



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

GLOBAL FORUM ON INDUSTRY

Perspectives for 2000 and Beyond

NEW DELHI, INDIA, 16-18 OCTOBER 1995

Distr.
LIMITED

ID/WG.542/23(SPEC.)
29 September 1995

ORIGINAL: ENGLISH

21375

Panel V Industrial policy reforms: The changing role of Government and private sector development



Background Paper

Governments and industrialization: The role of policy interventions

Prepared by

SANJAYA LALL



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

This study was prepared by Sanjaya Lall, Fellow, International Development Centre, University of Oxford, United Kingdom, as consultant.

The views and comments contained in this study are those of the authors and do not necessarily reflect those of the United Nations Industrial Development Organization (UNIDO) nor do they officially commit UNIDO to any particular course of action. The designations employed and the presentation of material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. Mention of company names and commercial products does not imply the endorsement of UNIDO.

This document has not been edited.

CONTENTS

	Page
I. INTRODUCTION	1
II. THE THEORETICAL CASE FOR GOVERNMENT INTERVENTION ..	4
III. INTERVENTIONS IN PRACTICE	13
(a) Effective Interventions: The East Asian NIEs	13
(b) Countries that did not intervene selectively: Chile and Ghana	21
IV. INTERVENTIONS IN THE CONTEXT OF POLICY REFORM	25
V. THE RISK OF GOVERNMENT FAILURE	31
REFERENCES	35
 LIST OF TABLES	
Table 1. Industrial Policy Objectives of NIEs	15
Table 2. Manufactured Exports by NIEs	16
Table 3. R&D Expenditures	17
Table 4. Annual FDI Inflows into Asian NIEs	20
 LIST OF BOXES	
Box 1. Five "Long Waves" in Technology Development	2
Box 2. Encouragement of Technological Activity in the Republic of Korea	18
Box 3. Subcontracting Promotion in the Republic of Korea and in Taiwan Province of China	28
Box 4. Skill Creation for Industry in Singapore	30
 LIST OF FIGURES	
Figure 1. Enterprises and Markets	10
Figure 2. Constraints to Enterprise Development	12
Figure 3. Nature of Interventions	14
Figure 4. Manufacturing Growth Rates in Ghana, 1984-92	24

LIST OF ABBREVIATIONS

FDI	Foreign Direct Investment
GATT	General Agreement on Tariffs and Trade
MVA	Manufacturing value-added
NIEs	Newly Industrializing Economies
TNCs	Transnational Corporations
SMEs	Small and medium enterprises

I. INTRODUCTION

The global economy is undergoing a series of sweeping changes, driven by rapid technical progress in the industrialized economies. These changes are altering fundamentally the methods and organization of the production of goods and services, and the skills, information, infrastructure and institutions needed to operate an economy efficiently. So broad and far-reaching are these technological developments that analysts^{1/} see the emergence of a new industrial revolution within the developed world (see Box 1). The new "paradigm" of production involves, not only new technologies (in the traditional sense), but also new management and organizational techniques, different forms of linkages between enterprises, and tighter relations between industry, pure science and flows of information between economic agents (for the sake of brevity, however, this whole complex is referred to as 'technology' here). It thus entails important structural changes *within* each industrialized country.

The nature of the current industrial revolution is such that the long-term success of all productive systems, including those in developing countries, *ultimately depend on the ability to harness the new technologies*. The current wave of technological changes involves the use in manufacturing of a spectrum of new products, processes and materials, as well as new methods of organization and management. While traditional scale economics persist in several activities, especially process industries, in a range of engineering industries they entail a shift away from mass production and mass consumption to methods based on flexibility, differentiation and speed of response. These methods require more efficient networking of firms and suppliers, better systems of quality management and a multi-skilled workforce. The "information industry" plays a growing and increasingly critical role in the new production system. *It is suggested that around 50 per cent of the working population in industrialized countries is now engaged in information processing.*

The need for new skills is particularly felt in the context of the *organizational changes* that are so prominent in the current technological revolution.^{2/} In the mass production system, skills were differentiated and directed to the fragmented tasks performed by individual workers. This pattern of specialization and fragmentation is now changing, for four reasons: First, the need to make production more flexible and responsive to rapid market changes calls for multi-tasking rather than single-tasking. Second, the move to lower inventories, just-in-time production systems and total quality management relies heavily on worker skills and discretion, again requiring better training and motivation. Third, a major source of productivity change is now recognized to be continuous improvement on the shop-floor by workers. This involves both close interaction between workers and management, as well as higher skill levels on the part of workers. Finally, work is now optimally performed by multi-skilled teams rather than by individual workers. Team work requires new attitudes and incentives, and also a general upgrading of skills.

1/ The leading among these are Freeman and Peretz (1988).

2/ See Kaplinsky (1989, 1994).

Box 1: Five "Long Waves" in Technology Development

- The first wave, from the 1770s to 1830-40, the first industrial revolution, was based on the steam engine in textiles, iron-working and potteries. The main organizational form was the small firm headed by individual entrepreneurs, relying on their own savings and local capital. Innovation was also individual based. Training was part-time and on the job. Migration was the main form of technology transfer.
- The second wave, from the 1830s to the 1880s, applied steam power to railways and ships. Machine tools emerged as a major industry, followed by transport equipment, some heavy engineering and synthetic dyes. Firms were larger, and limited liability and joint-stock companies emerged as an organizational form. As skill needs rose, there was more professional training of engineers and skilled workers. Formal methods of technology transfer emerged as intellectual property protection was instituted. However, many countries ignored such protection, and "reverse engineering" was an important form of technology development.
- The third wave, from the 1880s to the 1930s, was the age of electrical and heavy engineering. The dominant industries were steel ships, heavy armaments, heavy chemicals, synthetic dyes and electrical machinery, with the emergence of such industries as automobiles, aircraft, radios and consumer durables. Firms grew to giant size, and cartels were common. "Finance" capital and concentrated banking structures emerged. Formal in-house R&D was started by chemical and electrical engineering firms in Germany and the USA. University trained scientists and engineers were increasingly recruited by industry. Germany set up its system of apprenticeship training. Technology infrastructure (standards, metrology, research laboratories) started to grow in significance. Direct investment became an important tool of technology transfer.
- The fourth wave, from the second world war to the 1980s, was the age of "Fordist mass production", led by such industries as automobiles, aircraft, process plant, fine chemicals, consumer durables, petrochemicals and synthetics. Electronics started to become important by the end of the period. Competition was oligopolistic, and transnational companies grew rapidly. There was growing concentration, and control within firms was hierarchical. Specialised R&D departments spread to most industries, with defence making a major contribution. Education was more widespread at all levels, and specialised industrial training grew rapidly.
- The fifth, current wave is the information and communications age, dominated by electronics based technologies, software, telecommunications, robotics, optical fibres, new materials, biotechnology, fine chemicals and aerospace. Production systems are becoming more flexible, and hierarchical organizations are being replaced by networks and co-operative systems. Industry is increasingly characterised by total quality management, just-in-time inventory systems, close links between vertically related firms and tight production planning. There is increasing integration of planning, R&D, design, production and marketing. Workers are required to be more flexible and multi-skilled. There is increasing networking and collaborative research, along with strategic alliances between firms and state support for generic new technologies. Universities collaborate more with industry. Intellectual property is more strictly enforced, and patent laws are being adapted to new forms of technology. There is intensification of competition globally as transport and communication costs come down and firms base their strategies on world markets.

Source: Adapted from Freeman and Perez (1988).

All these trends mean sweeping changes *within* firms, in their information and incentive systems, control structures, training activities, interactions between different functions that were traditionally kept separate, and systems of productivity monitoring. There are also changes in relations *between* firms, which have to evolve new relationships between themselves, their customers, their suppliers and even their competitors. Again, increased responsiveness to changing conditions and technologies, specialization and networking are the new parameters that govern efficiency and competitive success. There is an increasing tendency for high technology sectors to establish closer linkages with research institutions and universities, and many developed country governments have set up mechanisms to sponsor research into selected frontier technologies and to increase collaboration between innovating firms. The growth of "strategic alliances" between large industry leaders has been noted often in the literature. It has been argued that this affects the way that technologies are transferred between the countries and reduces the opportunities for newcomers in the developing countries to access these new technologies.^{3/}

The new production system also involves a much larger role for *international factors* like trade and capital movements. Driven partly by evolving technologies and increasing specialization, and partly by falling transport, travel and communication costs, foreign trade has been rising faster than world production. Thus, trade accounts for a steadily increasing part of income to many industries and countries, and many new technologies are created very much with global markets in mind. Similarly, international capital flows, both direct and portfolio, are rising rapidly, contributing increasing proportions of national investment in many countries. 'International production', under the aegis of transnational corporations (TNCs), now amounts to more than global trade in goods and services, and its share of production is also rising over time. TNCs are 'globalizing' their operations, rationally integrating production, sales and other functions across national boundaries, and spreading the new organizational methods that are gaining dominance in the advanced world. At the same time, the rapidity of technological progress and improvements in communications mean that technologies are maturing faster and being transmitted more quickly across countries.

All these forces make for a remarkable 'shrinking' of economic space and intensification of direct competition between countries for markets, capital and technologies (and for skilled personnel). They also make for deep structural changes in the international economy and for changing patterns of comparative advantage. The geographical impact of these changes — rapid technical progress and intensifying competition in a more integrated world economy — is not confined to the developed countries. On the contrary, it encompasses all the economies of the developing world.

These technological changes are driving, and themselves being driven by, changes in *national and international policies*. National governments across the world have been moving towards more open and market-oriented regimes, with greater reliance on private business and less direction of resource allocation. Past strategies of development are being abandoned. Protective barriers are being lowered, restrictions to foreign direct

^{3/} See Ernst and O'Connor (1989).

investment removed and the private sector allowed into areas previously reserved for public enterprises. This shift has its counterpart in the international sphere, where there is now a general consensus in favour of more liberal economic policies and stronger support for private enterprise. In particular, the new GATT agreement on trade and trade-related investment and intellectual property rights, and the thrust of policy advice and adjustment policies by the Bank and Fund, are creating a highly liberal environment for all forms of international transactions and private enterprise.

The emerging international environment for developing country enterprises will thus be very different from the one they have been nurtured on. They are being exposed to world competition at a time when the pace of competition itself is "hotting up" and the technologies driving it are evolving more rapidly. The growth of globalized production, under the aegis of TNCs, offers a way forward for those countries that are able to attract sufficient amounts of transnational interest. But even doing this is not simply a matter of 'opening up' the economy in a passive sense: it requires the creation of productive factors, skills and supplier systems. In any case, foreign investment cannot displace indigenous development — the existence of a dynamic and competitive domestic industrial sector itself attracts 'higher quality' foreign investment and allows the host economy to reap much larger benefits from it.

Thus, the development of indigenous industrial capabilities and productive systems is a *sine qua non* of long-term industrialization. Are the new liberal "rules of the game" adequate for such development? Or are free markets themselves subject to deficiencies? If so, they need intervention to improve them: what kinds of interventions does theory suggest are needed to promote industrial development? And what does experience show on the use of such interventions?

II. THE THEORETICAL CASE FOR GOVERNMENT INTERVENTION

The growing dominance of the neo-liberal rules of the game is based on a particular view of development and industrialization policy: markets are basically efficient and governments basically inefficient, resource allocation is optimized by responses to free markets, and the *best industrialization policy is to remove all interventions in the functioning of markets*. This paradigm combines simple economic theory with certain empirical assumptions about how economies and governments function, what drives growth and structural transformation, and what 'good' development policy consists of. There is increasing concern about some of the underlying assumptions and values of this new paradigm: about market efficiency, government inefficiency, the links from static optimization to dynamic growth, and the role of government interventions in the explaining recent industrial success.

In part the move to liberal prescriptions was driven by the evident failures and inefficiencies of 'classic' import-substituting strategies, with which most developing countries had started their industrialization process. The success of the export-oriented NIEs of East Asia was, however, taken to mean, not just that one trade strategy was

better than another, but that all forms of government intervention were undesirable. Export-orientation became identified with 'neutrality' in trade, which in turn became equated with free trade, openness to all other forms of foreign transactions (in direct investment and technology flows), neutrality in domestic resource allocation, and finally with liberal ("minimalist") governments that provided basic public goods, a legal framework and the rules of the game, and managed the macro economy well.^{4/} This transition from export orientation to neo-liberal political economy was smooth and imperceptible, and at the time persuasive. The evidence of the NIEs seemed to suggest that standard theoretical models of comparative advantage (based on optimizing the use of their abundant resource, cheap unskilled labour) were borne out in practice, fears about market failure were unfounded, and countries that intervened strongly in markets suffered from gross inefficiencies.

