumers

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[23] Harrold, Jayawickama and Bhattasali 1996: Practical Lessons for African from East Asia in Industrial and trade Policies". World Bank Discussion paper 310.

[24] Michael Porter: Competitive Strategy, The Free Press, 1980.

are willing to pay more. The third strategy - of niche or focus - applies where an enterprise produces and markets for a limited segment of the market.

Historically, East Asian success stories initially penetrated OECD markets by taking the cost leadership route - Japan in the 1960s and 1970s, Korea, Taiwan Province of China, China, Malaysia and Thailand since. Subsequently, many exporters in these countries, especially Japan and the original four Asian Tigers, were forced by rising wages and exchange rates to differentiate or niche, rather than rely on cost leadership. Quality, design, style, a capacity to adapt products to meet the demands of individual markets, replaced cost and price as the basis of global competition.

This trend has been accentuated by the diminishing significance of direct labour costs in manufacturing and total costs. Table 10 shows that over the last 30 years, the cost structure of the typical manufacturing firm has changed significantly. Three trends are evident: (i) Technological advance, experience effects and greater automation has resulted in a sharp decline in direct labour costs from 40 per cent of manufacturing costs and 36 percent of total costs in the 1960s to 10 per cent of manufacturing costs and 7 per cent of total costs by the mid-1990s; (ii) More sophisticated inventory control techniques, the adoption of just-in-time strategies, improved quality control and a focus of "getting it right first time" have reduced wastage, spoilage and defects, thereby lowering the costs of after sales service as well as of material inputs; (iii) The shift towards more flexible, customised production has increased setup costs (manufacturing overheads), while higher levels of automation have raised depreciation expenses (also manufacturing overheads).

Table 10. Components of cost for a typical manufacturing firm, 1960s versus 1990s (Percentage)

	Of manufacturing cost		Of total cost	
	1960s	**1990s**	**1960s**	**1990s**
Direct labour	40	10	36	7
Direct materials	35	35	32	25
Manufacturing overhead	25	55	23	39
Manufacturing costs	100	100	90	70
Selling & general admin.expenses			10	30
Total costs			100	100

Source: "Economics of Strategy", David Besanko, David Dranove & Mark Shanley, 1996, John Wiley & Sons, Inc. Page 502.

Global integration, falling transport and communications costs and technological change mean that firms can longer compete on the basis of cost and price alone, except in raw material, commodity industries. Increasingly, quality, design and on-time deliveries are sources of competitive advantage rather than cost leadership.

BOX 10: Productivity in Ghana, Kenya and Zimbabwe

An analysis of total factor productivity in four sectors (clothing and textiles, food processing, wood working and metal working) in Ghana, Kenya and Zimbabwe concludes:

- African manufacturing displays similar structural relationships to those found in other developing regions;

- Considerable variations in the technical efficiency of firms across the three African countries, with efficiency highest in Zimbabwe in each sector while Kenyan firms are more efficient than those in Ghana in at least two of four sectors. This is a notable finding if only because both Kenya and Zimbabwe have much lower "structural adjustment" ratings in the eyes of the World bank and IMF, than Ghana, widely regarded as a success story

- Medium-sized firms appear to be the most efficient in the sample. In firms employing at least 20 people, efficiency increases with firm size, before declining for the largest firms. Firms employing 100 to 199 workers are the most efficient in clothing and textiles, while in the two other sectors (wood and metal working) the most efficient firms on average are those employing between 50 and 99 people. There is no clear relationship between size and productivity in food processing.

- On average African firms have lower levels of total factor productivity in international terms. African firms are well below the best-practice frontier for firms in other developing regions, though this is less so in the food processing sector.

- A one per cent increase in the number of workers trained on-the-job - both inside and outside the firm - could increase value added by as much as 60 per cent

- Informational links established through FDI increase value added by 30 per cent - a comparable benefit to that obtained by technology transfer through licensing arrangements or technical assistance

- Access to working capital contributes to a 37 per cent increase in value added, but the contribution to firm productivity of access to longer-term bank loans is insignificant

- In very small firms training is the most important single contributor to value added, while access to working capital results in a 40 per cent improvement. Previous experience of the entrepreneur/owner and the age of the firm - both influencing the firm's "knowledge and human capital" are also positive associated with value added

- Within very small firms, firms in the formal sector have "substantially higher levels of value added" than informal firms.

- Experience and scale economy effects were important - that the longer the production run the higher is task-level efficiency

- The studies identified a number of constraints on export competitiveness which provide a basis for selective policy interventions designed to eliminate such bottlenecks:

  * weak infrastructure
  * lack of technical learning
  * difficulties in access export finance and export markets
  * a restrictive business environment
  * high transport costs

Source: Structural Aspects of Manufacturing in Sub-Saharan Africa: Findings from a seven country Enterprise Survey. World Bank Discussion paper No 346, 1996.

It is essential for LDC policymakers to take account of these trends which cast doubt on the extent, and durability, of cost-driven comparative advantage in manufacturing. "The increasing sophistication of manufacturing and the growing importance of having world class suppliers are causing more multinationals to place less emphasis on low wages when they are choosing foreign manufacturing sites"[25].

[25] Kasta Ferdows: Making the Most of Foreign Factories" Harvard Business Review, March-April 1997, page 74.

BOX 11: The limitations of cost leadership strategies

When world class manufacturers establish offshore factories, they invariably locate their plants in areas that have the most advanced infrastructure and workers' skills rather than those that merely offer the lowest wages. United States Multinational Am chose Bangalore as a manufacturing site, despite the fact that land is more costly and wages higher than in many other parts of India. Bangalore offered more skilled labour and suppliers as well as more sophisticated competitors, from which Am stood to benefit indirectly from the combination of external economies and sharper competition which put pressure on management and labour alike.

Similarly, in China Xerox and Motorola located plants in Shanghai and Tianjin which are two of the country's higher cost locations. Hewlett-Packard's establishment of a factory in Singapore in 1970, was driven by cost considerations - the plant's focus was on simple, low-cost labour-intensive components. But by the 1990s it had become a global centre for the design, development and manufacture of key components like keyboards and inkjet printers.

Although the initial focus was cost-driven, HP chose Singapore over cheaper Asian locations because it offered "intangible", longer-term benefits - a better educated workforce, that spoke English, a developed infrastructure and a stable political environment.

Source: Kasra Ferdows Making the Most of Foreign factories, Harvard Business Review, March-April 1997, pp 73-88

In 1995, FDI inflows to developed market economies exceeded $200 billion or 65 per cent of the global total. The main recipients were not countries offering low wage, material or infrastructure costs - the key determinants instead being market size and access and availability of skilled, rather than lost-cost, personnel. "Although manufacturing wages in India and the Philippines are much lower than those in the United States, their average manufacturing labour cost is higher after adjustments are made for productivity"[26].

Not only that but the need to shorten product development lead times while improving co-ordination between the research and development and production divisions of a business has led to the concentration of production and development in the same geographical area. This trend marks a break with the past when offshore factories were seen as "screwdriver assembly factories" tasked with producing cheap components for a multinational company, with limited technological spinoff. In the 1990s, foreign plants are increasingly fulfilling a broader, deeper role which means they require skilled, rather than cheap, labour and a conducive business environment.

Economic Integration

Unilateral trade liberalization can attract industry by opening a previously-protected LDC to a cheaper supply of imported intermediate goods which becomes the dominant supply side force enabling industry to take root.[27] While import competition has a negative impact on the product market in the form of competition from finished goods, openness to imports of intermediates stimulates local production. Industry will develop sooner - and on a larger scale - the greater is the share of intermediate goods in production and the larger the domestic market.

South-South preferential trading areas (PTAs) increase market size and their success depends on their combined market size being large enough to attract industrial investment. The

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[26] Ferdows op cit, page 75.

[27] Venables A J : Trade Policy, cumulative causation and industrial development. Journal of Development Economics, 1996.

downside is that the smaller the LDCs markets in a south-south PTA, then the later, and the less, the industrialisation. The disappointing results of many south-south PTAs is attributable to inadequate scale.

According to Corden: " It is far better for Argentina to the go to the world market - to liberalise unilaterally - as she has been doing - than just go for the Brazilian market. Brazil has the largest economy in the third world and yet it is smaller even than Canada's ..."[28]

A PTA agreement between North and South works very differently by ensuring: (i) improved access to northern markets; (ii) improved - and cheaper - supplies of intermediate goods; and (iii) increased domestic (import) competition in the home market

Puega and Venables (1997) conclude that: (a) unilaterally liberalising imports of manufactures can promote local manufacturing development through forward linkages from imported intermediate goods; (b) the gains from liberalisation through PTA membership are likely to exceed those of unilateral trade liberalisation as a result of scale effects; and (c) North-South PTAs seem to offer better prospects in the form of improved access to northern markets, better and cheaper imported inputs and enhanced domestic competition.[29]

9. Selective Interventions

Discussion of detailed selective interventions lie beyond the scope of this paper, but the crucial areas for such intervention, especially at the SME end of the market, include:

- ***Finance:*** Access to finance is a constraint on industrial investment and growth. Research for the World Bank's Regional Program on Enterprise Development (RPED), drawing on survey data from 200 large and small manufacturing firms in seven African countries[30] finds that in almost all countries lack of credit ranks highest as a constraining factor especially amongst smaller firms[31]. This is a different conclusion from that reached in the Bank's 1997 survey of 1 288 Sub-Saharan firms (box 8), which may reflect a greater emphasis in the RPED study on SMEs which habitually cite access to, and cost of, finance as a constraint on growth. The study finds that in Kenya, a third of the firms studies were unable to undertake a profitable investment because of a lack of funds, while two-thirds of the Kenyan firms said they would cut production and downsize the firm to avoid cash-flow problems.

  A basic principle of finance, often overlooked in interventions designed to ease these constraints is the need to relate the source of funding to the degree of risk. Loan finance, while cheaper than equity, is also riskier. Start-up businesses in manufacturing are invariably high risk projects and should be funded from lower risk - i.e. equity - sources rather than bank or financial institution lending. Accordingly, more emphasis should be placed upon developing equity sources of finance - such as venture capital companies - than subsidising loans.

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[28] W M Corden: Roundtable Discussion in J de Melo and A Panagariya: New Dimensions in Regional Integration. Cambridge University Press. 1993.

[29] D. Puega and A. J. Venables: Trading Arrangements and Industrial Development, World Bank Policy Research Working Paper 1787, June 1997.

[30] Burundi, Cameroon, Cote d'Ivoire, Ghana, Kenya, Tanzania, Zambia and Zimbabwe.

[31] World Bank" Structural Aspects of Manufacturing in Sub-Saharan Africa. Discussion paper No. 346, Chapter 2.

- ***Technology***: In the late 1990s there are two main routes to global competitiveness:
  - i) technological upgrading to improve productivity, raise quality standards and cut costs; and
  - ii) enhanced cost competitiveness achieved by maintaining or raising productivity while cutting costs - specifically by cutting the real cost of labour, through rightsizing.

While technological upgrading is the optimal route to dynamic comparative advantage, a low-wage industrialisation strategy has enormous political and social attractions in terms of job generation. One major snag - the diminishing relative importance of direct labour costs in manufacturing and indeed in total costs, is illustrated in Table 10 while the World Bank's recent long-range scenario for developing economies also cautions against a labour intensive strategy.

The advance of the Big 5 (China, Russia, Brazil, India and Indonesia) will generate "significant competitive pressures in unskilled labour-intensive sectors " where LDCs as a group might hope to build competitive advantage. Apart from other ASEAN (Association of Southeast Asian Nations) countries which have already made big advances in manufacturing, " few other developing regions will increase their specialisation in these sectors by 2020", says the World Bank.[32] This does not mean that LDCs will not be able to develop lucrative manufacturing activities, but that they will have to develop "specialised manufacturing lines where they can demonstrate comparative advantage in highly competitive world markets".[33]

This is very disconcerting for LDCs especially as the World Bank projects further deterioration in their terms of trade over the next 25 years. Furthermore, the prospects for exploiting niche manufacturing markets on a significant scale from a low technology, low-productivity base, are slim.

The Bank's analysis highlights the need for competitive advantage that exploits higher order factors of production - specifically capital, skills and technology. But LDCs are hugely disadvantaged when its comes to technology - partly the result of path-dependence, which implies that even were the technology to be made available (itself problematic), the quality of labour and invariably also management, is seldom up to the task.

