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**The Industrialization of Africa in the  
Context of Global Economic Developments**

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## I. Background

The world in which African industry will operate in the coming decade will be very different from the world in which it was set up and nurtured in the past three decades. There are four major changes in the global economic environment to which it has to adjust. Each affects the context in which industry in all developing countries has to compete; together they amount to a 'paradigm' change for industrialisation.

*Technological change:* The rapid and sweeping pace of technological developments in industry, services and infrastructure, with the use of microelectronics, new materials, biotechnology, information flows and networking, is causing massive changes in the determinants of industrial competitiveness and in the location of industry. These changes are altering fundamentally the methods and organisation 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 see the emergence of a new industrial revolution within the developed world. The new "paradigm" of production involves, not only new technologies (in the traditional sense), but also new management and organisational 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 entails, therefore, important structural changes *within* each industrialised country. It also creates new requirements for competitiveness, including a broad range of operational, technical and management skills, the capability to use and improve upon sophisticated technologies, high quality infrastructure (both physical and technological) and a developed system of suppliers and service firms to support just-in-time production systems.

*Growing internationalisation of production and trade:* The role of trade and international investment in economic activity has increased dramatically in recent years, with a "shrinking of economic space" and a sustained rise in the role on international production and intra-firm transactions by transnational corporations. Driven partly by evolving technologies and increasing specialisation, and partly by falling transport, travel and communication costs, foreign trade has been rising faster than world production. 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 'globalising' their operations, rationally integrating production, sales and other functions across national boundaries, and spreading the new organisational methods that are gaining dominance in the advanced world.

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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 intensifying direct competition between countries for markets, capital and technologies (and, in the future, for certain kinds of human capital). 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. 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.

*National policy changes:* 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, with high levels of protection, wholesale interventions by the government and a leading role for the public sector, are being abandoned. The inward oriented strategy on which most industrialisation was founded, in Africa and elsewhere, have been found to be costly and inefficient. Protective barriers are being lowered, restrictions to foreign direct investment removed and the private sector allowed into areas previously reserved for public enterprises. Every developing region now wants to participate in international trade and investment and competition for resources, technology and markets is intensifying. All countries are offering similar policy packages, though with different degrees of macroeconomic and political stability. This sea change in policy regimes has sweeping implications for the course of industrial development, since the incentive structures facing investors are quite different from before.

*International policy changes:* This shift in national policies 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. The rules of the game are being strengthened by the international institutions and aid donors to ensure that all countries conform to this consensus. Structural adjustment and stabilisation programmes by the Bretton Woods institutions, the new GATT agreement and the impending International Trade Organisation, the policy conditions being placed by bilateral donors, all provide new "rules of the game" for developing countries.

These rules constrain countries from some of the mistakes of the past, but also limit their flexibility to undertake policies to promote industrialisation: many of the policy instruments used earlier by the presently

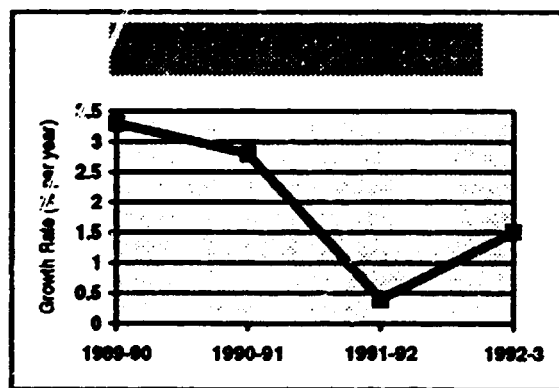
developed countries, and in the recent past by the newly industrialising countries of East Asia, are now unacceptable in the international arena.

## II. Industrial Performance in Sub-Saharan Africa

Industrial performance has been disappointing in Sub-Saharan Africa. The growth of manufacturing value-added (MVA) over 1980 to 1993 was only 3 percent *per annum* in real terms. The rate of growth declined steadily over time, from 3.7 percent in the first half of the 1980s to 2 percent in 1989-93. As Figure 1 shows, this trend persists within the latter period: MVA growth fell from 3.3 percent in 1989-90 to 0.4 percent in 1991-92, with only a modest recovery to 1.5 percent in 1992-93. Moreover, this growth performance conceals continued stagnation or actual falls in MVA in a large number of countries, particularly in Sub-Saharan Africa. Many African countries suffered sustained "deindustrialisation" over the past decade and a half, the most serious loss of manufacturing capacity anywhere in the developing world.