This interpretation of the East Asian experience was soon challenged. Irrefutable evidence was produced had accumulated that most NIEs did not conform to the neo-liberal characterization. They were aggressively picking or creating 'winners' at the industry (and even firm) level by intervening in trade, credit allocation, technology imports and local technology diffusion and creation, education and training, export activity and so on.^{5/} The results were unprecedented rates of growth and diversification of manufacturing industry and exports, though with marked differences among the countries reflecting their differing levels and kinds of intervention (below). This presented a dilemma — either the interventions were desirable and there were pervasive market failures (in which case the neoclassical development paradigm was undermined), or the interventions were irrelevant despite being pervasive (in which case explanations were needed as to why they were undertaken, what they achieved, and why they did not lead to the kind of inefficiencies associated with them elsewhere).

The challenge was taken up by the World Bank in its publication *The East Asian Miracle*. The effort was partly in response to a controversial internal study by its Operations Evaluation Department that criticized the biased interpretation by the Bank of its own evidence on the Republic of Korea (OED, 1992), and partly in response to demands by the Japanese government for less ideological policy advice. The *Miracle* study drew a distinction between desirable "market friendly" and other, undesirable, interventions. *Market friendly interventions were 'functional'* — those that did not try to direct resources to particular activities, but remedied generic failures in markets. Non-market friendly ones were 'selective', influencing resource allocation in favour of 'winners' picked by the government. The study explained the success of East Asia with reference to market friendly interventions, arguing that selective interventions, while present, were unnecessary and contributed little, if anything, to East Asian success. There were no reasons in theory for selectivity, and no benefits to other countries from adopting these

^{4/} This view of the East Asian experience emerged in writings of Balassa and Krueger, and their associates at the World Bank, which by the late 1980s emerged as the leading proponent of the neoclassical development school.

^{5/} Of the large literature on this, see Amsden (1989, 1994), Jacobsson (1993), Lall (various), OED (1992), Moreira (1994), Pack and Westphal (1986), Singh (1994), Wade (1990), Westphal (1990).

market unfriendly policies, especially because they lacked the unique political economy to administer such policies.

The *Miracle* study was an important step forward in the industrial policy debate. It departed from the earlier Bank approach by admitting that *some* markets actually did not function efficiently, and that government intervention was needed to remedy market failure. It also admitted the existence and pervasiveness of selective interventions in East Asia. However, it was obliged to defend the fundamental postulates of the World Bank's policy advice— that governments should not be selective in influencing resource allocation, and, in particular, not mount industrial policy. Thus, it *redrew the lines of the legitimate functions of the government around a "market friendly" set of policies*, which were confined to support for human capital formation (health and education), openness to information flows (technology inflows from abroad), and export promotion (export activity was believed to create generic externalities). The current industrial policy debate thus revolves around the appropriateness of selective versus functional interventions, and not so much on the role of government as such.

The debate on selectivity is far from over. A growing literature on capability building in developing countries approaches industrial policy from a different vantage point, that of micro-level technical change.^{6/} Drawing upon the 'evolutionary' approach (Nelson and Winter, 1982), it draws upon a wide base of empirical research, and focuses on market failures affecting the development of capabilities at the enterprise level. It marries this analysis with the conduct of industrial policy in East Asia, and draws very different conclusions from the World Bank on the significance of selective interventions.

There are two broad issues at stake. Is the distinction between market friendly and other interventions valid? And can selective interventions be justified in theory?

On the *first*, there are clearly no theoretical grounds for distinguishing between 'market friendly' and selective interventions: *any* policy that remedies market failure is 'friendly' to the market. The evidence of East Asia suggests that selectivity could be used very effectively. The evidence of some other regions suggests, perhaps more interestingly, that *not* remedying market failures by selective interventions can stunt industrial development. The particular definition of market friendly interventions used by the Bank is also suspect. Are interventions in skill formation or openness to technology inflows necessarily non-selective? It seems not.

The creation of skills at the school level, and in some tertiary education, is broadly non-selective. However, certain forms of vocational training, university, technical and scientific education, and specialized industry training, can be extremely selective. If the pattern of investment in skills is closely geared to industrial promotion, then the former becomes just as selective as the latter. The East Asian evidence suggests that many education and technology import policies were in fact extremely selective, with close

^{6/} See, among others, Bell and Pavitt (1993), Katz (1987), Lall (1990, 1992, 1993, 1994.b), Pack and Westphal (1987).

government direction of the content of enrolments and curricula to ensure conformance with the thrust of industrial policy.

The *second* issue is more important: the case for selective intervention. In theory, according to the *Miracle* study, there may be four market failures in resource allocation:

- capital market deficiencies (caused by information gaps),
- lumpiness of investment (scale economies),
- imperfect appropriability of firm-level investments in knowledge and skills, and
- the inability of individual investors to act rationally when there are technologically interdependent investments.^{7/}

Where these distortions exist, efficient resource allocation in fact calls for intervention to coordinate investments and counteract externalities. The intervention cannot be functional, since different activities, with differing technological characteristics and spillovers, suffer to different degrees from these failures. The *Miracle* study, having noted the theoretical case, makes no attempt to analyse its empirical significance in East Asian industrialization, whether or not governments attempted to remedy them, and how successful they were.

While these four market failures provide valid arguments for selective intervention, they do not comprise all the failures that affect industrial development, nor even the most important ones. They are derived from a simplified set of assumptions that essentially ignores the slow, *costly, risky and largely unpredictable process by which firms in developing countries become efficient*. This process faces important market failures, which provide the most critical arguments for selective intervention.

The neoclassical depiction of industrial development assumes that technology is freely available from a known 'shelf', from which firms choose according to their factor and product prices. This technology is then absorbed costlessly and risklessly and used at 'best practice' levels.^{8/} There is no need for intervention to support the process, and by definition any tampering can only lead to inefficiency in the choice and use of technology. There is an even stronger premise: any actual inefficiency *must* be due to interventions in efficient markets, and the removal of such interventions will be necessary and sufficient for restoring efficiency. Only 'good' and 'bad' firms exist, and they can only be sorted out by free markets.

If there is any lag in efficiency it can, at most, only be for a brief period in which technologies until scale economies are fully realized or costs fall in a 'learning by doing' process. However, these are taken to be predictable (scale economies are given by technical design parameters, while the learning curve is taken to be known) and a simple function of the quantity of output: there is no need for intervention because firms can anticipate the process perfectly and raise money in efficient capital markets to finance the process.

^{7/} World Bank (1993), p. 90-92.

^{8/} Nelson (1981).

If there is failure in capital markets, the theoretical solution is to improve their functioning rather than to intervene selectively to support particular activities. Thus, capital market failures and scale economies may not provide grounds for selectivity unless these failures cannot be remedied and protection or subsidies are used as second best solutions.

The capabilities literature suggests that this is oversimplified and misleading. Technology has many 'tacit' elements and cannot be transferred like a physical product. Its mastery and use require the recipient to invest in new skills, technical information, organizational methods and external linkages. The process continues over time, and varies by technology. It may be relatively short, cheap and predictable in 'easy' technologies where the knowledge is more embodied in simple equipment, the range of skills is limited, and the operation is relatively self-contained in an enterprise. In technologies that have complex processes and sophisticated equipment, the range of skills is large, there are many differing stages of production and large numbers have to interact in the value-added chain, mastery may be prolonged, costly and risky. When firms are undergoing learning, it is difficult to sort out 'good' and 'bad' firms, since there is a large intermediate category.

More important, the process of learning in developing countries may be distorted and curtailed if firms do not *know* how to go about learning, how long it will take, how much it will cost, or where to look for information and skills. There may be a 'learning to learn' process (Stiglitz, 1987), which firms facing full international competition may be unwilling to undertake. Dropping the assumptions on perfect information of technology markets and transferability of technology (with no tacit elements or learning periods) thus poses market failures in resource allocation. Given the cost, risk and information gaps within the firm in learning, in free markets firms will tend to underinvest in technologies that have costly, prolonged and risky learning periods. This will also affect the process of technological deepening: entering more complex technologies, increasing local content, or undertaking more demanding technological tasks (say, from simple final assembly technology to design and development activity).

The capability approach does not suggest that *no* industry will take root in free markets. Where there is a modicum of skills, infrastructure and low labour costs, simple labour-intensive activities may start (though in modern industry even the simplest of industries require advanced technical and management skills). However, *entry into more complex and demanding technologies may be limited by the absence of supportive interventions to overcome learning costs*. Such interventions cannot be functional — since technologies differ in their learning needs, they *have* to be selective.

The protection of infant industries is one, and historically the most popular and effective, means of remedying the failures.^{9/} However, protection is a dangerous tool. Apart from

^{9/} The reason is put nicely by John Stuart Mill, a notable and perceptive admission in his vigorous defence of free trade: "The only case in which, on mere principles of political economy, protecting duties can be defensible, is when they are imposed temporarily (especially in a young and rising nation) in the hopes of naturalising a foreign industry, in itself perfectly suitable to the circumstances of the country. The superiority of one country over another in a branch of production often arises

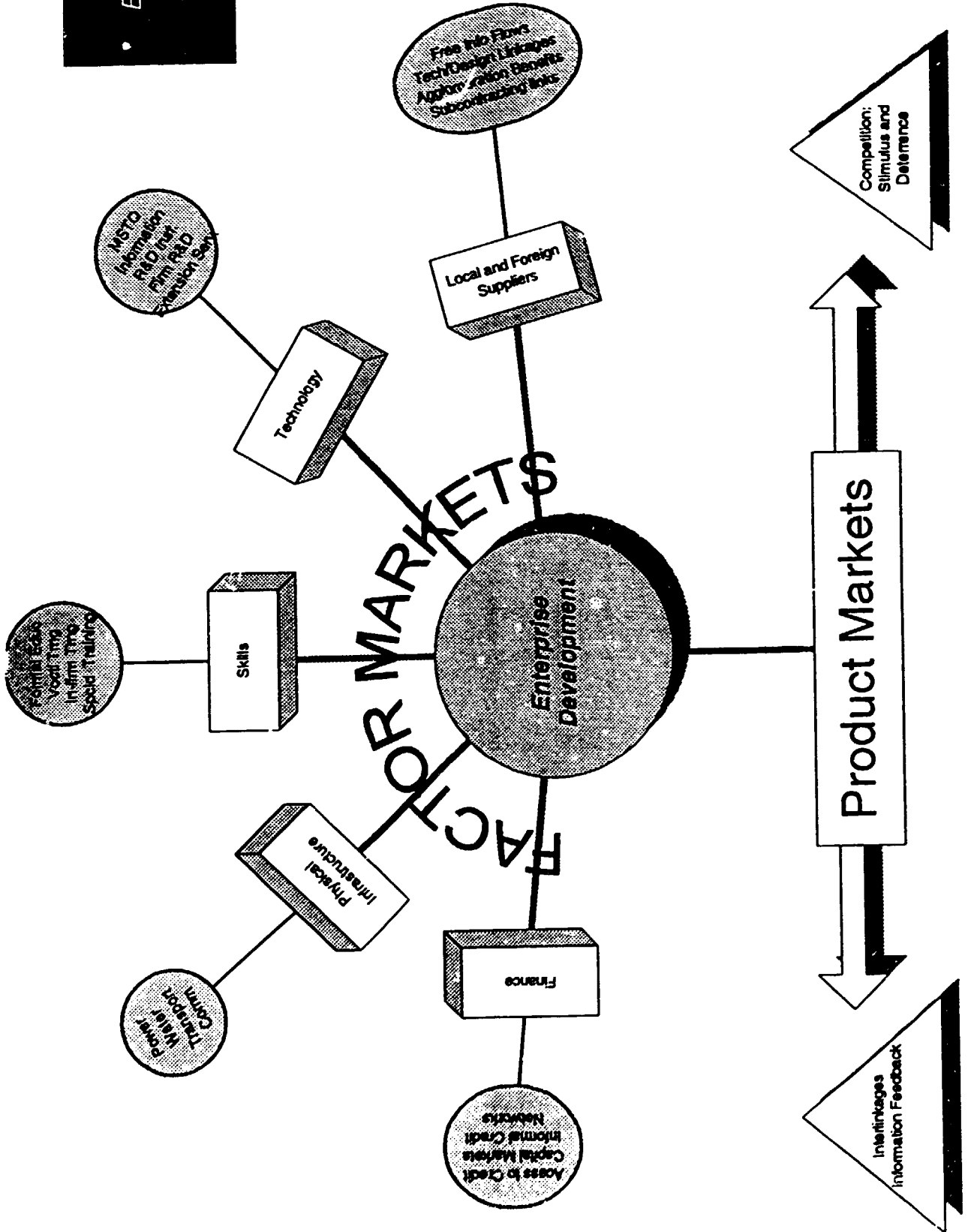
the cost to the consumer, it dilutes the incentive to invest in capability development, the very process it is meant to foster. Firms are very sensitive to competitive pressures in deciding to invest in capabilities, and the protection offered in typical I-S regimes tended to detract from costly and lengthy investments in competitive skills and knowledge. There may be many solutions: offer limited protection (the Mill proposal); impose performance requirements; or enforce early entry into export markets while maintaining domestic protection. The last has the advantage that it exploits the externalities generated by export activity, and was the one used widely by the larger NIEs (that developed the deepest and most diverse industrial sectors).