However, selective policies, such as those in export-intensive and high-tech activities, may improve the quality of FDI inflows. At present, the distribution of such flows is extremely uneven across countries. Developing countries able to negotiate preferential access to major trading blocs - i.e. east European and Mediterranean countries with the EU, and Mexico with Canada and the United States - enjoy a substantial advantage over other regions.

Similarly, by creating a critical mass in terms of market size while enhancing growth potential, regional economic integration among poorer countries could also become an increasingly important determinant of FDI and other capital inflows. Unfortunately, however, past experience suggests that such regional groupings give rise to the polarisation of investment and industrialisation, resulting in inequitable patterns of growth within the regional groups.

Technology import policy needs to strike a delicate balance between discouraging domestic R&D investment and fostering a false sense of complacency. While a too liberal policy towards technology imports under licensing and FDI may discourage local technological effort,

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[32] World Bank 1997: Global Economic Prospects and the Developing Counties, page 25.

[33] World Bank 1997 page 25.

a restrictive, regulatory policy may make local enterprises complacent about the need for constant upgrading.

10. Conclusions

i) Industrial policy should be treated holistically as part of the broad array of development strategies implemented by LDCs, rather than as measures designed to foster manufacturing industry at the expense of mining, agriculture or tourism. Major differences in resource endowments, population size, culture, experience and geography demand a case-by-case approach rather than generalist solutions.

ii) The goal of industrial policy in LDCs should be to build comparative advantage at national level and facilitate - rather than endeavour to create - competitive advantage at enterprise level.

iii) At national level this implies an enabling environment characterised by:

- macroeconomic stability
- minimal price distortions
- investment in physical infrastructure, institutional capacity and human capital
- an open, outward-oriented economy that fosters foreign trade and foreign direct investment
- measures to facilitate the transfer of technology by encouraging cross-border strategic alliances and other non-equity links

iv) Specialisation will be enhanced and scale and scope economies and experience effects better exploited where LDCs broaden their markets by joining a free trade area. The evidence suggests the gains are likely to be greater if north-south rather than south-south FTAs can be developed.[34]

v) Industrial performance will be improved where underperforming state-owned manufacturing enterprises, utilities and parastatals are subjected to market discipline by way of deregulation, commercialisation and privatization.

vi) At enterprise level the aim should be to eliminate obstacles to firm creation and expansion by: (a) minimising financial, legislative or administrative entry barriers that increase the cost of doing business; (b) limited selective interventions designed to ease specific constraints, most notably those on technological advance and those affecting availability and cost of finance; (c) investment in training and skills development directly by state spending, and indirectly by tax-breaks for inhouse skills development programmes. Given the budgetary and skills constraints on most LDC governments, the main burden will have to be shouldered by the private sector; and (d) encouraging exports by ensuring that imported inputs are available to manufacturers at world prices (duty-drawback and inward processing rebate schemes), and facilitating mechanisms for export finance.

vii) Where such selective interventions are used, these must be closely coordinated and integrated. Uncoordinated intervention in factor markets without appropriate measures in product markets will be ineffective or even counter-productive.

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[34] Diego Puga and Anthony J Venables:Trading Arrangements and Industrial Development. World Bank, Policy Research Working Paper 1787 June, 1997.

viii) Because resources are limited, only a few activities should be supported at any one time. Targeting is crucial.

ix) Domestic rivalry is a prerequisite for competitiveness. For this reason competition policy - a form of selective intervention - may well be needed, though in small economies where domestic industrial production is highly concentrated, competition from imports may be the most effective means of securing efficiency gains.

x) Clusters and industrial districts have an important role in the development of globally competitive SMEs. This is an area where UNIDO can make an increasingly important contribution. Competitive advantage can be created by fostering close working relationships between networks of home-based suppliers, thereby reducing dependence on imported components and inputs, and facilitating the adoption of flexible production systems.

The great weakness of SMEs is less their size than their isolation.[35] Cluster-building, the provision by governments and international agencies, such as UNIDO, of collective support in the form of consultancy services, market research and "twinning" - putting SMEs in contact with potential foreign buyers or investors - must be given top priority. To overcome their isolation, SMEs need access to information networks that governments and international agencies can provide.

Petri's excellent assessment of the case for selective interventions should guide policy-makers: "East Asia's experience shows that rapid catchup can be achieved in various ways. A market-oriented environment is a key ingredient, but interventionists approaches were also prominent. But intervention was neither sufficient nor necessary for rapid progress - indeed the region's most interventionist policies were generally unsuccessful and had to be abandoned. The real issue is not whether the policy environment is generally interventionist or laissez faire, but whether policies are properly structured to address the basic requirements of growth, and whether they fit the economy's capacities and environment."[36]

11. Competitiveness - A Role for UNIDO

The debate over competitiveness should not be seen as one of concern only to developed market economies and NIEs. Globalisation means that global players encroach increasingly on markets that domestic enterprises have hitherto regarded as their own field of activity., The spread of multinational retail chains, banks, advertising agencies, and construction firms is a reminder that the home or proximate economy is being penetrated by global players.

It is no longer enough for LDC governments to act as if they were playing in the third or fourth division and adhere to different rules and standards than those in the top division.. The use of competitiveness league tables of the kind compiled by the World Economic Forum should be extended to cover LDCs, thereby reminding politicians, businesspeople and bureaucrats that it is not enough to be as competitive as another low income country, but that the prosperity of the people depends on the economy becoming increasingly competitive.

UNIDO has a role to play here by linking up with other international agencies and organisations to compile a global competitiveness report for Least Developed Economies that will help policymakers to benchmark their policies and performance against that of their peers.

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[35] UNIDO 1996: The Globalization of Industry: Implications for Developing Countries Beyond 2000.

[36] Peter A Petri: The Lessons of East Asia, World Bank, 1993.

Industrial Development Issues and Industrial Policy Concerns of Economies in Transition

Mojmir Mrak*

1. Introduction

The decades long central planning period has distorted the industrial sector of the Central and Eastern European (CEE) countries and of the former Soviet Union in several ways: first, the share of industry in the countries' GDP and employment was typically much higher than in developed market economies, and within the industrial sector, there was very often high concentration on heavy industry branches, including armaments in some countries. Second, there was a high concentration of industrial capacities in a very small number of large state-owned industrial enterprises; there was practically no small and medium-sized industrial enterprises. Third, industrial capacities were, by and large, non-competitive with outdated technology, polluting, and energy and raw material intensive. Fourth, industrial exports and imports were heavily dependent on a few trading partners among the Council for Mutual Economic Assistance (CMEA) countries.

This unfavourable legacy has required from all ex-communist economies to drastically transform their industries. In the broadest sense, industrial sector transformation of countries in Central and Eastern Europe refers to all processes needed to increase international competitiveness of their industrial firms. These processes include a broad range economic, legal and political reforms necessary to create an appropriate policy environment as well as privatisation and restructuring of individual industrial enterprises. An important part of the transformation process is also integration of industrial firms into global markets. For transition economies, eager to reverse the inward-looking legacy of their central planning, the trend towards a growing global inter-dependence presents both new opportunities and challenges.

Most of the countries in transition are now five to seven years in the process of transformation of their industrial sectors. What has been achieved over these years, what are the problems, constraints and obstacles to industrial development in the region, what are the industrial policy options for the years to come and what might be role of UNIDO in supporting industrial development policy-making in transition economies? These questions form the focus of this paper.

In addition to this Introduction, the paper is made of four parts. In the first one, trends, obstacles and strengths of the post-1989 industrial development in transition economies are presented while the second part examines the conceptual framework and actual implementation

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of the industrial sector transformation. The next part discusses the scope and options for industrial competitiveness policy in the region. In the last part of the paper, an attempt is made to identify those demands of transition economies for UNIDO's services where the Organisation has the strongest comparative advantages and where its services can have the greatest impact on the recipient countries.

2. Key Issues of Industrial Sector Development: Trends, Obstacles and Strengths

2.1. Output

All countries in transition have experienced a painful economic contraction in early 1990s. Reasons for this output shock included: (i) the introduction of price and exchange rate liberalisation resulting in a significant cut of domestic purchasing power, (ii) general collapse of the former system of enterprise linkages and finance, and (iii) the breakdown of the socialist trading block. While most of the CEE countries and the Baltic states started recovering in 1993 and 1994, as shown in Table 1, the countries of the Commonwealth of Independent States (CIS) continued their decline, albeit at a less dramatic speed than before. Only in Poland, real GDP in 1996 already exceeded the official pre-transition level while in other Central European Free Trade Area (CEFTA) countries, the 1996 output was around 90 per cent of its level in 1989. On the other hand, there are countries, most of them in the CIS, like Armenia, Azerbaijan, Georgia, Moldova and Tajikistan, where the real output was in 1996 still below 40 per cent of its pre-transition level (EBRD, 1997, p.7).

Not all sectors of transition economies were equally hit by the beginning of their transformation from centrally-planned to market-based systems. Trade liberalisation, the new power of consumer preferences and the cutback in defence spending are only some of the reasons explaining why industrial growth rates were even more disappointing than the GDP rates (see Table 1).

Poor industrial sector performance in the first years of transition has caused a significant drop in the region's contribution to the world industrial output. The decline has been the most pronounced in the countries of the former Soviet Union where their 1995 share in the world manufacturing value added (MVA) was 56 per cent below that of 1990 (1.5 per cent in 1995 against 3.4 per cent in 1990). Contribution of the CEE countries to the global industrial output was reduced much less drastically - for 24 per cent (1.6 per cent in 1995 against 2.1 per cent in 1990) (UNIDO, 1996a, p. 39). Different scale of industrial sector losses may partly be attributed to differences in the structure of manufacturing and partly to differences in the timing and sequencing of the transformation process applied by different groups of countries.

Table 1. GDP and Industrial Growth in Transition Economies, 1990 - 1996 (in per cent)

Country	1990	1991	1992	1993	1994	1995	1996
Albania							
- GDP at constant prices	-10.0	-27.7	-7.2	9.6	10.3	9.5	8.5
- Industrial production	-7.6	-36.9	-44.0	-10.0	-2.0	2.0	3.0
Belarus							
- GDP at constant prices	-3.0	-1.2	-9.6	-10.6	-12.2	-10.2	2.6
- Industrial production	-	-0.2	-5.2	-10.5	-19.9	-11.5	3.3
Bulgaria							
- GDP at constant prices	-9.1	-11.7	-7.3	-2.4	1.8	2.6	-10
- Industrial production	-16.0	-27.8	-15.0	-11.8	7.8	8.6	-4
Croatia							
- GDP at constant prices	-6.9	-20.0	-11.0	-0.8	0.6	1.7	4.5
- Industrial production	-11.0	-29.0	-15.0	-6.0	-3.0	0.3	3.1
Czech Republic							
- GDP at constant prices	-0.4	-14.2	-6.4	-0.9	2.6	4.8	4.1
- Industrial production	-3.5	-22.3	-7.9	-5.3	2.1	8.7	6.9
Georgia							
- GDP at constant prices	-12.4	-13.8	-44.8	-25.4	-11.4	2.4	10.5
- Industrial production	-29.9	-24.4	-43.3	-21.0	-40.0	-	-
Hungary							
- GDP at constant prices	-3.5	-11.9	-3.1	-0.6	2.9	1.5	0.5
- Industrial production	-9.3	-18.4	-9.7	4.0	9.6	4.8	2.0
Kazakstan							
- GDP at constant prices	-0.4	-13.0	-14.0	-12.0	-25.0	-8.9	1.4
- Industrial production	-1.0	-1.0	-14.0	-16.0	-28.0	-7.9	0.5
Kyrgyzstan							
- GDP at constant prices	3.0	-5.0	-19.0	-16.0	-26.5	1.3	5.4
- Industrial production	-0.6	-0.3	-26.0	-25.0	-28.0	-12.5	10.8
Lithuania							
- GDP at constant prices	-5.0	-13.4	-37.7	-24.2	1.0	3.1	3.0
- Industrial production	-	-	-	-34.4	-26.5	5.2	-
Macedonia							
- GDP at constant prices	-9.9	-12.1	-21.1	-8.4	-4.0	-1.5	3.0
- Industrial production	-10.6	-17.2	-16.0	-10.0	9.0	-11.0	3.0
Poland							
- GDP at constant prices	-11.6	-7.0	2.6	3.8	5.2	7.0	6.0
- Industrial production	-	-8.0	2.8	6.3	12.1	9.9	8.0
Romania							
- GDP at constant prices	-5.6	-12.9	-8.8	1.3	3.9	6.9	4.3
- Industrial production	-23.7	-22.8	-21.9	1.3	3.3	9.4	6.0
Russian Federation							
- GDP at constant prices	-	-13.0	-14.5	-8.7	-12.6	-4.0	-6.0
- Industrial production	-0.1	-8.0	-18.8	-16.2	-22.8	-4.7	-5
Slovak Republic							
- GDP at constant prices	-2.5	-14.6	-6.5	-3.7	4.9	6.8	6.9
- Industrial production	-3.6	-17.6	-14.4	-10.2	6.4	8.3	2.5
Slovenia							
- GDP at constant prices	-4.7	-8.1	-5.4	2.8	5.3	3.9	3.5
- Industrial production	-10.5	-12.4	-13.2	-2.5	6.1	2.4	1.5
Tajikistan							
- GDP at constant prices	-1.6	-7.1	-29.0	-11.0	-21.5	-12.5	-7.0
- Industrial production	1.9	-2.0	-23.3	-17.8	-31.4	-	-
Turkmenistan							
- GDP at constant prices	2.0	-4.7	-5.3	-10.0	-20.0	-10.0	-4.0
- Industrial production	-	5.0	-15.0	4.0	-25.0	-18.0	17.0
Ukraine							
- GDP at constant prices	-3.4	-9.0	-10.0	-14.0	-23.0	-11.8	-10.0
- Industrial production	0.0	-5.0	-6.0	-9.0	-28.0	-13.0	-5.0
Uzbekistan							
- GDP at constant prices	1.6	-0.5	-11.1	-2.3	-4.2	-1.2	1.0
- Industrial production	1.8	1.8	-12.3	-8.3	-	-	-