There are many reasons for the poor record of African industry, analysed at length in numerous reports and studies.<sup>1</sup> In Sub-Saharan Africa in particular, a number of factors interacted to produce a substantial worsening of industrial performance. External shocks, political instability and falling prices for primary exports in many countries sapped domestic demand and the resources to buy essential imported inputs, while creating an unfavourable environment for investment and growth. Poor macro-economic management, with burgeoning budget deficits, heavy debt burdens, controlled internal prices, overvalued exchange rates and inefficient rationing of credit and foreign exchange added to the deleterious effects of this environment. The general neglect of agriculture contributed to falling demand and stagnating exports. Physical infrastructure was poor, and tended to worsen over the 1980s.

The policy environment for industrialisation was also not conducive. Trade and industrial policies were characterised by high levels of protection and interventions in domestic resource allocation, a dominant role for largely inefficient public enterprises and a general distrust of the private sector. Small and fragmented local markets led to plants that were too small-scale to be efficient. Foreign direct investment was often deterred by hostile, unstable and non-transparent policies. Indigenous industrial entrepreneurship was weak,



<sup>1</sup> See, in particular, the World Bank, *Adjustment in Africa*, Washington, DC, 1994, and Sanjaya Lall, "Structural Problems of African Industry" in F. Stewart, S. Lall and S. Wangwe (eds.), *Alternative Development Strategies in Sub-Saharan Africa*, London: Macmillan, 1992.

mainly concentrated in low productivity, traditional small-scale activities serving very local markets, with little 'graduation' to large scale modern production that could compete in world markets. The small base of human capital for industry, from the level of the shopfloor to supervisory, managerial and technological skills, meant that manufacturing activity could not match international levels of efficiency. Institutional support for industrial training, technological activity and technical support was extremely weak in most countries.

The results are evident. African manufacturing industry is losing its already small share of world manufactured exports and foreign investment flows. Few of the industrial activities promoted, beyond those doing minimal processing of local natural resources, have 'matured' to full competitiveness. The "value added" export-oriented activities that have driven many dynamic developing economies are conspicuously absent in Sub-Saharan Africa. Despite low wages, few labour-intensive activities aimed at world markets have taken root there. Local industrial linkages remain shallow. The technological mastery of existing industrial activities remains generally weak. In broad terms, therefore, industry in Sub-Saharan Africa has failed to drive structural transformation and export diversification. Yet this was the expectation of governments and policy analysts, and this was the purpose that industry served in many other parts of the developing world.

For most African countries, as elsewhere in the developing world, *industry remains the main instrument for long-term development*. There are few countries that can hope to grow and change the structures of their economies on the basis of existing natural resource endowments (primary products and tourism).

Agricultural growth should certainly be pursued, but over the long-term this is unlikely to provide the engine of structural transformation that is the essence of economic development. As Chenery and associates noted after their comprehensive survey and statistical analysis of patterns of structural change in the world, industrialisation will continue to be the engine of structural change and growth.<sup>2</sup> What then is to be done to revive and promote industrial development in Sub-Saharan Africa and to make it the engine of growth? And is the impact of recent policy reforms in the new "rules of the game" that are being developed and imposed on Sub-Saharan Africa favourable to this aim?

### **III. Approaches to Industrial Policy Reform**

#### **III.a. Introduction**

**T**here is general acceptance among analysts and governments that widespread policy reform is now needed to promote industrial development in Africa. Many elements of this reform are also not in

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<sup>2</sup> H. B. Chenery *et al*, *Industrialization and Growth*, New York: Oxford University Press, 1986.

[REDACTED]

dispute. There is consensus on the need for macroeconomic stability, fiscal discipline, realistic exchange rates and prices, clear and predictable policies, and a more supportive set of policies for agricultural development. It is accepted, in Africa as elsewhere, that the previous strategies of import-substituting industrialisation, led by state-owned enterprise, have failed to produce dynamic and efficient industries, and that in the future economies should be more outward looking and more open to private investment, both foreign and domestic. The private sector is to be given the lead role in industrial development more generally, and the public sector is to be restructured or privatised. The ultimate objective is that African economies should aim for full integration with the international economy, on the lines that other regions are presently attempting.

There are other elements of policy reform, however, where there remain controversies on how the reforms should be designed and implemented. These controversies arise from different basic approaches on the efficiency of markets and from more practical debates on the administrative abilities of governments and the potential competitiveness of industries. Among others, those that affect industrial development include:

- the extent and speed of trade liberalisation;
- the role allotted to the government in resource allocation and industrial restructuring, both during the reform process and after the desired level of liberalisation has been achieved;
- the integration of incentive reforms with reforms and policies to improve the supply capacity of the economy; and
- the linking of reforms to improvements in the capabilities of government to mount effective supportive policies.