Since firms do not learn on their own, however, protection can only *partly* remedy market failure. Firms draw upon a number of other firms and markets for capability development: input and equipment suppliers, skills, finance, technology, market information, and infrastructure. Figure 1 shows schematically the different markets in which a firm operates. All these markets may suffer from deficiencies. *Offering protection without remedying these can be wasteful, while simply improving factor markets without offsetting market failures to learning within firms can lead to narrow and shallow technological development.*

Most of the market failures outside firms are well recognized. The coordination problem caused by technological linkages between firms are noted in the *Miracle* study. The case for intervention, however, goes beyond simply coordinating individual investment decisions when there are externalities. The nature of the externalities is also important — when certain industry 'clusters' generate strong benefits for the economy in terms of technological learning, spillovers and dynamism, there may be a case for promoting them over others that have more limited or static effects. This case for 'strategic' sectors is noted by some new growth theorists, who distinguish between specializations that lead cumulatively to technological stagnation or dynamism (Young, 1991). Arrow (1962) noted the risk of underinvestment in skills and technology because of inappropriability and leakages. Failures in markets for finance, skills, technology and infrastructure are universally accepted. All countries, developed and developing, have undertaken measures to remedy them, often selectively. These measures may involve creating new markets and institutions, or they may involve encouraging large firm size to enable the internalization of the deficient markets (both were practised in East Asia).

only from having begun it sooner. There may be no inherent advantage on one part, or disadvantage in another, but only a present superiority of acquired skill and experience... *But it cannot be expected that individuals should, at their own risk, or rather to their certain loss, introduce a new manufacture, and bear the burden of carrying on until the producers have been educated to the level of those with whom the processes are traditional.* A protective duty, continued for a reasonable time, might sometimes be the least inconvenient mode in which the nation can tax itself for the support of such an experiment." (J. S. Mill, 1940, p. 922). Emphasis added.

Figure 1:
Enterprises
and
Markets



Market failures are particularly binding for *local* enterprises, and even more so for new small and medium sized entrants into modern industry. Foreign investors, especially affiliates of large TNCs, face fewer failures in developing countries. Their *raison d'être* lies in the internalization of many intermediate markets, especially for capital, skills and technology. This is why TNCs can be a powerful means of launching industrialization in developing countries (as long as some complementary factors exist). Their significance is rising in activities where technologies are changing rapidly, production growing more linked across nations, and export market access is growing more difficult for new entrants. However, the advantages offered by FDI does not mean (as neoclassical theory suggests) that the best way to develop is to adopt passive open door policies in concert with free trade and other non-interventionist policies. There may be important market failures in the FDI process that call for interventions with the entry process and factor markets that affect TNC activity.^{10/}

First, a passive liberal policy may only attract TNCs into areas of static comparative advantage. Selective and functional interventions can guide FDI into dynamic and more complex activities (Singapore's strategy). Second, TNCs tend to transfer operating know-how rather than complex technological functions to developing host economies. The design and development process remains in advanced countries near sophisticated suppliers, R&D systems and skills. However, as countries industrialize it becomes increasingly important to develop R&D capabilities, to keep abreast of and absorb technologies, deepen industry and reduce the cost of importing technology. Again, there is a need to intervene to induce an upgrading of TNC technological activity (as in Singapore), or to restrict foreign entry as local firms have to establish their own innovative base. The latter strategy is designed to develop *indigenous* R&D capabilities, to capture the greater externalities and dynamic benefits that this may offer (as in the Republic of Korea and Japan).

Theory thus provides valid grounds for interventions to promote industrial development. Market failures can take three forms: *within firms*, *in inter-firm relations* and *in factor markets* (Figure 2). These failures are inter-related, and their remedy calls for a range of *selective and functional* interventions. Those within firms have to be dealt with by providing a 'cushion' for learning (e.g. by protection), and by the provision of information and other support. Those between firms can be remedied by the coordination of investments (partly by protection), geographical clustering and promotion of linkages. And those in factor markets need direct interventions at source to remedy the failure. Note that protection meets only a small part of the need (within firms and in inter-firm relations); used by itself, it can be harmful for technological development because it leaves other failures untouched. To conclude:

^{10/} Lall (forthcoming).

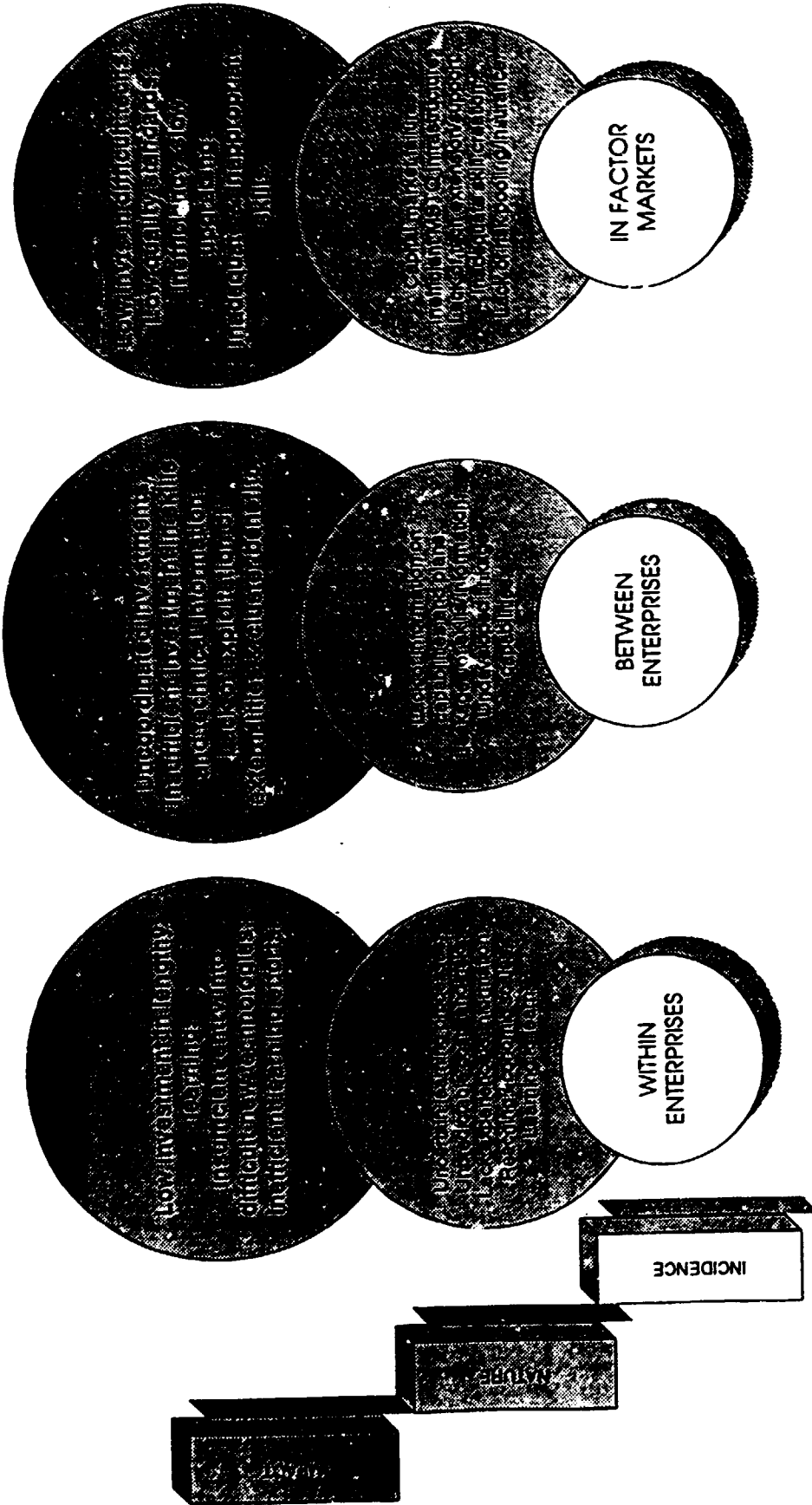


Figure 2: Constraints to Enterprise Development

- Interventions in factor and product markets have to be closely coordinated and integrated; one without the other may be ineffective, even counter-productive. Factor market policies *per se* do not provide an explanation of rapid industrial development by local enterprises, since they ignore the costs of learning and the market failures faced.
- Distortions introduced by interventions must be offset, and protection must be countered by competitive pressures to enter world markets. This IS strategies failed to provide.
- Since intervention resources are limited, only a few activities should be supported at any time. Intervening in a large number of unrelated activities risks waste and failure.
- Since learning is a cumulative, incremental process, interventions must support activities that have a base in existing skills and knowledge. New technological 'leaps' must be modest, based on realistic assessment of what is feasible within reasonable periods of time.
- The line between market friendly and selective interventions is almost impossible to draw. Each market may be subjected to a combination of functional and selective policies. Figure 3 shows some of the interventions in the main markets within which capability development occurs (drawn from the actual policies of the NIEs).

III. INTERVENTIONS IN PRACTICE

III.a. Effective Interventions: The East Asian NIEs

It is now widely accepted that there was no unique "East Asian model" of industrialization. There was a different model for each NIE, within a common context of export orientation, good human capital and strong regional spillovers. Each NIE had different industrial objectives and used different interventions (though some, like support for exporters and for small enterprises, were very similar). As a result, each had a different pattern of industrial and export growth, reliance on FDI, technological capability and enterprise structure. However, for none, even the least interventionist, was simply "getting prices right" a sufficient explanation of industrial success. The different objectives of the NIEs are shown in a simplified form in Table 1. There was an enormous range, from the *laissez faire* to selective targeting and control.

Hong Kong was at the first end, combining free trade, no selective targeting and an open door policy to FDI. An object lesson in the virtues of free trade to other developing countries? Not necessarily: Hong Kong had unique initial conditions — its long *entrepôt* tradition (with global trading links), an established infrastructure of trade and finance, the presence of large British companies (the "Hong") with immense spillovers in skills and information, and an influx of entrepreneurs and trained textile and metalworking engineers and technicians (with considerable embodied learning) from mainland China.

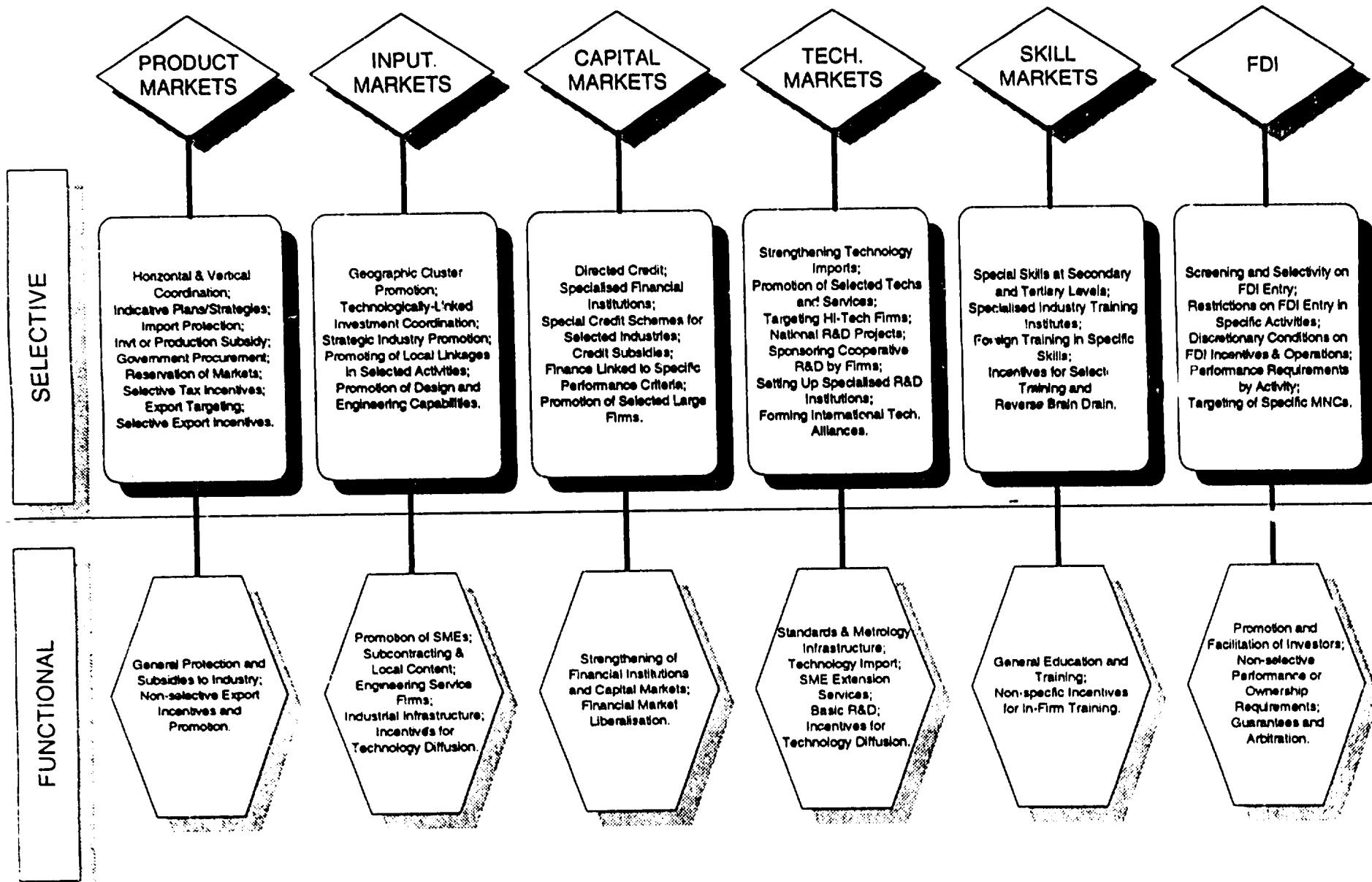


Figure 3: Nature of Interventions

This unique background allowed it to launch into export-oriented light manufacturing under free trade, and its experience has been unique in the developing world. Simply "getting prices right" has not created other Hong Kongs, even in other free trade havens with good human capital and favourable location.