Source: Transition Report Update, April 1997. EBRD : London, 1997, p. 35-59

Sharp decline of the industrial output during the early 1990s accompanied by a strong performance of the services sector has resulted is a dramatic shift in the economic structure of transition economies. As shown in the Table 2, the general pattern is that service sector has gained substantially in most countries in terms of GDP share at the expense of industry, and, to a lesser extent, of agriculture. Through this process, a highly distorted structure of centrally-planned economies with exceptionally high shares of industry and depressed services sector has in many transition economies become much more in line with the usual distribution of GDP across sectors in developed market economies. There is, however, one crucial difference between transition economies and developed market economies in this respect. While in the latter, services sector has grown steadily and in proportion with structural requirements of the overall economic development[1], in transition economies, the shift in the GDP structure has been made through a deep recession, especially of the industrial sector, and in a very short period of time.

Table 2. Changes of Sector Shares in GDP in Transition Economies, 1989 - 1993
(change in share - per cent of GDP)

Country	Industry	Agriculture	Services[1]
Albania	-26.4	6.7	19.7
Armenia	-22.5	47.9	-25.4
Azerbaijan[2]	7.7	0.7	-8.4
Belarus	5.2	-5.5	0.3
Bulgaria	-23.5	1.3	22.2
Croatia[3]	-3.6	2	1.6
Czech republic	-10	-0.4	10.4
Estonia	-8.4	-9.9	18.3
Georgia	-21.3	34	-12.7
Hungary	-8	-8	16
Kazakstan	9.2	-15.1	5.9
Kyrgyzstan	-6.7	4.1	2.6
Latvia	-13.1	-4.3	17.4
Lithuania	-3.3	-6.7	10
Macedonia[2]	-7.3	2.6	4.7
Moldova	1.8	-11.9	10.1
Poland	-19.4	-5.9	25.3
Romania	-19.3	6.7	12.6
Russia	-11.1	-5.6	16.7
Slovak Republic	-14.9	-2.7	17.6
Slovenia	-8.9	0.2	8.7
Tajikistan	1.3	6.1	-7.4
Turkmenistan[4]	1.7	-4.3	2.6
Ukraine	-3.5	13.5	-10
Uzbekistan	2.7	-7.8	5.1

1 - calculated as a residual for some countries
2 - change over 1998-92
3 - change over 1990-93
4 - change over 1989-91
Source: Transition Report 1995. EBRD : London, 1995, p. 79.

[1] The 1997 World Economic Outlook discusses causes and implications of the so-called "deindustrialisation" process, i.e., of the declining share of manufacturing value added in GDP and of the declining share of manufacturing employment as a share of total employment in advanced economies.

2.2. Employment

Transition from centrally-planned to market-based economies has been associated with major changes in the level of employment. Prior to transition, open unemployment was almost non-existent in the region. The situation reversed dramatically then after, when following the output collapse in early 1990s, registered unemployment grew throughout the region. It exceeded 15 per cent in Bulgaria and Poland, and amounted to between 12 and 15 per cent in Croatia, Hungary, Slovak Republic and Slovenia. In contrast to these countries, unemployment rates remained rather low in Czech Republic, between 3 and 4 per cent, and even lower in the most of the CIS during the transition (EBRD, 1997 p. 35 - 59). Revival of the output growth in more advanced countries of the region over the last few years, has so far not lead to a significant revival in registered employment. This is partly explained by continuing process of laying-off redundant labour, and partly by the fact that a substantial proportion of new jobs has been created in the informal sector.

Employment structure changes in the region have been strongly influenced by the closure of many technologically outdated industrial firms on the one hand and by the boom in services sector development on the other. As a consequence, a declining manufacturing employment as a share of total employment has been registered throughout the region. In Poland, for example, this share was reduced for 7.9 percentage points (between 1992 and 1995), in Czech Republic for 5.5 percentage points (1991 - 1995) and in Hungary for 3.5 percentage points (1992 - 1995) (Laporte and Ringold, 1997, p. 14).

2.3. Labour Productivity and International Competitiveness

As shown in Table 3, labour productivity in industry, defined as the number of units of output produced per employee, has increased significantly in the countries in transition. While in 1991, it was negative in all countries for which data are available, in 1995, labour productivity turned into positive throughout the region. In some countries, like Czech Republic, Poland and Romania, the quantity of output per worker in manufacturing/industry rose by more than 10 per cent in that year.

Productivity growth in transition economies reflects a combination of two major sets of factors. The first one deals with productivity gains independent of capital investment. They have been achieved both through reductions of redundant labour force and through their better use within enterprises. This part of labour productivity has increased also due to better utilisation of existing manufacturing capacities. In this respect, there are significant differences among transition economies. While in some countries of the Central European Free Trade Association (CEFTA) manufacturing capacities utilisation was more than 70 per cent in 1995 (Czech Republic - 84 per cent; Slovak Republic - 76 per cent; Poland - 71 per cent; Hungary - 76 per cent in 1994), in Russia this proportion was only 33 per cent, in the same year (Rapacki, p.6). Another source of productivity gains is investment related. It is aimed at reducing incremental capital-output ratio (ICOR) through either replacement of the existing capital stock or through its expansion. Taking into account the large technological gap between advanced economies and countries in transition, there continues to be a considerable scope for productivity gains of this kind in the region.

Table 3. Indicators of Industrial Sector Labour Productivity and Competitiveness in Transition Economies, 1991 - 1995 (in per cent)

Country	Percentage Change				
	1991	1992	1993	1994	1995
Bulgaria					
- labour productivity in industry[1]	-11.1	0.2	5.5	14.2	9.0
- unit labour cost in industry[2]	-35.8	85.4	21.5	-31.4	17.3
Czech Republic					
- labour productivity in manufacturing[1]	-16.6	-7.6	-3.5	4.0	20.5
- unit labour costs in manufacturing[2]	-14.8	32.8	25.8	13.2	6.9
Hungary					
- labour productivity in manufacturing[1]	-17.9	10.7	18.5	7.3	11.2
- unit labour costs in manufacuring[2]	29.4	7.6	-9.6	-1.0	-8.7
Poland					
- labour productivity in manufacturing[1]	-11.9	17.1	14.5	19.2	9.6
- unit labour costs in manufacturing[2]	66.5	-8.7	-8.8	-7.3	15.1
Romania					
- labour productivity in industry[1]	-18.5	-12.3	9.0	11.6	15.7
- unit labour costs in manufacturing[2]	-18.9	-22.6	13.1	-4.7	5.0
Slovak Republic					
- labour productivity in industry[1]	-	7.4	0.6	6.8	4.0
- unit labour costs in industry[2]	-	13.0	12.4	5.9	19.3
Russia					
- labour productivity in industry[1]	-	-	-14.2	-13.6	4.7
- unit labour costs in industry[2]	-	-	134.5	89.3	12.0
Germany					
- unit labour costs[2]	1.6	12.2	-2.1	-4.1	13.0
United Kingdom					
- unit labour costs[2]	6.1	1.8	-14.6	2	6.7

1 - output per employee
2 - in US dollars.

Source: Transition Report 1996. EBRD : London, 1996, p. 118.

Positive trends in labour productivity in industry have been accompanied by a rapid growth of wages measured in dollar terms in most of transition economies (see Table 4). As these increases have been much higher than in industrialised countries, this raises a concern about industrial competitiveness of transition economies. There is no simple answer to this concern, as the change in the dollar wage reflects not only productivity gains but also changes in local currency/dollar exchange rates. Experience of the last few years clearly indicate that an important part of recent dollar wage increase in transition economies is to be attributed to the real appreciation of their currencies, as prices in these countries have risen faster than in advanced economies, while exchange rates vis-a-vis currencies of these countries have either remained stable or depreciated more slowly than inflation. Real appreciation of local currencies, especially in a number of the CEE countries, has been claimed to be one of the main reasons for their growing current account deficits and for losing their international competitiveness.

Table 4. Dollar Wages in Manufacturing or Industry in Transition Economies, 1992 - 1996
(in $ a month, net of social security taxes)

Country	Year				
	1992	1993	1994	1995	19961
Bulgaria	96	123	97	117	126
Czech Republic	162	196	231	296	316
Hungary	224	237	249	250	246
Poland	168	175	220	285	329
Romania	61	74	80	101	100
Slovak Republic	161	175	196	242	256
Estonia	46	78	137	211	255
Latvia	60	73	143	194	221
Lithuania	20	48	87	139	170
Belarus	27	23	33	74	95
Kazakstan	27	70	69	117	152
Kyrgyzstan	14	16	34	53	56
Moldova	20	22	37	48	60
Russian Federation	32	63	96	115	185
Ukraine	28	14	26	47	55

1 - based on data for the first half of 1996

Source: World Economic Outlook, May 1997. IMF: Washington, D.C., 1997, p. 100.

Taking into account the above-mentioned exchange rate considerations, wages measured in dollar terms are not a very good indicator of international competitiveness. A better and a more widely applied measure is the so-called "unit labour cost in manufacturing (in dollar)" which is a ratio of labour related expenses measured in dollar against the productivity of labour. As Table 3 shows, despite productivity gains, Bulgaria, Poland, Slovak Republic and Russia registered unit labour cost increase in 1995 at a rate which was higher or broadly comparable with that recorded in Germany. This indicates that their international competitiveness position deteriorated in 1995 vis-a-vis one of their most important trading partners. On the contrary, competitiveness position of Czech Republic, Romania and especially Hungary improved in the same year (EBRD, 1996a, p. 120).

2.4. Expansion and Geographical Reorientation of Trade

Since the start of the transition, trade has become an increasingly important part of the transition country economies. The ratio of foreign trade (average of export and import) to GDP increased throughout the CEE countries as a result of both, strong growth of foreign trade on the one hand and the GDP decline on the other. In 1995, a combined trade to output of the five CEFTA countries was already at the almost 40 per cent level. For advanced and developing countries, this ratio was only around half of that in the same year. In the Baltics, Russia and some other members of the CIS, the share of trade to GDP has actually fallen between 1990 and 1995. This reflects exclusively the collapse of the trade within the territory of the former Soviet Union while trade with rest of the world has expanded. This has particularly been the case with the Baltic states which more than doubled their trade with the rest of the world to GDP ratio; from around 15 per cent in 1990 to more than 30 per cent in 1995 (IMF, 1997, p. 96-97).