	Deepening Industrial Structure	Raising Local Content	FDI Strategy	Raising Technological Effort	Promotion of Large Local Enterprises
Hong Kong	None	None	Passive Open Door	None except tech. support for SMEs	None
Singapore	Very strong push into specialised high skill/tech industry, without protection	None, but subcontracting promotion now started for SMEs	Aggressive targeting & screening of MNCs, direction into high value-added activities	None for local firms, but MNCs targeted to increase R&D	None, but some public sector enterprises enter targeted areas
Taiwan	Strong push into capital, skill and technology intensive industry	Strong pressures for raising local content and subcontracting	Screening FDI, entry discouraged where local firms strong. Local technology diffusion pushed	Intense tech. support for local R&D & upgrading especially by SMEs. Govt. orchestrated high tech development	Sporadic: to enter heavy industry, mainly by public sector
Korea	Strong push into capital, skill and technology intensive industry, especially heavy intermediates and capital goods	Stringent local content rules, creating support industries, protection of local suppliers, subcontracting promotion	FDI kept out unless necessary for technology access or exports, joint ventures and licensing encouraged	Ambitious plans for local R&D in advanced ind., heavy investment in technology infrastructure. Targeting strategic technologies	Sustained drive to create giant private conglomerates to internalise markets, lead heavy industry, create export brands

Moreover, the lack of selective promotion had important effects on the manufacturing structure. Hong Kong *started and stayed with* light labour-intensive manufacturing industry,^{11/} where learning costs were relatively low and predictable. There was some 'natural' progression as product quality improved and new consumer products were added. But there was little industrial or technological deepening over time, in contrast to the other NIEs that pursued selective deepening strategies.

As a result, Hong Kong has underwent massive deindustrialization as wages and land costs rose (during 1986-92 it lost about 35 per cent of its manufacturing employment, and the process is continuing^{12/}). The colony relocated its manufacturing to other countries, mainly China, and its own export growth went into decline since the mid-1980s (Table

^{11/} Its "machinery" exports consist of electronic watches and games rather than capital goods, unlike the other NIEs.

^{12/} *Financial Times*, London, 4 May, 1993, "Survey of Hong Kong", p. 6. Manufacturing employment declined from 45% to 23% of the total in 1980-92, and its contribution to GDP from 27% to 16%.

2). The economy is continuing to grow and prosper, but the lessons of the Hong Kong "miracle" for *industrial development* are ambiguous. The lack of industrial deepening and deindustrialization, a direct result of the absence of industrial policy, would be very undesirable in other developing economies.

		Hong Kong		Korea		Singapore		Taiwan	
		1987	1992	1987	1992	1987	1992	1987	1992
Total	Value	44597	28738.5	43398.2	71046.4	20586.2	49441.1	47276.6	75643.4
	Growth	-8.4%		10.4%		19.2%		9.9%	
Textiles & Clothing	Value	11537.1	8591.3	6957.9	8097.8	497.5	824	5444.4	6035.2
	Growth	-5.7%		3.1%		10.6%		2.1%	
Machinery & Transport Equipment	Value	10664.5	7260.2	15566.8	30557.6	12294.6	32960.7	15250.5	32534.8
	Growth	-7.4%		14.4%		21.8%		16.4%	

Source: World Development Report 1989 and 1994

In contrast, Singapore illustrates a *highly interventionist policy combined with free trade*. Singapore has half the population of Hong Kong and higher wages, but has not suffered a similar "hollowing out" of industry. Its industrial structure is far deeper (in the complexity of production and exports), and it enjoys high sustained industrial growth. It relies heavily on TNCs; but, unlike Hong Kong, the government targeted activities for promotion and aggressively sought and used FDI as the tool to achieve its objectives. Singapore started with a base of capabilities in *entrepôt* trading, ship servicing and petroleum refining. After a brief period of import substitution, it moved into export-oriented industrialization, based overwhelmingly on investment by TNCs. There little influx of technical and entrepreneurial know-how from China, and a weak tradition of local entrepreneurship. After a decade or so of light industrial activity (garment and semiconductor assembly), the government acted firmly to upgrade the industrial structure. It guided TNCs to higher value-added activities, narrowly specialized and integrated into the world-wide structure of their operations. It intervened to create the specific skills needed,^{13/} and set up public enterprises to undertake activities considered in the country's future interest, where foreign investment was unfeasible or undesirable.

Such specialization, along with the heavy reliance on foreign investments, greatly reduced the need for indigenous technological effort. While the government mounted strong efforts to induce TNCs to establish R&D facilities, the technological depth of the affiliates is still comparatively low. This technological strategy is feasible only for relatively small and specialized economies, and may not be relevant to most developing countries with a large local industrial structure and a more diverse range of activities.

^{13/} See Lim (1994) on industrial policy, and for a comprehensive analysis of Singapore's selective interventions in education Selvaratnam (1994).

The Republic of Korea and Taiwan Province of China adopted far more interventionist strategies on trade and domestic resource allocation. They had a clear preference for promoting indigenous enterprises and for deepening local technological capabilities, and assigned FDI a secondary role to technology import in other forms. Their export drive was led by local firms, and a series of interventions allowed local firms to develop impressive technological capabilities. The domestic market was not exposed to free trade; a range of quantitative and tariff measures were used over time to give infant industries 'space' to develop their capabilities. The deleterious effects of protection were offset by strong incentives (in the case of the Republic of Korea, almost irresistible pressures) to export and face full international competition.

The Republic of Korea went much further in developing advanced and heavy industry than Taiwan Province of China.^{14/} To achieve its compressed entry into heavy industry, its interventions had to be more detailed and pervasive. The Republic of Korea relied primarily on capital goods imports, technology licensing and other technology transfer agreements to acquire technology. It used reverse engineering, adaptation and own product development to build upon these arm's length technology imports and develop its own capabilities.

Its R&D expenditures are now the highest in the developing world, and ahead of all but a handful of leading OECD countries (see Table 3). This was partly a result of its selective interventions in trade and industrial structure; but it also reflects its wide array of interventions to promote industrial technological effort (Box 2).

Table 3: R&D Expenditures (% GDP)

	By Industry	Total
Hong Kong	0.3	0.5
Singapore	0.6	1.0
Korea	1.8	2.1
Taiwan	0.8	1.7

Source: UNESCO, *Statistical Yearbook*, various; Council for Economic Planning and Development (Taiwan), *Taiwan Statistical Data Book 1994*.

One of the pillars of Korean technological strategy, and one that marks it off from the other NIEs (but mirrors Japan), was the deliberate creation of large private conglomerates, the *chaebol*. The *chaebol* were hand-picked from successful exporters and were given a range of subsidies and privileges, including the restriction of TNC entry, in return for furthering strategy of setting up capital and technology-intensive activities geared to export markets. The rationale for fostering size was obvious: in view of deficient markets for capital, skills, technology and even infrastructure, large and diversified firms could internalize many of their functions. They could undertake the cost and risk of absorbing very complex technologies (without a heavy reliance on FDI), further develop it by their own R&D, set up world-scale facilities and create their own

^{14/} For a summary description see Lall (1994.b). For details on Korea see Amsden (1989), Moreira (1994), Westphal (1990), Kim (1994) and Lall and Najmahadi (1995).

Box 2. Encouragement of Technological Activity in the Republic of Korea

Korea is the best known example of the use of strategic industrial policy to develop indigenous technological capabilities. It combined import-substitution with forceful export promotion, selectively protecting and subsidizing targeted industries that were to form its future export advantage. This strategy had many remarkable successes, though in the 1970s (when a compressed and diverse drive into heavy industry was attempted) it generated large costs and macroeconomic imbalances. Korea drew extensively on foreign technology, but in forms that promoted local control: it was one of the largest importers of capital goods in the developing world, and allowed its firms unrestricted access to the latest equipment (except when it was promoting particular domestic products); it encouraged the hiring of individual foreign experts; it allowed licensing and, where necessary, foreign minority ownership (but foreign majority ownership was discouraged unless deemed necessary to gain access to closely held technologies or to promote exports in internationally integrated activities). It intervened in major technology contracts to strengthen the negotiating position of domestic firms, and sought to maximize the participation of local consultants in engineering contracts.

Technological effort in Korea was supported by the government in several ways. Private sector R&D was directly promoted by a number of incentives and other forms of assistance. These included tax exempt TDR (technology development reserve) funds, tax credits for R&D expenditures as well as for upgrading human capital related to research and setting up industry research institutes, accelerated depreciation for investments in R&D facilities and a tax exemption for 10 percent of cost of relevant equipment, reduced import duties for imported research equipment, and a reduced excise tax for technology-intensive products. The commercialization of research results was encouraged by a 6 percent tax credit or special accelerated depreciation of the relevant investments. The import of technology was promoted by tax incentives: transfer costs of patent rights and technology import fees were tax deductible; income from technology consulting was not taxed; and foreign engineers were exempted from income tax.

In addition to tax incentives, the government also gave financial *grants* and *long term low interest loans* to enterprises that participated in "national projects" (below). Tax privileges and official funds were given to private and government R&D institutes to carry out these projects. SMEs (small and medium enterprises) were helped with shop-floor advice and guidance to upgrade technical capabilities and productivity by KOPTeC (Korea Production Technology Corporation). KOPTeC complemented the help provided by the SMIPC (Small and Medium Industry Promotion Corporation), which also gave technical, training, and other services to SMEs. SMEs were further assisted by the Korea Academy of Industrial Technology, as well as by "technology guidance systems" operated by government research institutes. The KTAC (Korea Technology Advancement Corporation) helped firms to convert research findings into commercial applications. Several *legal measures* to promote technology development were undertaken. In 1973, the government enacted two pieces of legislation: the Engineering Service Promotion Law to protect and strengthen the domestic engineering services sector, in particular small firms, and the Law for the Development of Specially Designated Research Institutes to provide legal, financial and tax incentives for private and public institutes in selected technological activities.

The Korean government invested in a large array of *technology infrastructure institutions*. In 1966 it set up KIST (Korea Institute of Science and Technology, charged with the responsibility of conducting applied research of various kinds for industry. In its early years, KIST focused on solving simple problems of technology transfer and absorption. In the 1970s the government set up other specialized research institutes related to machinery, metals, electronics, nuclear energy, resources, chemicals, telecommunications, standards, shipbuilding, marine sciences, and so on. These were largely spun off from KIST, and by the end of the decade there were 16 institutions in public R&D. In 1981 the government decided to reduce their number and rationalize their operations. The existing institutes were merged into 9 under the supervision of the Ministry of Science and Technology.

The government launched a series of *National R&D Projects* in 1982. These were large scale projects which were regarded as too risky for industry to tackle alone but which were considered to be in the country's strategic industrial interest. National Projects were conducted jointly by industry, public research institutes and the government, and covered activities like semiconductors, computers, fine chemicals, machinery, material science and plant system engineering. "Centers of Excellence" were formed in these fields to boost Korea's long term competitiveness. National Projects were a continuation of the strategy of interventions to identify and develop the country's dynamic comparative advantage, orchestrating the different actors involved, underwriting a part of the risks, and directly filling in gaps that the market could not remedy. Strategic technological activities are still targeted and promoted.

Other policy measures to stimulate technological effort in Korea include the setting up of *Science Research Centers* and *Engineering Research Centres* at universities around the country to support R&D activities and the common utilization of advanced R&D facilities, and the construction of *science towns*. Daeduk Science Town has been under construction since 1974, and a large number of research and educational institutions are already well established there. The construction of Kwangju Science Town has started; others are planned.

brand names and distribution networks. This was a costly and high-risk strategy; the risks were contained by the strict discipline imposed by the government in terms of export performance, vigorous domestic competition, and deliberate interventions to rationalize the industrial structure. The government also undertook various measures to encourage the diffusion of technology, putting pressures on the *chaebol* to establish vendor networks.^{15/} Apart from the direct interventions to support local enterprises, the government provided selective and functional support by building a massive technology infrastructure and creating general and technical skills. The Republic of Korea today has the highest rate of university enrolment in the developing world, and produces more engineers each year than the whole of India.

Taiwan Province of China's industrial policy encompassed import protection, directed credit, selectivity on FDI, support for indigenous skill and technology development and strong export promotion.^{16/} While this resembles Korean strategy in many ways, there are important differences. Taiwan Province of China did not promote giant private conglomerates, nor did it attempt the intense drive into heavy industry that Korea did. Taiwanese industry is largely composed of SMEs, and, given the disadvantages to technological activity inherent in small size, these were supported by a variety of inducements and institutional measures in upgrading their technologies. Taiwan Province of China has the developing world's most advanced system of technology support for SMEs.

In the early years of industrialization, the Taiwanese government attracted FDI into activities in which domestic industry was weak, and used a variety of means to ensure that TNCs transferred their technology to local suppliers. As with the Republic of Korea, FDI was directed to areas where local firms lacked technological capabilities. The government also played a very active role in helping SMEs to locate, purchase, diffuse and adapt new foreign technologies. Where necessary, the government itself entered into joint ventures, for instance to get into technologically very difficult areas such as semiconductors and aerospace.

The data on FDI in Table 4 show, in very broad terms, that the countries that developed the most diverse, deep, complex and technologically dynamic *indigenous* industrial sectors (Republic of Korea and Taiwan Province of China) had the least reliance on FDI. It was clearly not the lack of incomes, growth or competitive potential that led to this low reliance: the reason lay in their deliberate policies to restrict FDI inflows. Certainly, their industrial strategies were directed, among other things, at the promotion of local enterprises and the development of indigenous technological capabilities, and selectivity on FDI was one important aspect of their strategies.

^{15/} It enacted a law to promote subcontracting by the *chaebol*, designating parts and components that had to be procured through SMEs and not made in-house. By 1987 about 1200 items were so designated, involving 337 principal firms and some 2200 subcontractors, mainly in the machinery, electrical, electronic and ship-building fields. Generous financial and fiscal support was provided to subcontractors, to support their operations and process and product development.

^{16/} For a comprehensive analysis see Wade (1990). Also see Brautigam (1995) for a concise exposition of Taiwan's industrial policies and the role of selective interventions.

Table 4: Annual FDI Inflows into Asian NIEs, 1982-93 (US \$ m.)

Country	1982-1987 average	1988	1989	1990	1991	1992	1993	FDI % of Gross Investment (1986-90)
H Kong	1014	2627	1077	1723	538	1918	1667	13.6
Korea	253	871	758	715	1116	550	n a	1.3
Singapore	1605	3655	2773	5263	4395	5635	6830	33.9
Taiwan	306	959	1604	1330	1271	879	917	3.5

Source: UNCTAD (1994, 1995)

This suggests that the governments of the industrially more advanced countries were seeking to *exploit causal relationships* between the restricted entry of FDI, the growth of domestic enterprises and the development of local innovative capabilities. However, most of the other NIEs had different perceptions of the market failures that confronted their long-term industrial development and so adopted different strategies; this reflected perhaps their more limited options in view of their smaller size, but it also differing ideologies and political economies. This sketch leads to the following conclusions:

- Selective as well as functional interventions played a vital role in the pattern of industrial and technological development in the NIEs. The extent of industrial and technological deepening achieved was strongly related to selective interventions to promote such deepening.
- Governments showed an ability to devise and implement interventions effectively, partly because export-orientation imposed a strict discipline on both industry and governments and partly because of the high levels of training, adequate remuneration and political insulation of bureaucrats.
- The nature and impact of interventions differed according to differing government objectives and political economies.
- FDI was treated very differently by each of the four countries and so played very different roles in their technological development. Those that wanted to promote *indigenous* technological deepening had to intervene to restrict foreign entry and to guide their activities and maximize the spillovers. Those that chose to rely on TNCs and upgrade within their global production structure had to intervene to target investors, guide their allocation and induce them to set up more complex functions than they would otherwise have done.
- The options and compulsions applicable to the larger economies, with greater scope for internal specialization and local content as well as better established indigenous enterprises, were different from those open to small states with weak indigenous entrepreneurship and a tiny internal market. Given the need to spread technological development more widely, the former had to take more direct steps to assist local firms.

III.b. Countries That Did Not Intervene Selectively: Chile and Ghana

It would be interesting to look at two examples from different regions of cases that are held up as models of policy reform in the "market friendly" directions praised by the World Bank. One is from Latin America, often referred to as a Tiger in the East Asian mould: Chile, which started on a liberalization programme in 1973 and by the 1980s had a liberal, open door regime in place. The other is Ghana, one of the Sub-Saharan African countries best endowed with human resources, and with the longest and best implemented experiences of liberalization and adjustment in the continent. Has the prescribed policy remedy succeeded in dynamizing industrial growth, recreating the NIE experience by depending on market forces?

Chile: Chile's annual rates of growth of manufacturing and total commodity exports have been 0.6 per cent and 7.9 per cent respectively during 1965-80, and 3.6 per cent and 5.2 per cent during 1980-90. This was better than most of the Latin American continent, caught in the throes of its macroeconomic crisis (Chile was able to stabilize its economy earlier), but modest by the standards of most Asian countries, even those with massive interventions like India. The total value of Chile's manufactured exports in 1992 came to \$1.3 billion,^{17/} compared to \$70.0 billion for Taiwan Province of China: only 2 per cent per cent of the latter (Chile's population was 67 per cent of Taiwan Province of China's). On a per capita basis, Chile's manufactured exports were \$96, as compared to \$3,500 for Taiwan Province of China (or \$1 539 for the Republic of Korea). During 1980-87, by which time structural reforms were well entrenched, the rate of growth of Chile's manufactured exports was 3.3 per cent per annum, compared to 15 per cent for the Republic of Korea and 13 per cent for Taiwan Province of China.

While Chile's export performance shows some dynamism, despite two decades of stringent neoclassical policies to 'free up' comparative advantage from the shackles of government intervention, it is a pale shadow of the performance of the Asian NIEs. Chile did not lack the human resources for the development of its exports, the factor most closely identified by the World Bank with the East Asian success. It had one of the best educational systems in Latin America, with a substantial skill base in engineering and technology. It had a long history of industrial experience and entrepreneurship. However, because of the unselective nature of its protection, it did not manage to build up competitive capabilities that could take on world market competition. The rapid liberalization led to massive deindustrialization, with about half of employment in manufacturing disappearing within a short period.

According to neoclassical prescriptions, this was not undesirable. Inefficient activities should die out, and the remaining industrial sector should then expand exports dynamically in response to the export oriented trade regime: after all, this was supposed to be the lesson of East Asia. The data suggest that this did not happen. The growth of manufactured exports was relatively slow and its range was fairly confined. Unlike the East Asian NIEs, whose export dynamism was based on diversification in non-resource based activities, and encompassed increasingly skill and technology intensive activities,

^{17/} Data from *World Development Reports*, various.

Chile's was based on natural resources (predominantly agricultural-resource based products). Because of this, it actually *diminished* in skill and technology content over time: the share of high wage products in total manufactured exports (an indicator of skill-intensity) fell over the period 1966-86, as did the share of products intensive in the use of technical and engineering manpower (an index of technological intensity).^{18/} In Taiwan Province of China and the Republic of Korea, by contrast, these shares rose sharply.

This is not to say that there was no dynamism in Chilean exports. Agro-based activities were the main source of export expansion; here new products and new processing technologies were introduced for the export market. The capability approach suggests that there must have been a base for technological development in these activities. This is the case: this sector did benefit from selective government support, for biotechnology and agriculture-related research. Moreover, Chile had a traditionally strong agricultural sector (aided by the "dovetailing" of its seasons into those of North America) and a good base of skills and education in these activities. These provided the protection and stimulus needed to undertake the necessary technological effort.

By the same token, the inability of Chile to "do a Taiwan Province of China", despite its human resource base for industrialization and getting its macroeconomy and prices 'right' in neoclassical terms, may also be explained by the capability approach. Chile was a relatively high wage economy that could not expand exports of simple labour-intensive products. The absence of interventions to promote learning in more difficult, higher value-added activities meant, however, that the upgrading of its comparative advantage was confined to activities where there was an established or predictable cost advantage. The pace of such upgrading was far slower, and its spread more limited, than in East Asia. Thus, the creation of new industrial comparative advantages in Chile under relatively non-interventionist conditions was severely constrained. It could not overcome the inherent market failures in technological capability building in complex industrial activities.

Ghana: The experience of Ghana is probably the most useful in the Sub-Saharan region for analysing the effects of SAPs, since it has the *longest history of consistent adjustment* (though other countries, like Kenya, have had earlier adjustment programmes which were not fully implemented). In the World Bank's assessment Ghana is now the most advanced country in Africa terms of reaching low tariff-based protection and free trade.^{19/} It started its policy reform with an Economic Recovery Programme in 1983. The first World Bank structural adjustment programme started in 1986, and was followed by two others until 1991. It was over these SAPs that the process of liberalization and market orientation was launched. By the start of the present decade Ghana had a relatively stable and liberal economy in place, and was often referred to as a model of successful adjustment in Africa.

^{18/} For a full analysis of Chile's export performance, see Pietrobelli (1994).

^{19/} World Bank, *Adjustment in Africa*, p. 67.

Ghana's accomplishments in terms of liberalization are impressive. It undertook a massive devaluation in the exchange rate, from 2.75 cedis to the dollar in 1982 to 920 cedis to the dollar in early 1994. It removed quantitative restrictions on imports and lowered tariffs to a relatively uniform 10-25 per cent range (only some luxury products are at the high end of this range). It reduced corporate taxes to 35 per cent and capital gains tax to 5 per cent and removed price controls and subsidies. It abolished credit ceilings and guidelines, privatized state owned enterprises and revised the investment code to attract foreign investors. It gave strong incentives for exporters and invited private investment in infrastructure.^{20/}

There was a substantial increase in net inflows from foreign sources (mostly in the form of aid), from \$196 million in 1985 to an average of \$878 million per annum over 1989-92.^{21/} This massive injection of aid resources, one of the highest in the world, allowed the economy to finance imports and to revive domestic demand. Initially the manufacturing growth did fairly well. The *average* growth rate, which was negative in the first half of the 1980s, rose to 4.5 per cent per annum over 1987-91. This is what prompts the World Bank to argue that adjustment was beneficial to Ghanaian industry, and that it has been sufficient to launch it on a long-term growth path.

However, averages can be highly misleading. Manufacturing value-added did rise rapidly after 1983, when imported inputs were made available to existing industries that were suffering substantial excess capacity, but there was no direct import competition to final products. The rate of growth was 12.9 per cent in 1984, 24.3 per cent in 1985, 11.0 per cent in 1986, and 10.0 per cent in 1987. However, as liberalization spread to other imports and excess capacity was used up, the exposure to world competition led to a steady deceleration of industrial growth. Thus, the rate of growth of MVA fell to 5.1 per cent in 1988, 5.6 per cent in 1989, 1.1 per cent in 1990, 2.6 per cent in 1991 and 1.1 per cent in 1992 (see chart below). This does not suggest that Ghanaian manufacturing responded well to liberalization. Employment in manufacturing fell from a peak of 78,700 in 1987 to 28,000 in 1993.^{22/} There was a rise in the number of small enterprises, but this was primarily in low-productivity activities aimed at very local markets. Foreign investment did not increase after the adjustment, and most of it concentrated in primary activities rather than in manufacturing. Domestic private investment did not pick up sufficiently to dynamize manufacturing growth.