Another important foreign trade pattern of transition economies is geographical reorientation of their trade towards the Western market economies, especially in Europe. The CEE countries and the Baltic states have achieved by far the most in shifting away their trade from the former CMEA countries and in integrating themselves into the global trading system. They

roughly doubled the share of advanced countries in their total exports and imports in the 10-year period between 1986 and 1995; each from below 35 per cent to almost 70 per cent (IMF, 1997, p. 98). This way, the CEE countries succeeded in increasing their portion in the overall imports of the OECD countries. Just between 1990 and 1993, this share increased from for 55 per cent, as shown in Table 5. The penetration of OECD markets was even more successful in the area of manufactured goods where CEE countries more than doubled their share in the same period. This has been due to both, labour intensive industries, especially textiles, as well as more sophisticated manufacturing activities. Within this group, the SITC category 78 (finished cars, parts and components) needs special mentioning, as the market share of the CEE countries increased for more than 4 times between 1990 and 1993. The figure reflects the quickly growing exports of automobiles and automotive parts coming from plants constructed with foreign capital and technology in countries like Czech Republic, Hungary, Slovak Republic, Poland and Slovenia. (UNIDO, 1996a, p.40).

Table 5. Import Shares of Transition Economies in OECD Markets, 1987 - 1993 (in per cent)

Economic Grouping, Region or Country	Year	Total Trade (SITC 0-9)	All Manu-factures (SITC 5-8)[1]	Vehicles (SITC 78)
Central and Eastern Europe	1987	0.94	0.67	0.19
	1990	0.91	0.71	0.19
	1993	1.46	1.43	0.76
Countries of the Former Soviet Union	1987	1.16	0.25	0.23
	1990	1.17	0.21	0.21
	1993	1.17	0.31	0.13

1 - excluding SITC 67 and 68

Source: Industrial Development : Global Report 1996. UNIDO : Vienna, 1996, p.41.

Several factors contributed to the success of the CEE countries and the Baltic states in reorienting their industrial exports. These countries benefited from their geographical proximity to Western Europe and had better initial economic conditions. They also more rapidly stabilised their economies and started the process of industrial restructuring. In addition, these countries have made significant steps towards institutionalising their access to export markets in the advanced countries. A number of the CEE countries and the Baltic states received most-favoured-nation status under the GATT early in transition and later on became members of the WTO. Three countries of this sub-group, Czech Republic, Hungary and Poland, joined the OECD while they and some others also enjoy preferential treatment under the "Europe Agreements" concluded with the EU.

Less favourable geographical position, slower progress in macro-economic stabilisation and industrial restructuring as well as the lack of institutional trade arrangements with Western partners explain why Russia and other member of the CIS have been less successful in reorienting their trade flows. As Table 5 shows, the share of all countries on the territory of the former Soviet Union (these data, therefore, include also the Baltic states) in the total OECD imports stagnated between 1990 and 1993 while their participation in the OECD manufacturing imports, though slightly increased in this period, was in 1993 still more than 3 times lower than the corresponding share of the CEE countries.

2.5. Progress with Financial Integration and Foreign Direct Investments

In the pre-transition period, centrally-planned economies had been largely excluded from the global financial system, as most of them were not members of multilateral financial institutions and as many of them, due to considerable debt servicing problems, had no access to international capital markets.

Reintegration of the region into global financial system started at the outset of the transition process, when practically all countries of the region rapidly joined the three multilateral financial institutions, IMF, World Bank and EBRD. By end 1996, these, together with other multilateral and bilateral official institutions, provided an equivalent of some $75 billion to the region in the form of medium and long-term loans ($43 billion) and grants ($32 billion) (IMF, 1997, p. 102). These official flows, in which all transition economies participated, have paved the way for an increasing flow of funds from private sources. Their share in total transition economies' foreign financing increased from 15 per cent in 1991 to 65 per cent in 1996. While CEE countries and the Baltic states practically ceased to rely on official financing, as seven of them have been investment grade rated and have therefore established full access to international capital markets, a number of other countries, such as Russia, Kazakstan, Moldova and Romania, continue to rely on official resources although they have established a limited access to private capital sources. The third group consists of other member of CIS to which access to international capital markets is still completely denied. They therefore continue depend entirely on official sources of foreign financing.

By far the most important single source of foreign financing for the region, and particularly for its industrial sector, are foreign direct investments (FDI).They do not only complement domestic saving, but also induce an inflow of new technologies, better management practices and create conditions for an improved access to foreign markets - all of them scarce in transition economies. The volume of FDI to countries in transition increased several times during the 1990s (see Table 6). From an annual level of $2.4 billion, it rose to a record volume of $13.1 billion in 1995. In the following year, the volume of FDI declined to $11.3 billion, as intensity of the privatisation process started to slow down. Similarly as in Latin America, a significant portion of FDI to the region is associated with privatisation. Transition economies raised this way $ 8.6 billion in the period 1991 - 1994 and this was equivalent to almost one half of their total FDI inflow in this period (UNCTAD, 1996, p. 64). Foreign investment in "greenfield" investment are slowly gaining importance, especially in countries where GDP growth resumed.

Surge of FDI to the region has been caused by a combination of factors, including strong interest of companies from home countries to spread their operations into new markets, improved macro-economic performance in many countries in the region and reduction of barriers in trade of these countries among themselves and with advanced countries, especially with the EU. In spite of the fact that the region has become increasingly attractive destination for FDI, their cumulative inflow in the 1994 - 1996 is estimated to be only around 4 per cent of the region's GDP compared to around 6 per cent for Latin America and around 13 per cent for East Asia (IMF, 1997, p. 106).

Geographical distribution of FDI inflows has been very uneven. The CEE countries and the Baltic states attracted some 70 per cent of total 1991 - 1996 inflows, and even within this sub-group of countries, there is a big concentration, as Hungary, Poland and Czech Republic alone accounted for almost 60 per cent of total inflows. There are several explanations for this high

Table 6. Net Foreign Direct Investment in Transition Economies, 1991 - 1996 (in millions $)

Country	Yearly inflows					
	1991	1992	1993	1994	1995	1996
Albania	-	10	45	53	70	70
Armenia	-	-	-	3	10	23
Azerbaijan	-	-	-	22	275	601
Belarus	-	7	18	10	7	12
Bulgaria	56	42	40	105	165	180
Croatia	100	13	74	100	100	200
Czech Republic	393	983	552	749	2,526	1 165
Estonia	-	80	154	212	202	210
Georgia	-	-	-	8	6	20
Hungary	1 474	1 471	2 329	1 097	4 410	1 986
Kazakstan	-	100	473	635	859	930
Kyrgyzstan	-	-	10	45	61	31
Latvia	-	43	51	155	165	200
Lithuania	-	10	23	60	55	96
Macedonia	-	-	-	24	12	35
Moldova	25	16	14	18	72	46
Mongolia	-	2	8	7	7	7
Poland	117	284	580	542	1 134	2 205
Romania	37	73	95	347	417	410
Russia	-25	700	900	630	2 000	2 000
Slovak Republic	197	50	134	170	70	66
Slovenia	-	113	112	140	140	145
Tajikistan	-	9	12	12	13	13
Turkmenistan	-	11	79	103	64	80
Ukraine	-	170	200	91	266	436
Uzbekistan	-	9	48	73	-24	84
TOTAL	2 374	4 195	5 950	5 412	13 082	11 250

Source: World Economic Outlook, May 1997. IMF: Washington, D.C., 1997, p. 107

concentration of FDI inflows on these countries: (i) they are fairly advanced in the transition process in terms of macro-economic, political and institutional stability, (ii) they have traditionally strong business and trade linkages with the neighbouring developed countries, (iii) geographical proximity seems to have encouraged not only TNCs but also small and medium-sized companies in EU countries to become international by investing the CEE countries, (iv) prospective membership in the EU has attracted many foreign investors, notably companies from the EU, to relocate labour-intensive lines of manufacturing to countries in Central and Eastern Europe where wages are still well below the labour costs in their home countries, and (v) in some countries, like Hungary, FDI have been stimulated by the form and timing of privatisation, as foreign participation is one of its central pillars. Austria, Germany and the United States have so far been the most important FDI source countries for the region. They accounted for almost 2/3 of cumulative investment inflows into transition economies in the period 1988 - 1994 (IMF, 1997, p. 106).

In terms of sectoral composition, data indicate that in early years of transition, a large proportion of FDI has gone into sectors mainly oriented towards supplying domestic markets, such as trade and distribution services. Within manufacturing, it roughly accounts for some one half of total accumulated FDI in the region, early investments were made primarily in food, beverage and tobacco processing industries. Later on, foreign investors have started to express

more interest in a broader segment, including engineering, automobile production, textiles and chemical industries. This seems to indicate that manufacturing FDI in the CEE countries are becoming more outward oriented and generate an increased trade flows, as foreign investors take advantage of relatively well educated and skilled labour force at a cost much lower than in their home countries.

Following experience of more advanced developing countries, some CEE countries have started to complement FDI inflows with the outflow of investments. This activity is based on traditional business and trade linkages among the CEE countries, some of them have not so long ago been parts of the same states, and is motivated by the search for a supply of key inputs and by requirements for a continuous market presence. Czech firms, for example, have made manufacturing sector investments not only in the Slovak Republic (chemical industry) but also in Slovenia (paper mill, metal products).

2.6. Energy Efficiency and Environmental Degradation

An important feature of industrial structures throughout the transition economies' region is their high energy intensity which is line with the overall energy intensity of these economies. In 1994, for example, with each unit of energy uses (kg of oil equivalent), they produced less than one dollar of GDP. For the world as a whole, this ratio was 2.4 while for the group of high-income economies, where most OECD members are included, the ratio was even 3.4 (World Bank, 1997, p.110-113). Although high energy intensity may be influenced by several other factors, such as structural patterns of the economy, it nevertheless clearly indicates that transition economies are among the most inefficient users of energy in the world.

Energy-intensive manufacturing processes together with the extensive use of solid fuels to produce electricity had resulted in a substantial atmospheric pollution in many countries of the region with negative impacts on the health status of the population as well as on forest degradation. In 1992, for example, carbon dioxide emissions from industrial processes were in relative terms at least five times higher in transition economies than in high income countries (World Bank, 1997, p. 110-113). Transition economies are faced with other environmental problems as well. The inadequacy of waste-water treatment and the disposal of polluted waste water had led to dangerous contamination of surface and underground waters while extensive use of fertilisers and pesticides together with inappropriate treatment of hazardous waste had contributed to further contamination of both, water and soil.

Industry's energy intensity as well as environmental degradation caused by firms from this sector are to a large extent a legacy from the pre-transition period. During the years of transition, the extent of pollution has been reduced as a consequence of both, the fall of economic activity, especially in industry, and because of more effective environmental regulation and improved enforcement. A combination of market reforms and appropriate market policies is required to further improve environmental performance in the region. One view on these policies is presented in Box 1.

Box 1: Policies to Improve Environment

First, changes in relative prices should promote more efficient use of energy and natural resources. Second, privatisation and reduced state interference in industrial decisions will encourage management to improve the operating performance of existing plant, while replacing old equipment with new plants incorporating cleaner production technologies. Well designed environmental regulation and investments can contribute to this process. Third, a clear institutional separation of enterprise ownership from environmental regulatory authority should help ensure realistic environmental standards. Fourth, foreign direct investment and international cooperation can bring in best environmental practices from around the world.

Source: World Development Report 1996. The World Bank : Washington, D.C, 1996, p. 33.,

2.7. Human Resource Level and Development

One important comparative advantages of centrally-planned economies is their relatively highly qualified and skilled labour force, and in this respects, countries from this region were relatively well prepared for the beginning of the transformation The system had provided almost universal primary and secondary enrolment, high levels of literacy compared with countries at similar levels of income, and the quality of education in certain fields, especially math and sciences, was and remains exceptional. The latest findings of the Third International Math and Science Study (TIMSS) provide some indication of the quality of education in these two fields. Of the 41 country in which half a million of 13 year-olds were tested, some former centrally-planned countries did significantly better than many advanced economies. Six of the top 15 places in both math and science went to Bulgaria, Czech Republic, Hungary, Russia, Slovak Republic and Slovenia (Economist, p. 22).