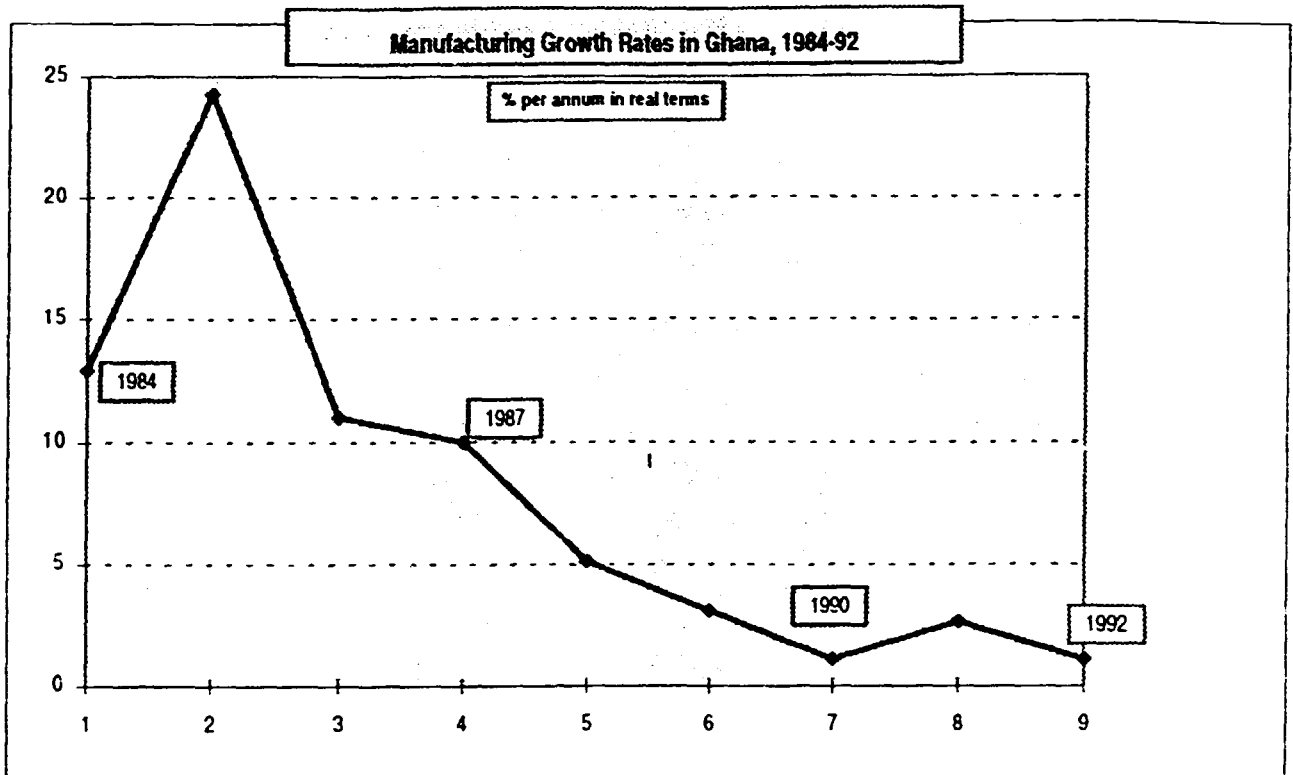
As far as exports of manufactures are concerned, the expectation was that they would grow and diversify rapidly under the new incentive regime. However, while manufactured exports *have* grown since 1986, the values are extremely small, coming to a total of \$14.7 million in 1991. The growth has come mainly from wood and aluminium products, both *long-established export sectors*, and from firms established in export markets, rather than

^{20/} African Development Bank, *African Development Report 1994*, pp. 57-62.

^{21/} *Ibid.* Table 27.

^{22/} *African Development Report 1994*, p. 61.

from new products or producers.^{23/} There is relatively little sign of a broad-based response on the part of Ghanaian manufacturing enterprises, particularly in its main potential area of comparative advantage, cheap labour. Labour-intensive exports like garments, footwear, toys or other light consumer goods and metal products, that led the initial export thrust of the Asian NIEs, are conspicuous by their absence.



At the same time, large swathes of the manufacturing sector have been devastated by import competition. It is obvious that the long period of import-substituting industrialization, with the lead taken by state-owned enterprises, left a legacy of inefficiency and technological backwardness. It may also have left some technological capabilities, but not at the level that rapid liberalization could stimulate them to reach world levels. The adverse impact of liberalization has therefore been strongest in the more modern, large-scale part of the industrial sector, which had the most complex technologies and so suffered most from the lack of technological capabilities. Industrial survivors and new entrants are basically in activities that have "natural" protection from imports: very small-scale enterprises, making low-income or localized products, and larger enterprises protected by high transport costs or based on processing of local raw materials.

^{23/} The values of the main non-traditional manufactured exports in 1991 were: aluminium \$5.5 m., wood products \$6.2 m. (of which furniture accounted for \$3.6 m. and other wood products for \$2.6 m.), canned foods \$0.3 m., tobacco \$0.4 m., soaps \$0.6 m., machetes and iron rods \$0.8 m., and others \$1.3 m.

Rapid exposure to market forces in these conditions may thus be retarding the development of Ghana's comparative advantage. The rapid pace of exposure to world competition is killing off not just inherently uneconomic activities but also some that could be the basis of new labour-intensive manufactured exports. The lack of policies to upgrade skills, technical information and technological support is exacerbating market failures in inputs that are essential for developing competitive capabilities. Ghana's comparative advantage is likely, in this policy framework, to evolve very slowly unless there is a rapid inflow of foreign manufacturing investments. However, the lack of industrial capabilities itself means that foreign investors are not attracted to set up facilities that are immediately exposed to direct import competition.

IV. INTERVENTIONS IN THE CONTEXT OF POLICY REFORM

The capabilities approach provides a much deeper and more realistic insight into the determinants of industrial competitiveness than simple approaches that assume the efficiency of markets. It also suggests that the process of policy reform that most developing countries are engaged in, and which is clearly necessary in order to meet the challenges of the world market and emerging technologies, has to be carefully crafted and must preserve a large role for the government. This section considers some of the major elements of new policies that the previous analysis suggests.

Industrial policy reform must be in the direction of conformance to market forces, but the failures that exist in many markets mean that reform cannot consist simply of a wholesale withdrawal of governments from markets and resource allocation. The best way to approach industrial strategy may be to gear it directly to *enhancing industrial competitiveness*, i.e. improving the ability of exporters and import substituting industries to compete in world markets. Given that resources and skills in the government and the economy at large are very limited, it is best to adopt a targeted approach where governments can get maximum "bang for the buck" in terms of policy response.

In general terms, such strategy involves following steps:

- Trace the competitive evolution of its industrial sector,
- Identify potential existing industry 'clusters' that can be promoted with the limited resources available,
- Select new areas of competitiveness that need to be developed to diversify its position in world markets,
- Devise appropriate policies to improve their competitiveness,
- Strengthen the information, administrative and human resources needed to undertake such policies, including organizational reforms to the government apparatus.

Competitiveness analysis is now increasingly used in many industrializing countries. While it has several variants, it essentially consists of analysing the trade and growth performance of industries, relating this to evidence on technological efficiency at the

industrial and firm level, and identifying the most important support measures that need to be undertaken to raise efficiency and performance.

Incentive Systems; The most important aspect of the reforms to the incentive structure for industry is the liberalization of the trade regime. The recommendation of the new "rules of the game" is to undertake a sweeping and rapid liberalization of imports, so that within a period of three to five years the industrial sector is exposed to import competition with moderate and uniform tariffs of around 10 percent, leaving no room for further protection at the end to encourage industrial diversification. This is at variance with the pattern of structural adjustment undertaken by most of the successful Asian NIEs, where *liberalization was gradual, geared to the differing needs of different industries, and retained the scope for promoting new infant industries at the end of the adjustment period.*

On analytical grounds also, a consideration of the technological development process and the market failures that it faces favours the "Asian adjustment approach". The restructuring needs of existing industries requires a gradualist and pro-active approach to liberalization rather than the sweeping and non-discriminatory approach usually recommended by neo-liberal economists. This is because not all industries that are presently uncompetitive are *basically* uncompetitive in the longer term if they are given the time and resources to develop new skills and master new technologies. There are certainly some inherently uneconomic activities that deserve to be closed down immediately, and some, at the other end, that can be exposed immediately to international markets. In between lies the bulk of manufacturing industry, which has to undergo a process, varying in duration and content by activity, of "relearning" and new capability acquisition, after which it can cope with import competition and establish a position in export markets. These activities have a great deal already invested in them, and may have accumulated a substantial base of technical and other skills. If exposed suddenly to import competition without the time and supply-side support to cope, they can die and their physical and human investments dissipate.

The process of economic liberalization should thus be a gradual and controlled process of opening up accompanied by a *strategy* of industrial restructuring and upgrading, rather than the rapid and sweeping exposure to international market forces. The strategy should be guided by a realistic assessment of the competitiveness potential of various activities, with a clear evaluation of which are viable in the medium term and which are better left to disappear in view of the time and costs involved. The strategy should be developed after a close study of and *in collaboration with* the industrial sector, and should be pre-announced so that enterprises have time to adjust. Once announced, moreover, governments should stick to the programme to ensure its credibility. They must not allow backsliding that allows inefficient performers to survive indefinitely.

In the entire process of opening up the external sector, governments should retain powers to influence resource allocation, but in a clear and transparent manner. Unlike earlier strategies of import-substitution where governments tended to offer protection with little discrimination and with no requirements of international competitiveness, this model of adjustment places strong pressures on industries to invest in building up new capabilities to face the import and export competition within a limited period. It is

designed to overcome market failures, not to ignore them. It involves close monitoring of the progress of liberalization, and it requires that the government is able to address the supply side needs of industries (see below) along with allowing a phased process of liberalization. After the adjustment process is complete, the government should retain the option to select and promote a few infant industries at a time to accelerate the process of upgrading the country's comparative advantage.

It cannot be too strongly emphasized that to recommend a more gradual strategy of liberalization is *not* to suggest that governments simply slow down the adjustment process. What is needed is *not to delay the adjustment, but to actively prepare for it* in the grace period provided. An important factor to take into account is that many governments may not at this time have the capabilities to mount effective selective interventions in support of industrialization. The levels of intervention they exercise must therefore be tailored to their relatively limited capacities to monitor and implement selective industrial restructuring and promotion policies. At the same time, government capabilities can themselves be improved with training, better incentives and greater insulation from the political process. As noted above, the development of such capabilities must in fact be one of the intrinsic components of structural adjustment policy.

On the other incentive measures, the liberalization of the industrial policy regime is important to remove artificial restraints to domestic competition and to remove common biases against the growth of *small and medium sized enterprises*. Specific measures are needed to promote linkages between large and small enterprises, which have been slow to take root in many countries and which are not addressed in adjustment programmes. One of the best ways to include the small enterprise sector in the mainstream of industrial life is to promote subcontracting and other supply linkages with large firms; these measures were assiduously promoted in East Asia and over time yielded considerable benefits. Box 3 illustrates with some examples from the Republic of Korea and Taiwan Province of China.

Supply Side Measures: Of all the constraints to industrial development, the most common and often the most important is the lack of *human, especially technical and managerial, capital* that industry has to work with. This is so well recognized now that it need not be belaboured here — what is surprising that the design of liberalization programmes hardly takes into account the need to build human resources to cope with international competition. The pace of liberalization is generally much faster than any economy is able to provide the new skills and capabilities that industry needs, yet, as noted, the opening up actually destroys many of the skills that have already been built up. The skills that deserve immediate attention are the provision of better and more training in specific industrial skills for the most important industry clusters that would form the dynamic edge of industrial growth. This need not wait for longer-term investments in education and vocational training, which are of course also necessary.

Box 3. Subcontracting Promotion in the Republic of Korea and in Taiwan Province of China

The Korean government initially placed the burden of industrial development on the giant conglomerates (the *chaebol*), but over time have realized the importance of a dynamic, flexible and efficient SME sector that can provide specialized subcontracting services to the large firms. Since the early 1980s a number of laws were passed to promote SMEs, leading to a perceptible rise in their share of economic activity (in 1975-86 the share of SMEs in employment, sales and value added rose by at least 25 percent). The system of policy support was crucial to the reversal in their performance: this covered SME start-up, productivity improvement, technology development and export promotion. A host of tax incentives was provided to firms participating in these programs, as well as finance at subsidized rates for using support services, credit guarantees, government procurement and the setting up of a specialized bank to finance SMEs. A number of other institutions were set up to help SMEs (such as the Small and Medium Industry Promotion Corporation to provide financial, technical and training assistance and the Industrial Development Bank to provide finance) and the government greatly increased its own budget contribution to the program, though SMEs also had to pay a part of the costs of most of the services provided to them.

To promote subcontracting by the *chaebol*, the government enacted a law designating parts and components that had to be procured through SMEs and not made in-house; by 1987 about 1200 items were so designated, involving 337 principal firms and some 2200 subcontractors, mainly in the machinery, electrical, electronic and ship-building fields. By this time, subcontracting accounted for about 43% of manufacturing output and 65-77% of the output values of the electrical, transport equipment and other machinery industries. Generous financial and fiscal support was provided to subcontracting SMEs, to support their operations and process and product development. In addition, subcontracting SMEs were exempted from stamp tax and were granted tax deductions for a certain percentage of their investments in laboratory and inspection equipment and for the whole of their expenses for technical consultancy. Subcontracting promotion councils were set up by industrial subsector and also within the Korea Federation of Small Business to help SMEs in the contractual relationship, arbitrate disputes and monitor contract implementation. The government put pressures on the *chaebol* to establish vendor networks; such pressures were extremely effective and resulted in a rapid expansion of localization of components among subcontractors.

There are three main reasons for the success of Korean policy of encouraging SMEs. The policy received support at the highest policy levels in Korea and was backed by considerable financial resources from the government budget. The supporting interventions were comprehensive and well-designed. Finally, the presence of a strong business group, the Korea Federation of Small Business, gave SMEs a powerful voice in the public domain and also provided a range of support services.

In Taiwan, the industrial structure, unlike Korea's, is dominated by SMEs, and programs to promote subcontracting have been of special significance to the country's industrial development. There are around 700 thousand SMEs in Taiwan, accounting for 70% of employment, 55% of GNP and 62% of total manufactured exports. In 1981 the government set up the Medium and Small Business Administration to coordinate the efforts of several support agencies that provided financial, management, accounting, technological and marketing assistance to SMEs. Financial assistance was provided by the Taiwan Medium Business Bank, the Bank of Taiwan, the Small and Medium Business Credit Guarantee Fund, and the Small Business Integrated Assistance Centre. Management and technology assistance was provided by the China Productivity Centre, the Industrial Technology Research Institute (ITRI) and a number of industrial technology centres (for metal industry, textiles, biotechnology, food, and information). Of these the best known is ITRI, which engages in generic R&D in a number of manufacturing industries and passes on its results to the private sector for commercial development.

The Joint services Centre of the Ministry of Economic Affairs acts as a source of information on SME assistance; the government covers 50-70 percent of consultation fees for management and technical consultancy services for SMEs. The Medium and Small Business Administration is setting up a fund for SME promotion of NT \$ 1J billion.

Taiwan has a Centre-Satellite Factory Promotion Program of the Ministry of Economic Affairs is to organize and integrate smaller factories around a principal one. This program involved vendor assistance and productivity raising efforts, and a rational sharing of tasks between participating enterprises. By 1989 there were 60 networks with 1,186 satellite factories in operation, mainly in the electronics industry.

The government has also adopted several measures to promote backward linkages by foreign investors. In some cases, especially in the early years, it applied minimum content requirements in industries like motor vehicles and consumer electronics. Over time it moved to indirect measures to promote linkages, by giving incentives for principal firms to use local subcontractors and by improving the technological and business capabilities of SMEs. The outward-oriented trade regime encouraged firms to invest in upgrading their capabilities. Tax incentives were given for R&D expenditures and skill levels were improved through sustained investments in education and training. The purchase of local equipment and entry into "linkage-intensive" activities were encouraged by tax incentives. In essence, therefore, backward linkages were created by upgrading the technological capabilities of potential subcontractors and by guiding market forces by careful interventions backed by considerable funding and human resources.

The stimulation of in-firm training is another key area of policy intervention which may be successful in the medium term. It requires the launching of concerted campaigns to inform firms, especially smaller ones, of the need for training to raise their competitive capabilities in the face of import competition. But informing and propaganda are not enough: firms have to *shown* how to train, how much and in what areas; they need teachers and guides; and they need financial support. Often training has to go together with the provision of new equipment, better layout, improved process know-how and more modern product technology. All these may need specific policies addressing their informational, financial and other needs. The case of Singapore, perhaps the leader in the Third World in terms of upgrading and guiding training to industrial policy ends, is reviewed briefly in Box 4 below.

The other important need of industrial upgrading is *technology*. The rapid pace of technological change means that all enterprises have to be geared to coping with new products, processes, equipment and organizational systems. However, large parts of the industrial sector in most developing countries are not able even to cope efficiently with the technologies that they already have. The level of productive efficiency and quality tends to be low, and most firms do not, and do not know how to, undertake the training and technical effort needed to approach "best practice" levels of efficiency. Market failures are rife here: information is lacking, costs and returns are risky and unpredictable, there are massive externalities and institutional support is weak.

Take the case of quality management. A very important development in the field of quality management for export markets is the increasing use of the new ISO 9000 standards. Many industrializing countries are investing large amounts of money and effort in introducing these extremely complex and demanding systems to their firms. While not mandatory for the export of non-food and medical products, the observance of the standards is an extremely effective way of improving quality consciousness, raising the image of the product and diffusing modern technology. The system provides an objective set of rules and qualifications that must be possessed by firms if they are to approach world best practice levels of quality management. Yet it is costly to introduce ISO 9000 systems. The quality audit itself is expensive (in the UK is costs over £50 thousand per firm); this has to be followed by a series of changes to the production process, quality control equipment and procedures and the training of personnel. Even large firms find the process daunting; SMEs generally regard it as beyond their means altogether. Yet its widespread introduction would greatly benefit the SME sector.

There is clearly a case for the government to subsidize and promote the spread of such quality standards. This would call for a concerted campaign that combined finance, publicity, technical assistance, training and equipment provision.

This is simply one example of the need for strong promotional and support efforts by governments in upgrading technology. The same applies to extension services to industry: this requires a package of skills, information, equipment, training and finance, provided along with a change in the incentive regime and with considerable persuasion from the government (including giving preferences in, say, export facilities, government procurement and so on). Individual firms often lack the ability to undertake such efforts on their own, and the enormous amount of subsidies and effort invested in East Asian

countries in raising firm productivity shows that the market failures involved are indeed enormous. This applies particularly to support for technology upgrading by SMEs. The Asian NIEs provided a range of support measures for their smaller enterprises, some of which are highlighted in Box 3. It should be noted that even *laissez faire* Hong Kong had strong public support for its technical services for small and medium exporters.

Box 4: Skill Creation for Industry in Singapore

Singapore has one of the best systems in the developing world for education and training for industrial needs. It has a high quality education system, which is tightly regulated and directed by the government to ensure its standards and relevance to emerging technological needs, and receives considerable financial support from the state.²⁴ It was able to transform its colonial elitist education system into one that was merit-based, vocationally oriented and demand driven. The higher education system has three levels: the public universities at the top, four polytechnics in the middle and middle-level job oriented training institutes at the bottom. These include centres set up by the government in collaboration with MNCs as well as a number of centres set up by statutory boards, professional bodies and private institutions.

As a result, Singapore is a regional leader in employee training programs held outside the firm. The Vocational & Industrial Training Board (VITB) established an integrated training infrastructure which has trained and certified over 112,000 individuals, about 9% of the existing workforce, since its inception in 1979. The VITB administers several programs. The Full-Time Institutional Training Program provides broad-based pre-employment skills training for school leavers. The Continuing Skills Training Program comprise part-time skills courses and customized courses. Customized courses are offered to workers based on requests from companies and are specifically tailored to their needs. Continuing Education provides part-time classes to help working adults.

VITB's Training and Industry Program offers apprenticeships to school leavers and ex-national servicemen to undergo technical skills training and, at the same time, earn a wage. The program consists of both on-the-job and off-the-job training. On-the-job training is carried out at the workplace where the apprentice, working under the supervision of experienced and qualified personnel, acquires skills needed for the job. Off-the-job training includes theoretical lessons conducted at VITB training institutes or industry/company training centres. Under the Industry-Based Training Program employers, with VITB input, conduct skills training courses matched to their specific needs. VITB also provides testing and certification of its trainees and apprentices as well as trade tests for public candidates. The Board, in collaboration with industry, certifies service skills in retailing, health care, and travel services.

In addition, Singapore has set up a number of training centres in advanced manufacturing skills for employees. These were established in collaboration with multinational companies, including Philips of Holland and Tata of India, to provide state of the art training in special technologies and equipment. The government subsidises training provided by these centres, and regards these as a strong competitive edge in attracting high-tech foreign investments.

Using various grant schemes, the National Productivity Board's Skills Development Fund (SDF) created 405,621 training places in FY90. The initial impact of the program was found mostly in large firms, however, efforts to make small firms aware of the training courses and to provide support for industry associations has increased the SDF's impact on smaller organizations. One particular program, the Training Voucher Scheme provides support to employers to augment training course fees. This Scheme enabled the SDF to reach more than 3,000 new companies in FY90, many of which had 50 or fewer employees. The Training Leave Scheme encourages companies to send their employees for training during office hours. This scheme provides 100% funding of the training costs for approved programs, up to a maximum of \$20 per participant hour. In FY90, over 5,000 workers benefited from this Scheme. The success of the Skills Development Fund is due in part to an strategy of incremental implementation. Initially, efforts focused on creating awareness among employers, with *ad hoc* reimbursement of courses. The policy was then refined to target in-plant training, and reimbursement increased to 90% of costs as an additional incentive. Further modifications were made to encourage the development of corporate training programs by paying grants in advance of expenses, thus reducing interest costs to firms. More recently, the Fund has focused on smaller firms and training quality.

The promotion of *formal R&D* by industrial enterprises becomes important as the industrial structure grows more complex, not to 'innovate' at world frontiers but to adapt and assimilate new technologies and to create new products on the basis of existing technologies. The measures taken by the Republic of Korea to encourage indigenous technological activity have been noted earlier. Many other countries also have strong promotional measures, including generous tax incentives for R&D. However, very often their efforts have been concentrated on large public research institutes that are generally divorced from production and contribute little to technological upgrading in industrial

enterprises. This is practically a universal problem, and most governments are moving towards reform. They are forcing their laboratories to establish closer links with industry and earn more of their keep from selling technologies and services, with some success. However, the real contribution of the public science and technology infrastructure can only be realized when enterprises themselves engage in meaningful R&D activity and so reach a meaningful division of labour with the S&T infrastructure. Only then are they able to tap the potential offered by public laboratories and universities, with their advantage in basic research. In other words, a "demand pull" strategy of promoting technological activity is much more likely to succeed than a "supply push" strategy.

The creation of a "technology culture" in the industrial sector is far from easy, and few industrializing countries have succeeded in doing it. The East Asian case suggests that its mainsprings lie in a combination of infant industry promotion, exposure to world markets, provision of skills, a supportive financial system and clear direction from the government (including the targeting of technologies) rather than in simple liberalization and a passive reliance on FDI inflows. Again, it is the careful blend of selective interventions of different types that is essential.

This discussion of supply side factors is not complete, but this is not the venue to enter into more detailed analysis of all the measures that governments can or should take to support industrial competitiveness. The main point has been that there *is a positive and important role for the government*, and that it will often be selective: the resources available for effective intervention are simply too scarce to spread over the entire industrial sector. Governments have to "pick winners" in order to have an impact on competitiveness.

V. THE RISK OF GOVERNMENT FAILURE

While it may be accepted in principle that interventions can be helpful to remedy market failures, many analysts argue that in practice most governments are unable to act (selectively) in the national interest.^{24/} Some believe this on an empirical, case-by-case basis, but there is a strong ideological strain in economics and political economy that believes that governments are intrinsically incapable of intervening in the national interest. While the risk of government failure is a real and important one, the East Asian experience suggests that there is a strong *prima facie* case that governments can intervene selectively and very effectively; thus, the neo-liberal ideological case is clearly not a generalizable one. It is worth looking at the more practical reasons for government failure.

Several reasons are for failures of industrial policy: governments cannot have enough information to select better than the market; they do not have the skills to design and implement detailed interventions; they are inflexible and unable to change course when mistakes become apparent; they tend to represent sectional rather than national interests; and they are venal or corruptible. These reasons have some validity. There are

^{24/} For reviews see Chang (1994), Shapiro and Taylor (1990), Streeten (1993).

clearly circumstances in which particular governments cannot undertake selective industrial policies. However, these are not absolute given that rule out selectivity altogether.

Let us briefly consider the arguments in turn:

Lack of information: Most developing country governments lack the information to make selective decisions. However, difficulties in "picking winners" can be exaggerated. Industrial latecomers have much more information (on market and factor conditions, technological requirements, skill and organizational needs) than countries at the frontiers of innovation, where the risk of selectivity is much greater. It is easier for the former to follow countries further up the industrialization scale: the way that the Republic of Korea 'followed' Japan is a case in point. Moreover, industrial policy does not involve picking winners so much as *creating* them. There are a number of viable options facing late industrializers, any of which could be made to work if the right skills, technologies, institutions and incentives are mustered. What is necessary is to be 'right' in a broad range, and to mount a systematic and coherent strategy. Finally, where information is lacking, there is certainly a need for governments to collect it, from other countries, from domestic sources and by close interaction with the industrial sector. One of the most important lessons of the Asian NIEs, well analysed by the *Miracle* study, is that interventions were not conducted by bureaucrats acting on grand plans based on abstract planning models or grandiose schemes of national aggrandizement, but in close consultation with the private sector. This provided information on trends and conditions that the government could not have accessed otherwise. Note also that they exercised different levels of selectivity — the Republic of Korea was much more detailed and pervasive than Taiwan Province of China, and called for more detailed information. Lower levels of selectivity are less information intensive, and also involve lower risks.