In spite of these qualities, transition to a market economy has nevertheless revealed some serious systematic weaknesses in education and training systems of transition economies. Education under socialist system was targeted towards the needs of the socialist state, emphasising vocational and career-specific training. Workers with vocational background were expected to enter directly the workforce, rather than to continue studies at a university. This philosophy rendered socialist education systems inadequate to the needs of a market economy in at least three aspects (Laporte and Ringold, p. 124): (i) although basic education was in many ways superior to that in many Western countries, subsequent training was too specialised from too early an age, (ii) adult education, essential for job mobility, was neglected, and (iii) subjects like economics, management sciences, law and psychology were deemed largely irrelevant. It is interesting, in this context, to point out that candidates from transition economies do better in international comparative tests on how much they know (see the above TIMSS test) than on tests that ask them to apply the knowledge in new, unanticipated circumstances (see World Bank, 1996, p. 125).

The post-1989 period has already lead to visible changes in the human resource development, as measured by educational enrolment. Recognising the weaknesses of this measure (non-inclusion of informal education; differences in dropout rates among countries), enrolment rates still provide the best available data for measuring cross-country human resource development. The already mentioned study by Laporte and Ringold provides some interesting insights into educational access trends for nine CEE countries in transition(Albania, Bulgaria, Czech Republic, Macedonia, Hungary, Poland, Romania and Slovak Republic) in the 1990 - 1994 period.

- basic education enrolment rates remained at traditionally high above 90 per cent level;
- within secondary school enrolment, the trends were different reflecting developments on the labour market. While enrolments in general 4-5 year secondary program providing general education typically increased, enrolments in 1-3 year vocational/technical programs

This structural change clearly indicates a renewed preference for more flexible secondary education which allows pupils to apply for university admission over the programs providing more narrow training for specific industries and occupations. There is also much less interest for this form of education, as unemployment rates among graduates of apprentice schools are much higher than for other forms of secondary education;

- as far as tertiary school enrolment is concerned, enrolment rates have a tendency of increase, although differences in their level remain huge. In 1994, they ranged from less than 5 per cent in Albania to over 15 per cent in Bulgaria, Hungary, Macedonia, Poland or Romania; this is still less than a half of tertiary enrolment rates in majority of advanced economies. Labour market development have strongly influenced the changing structure of university enrolments. Drastically reduced demand for jobs in heavy industries and high unemployment rates for graduates with university education in manufacturing, engineering and mining have destimulated students from choosing these studies. The shift away from engineering programs was accompanied with growing enrolments in the social sciences, including economics, law, accounting and management, and humanities.

2.8. R&D Performance

Another important potential of centrally-planned economies for efficient restructuring of their industrial base was an established research and development base. Similarly as developed economies, many countries in the region had, before the transition started, a large community of scientists and engineers involved in R&D. The activity was, however, completely differently organised. In contrast to developed market economies, where R&D activities have been carried out primarily at universities, in centrally-planned countries, they had been concentrated around national academies of sciences and around research institutions belonging to branch ministries or to large state-owned enterprises. In these countries, universities were focused almost exclusively on the teaching function.

The organisation of R&D activities in transition economies had provided, in general and with some exceptions, very few incentives for both, providers and potential users of R&D, to work towards creation and commercialisation of marketable technological products. It is therefore not surprising that R&D activities have come under strong pressure during the transition period. As a result of the transition shock and the lack of policy guidelines for the transformation of the technological activities, R&D capabilities in many of these countries have been significantly reduced. This applies to both, the total number of institutions in the R&D area as well as the number of researchers employed therein. It seems that industrial sector research capacities have been most drastically cut at the enterprise level, as firms, facing treats to their survival, have usually been forced to adopt measures with only short-term perspective in mind. These measures have very often included cuts of "unproductive employment", including R&D activities, which give results only on a longer term.

Although expenditures on R&D as proportion of GDP are not a perfect measure of a country's technological status (they do not cover the full extent of this activity), they nevertheless provide an indication of its technological activity. In contrast to Poland, Romania and Latvia which allocated less than 1 per cent of their 1992 GDP for these purposes, for Czech Republic, Slovenia and Hungary the ratios were between 1.1 and 1.8 per cent (World Bank, 1997, p. 280-282). This is comparable with spendings in some other East Asian countries, like Singapore (1.0 per cent in 1992) or Taiwan (1.7 per cent in 1993), but also well below the rates in some OECD countries, such as Japan (3.0 per cent in 1995), Korea (2.7 per cent in 1995), France (2.4 per cent in 1994), United States (2.4 per cent in 1995) or Germany (2.3 per cent in 1991) (Lall, p. 29).

3. Industrial Sector Structural Transformation

In countries in transition which had rather quickly and successfully stabilised their economies, it has soon become clear that macro-economic reforms alone, although necessary, will not lead automatically to supply responses needed for a comprehensive transformation of these countries' economies in general and their industrial sectors in particular. These reforms namely do not deal systematically with structural weaknesses of the existing industries (they have, by and large, shown to be highly non-competitive, inefficient, unprofitable and polluting), with the lack of entrepreneurial cadres as well as managerial and supervisory personnel, and also with inadequacies in technological, financial, accounting, marketing and quality control areas.

To address these weaknesses at both sectoral and enterprise levels, a comprehensive structural transformation of the industrial sector has become of crucial importance. Major components of this transformation - it is by its very nature a much more long-term process than macro-economic stabilisation - are the following: (i) strengthening of the legal and regulatory framework, (ii) financial sector reforms, and (iii) enterprise sector reforms, comprising private sector development through privatisation and promotion of new private enterprise, and enterprise restructuring.

Similarly as in areas related to macro-economic stabilisation, there are huge differences among individual transition economies in terms of the progress achieved in the structural transformation of their industries. Countries that have already carried out comprehensive macro-economic stabilisation program, mainly those from the CEE and Baltic sub-regions, are typically also countries which are now in a more advanced stage of industrial sector transformation. In contrast, countries which have been late with the introduction of macro-economic stabilisation measures, are lagging behind also with industrial transformation processes.

3.1. Strengthening of the Legal and Regulatory Framework

Being aware of the fact that an appropriate legislation is a necessary condition for an efficient transition from centrally-planned to market economy, all countries in the region started at the very outset of the transition with a comprehensive reform of their legal and regulatory systems. Although the design of a fully operational legal and regulatory framework takes time and makes heavy demands on scarce human resources of these countries, many of transition economies have already gone a long way in drafting laws in all areas fundamental for industrial sector transformation. By now, a majority of countries have adopted property, contract, security, bankruptcy, competition and company legislation.

Although passing the legislation is an important step forward, experiences indicate that it is of limited relevance if not accompanied with effective implementation and enforcement. In the property legislation, the letter of the law typically puts private property on equal footing with state property. Yet several of these new rights still remain limited by various constraints. In some countries of transition there is a general lack of reliable land registration system what makes it difficult to ascertain the identity of the actual owner of a particular land, which in turn makes the validity of transaction over such property dubious. Another problem associated with property rights is the reluctance to make loans when the only collateral is movable property.

Similar problems may be observed in practically all other legal and regulatory areas. Contract legislation, for example, is often constrained by a shortage of institutions to enforce contracts what reduces the scope of transactions and makes contracts more costly. As far as legal rules fostering investment are concerned, cross-country differences are not only in terms of

judicial enforcement but also in terms of their approximation to international standards and clarity in their design. Experiences indicate that the CEE countries and the Baltic states have in general made greater progress than those in the CIS sub-region. In these countries, the laws are often compromised by being unclear due to poor drafting potentials, they are inaccessible or hardly accessible to all interested, and they are also poorly supported administratively and judicially (EBRD, 1995, p. iv and 104-107).

Bankruptcy legislation is another extremely important legal segment closely related to industrial transformation process. Efficient bankruptcy law, it includes procedures for both liquidation and reorganisation of problem firms, plays several important roles in market economies. It provides failing firms with an orderly procedure of exit and ailing but potentially viable firms with a means of restructuring. It also promotes the flow of credits by protecting lenders (World Bank, 1996, p. 91). Although many transition economies have adopted well designed bankruptcy laws, inadequate judicial and administrative support have in some cases slowed down their implementation.

3.2. Financial Sector Reforms:[2]

Transition to market economy has required a completely new role for the financial sector and the main challenge for policy makers in this area has been to overcome the legacy of the central planning in this area while at the same time design and develop an efficient system of financial markets and institutions. There are at least two reasons why financial sector restructuring has been of strategic importance for transition economies. First, without active financial market mechanism, these economies, having abandoned planning, have no alternative allocation mechanism. Second, through the intermediation of financial institutions, resources can be channelled directly to newly privatised firms and private entrepreneurs.

Taking into account the dominance of banking in overall financial systems of countries in transition as well as the nexus of non-performing loans and enterprise sector losses, banking sector reform has been in the forefront of financial reforms. Introduction of market reforms has forced banks to start their transformation from passive distributors of credit to professional bankers. As in other market economies, banks in countries in transition are now required to be active in meeting their clients' financial needs on the one hand, and on the other, they have to adhere to capital adequacy criteria and to new accounting rules regarding the provisioning of debt.

The banking sector transformation process has been challenged by:

(i) high concentration of banking markets: Market shares accounted by the top five banks in Belarus, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Slovenia and Ukraine ranged between 63 and 79 per cent in 1994 (EBRD, 1995, p. 161). These high shares, a direct legacy of the pre-transition period, reflect the continued dominance of state banks or former state banks.

(ii) non-performing loans: As a result of transition shocks, huge financial losses have been accumulated by the enterprise sector in all countries of the region and their mirror picture

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[2] Due to the continued dominance of banks in the structure of transition economies' financial sector, the section does not discuss issues related to securities markets and non-bank financial institutions, although their recent development has been extremely rapid in some countries of the region and clearly offers a substantial potential to complement the banking sector in meeting financing needs of the corporate sector, and particularly of larger companies.

has been an appearance and/or increase of non-performing loans in the balance sheets of banks. In the three more advanced transition economies, Hungary, Czech Republic and Poland, non-performing loans accounted between 29 and 39 per cent of total bank loans in 1994 (IMF, 1996, p. 96) while fragmentary data indicate that this ratio is much higher in several other countries of the region.

(iii) high transaction costs: It is apparent that high level of non-performing debts has compelled banks in many transition economies to maintain quite wide margins between lending and deposit rates. In more advanced countries in transition, spreads range between 4 per cent in the Slovak Republic and 13 per cent in Estonia (IMF, 1996, p. 96). Another reason for high transaction costs are high operating cost of banks. Due to lower efficiency of the banking sector, these are typically twice as high as in developed market economies.

(iv) access to bank loans: Bank lending is highly concentrated on existing customers from mid-size and large companies, very often still in state ownership. The de-facto privileged access of these companies to bank financing limits the amount of credit available to new potential borrowers, especially small enterprises and individual entrepreneurs.

There are other obstacles on the road of efficient banking sector transformation. Banks are typically characterised by the lack of senior banking staff with experience in credit and risk analysis. They have to deal with the staff risk aversion problem as well as with the lack of banking culture that emphasises the need for partner-type cooperation with enterprise. Very often banks have to cope with the problem of insufficient information concerning the creditworthiness of potential clients and have to operate in a environment with inadequate protection of lenders' property rights.

As a result of all above, there continues to be a lack of active involvement of banks in the restructuring of the corporate sector in many transition economies (Box 2 discusses structure of corporate financing in transition economies). Instead of becoming actively involved, banks often remain passive observers, unaware of enterprises' needs. Consequently, they are unwilling and/or unable to play an active role in addressing real problems of the enterprise sector. Appetite of bankers for corporate financing in transition economies is further reduced because of their preference for government securities. Investment in government papers namely carries similar nominal yield as lending to enterprise, but with practically zero risk.

Box 2: Structure of Corporate Financing in Transition Economies

Fragmented empirical evidence (EBRD, 1995, chapter 5 and Žižek and von Liechenstein, 1995) suggests that in contrast to enterprises from the developing world, enterprises from transition economies rely much more on their internal cash flow. This pattern of corporate financing which largely reflects the withdrawal of government from the direct or indirect provision of finance for enterprise financing is in close similarity with the structure of corporate financing in the developed world. Although the structure of corporate financing in transition economies is close to that one in developed market economies, this similarity is far from being a desirable one. In transition economies, high dependence on internal financing is namely caused by the ownership structure of enterprises which continues to be not conducive to efficient decisions and one way of improving efficiency in investment decision processes is to promote the increased use of outside finance by the enterprise sector.

Source: EBRD, 1995, p. 99.

In spite of difficulties, several transition economies have gone a long way in transforming their banking systems. The transformation has been implemented through a combination of various policy measures. In addition to creation of the two-tier banking system and interest rate liberalisation in early stages of transformation, government policies in this area have typically included reforms of prudential regulation and supervision, recapitalisation and privatisation of state owned banks and new entrance of new private banks.

Countries across the region differ not only in terms of the design of these policies but even more so in terms of their implementation. Capital adequacy regulations have been introduced throughout much of the region, but enforcement capability for effective banking supervision remains rather weak, especially in many members of CIS. As far as dealing with non-performing debts is concerned, two completely different approaches have been used even by countries with similar approaches to many other economic policy reforms. Among the five CEFTA countries, for examples, some of them have opted for a centralised or top-down approach with a special workout agency established to handle bad debt taken over from banks, while others have followed a decentralised or bottom-up approach, leaving banks and enterprises to directly negotiate solutions.

3.3. Enterprise Sector Reforms

This segment of structural transformation in countries in transition involves processes associated with a transition from a public dominated to a private dominated economy in general and industrial sector in particular. These processes include (i) introduction of competition and financial discipline in the enterprise sector; (ii) private sector development through both, privatisation of state-owned firms and promotion of new private firms; and (iii) restructuring of enterprises in both, pre or post-privatisation periods, aimed at their shifting away from low value-added industries with high energy and raw material intensity and with outdated and environmentally questionable technology.

a) Introduction of Competition and Financial Discipline: The collapse of the CMEA market and of the arms trade were among the most immediate causes for growing financial difficulties of the region's industrial sector already in the last years of the centrally-planned period. In many countries, enterprises initially responded to these shocks by continuing to produce for inventory, as financial resources were still available through forced bank lending.

   The first years of transition have seen a continuous deterioration of enterprises' liquidity position, as their sales have been further reduced or even stopped due the opening of the markets to foreign competition while the banks have, in a changed environment, become much more reluctant in extending new loans. In circumstances of strong liquidity squeeze and with a clear priority to pay labour costs first, enterprises typically started to defer their payments to suppliers. This has resulted in a rapid increase of inter-enterprise arrears and in some cases also of arrears of the enterprises on their tax and social security payments. In order to address this problem, several countries in transition have implemented complex schemes for netting out arrears between firms.

   In addition to curtailed bank lending, sharply reduced government subsidies, being made either through direct or indirect budget transfers or through subsidised energy and/or other input prices, have been another important element of imposing financial discipline on the enterprises sector. In Russia, for examples, total federal subsidies fell from 32 per cent of GDP in 1992 to about 6 per cent of GDP in 1994 (World Bank, 1996, p. 45) while on the territory of former Czechoslovakia they declined between 1998 and 1995 from

25 per cent to 3 per cent in the case of Czech Republic and 4 per cent in the case of Slovak Republic (EBRD, 1996a, p. 19).

b) Privatisation of State-Owned Enterprises: In contrast to market economies, developed and developing, where mixed economy has prevailed and where privatisation has meant an enhancement of already existing market rules in economic activity, for countries in transition, privatisation has become one of crucial tests for the commitment of new governments to the establishment of a market-based economic system and a political system based on private property rights and individual freedoms.

Practically all countries of the region have pursued privatisation on two parallel tracks. The first one, called "small-size privatisation", refers mainly to privatisation of retail outlets, transport equipment and service enterprises. This segment of privatisation has, typically, not been politically controversial and has received strong popular support, as the procedures were relatively transparent and positive effects strikingly visible on a relatively short run. "Small-scale privatisation" has been either completed or is in very advanced stage of implementation throughout most of the region. With exception of 4 countries, Azerbaijan, Belarus, Tajikistan and Turkmenistan, all transition economies for which progress in transition has been quantitatively measured by the EBRD have either completed or nearly completed "small-scale privatisation" (EBRD, 1996a, p. 11).

In contrast, the so-called "large-scale privatisation", i.e., privatisation of former state-owned enterprises, including those ones in industrial sector, has proved to be more complicated than originally thought and as a consequence, the advancements have been generally slower that in the case of "small-scale privatisation" and also less uniform across the countries of the region. Slower pace of "large-scale privatisation" has been typically caused by one or a combination of the following reasons: high capital requirement, major restructuring needs, restitution problems, regulatory and governance weaknesses and also political sensitivity or even resistance.

Countries have applied a wide range of methods for privatising their large and middle-sized companies. Some countries, Hungary is the most notable case, have been successful in selling their enterprises to strategic, often foreign investors. Others, like Croatia and Slovenia, have relied more on internal ownership transformation in the form of management buy-outs. An imperative for a massive and rapid privatisation accompanied to be done in an environment with the lack of prospective strategic buyers explain why voucher privatisation has also been extensively used in the region. Countries as diverse as Armenia, Bulgaria, Czech Republic, Slovak Republic, Poland, Romania, Russia, Ukraine and Slovenia, have privatised large stocks of their assets by applying various voucher schemes (EBRD, 1996a, chapter 2).

Table 7 shows achievements of individual countries in transition with "large-scale privatisation", as presented as presented in the 1996 Transition Report of the EBRD.

The most complete privatisation has been implemented by Czech Republic, Hungary and Estonia. These countries have already privatised most of their large scale industrial enterprises, keeping under state ownership only a limited number of "strategic" industrial corporations. With exception of Albania and Bulgaria, also other CEE countries and the remaining two Baltic states have made significant advancements in "large-scale privatisation" of their industrial entities. In contrast, privatisation of large enterprises continues to be either very slow or even non-existing in some CIS countries, like Azerbaijan, Belarus, Tajikistan, Turkmenistan and Ukraine.

Table 7. Progress in "Large-Scale Privatisation" and Enterprise Restructuring in Transition Economies

Countries	Large-scale Privatisation [1]	Enterprise Restructuring [1]
Albania	2	2
Armenia	3	2
Azerbaijan	1	2
Belarus	1	2
Bulgaria	2	2
Croatia	3	3
Czech Republic	4	3
Estonia	4	3
Georgia	3	2
Hungary	4	3
Kazakstan	3	2
Kyrgyzstan	3	2
Latvia	3	3
Lithuania	3	3
Macedonia	3	2
Moldova	3	2
Poland	3	3
Romania	3	2
Russian Federation	3	2
Slovak Republic	3	3
Slovenia	3	3
Tajikistan	2	1
Turkmenistan	1	1
Ukraine	2	2
Uzbekistan	3	2

1 - Countries are categorised according to the progress achieved. Category 1 means that little or no progress has been achieved while category 4 means that the process has been almost completed.

Source: Transition Report 1996. EBRD :London, 1996, p. 11.

Table 8 provides some additional information on the progress with privatisation of manufacturing firms in selected CEE countries.

Table 8 Progress with Privatisation of Manufacturing Firms, 1995 (per cent privatised)

Country	Firms (percentage)	Output (percentage)
Bulgaria	8	7
Czech Republic	89	93
Hungary	67	65
Poland	61	60
Romania	15	12
Slovak Republic	79	83
Slovenia	41	41

Source: Pohl, Gerhard. Privatisation and Restructuring in Central and Eastern Europe: Evidence and Policy Options. Transparencies presented in Ljubljana, spring 1997, p.3.

c) Promotion of SME Development; Small and medium-sized enterprises, as the most vital and dynamic component of market economies, play an important role in their overall economic growth and development. SMEs which typically account for more than a half of a country's industrial output and employment (EBRD, 1995, p. 139), are represented in all major branches of the industrial sector and are likely to be less concentrated in urban areas than large-scale enterprises. For all these reasons, SMEs, constitute an ideal vehicle for the promotion of economic and industrial development.

Now-days transition economies, with exception of some Central European countries, were effectively without the SME sector before the transition started in early 1990s. Since then, the situation has changed dramatically. Laws setting up a legal framework for small businesses development have been adopted and transition economies have actually witnessed an impressive growth and development of the their SME sector. The process has been marked especially by the surge of new small firms created either in the form of start-ups, mainly in trade and other service sectors, or through spin-offs of large state-owned enterprises.

By now, the size of the SME sector increased throughout the region. There are, however, large differences among individual countries. In some of them, like Poland and Macedonia, contribution of SMEs to GDP has already increased closely to one half of the total output. SMEs have also become important employers. In more advanced countries in transition, their employment share is typically over 20 per cent while in Russia and some other member of CIS, like Belarus, Kyrgystan and Tajikistan, this rate is 10 per cent or less half (EBRD, 1995, 147-152).

In early transition period, SMEs had been highly concentrated in services sector, but as the transition progresses, a more significant presence of industrial sector SMEs is being established. In most countries of the CEE and in the Baltic states, small industrial business already account for between 10 and 20 per cent of the total number of SMEs (19 per cent in Poland, 18 per cent, 17 per cent in the Czech Republic and Estonia, 15 per cent in Hungary, 13 per cent in Lithuania and Slovenia, 11 per cent in Romania). In some members of the CIS countries, this share is lower; 8 per cent in Azerbaijan, for example (EBRD, 1995, p. 147-152).

There are several obstacles entrepreneurs from transition economies are facing. Some of them are common to all countries in the region while others are more country specific.

One important barrier for an even faster development of SMEs are frequent changes in the regulatory environment. Over the years, major improvements have been made in this area in several countries, and consequently also the extent to which these changes are still considered as constraint has been reduced. Many other obstacles have also become less of a problem as transition advances. For example, macro-economic stabilisation has resulted in reduced inflation and lending rates, improving overall business environment for SMEs. Now, small businesses also depend less on large state-owned enterprises for buying inputs and for selling their products. They have also better access to specialised training aimed at quality improvement, management and technology counselling. Last but not least, sometimes hostile social environment to SMEs development has dissipated as social acceptance of the market deepens and a critical mass of entrepreneurs is established (EBRD, 1995, p. 143).

Table 9. Sources of Funds for SME Financing in Transition Economies (in per cent)

	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia
A: For start-ups					
Own savings	18	40	50	20	71
Commercial or investment bank loan	42	9	12	41	4
Profits from the business	14	7	10	17	6
Other	25	46	28	22	19
B: For established businesses					
Own savings	2	14	15	4	17
Commercial or investment bank loan	38	20	23	31	13
Profits from the business	46	44	36	52	61
Other	13	22	25	12	10

Source: Žižek, Jan and von Liechtenstein, Heinrich. Venture Capital and Entrepreneurship in Central and Eastern Europe : 750 Central and East European Dynamic Entrepreneurs Database Survey. PHARE, EFER and ECVA Final Report, 1995, p 18-19.

An important obstacle which continues to prevent an even faster SME development is the lack of both, financial resources and institutions specialised for this segment of financing. For starting up, SMEs typically rely primarily on their own savings, but then, once SMEs are established, they mainly combine reinvested profits and bank credits. Table 9 shows the structure of financial sources for SMEs in five CEE countries, based on the survey of more than 800 fast growing and successful private companies (at least 150 dynamic enterprises per country). Better access of SMEs to bank lending is usually constrained by the combination of high lending rates and demanding collateral requirements. The problem of SME financing is further complicated, as there is practically no equity financing available to these firms in many countries of the region.

d) Industrial Restructuring: In the world of constant changes, industrial restructuring is centrally concerned with improving the efficiency with which an industry adapts itself to changing constraints and opportunities in an economic environment. Firms throughout the

world must continuously restructure in order to maintain profitability challenged by increasing global competition and rapid technological changes. For countries in transition, industrial restructuring is even more important. For them, it does not only mean maintaining enterprise profitability but rather a process of transforming a highly distorted economy with many large loss-making industrial firms into a viable market economy in which most industrial enterprises are internationally competitive and profitable.

Industrial restructuring in countries in transition involves activities at both, policy and enterprise levels. Although restructuring at the company level is essential, it can only be effective if not closely coordinated with policies at national and sectoral levels. Successful restructuring, for example, depends crucially on the quality of corporate governance which is influenced by processes of property rights determination and privatisation and is closely linked with the banking sector reform. To be successful, enterprise restructuring has also to be accompanied by strict financial discipline characterised by phasing out of government subsidies and soft loans as well as by creation of a sound legal and regulatory environment. It should institutionalise necessary changes in the relationship between enterprises and their creditors empowering them to press for bankruptcies for enterprises unable to service their future debts. This relationship is highly controversial, because there is a constant danger of premature foreclosure and bankruptcy, particularly when present inability to service past debt is not an indicator of potential profitability. Balancing the objectives of not to prematurely close enterprises and avoiding moral hazard incentives that they will be bailed out again in the future, is one of the most difficult tasks of enterprise/financial reforms in the region.