Skills: Many administrations certainly do not at present have the economic or technical skills to design and mount selective interventions. Perhaps more important, they are often given multiple, unclear or conflicting objectives which make it difficult for any administration to design and monitor industrial policies. These can be remedied, albeit slowly, by increasing the education and training base of the economy and by having clearer economic objectives (the point about levels of selectivity also applies here). The Asian NIEs had the clear objective of increasing exports and gaining international competitiveness. This enabled them to design policies and to deploy their skills much more effectively.

Inflexibility: Many interventions turn out to be costly not so much because they are poorly designed (private business makes huge mistakes all the time) but because changing course is difficult and there is no official accountability for the outcome. Clearly all interventions have to be designed flexibly and monitored constantly so that mistakes can be rectified as they become apparent. There are precedents in the private corporate sector on how this can be done, but perhaps the most effective check is to impose performance requirements (e.g. export growth) and to make officials more directly accountable. Export orientation was itself the best guarantee of flexibility in policy making in the NIEs (Moreira, 1994). If the intervention is kept at fairly general levels,

the 'tie in' to particular choices is also correspondingly lower and the task of changing direction easier.

Sectional interest: 'Sectionalization' of decision making is a danger in most governments. This affects functional as well as selective interventions, of course, but the dangers may be greater for the latter. It can only be offset by clear leadership, the setting up of appropriate institutions and internal checks on the allocation of favours — that this can be done is amply illustrated by the Asian experience.

Corruption: There are several levels to this problem: the higher the level the more difficult it is to solve. At lower levels of government, changes in monitoring, employment conditions, salaries and incentives may help reduce rampant corruption. At the top levels, no one is able to impose sanctions on wrong-doers. Again, such venality can distort the most liberal regime, not just interventionist ones. The solutions, if any, lie in larger political and social processes that are beyond the purview of this analysis, but certainly a corrupt government should not be entrusted to undertake detailed industrial policy.

It does not appear, therefore, that the objections amount to a universal and permanent case against selectivity. The question is more of *degree* than of kind. There are *some* levels of selective intervention that most governments can undertake, and there are some governments that cannot for the time being be entrusted with any — but these are governments that are unlikely to carry through even the market friendly interventions that all development requires.

Some new political economists hold that there are no circumstances in which any government can be trusted to act impartially in the national interest and do it effectively. This is biased and ideological — it is not supported by the evidence of East Asia, and it is not clear that it would hold up to historical evidence in the West. Governments are fallible (just as markets are), but they can be improved. Government structures can be reformed, skills created, impartiality increased. It is only corruption and venality that perhaps is difficult to remove by an act of will, but then corrupt governments exist in liberal economies and free markets do not remove rent seeking.

There are degrees of industrial policy, with different levels and detail of selectivity in intervention. The need for industrial policy can also change with the development of markets; as economies develop and markets grow more competent and sophisticated, the need for intervention diminishes. What is important to remember is that *not intervening has its own costs*. Market failures can stunt industrialization if all governments do is "get prices right", and wait for markets to do the rest. Even market friendly interventions combined with liberal policies can narrow and constrict industrial development, as the case of Chile showed. The lesson of the larger NIEs is precisely that these constraints of the market can be relaxed, and the industrialization process greatly compressed and dynamized, by appropriate interventions. Countries need not be satisfied with the market-given pace and content of industrial development, but *use* the market to enlarge their opportunities.

Is the East Asian case replicable? Not perhaps in all its ramifications: no other country can "be a Republic of Korea" in the details of strategy. But then the Republic of Korea

was not a Japan, and Taiwan Province of China was not a Republic of Korea. There were sufficient similarities in their approach to identifying and remedying market failures that offer generic lessons for the rest of the developing world. These lessons are not only economic; they also concern the design, administration, financing and staffing of interventions. This is where the World Bank's *Miracle* study is particularly good, though after discussing the ways in which interventions were designed, 'contests' set up and neutrality promoted, it concludes that these were unique to the East Asians.

This seems mistaken, if not patronizing and offensive to other governments. Different economic, institutional and political conditions certainly dictate different strategies, but they do not rule out strategies altogether.

REFERENCES

- Amsden, A. H., "Why Isn't the Whole World Experimenting with the East Asian Model to Develop? Review of *The East Asian Miracle*", *World Development*, Vol. 22, No. 4, (April 1994), pp. 627-634
- Amsden, A. H., *Asia's Next Giant: South Korea and Late Industrialization* (New York: Oxford University Press, 1989).
- Arrow, K. J., "Economic Welfare and the Allocation of Resources for Innovation", in R. Nelson (ed.), *The Rate and Direction of Innovative Activity* (Princeton: Princeton University Press, 1962), pp. 609-626.
- Bell, M. and Pavitt, K., "Technological Accumulation and Industrial Growth: Contrasts Between Developed and Developing Countries", *Industrial and Corporate Change*, Vol. 2, No. 2 (1993), pp. 157-210.
- Brautigam, D., "The State as Agent. Industrial Development in Taiwan, 1952-1972", in H. Stein (ed.), *Asian Industrialization and Africa* (London: Macmillan, 1995), pp. 145-182.
- Chang, Ha-Joon, *The Political Economy of Industrial Policy* (London: Macmillan, 1994).
- Dahlman, C. J., Ross-Larson, B. and Westphal, L. E. (1987), "Managing Technological Development: Lessons from Newly Industrialising Countries", *World Development* 15(6): 759-775.
- Enos, J. (1992), *The Creation of Technological Capabilities in Developing Countries*, London: Pinter Publishers.
- Enos, J. and Park, W. H. (1987), *The Adaptation and Diffusion of Imported Technologies in the Case of Korea*, London: Croom Helm.
- Ernst, D. and O'Connor, D. (1989), *Technology and Global Competition: The Challenge for Newly Industrialising Economies*, Paris: OECD Development Centre.
- Fishlow, A., Gwin, C., Haggard, S., Rodrik, D. and Wade, R., *Miracle or Design? Lessons from the East Asian Experience* (Washington, DC: Overseas Development Council, 1994).
- Freeman, C. and Perez, C. (1988), "Structural Crises of Adjustment, Business Cycles and Investment Behaviour", in G. Dosi *et al* (eds.), *Technical Change and Economic Theory*, London: Pinter.
- Hobday, M. G. (1994), "Export-Led Technology Development in the Four Dragons: the Case of Electronics", *Development and Change*, 25(2): 333-61.
- Jacobsson, S., "The Length of the Learning Period: Evidence from the Korean Engineering Industry", *World Development*, Vol. 21, no. 3 (March 1993), pp. 407-420.
- Kaplinsky, R. (1994), "Easternisation", *The Spread of Japanese Management Techniques to Developing Countries*, London: Frank Cass.
- Katz, J. M. (Ed.), *Technology Generation in Latin American Manufacturing Industries*, (London: Macmillan, 1987).
- Kim, K. S., "The Korean Miracle (1962-80) Revisited: Myths and Realities in Strategies and Development", in H. Stein (ed.), *Asian Industrialization and Africa* (London: Macmillan, 1995), pp. 87-144.

- Kwon, J. "The East Asian Challenge to Neoclassical Orthodoxy", *World Development*, Vol. 22, no. 4 (April, 1994), pp. 635-644.
- Lall, S., "Governments, Globalization and International Business: The Developing East Asian Economies", in J. H. Dunning (Ed), *Governments, Globalization and International Business* (forthcoming).
- Lall, S., "'The East Asian Miracle' Study: Does The Bell Toll for Industrial Strategy?", *World Development*, Volume 22, No. 4 (April 1994.a), pp. 645-654.
- Lall, S., "Industrial Policy: The Role of Government in Promoting Industrial and Technological Development", *UNCTAD Review 1994*, (1994.b), pp. 65-89.
- Lall, S., "Understanding Technology Development", *Development and Change*, Vol. 24, No. 4 (October 1993), pp. 719-753.
- Lall, S., "Technological Capabilities and Industrialization", *World Development*, Vol. 20, No. 2 (February 1992), pp. 165-86.
- Lall, S., *Building Industrial Competitiveness in Developing Countries* (Paris: OECD, 1990).
- Lall, S. and Najmabadi, F., *Bank Lending for Industrial Technology Development* (Washington, DC: World Bank, Operations Evaluation Department, 1995).
- Lall, S., Navaretti, G. B., Teitel, S. and Wignaraja, G. (1994), *Technology and Enterprise Development: Ghana under Structural Adjustment*, London: Macmillan.
- Lazonick, W. (1993), "Learning and the Dynamics of International Competitive Advantage", in R. Thomson (ed), *Learning and Technological Change*, New York: St Martin's Press.
- Lim, L., "Foreign Investment, the State and Industrial Policy in Singapore", in H. Stein (ed.), *Asian Industrialization and Africa* (London: Macmillan, 1994), pp. 205-238.
- Lucas, R. E., "On the Mechanics of Economic Development", *Journal of Monetary Economics*, Vol. 22, No. 1 (March 1988), pp. 3-42.
- Mill, J. S., *Principles of Political Economy* (London: Longmans, Green and Company, 1940, first published in 1848).
- Moreira, M. M., *Industrialization, Trade and Market Failures: The Role of Government Intervention in Brazil and the Republic of Korea* (London: Macmillan, 1994).
- Nelson, R. R. "Research on Productivity Growth and Productivity Differences: Dead Ends or New Departures?," *Journal of Economic Literature*, Vol. 19, No. 3 (June 1981), pp. 1029-1064.
- Nelson, R. R. and Winter, S. J., *An Evolutionary Theory of Economic Change* (Cambridge, Ma.: Harvard University Press, 1982).
- OED, *World Bank Support for Industrialization in Korea, India and Indonesia* (Washington, DC: World Bank, Operations Evaluation Department, 1992).
- OTA (1990), *Making Things Better: Competing in Manufacturing*, Office of Technology Assessment, Washington, DC: US Senate.
- Pack, H. and Westphal, L. E., "Industrial Strategy and Technological Change: Theory versus Reality", *Journal of Development Economics*, Vol. 22, No. 1 (September 1986), pp. 87-128.
- Pietrobelli, C. (1994), "National Technological Capabilities: An International Comparison", *Development Policy Review*, 12(2): 115-148.

- Rosenberg, N , *Perspectives on Technology* (Cambridge: Cambridge University Press, 1986).
- Selvaratnam, V., (1994), "Innovations in Higher Education: Singapore at the Competitive Edge", Washington, DC: World Bank, Technical Paper No. 222.
- Shapiro, H. and Taylor, L., "The State and Industrial Strategy", *World Development*, Vol. 18, no. 6 (June, 1990), pp. 861-878.
- Singh, A., "Openness and the Market Friendly Approach to Development: Learning the Right Lessons from Development Experience", *World Development*, Vol. 22, no. 12 (December, 1994), pp. 1811-24.
- Stiglitz, J. E. "Learning to Learn, Localized Learning and Technological Progress", in P. Dasgupta and P. Stoneman (eds), *Economic Policy and Technological Development* (Cambridge: Cambridge University Press, 1987), pp. 125-55.
- Stiglitz, J. E., "Markets, Market Failures and Development", *American Economic Review Papers and Proceedings*, Vol. 79, No. 2 (1989), pp. 197-202.
- Stiglitz, J. E. *et al.*, *The Economic Role of the State* (Oxford: Basil Blackwell, 1989)
- Streeten, P. P., "Markets and States: Against Minimalism", *World Development*, Vol. 21, No. 8 (August 1993), pp. 1281-1298.
- JUNCTAD (1994), *World Investment Report 1994*, New York: United Nations Conference on Trade and Development, Division on Transnational Corporations and Investment.
- Wade, R., *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*, (Princeton: Princeton University Press, 1990).
- Westphal, L. E., "Industrial Policy in an Export-Propelled Economy: Lessons from South Korea's Experience", *Journal of Economic Perspectives*, Vol. 4, No. 3, (March 1990), pp. 41-59.
- Wood, A. (1994), *North-South Trade, Employment and Inequality*, Oxford: Oxford University Press.
- World Bank, *The East Asian Miracle: Economic Growth and Public Policy* (New York: Oxford University Press, 1993).
- World Bank (1994), *Adjustment in Africa: Reforms, Results and the Road Ahead*, Policy Research Department, Washington, D. C..
- Young, A., "Learning by Doing and the Dynamic Effects of International Trade", *Quarterly Journal of Economics*, Vol. 56, No. 2 (May 1991), pp. 369-405.