At the enterprise level, industrial restructuring is complex as well. To be successful, it has to efficiently combine skills in as diverse areas as management and organisation skill, marketing, accounting and financial control, specific training and technical and technological matters concerned with product adaptation.

Over the last five to seven years, countries in the region have achieved very different progress in restructuring their large, mainly industrial enterprises. According to the EBRD (see Table 7), only some CEE countries (Croatia, Czech Republic, Hungary, Poland, Slovakia and Slovenia) together with the three Baltic states, have made significant progress in restructuring their enterprise sector. Although non of these countries has reached standards and performance typical in advanced industrial economies" in this area, all of them have taken "significant and sustained actions to harden budget constraints and to promote corporate governance efficiently" (categories 3 and 4 in the Table 7) (EBRD, 1996a, 11-12). Better enterprise restructuring results of these countries can be attributed primarily to the their overall advancement in the transition, but also to their efforts for an early accession to the European Union. Main conclusions of the study analysing restructuring of industrial firms in seven CEE countries over the period 1992 - 1995 are presented in Box 3.

All other countries of the region have been less successful in their enterprise restructuring. Most of them, including the two largest ones - Russia and Ukraine, have taken some measures to increase competition and have tightened the access to government subsidies and soft loans (category 2 in Table 7), but they have remain weak in enforcing bankruptcy legislation and in establishing a more efficient corporate governance. There are also two countries, Tajikistan and Turkmenistan, where it is claimed, that serious restructuring is yet to start (category 1 in Table 7).

Box 3: Restructuring of Industrial Firms in Seven CEE Countries : Conclusions of an Empirical Study

The World Bank study, analysing restructuring of industrial firms in Bulgaria, Czech Republic, Hungary, Poland, Slovakia and Slovenia, is based on financial and operating data for more than 6,000 industrial firms over a period 1992 - 1995. All the firms were previously state-owned and many still are. In 1992, these firms accounted for between 40 and 95 per cent of the industrial employment in these countries.

The study has taken two measures of restructuring. The first one, the change in the profitability of firms, is used to determine whether, and if yes to what extent, firms have restructured over the 1992 - 1995 period. The conclusion is that some restructuring has occurred in all seven countries, but differences are substantial. More substantial progress has been made in the Czech Republic, Hungary, Slovakia and Slovenia, while firms in Bulgaria and Romania showed little improvement in profitability over the period.

Another measure of restructuring is the increase in total factor productivity. It is used to identify those government policies that most encouraged firms to restructure. They are the following: First, fast privatisation is instrumental in encouraging restructuring. On average, a firm that has been privatised for five years will increase its total factor productivity 150 per cent more than a similar firm that is still in state ownership; Second, restraining wage growth to a level below labour productivity growth is associated with higher levels of investment and thus restructuring. Third, policies that increase bank lending to firms or forgive debts of firms may do more harm than good. Only when banking systems are sufficiently reformed and market-based a positive effect of increased bank lending on restructuring has been observed. Fourth, bank recapitalisation can best wait. The safest course of action is to recapitalise the banks if necessary only as a part of their privatisation and to encourage them to negotiate the financial restructuring of firms including debt forgiveness only after they are privatised.

Source: Pohl, Gerhard and Anderson, Robert and Claessens, Stijn and Djankov, Simeon. Restructuring Industrial Firms in Central and Eastern Europe : Evidence and Policy Options. The World Bank : Washington, D. C., 1997 (mimeo)

4. Industrial Competitiveness Policies : Scope And Options

4.1. Industrial Policy under Central Planning and the "Pendulum Effect" in Early Transition Period

Ex-communist countries were placing a great emphasis on the development of the industrial sector therefore industrial policy was one of their main economic concerns. Under the centrally-planned system, industrial policy designed by governments and their planning commissions not only laid down production and investment plans for each individual industrial company as well as prices for their outputs but also guaranteed supply of inputs and development of marketing channels for output.

In the first years of transition, a kind of a "pendulum effect" has been registered in many countries of the region, as a highly interventionist industrial policy approach of the centrally-planned system was exchanged with another extreme, i.e., with complete hands-off approach to industrial policy. Under this approach, it is argued that industrial development should be left entirely to the market forces who should select winners and losers. It is further assumed that stable macro-economic environment would bring about necessary adjustment in the enterprise sector and that government involvement in the industry should only be exceptional.

On the conceptual level, the hands-off or laissez-faire approach to industrial development has prevailed in early transition period. In practice, however, governments of practically all countries in transition had been intervening directly or indirectly in order to address growing social tensions emerging from high rates of industrial unemployment. These interventions were most often ad-hoc and short-term in their character.

4.2. Industrial Competitiveness Policies are Gaining Importance in the Region

After a few years of being practically excluded from general economic policies, systematic support to industrial sector development is attracting again attention of policy makers. In contrast to the traditional industrial policy, characterised primarily by interventions aimed at protecting and promoting specific industries or sectors, the new approach, it is based on supply-side measures aimed at boosting international competitiveness indirectly, addresses more long-term and structural needs of the industrial sector.

Two sets of factors explain why the region has been increasingly relying on industrial competitiveness policies. The first one are factors of a global character. They refer to changes in the international business environment which have, through globalization and liberalisation of trade and capital flows, narrowed the range of industrial policy options available to governments. As a consequence, industrial policy has shifted away from interventions designed to protect and promote a special industry or sector to more horizontal programs aimed at increasing industrial competitiveness indirectly through measures, such as investment in education and R&D, greater support for technological development and technological transfer, investment in infrastructure, more efficient range of industry-related services.

Another set of factors in favour of industrial competitiveness policies is more region specific. It incorporates factors influenced by specific patterns of economic, and particularly of industrial development in transition economies since early 1990s. Some of them are the following:

(i) There has been a growing recognition of transition economies, especially among the advanced transformers, that hands-off approach to industrial development is not sufficient for a long-term and sustainable transformation of the industrial sector, as it does not deal systematically with structural weaknesses;

(ii) Over the five to seven years of transition, the industrial structure in the region has experienced dramatic changes, including sharp drop in production and geographical reorientation of trade, privatisation of many industrial capacities and an increased foreign participation in several industrial branches. In spite of these and some other structural changes, negative patterns of the industrial sector from the pre-transition period have not yet been eliminated. On the contrary, in some less advanced countries of the region, structural problems have even become more acute;

(iii) Although the region's industry has increased international competitiveness and is rapidly getting acquainted how to operate in a global environment, these improvements are not region-wide, and also within each individual country, they are typically concentrated on a relatively small group of firms.

(iv) In the light of their EU membership aspirations, the CEE countries and the Baltic states are facing a difficult task of accelerating the transformation of their industrial sector. Firms from these countries must become able to compete with EU firms without the need for subsidies or excessive risk of bankruptcy and loss of employment.

As advanced transforms, the CEE countries and the Baltic states, are ahead of the other countries in the region with respect to the acceptance and actual use of industrial competitiveness policies. Although forms in which these policies are incorporated into overall economic development vary from one country to another, they all have one thing in common. By introducing macro-economic stabilisation, trade liberalisation, enterprise privatisation and restructuring and by integrating themselves into international trade and financial flows, they have accepted a general competitiveness policy approach. For the time being, most countries of this sub-group implement industrial competitiveness policies implicitly what means that the policies

are embodied in several instruments addressing individual policy issues. There are also at least two countries, Hungary and Slovenia, which have put these policies into an explicit form. They have both adopted a special document aimed at increasing competitiveness capabilities of their industries.

In the CIS, overall transition process and also a general acceptance of industrial competitiveness approaches is less advanced. If this is less the case at the conceptual level, the issue is much more pronounced in practice. By and large, these countries have not yet succeeded to create a sound macro-economic environment and they are late in the privatisation of industrial capacities, especially of large industrial conglomerates, while their restructuring has in some countries not even started. All this strongly indicates that these countries are lagging behind also in activities aimed at strengthening industrial competitiveness of their economies as well as activities aimed at developing programs and policies for broadening their, in some cases, extremely narrow industrial base. An illustration of this point are the four Central Asian member of the CIS. None of them appears to have developed a clear "vision" for industry in the form of a comprehensive industrial development, although all of them have stated their intention to develop or launch such a program. Obstacles preventing them to do this effectively are numerous, including a lack of basic statistical data and limited capabilities within the governments (UNIDO, 1995, p. 2).

4.3. The Role of Governments in Promoting Industrial Competitiveness Policies in Transition Economies

Over the last five years, governments in transition economies have been continuously reducing their role as producer of industrial goods, giving the way to rapidly growing private sector. Nevertheless, the role of government policies in supporting industrial development remains significant. Governments have to create a regulatory framework and have to design and pursue policies that support industrial development. In line with the global trends and in contrast to pre-transition period, these policies are required to be horizontal and non-discriminatory in their character. They are also expected to foster competition and operation of market-forces.

Within this general approach, policies to be applied by authorities in transition economies in order to support their industrial competitiveness are numerous and vary in their relative importance for each individual country.. Some of these policies are general in their character and therefore address industrial competitiveness issue indirectly while others are more directly industry focused.

A precondition for an effective industrial competitiveness policy is maintaining or, if necessary, creating a stable macro-economic environment with low inflation, competitive exchange rates and sustainable fiscal position. Full integration into global economy achieved through increased competition on domestic markets, institutionalisation of foreign economic relations, promotion of FDI and better access to foreign financial markets is also instrumental.

It has been mentioned already that macro-economic stabilisation is not sufficient for effective industrial restructuring of transition economies if not accompanied by the whole segment of structural policy reforms. Among them, policies related to privatisation and restructuring of industrial firms, are of utmost importance from industrial competitiveness point of view. For export-oriented restructuring of industrial firms, governments need to take carefully-targeted policy measures which are to support these processes. They include measures aimed at (i) promoting exports, (ii) increasing innovative technological capabilities of enterprises, (iii) providing technological and institutional support for SMEs, especially in less developed regions, (iv) increasing educational level and skill development, (v) supporting use of modern information

technologies (vi) strengthening R&D capabilities, (vii) supporting physical infrastructure developing, and (vi) creating conditions stimulating environmentally sustainable development. All these supply-side policies, by and large horizontal in their character, are to be based on long-term industrial development visions designed and implemented in close coordination between the government and the private sector. By applying them, governments can and should create an economic environment conducive for private sector operation, but business decisions as such are left to the companies themselves.

As far as industrial interventions in the form of direct or indirect government subsidies and subsidised credits are concerned, their relative importance throughout the region has been eroding as a part of the transition process. In spite of this general trend, it is nevertheless expected that, for reasons similar to those in many advanced economies, i.e., economic and/or political importance of selected branches or large individual enterprises, these policy instruments will remain very much active also in the years to come. What countries should try to achieve in this respect is to use these instruments with an extreme selectivity in terms of the amount, duration and form and in close coordination with other macro-economic and structural policies.

5. Role of UNIDO in Supporting Industrial Development in Transition Economies[3]

5.1. Comparative Strengths and Weaknesses of UNIDO

Over the last four years, UNIDO has been making continuous efforts to adapt its functions and priorities to the new realities of the changing international economic environment, and also to strengthen its viability and efficiency. The ongoing reform process has required an assessment of the Organisation's main comparative advantages over other multilateral organisations. Among the now-a-days strengths of UNIDO, the following seem to be rather important: (i) it is the only specialised organisation of the United Nations mandated to support industrial development; (ii) it is widely recognised as an honest broker for industrial cooperation and as a neutral provider of technical assistance in various areas related to an efficient and environmentally sustainable industrial development; (iii) it has acquired extensive experience and possesses a strong potential for providing comprehensive expertise at all significant levels of industrial development, including the policy and strategy level, the institutional level and the enterprise level; (iv) it has gathered expertise and experience in providing industrial support to commercially less attractive agents, such as SMEs; and (v) it has established itself as a global forum for industrial statistics and as an important focal point for industrial research and information.

As far as now-a-days weaknesses are concerned, UNIDO has addressed many of them during the last few years of restructuring. In spite of significant achievements, the Organisation is still faced with several problems: (i) in certain environments, it continues to have a rather negative image of an inefficient, if not even absolute institution; (ii) its services are still claimed not to be focused sufficiently, and that therefore its human and financial resources continue to be spread too thinly over a too wide area of activities; (iii) it has financial problems due to drastic budget reductions over the last few years; (iv) although laying-off of staff has been concentrated on

[3] With respect to information regarding UNIDO, the chapter draws extensively on the report prepared by a team of external independent consultants for the Danish Ministry of Foreign Affairs/Danida in May 1997 (Danish Report).

technical staff and professionals in areas considered as non-core activities, restructuring process has nevertheless been associated with certain losses of professional expertise, as some of the best professional staff left the Organisation by opting for either early retirement or for other employment opportunities; (v) de-moralising atmosphere upon the staff, as its attention is focused on internal organisational changes and related personal uncertainties rather than on efficient provision of services to clients.

5.2. Expected Demand for UNIDO's Services from Transition Economies

UNIDO's activities in support of the industrial development of transition economies will have to fulfil several different criteria, including relevance in terms of countries' development objectives, sustainability in terms of their existing infrastructural and resource base, and economic efficiency. In order to be able to achieve these criteria, UNIDO's contribution to the sustainable industrial development of these economies will have to be "client" based. In supplying its services to the region, the Organisation will have to act in a flexible demand-driven manner, responding to specific needs of the "client" in each individual country in transition concerned. This "client" may either be central government itself, or a regional governmental or non-governmental organisation, or a private or public enterprise or institution.. The structure of demand for UNIDO's services will not be influenced only by differences among "clients" within each individual countries but even more so by differences in needs among the countries of the region.

Based on the analysis of industrial sector developments in transition economies (chapters II to IV) as well as on the presentation of now-days strengths and weaknesses of UNIDO (section 5.1), several activities, for which the Organisation has comparative advantages and are at the same time in demand by transition economies, can be identified. In general, these activities can be classified in two groups, first, technical cooperation services in particular areas of industrial development for "clients" in individual countries, and second, industrial global forum activities.

a) Services in Particular Areas of Industrial Development for "Clients" in Individual Countries: Technical cooperation services to be demanded by individual transition economies include assistance at both, policy and enterprise levels. As far as the first one is concerned, the design and elaboration of industrial development strategies seems to be of utmost importance policy. It has been mentioned already that global industrial development has undergone significant changes over the last 15-year period. These changes have been even far more dramatic in transition economies, as these countries abandoned the system of centrally-planned industrialisation and embarked on a process of introducing market-based industrial development. In several countries in transition, especially in those less advanced ones, there has been and still is a real lack of a coherent vision for industrial development (see, for example, UNIDO, 1995, p. 2). This and a high relative importance of the industrial sector for overall development of these countries in both, output and employment generation, clearly indicate their need for external assistance in these areas.

With its mandate and experience, UNIDO is well placed to support their elaboration of industrial development policies, sub-sectoral strategies as well as preparation of appropriate institutional arrangements for their implementation. All these policies, aimed primarily at opening industrial sector to the market economy conditions while at the same time achieving employment generation and regional development objectives, are to be fully integrated into macro-economic framework designed and implemented by these countries in coordination with other multilateral development institutions with comparative advantages in this area, like the two Bretton-Woods institutions and to some extent also EBRD.

At lower levels of industrial development, i.e., at sub-sectoral and enterprise levels, transition economies have large technical assistance needs as well. The demand for UNIDO's services is, however, expected to be concentrated in those areas where the Organisation has comparative strengths over multilateral and bilateral assistance providers as well as over the private sector.

- Industrial restructuring: Taking into account the status of industrial restructuring in the region, there is an enormous need of transition economies for services in this area.

  UNIDO has expertise and has build some experience in providing transition economies with technical assistance in certain segments of industrial restructuring. This assistance has typically been aimed at increasing international competitiveness of industrial enterprises concerned and in the case of less developed transition economies also at broadening their industrial base. In future, it is expected that UNIDO's industrial restructuring services will be requested primarily by those transition economies and by those manufacturing branches in other countries in the region, that have either no access to or have difficulties in obtaining required services from other, most often commercial sources.

- SME development: Taking into account that now-days transition economies, with exception of some Central European countries, were effectively without the SME sector ten years ago, there is a tremendous need for an efficient SME development support to many countries of the region.

  UNIDO has not only mandate to promote SME development, but has also built an extensive expertise and experience in this area. There is broad range of potential services, UNIDO can offer with respect to SMEs development and their integration into national industrial structures of transition economies. Some of these services include: (i) assistance in developing national capabilities in designing and managing SME strategies and policies; (ii) assistance in developing a network of institutions capable of offering a complete range of services to SMEs, such as information, training, technical support and finance; and (iii) assistance in developing different types of technology incubators, such as incubators aimed at exploiting the highly qualified scientific personnel available in the region or small business incubators with components, such as training for start-ups and existing businesses, preparation of business plans, risk assessment, facilitating access to markets and developing inter-enterprise linkages. All these services should be offered by UNIDO either individually or in the case-by-case designed packages reflecting specific needs of a "client".

- Environmentally sustainable industrial development: Industrial development under the centrally-planned system has been accompanied with an accelerated pace of resource depletion and environmental degradation. Transition to market-based economies has therefore put before these countries a challenge to improve the environment while at the same time increasing their industrial competitiveness.

  With industry as a driving force in the achievement of a sustainable development, UNIDO has recognised that it is crucial to integrate environmental issues with industrial activities at policy, institutional and enterprise levels in order to achieve environmentally sustainable industrial development. Within this context, the Organisation has built up expertise and experience in a wide range of industry-related environmental activities needed in many transition economies. At the enterprise level, UNIDO can be instrumental in meeting demand for assisting a "client" in process of selection of new, environmental friendly technology acquired as a part of investment modernisation process. In this respect, UNIDO's experiences with national cleaner production centres, like the one in Slovakia

(see, UNIDO, 1997), have proven to be very valuable. As far as policy level is concerned, UNIDO can efficiently respond on demands for assistance in preparation of industrial surveys for the identification of major existing and emerging sources of pollution as well as in designing policies to address specific issues of industry pollution.

Although it is expected that demand of transition economies for UNIDO's services will be concentrated in the above areas of industrial development, where the Organisation has comparative advantages, this does not mean that there will be no demand for services in some other areas which are directly or indirectly associated with industrial sector development. In these areas, however, UNIDO is in a less advantageous position to respond effectively to "clients" demands, either because it has no clear mandate and/or because it does not dispose with a critical mass of expertise and experience in that particular area. Areas of this kind include: (i) foreign direct investment and investment promotion; (ii) privatisation; (iii) management and entrepreneurship; and (iv) enhancing indigenous technological capacities .Whether, and if yes, to what extent UNIDO will be able to respond to these demands, depends to a large extent on the completion of its ongoing restructuring process.

From the transition countries point of view, it seems very important that UNIDO retains minimum capacities in these and all other areas which are essential for a country's industrial development. The Organisation should namely remain capable to assess the implications of specific industrial development issues and problems in the context of the sector' and the country's overall development.

b) Industrial Global Forum Activities: While concentrating their demand in particular areas of industrial development, countries in transition have also an interest for UNIDO as a global industrial forum. As an international organisation mandated to support industrial cooperation and as an organisation with expertise and significant experience at all levels, global, regional and national, UNIDO is well placed to perform this role. As far as industrial statistics is concerned, UNIDO is the only institution which systematically compiles national industrial statistics on a world-wide basis, and therefore represents a unique data source for all member countries, including countries in transition. Taking into account a growing concern of countries from this region about economic competitiveness of their industries, an even more comprehensive data-base containing not only MVA and industrial trade data but also some other information relevant for a country's international competitiveness position seems to be welcomed by these countries.

UNIDO has also important preconditions required to become a global centre of excellence on industrial development in general or at least on some of its segments. To get a de-facto world wide recognition of this role, and this means a recognition not only from governments of the member countries but also from other important players in industrial development, such as large industrial corporations, consultancy firms, other multilateral institutions and bilateral donors, the Organisation should enhance its analytical expertise in clearly focused industry-related areas and it should strengthen its international profile in these areas. This is a absolutely necessary if the Organisation would like to become a globally recognised forum on industrial development.

Looking at UNIDO's research activities, they should be focused at industrial competitiveness issues. In this context, the Organisation should be able to provide transition economies with the "best industrial development practices" of countries from other regions of the world. It might also be useful, but at the same time challenging, for the Organisation to consider developing its own industrial competitiveness assessment methodology (with the data-base mentioned above). As far as Industrial Development Global Report is concerned, it should

remain UNIDO's annual flagship publication and should aim to become the reference publication for industrial development in the world.

Another global forum area, where is a need for services and where UNIDO has significant comparative advantages in the area of developing specific norms and standards related to industrial development as well as of implementation of international protocols, agreements and conventions. The Organisation has already gathered some experience of this kind, especially in areas related to environmental-related norms and standards, and has capacities to move into some other areas, such as quality and safety standardisation.

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Annex

Agenda

Thursday, 16 October 1997

08:45-09:00	Registration
09:00-09:20	Welcoming remarks by Mr. Mauricio de Maria y Campos, Director-General (Chairman)

Session I: ***New industrial policy: concepts and essentials in the changed global context***

09:20-09:50	Presentation 1: New industrial policy: concepts and essentials in the changed global context by Mr. Claudio Frischtak
09:50-10:05	Comments: i) Mr. Sanjaya Lall
10:05-10:20	ii) Mr. Herman Muegge
10:20-10:50	**Coffee break**
10:50-11:05	Comments: iii) Mr. Wilson Perez
11:05-12:15	General discussion
12:15-14.00	**Lunch**

Session II: ***Policies for building industrial competitiveness***

14:00-14:30	Presentation 1: Technology policies and strategies for building industrial competitiveness by Mr. Linsu Kim
14:30-14:45	Comments: i) Mr. Jorge Mattar
14:45-15:00	ii) Mr. Wing Yin Yu
15:00-15:45	General discussion
15:45-16:05	**Coffee break**
16:05-16:35	Presentation 2: Policies for building systemic competitiveness: Conceptual framework and case studies of Republic of Korea, Brazil, Mexico and Thailand by Messrs. Tilman Altenburg, Wolfgang Hillebrand and Jörg Meyer-Stamer
16:35-16:50	Comments: i) Mr. John Martinussen
16:50-17:05	ii) Mr. Hirohisa Kohama
17:05-17:20	iii) Mr. Jorge Katz
17:20-18:00	General discussion

Friday, 17 October 1997

Session III: ***Industrial policy initiatives in support of small- and medium-scale enterprises***

09:00-09:20	Presentation 1: Impact of changes in industrial structure and integration on SME clusters by Mr. Patrizio Bianchi
09:20-09:40	Presentation 2: SME responses to global challenges: case studies of private and public initiatives by Mr. Khalid Nadvi and Hubert Schmitz
09:40-10.00	Presentation 3: UNIDO's programme to promote and support the organization and development of competitive and innovative SME clusters by Mr. Jean Frederic Richard
10:00-10:20	**Coffee break**

10:20-10:35	Comments:	i) Mr. Robert Crawford
10:35-10:50		ii) Mr. Faisal Nasr
10:50-11:05		iii) Mr. S. B. Mishra
11:05-11:20		iv) Mr. Huijiong Wang
11:20-12:30	General discussion	
12:30-14:00	**Lunch**	

Session IV: ***Special policy concerns of developing countries with special reference to Africa and economies in transition in central and eastern Europe***

14:00-14:30	Presentation 1:	Industrial development issues and industrial policy concerns of African countries by Mr. Tony Hawkins
14:30-14:45	Comments:	i) Mr. Charles Soludo
14:45-15:00		ii) Mr. Geoffrey Mwau
15:00-15:45	General discussion	
15:45-16:00	**Coffee break**	
16:00-16:30	Presentation 2:	Industrial development issues and industrial policy concerns of economies in transition by Mr. Mojmir Mrak
16:30-16:45	Comments:	i) Mr. Ryzard Rapacki
16:45-17:00		ii) Ms. Tatyana Kouznetsova
17:00-17:45	General discussion	
17:45-18:00	Closing remarks	

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