There are two broad approaches to these issues. One is the "neo-classical" approach, which stresses market efficiency and regards government intervention in resource allocation as basically distorting and undesirable. There are many variants on this approach, but in its more moderate version it is typified by the World Bank. The other is a more "structuralist" approach, which focuses on imperfections in the market in developing countries and assigns a larger and more positive role for the government. The implications of both approaches are spelled out below. To start with, it is important to note that *both* approaches are fully valid in terms of economic theory. Both advocate stable macroeconomic management and clear, predictable policy frameworks. The main difference between them lies in their reading of how well markets actually function in developing countries and how far it is possible for governments to improve on markets in promoting growth.



### III.b. The Structural Adjustment Approach

The mainstream approach to policy advice for Africa in the new international environment is best represented by the structural adjustment programmes (SAPs) of the World Bank. This approach reflects a strong belief that markets are fully efficient in developing countries and that government interventions in resource allocation are essentially distorting and inefficient. It is also supported by empirical evidence from East Asia where, it is argued, the NIEs practised liberal market-driven economic policies. In the context Africa, the essence of the Bank's approach is:

"unleashing markets so that competition can help improve the allocation of resources ... getting price signals right and creating a climate that allows businesses to respond to those signals in ways that increase the returns to investment. Having the proper macroeconomic framework ... provides the incentives needed for new investment and productive use of resources. But trade, agricultural, and other regulatory reforms ... are essential complements to reducing the government interventions that distort prices and tie up markets."<sup>3</sup>

Thus, macroeconomic stabilisation is a necessary first step to growth, but does not constitute adjustment proper. The latter comes from the implementation of policy reforms in trade and regulations affecting the productive sector. These 'reforms' are defined as reducing the role of governments to the greatest possible extent, and letting resource allocation be determined by individual economic agents responding to free market signals. It involves, in particular, trade liberalisation, removal of entry and exit barriers, liberal policies to foreign investment and the reform or privatisation of state-owned enterprises.

Some extreme proponents of this neoclassical approach to development would argue that all markets are efficient in the developing world and that the government need only provide a stable macroeconomic environment and enforce the legal framework for private enterprise. The World Bank is more moderate. It admits that certain markets do not work efficiently in developing countries, especially in the provision of infrastructure and education, and here it recommends functional ("market friendly") interventions that do not discriminate between activities.<sup>4</sup> Selective interventions, that favour some activities over others, are by contrast taken to be "market unfriendly" and to damage efficient resource allocation. In most such policy analysis, the case for infant industry protection or for other sources of "market failure" that call for selective interventions is played down or simply ignored. In the few cases that such conditions *are* admitted in theory, it is argued that no government can intervene efficiently in practice, or that market failures are invariably less costly than government failures.<sup>5</sup>

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<sup>3</sup> World Bank, *Adjustment in Africa*, 1994, p. 61.

<sup>4</sup> See, for instance, the World Bank's *World Development Report 1991* and *The East Asian Miracle: Economic Growth and Public Policy*, 1993.

<sup>5</sup> The underlying arguments are analysed in S. Lall, "Industrial Policy: The Role of Government in Promoting Industrial and Technological Development", *UNCTAD Review*, 1994.

[REDACTED]

The 'ideal' form of policy reform for industrial development thus takes the following form:

- Remove all forms of selective intervention and restore free market driven allocation, exposing activities to international competition. This reform to the incentive system (often referred to as "getting prices right") is crucial to all other adjustment measures.
- Apply this to all economies regardless of the level of development, since by definition all markets are efficient (or more efficient than governments).
- Carry out reforms quickly and across the board, since there is no economic justification for continuing to select activities for more gradual liberalisation. No 'strategy' is needed to guide the restructuring or upgrading process at the level of industry or firms since markets will give the correct signals and response capability is assumed to exist.
- Do not link the pace of reforms to the incentive structure to market friendly measures to improve human capital or infrastructure, since factor markets will also respond better if the overall set of signals is correct.
- Finally, having got rid of the legacy of inefficient interventions, do not retain any further scope for selective interventions to promote industrial growth.

The analysis underlying this approach is, however, based on a series of simplifying assumptions which can do violence to a complex reality and lead to misleading policy recommendations. In particular, it ignores certain market failures that are crucial to industrial development. Among these, the most important ones are about *how firms absorb technology and become competitive* in developing countries. It is worth briefly spelling them out since they are critical to the analysis of African industrialisation in the new global environment.

In the simple neoclassical framework that underlies SAPs, all firms operate with full knowledge of all possible technologies, have equal access to these technologies and use technologies equally efficiently with no need for further effort. All firms in an industry facing the same prices choose the same technologies; otherwise they would be allocatively inefficient. These firms are small and do not enjoy economies of scale; they sell homogeneous products as 'price-takers' in markets where there is perfect information about current and future prices. Similarly there is no risk or information gap in factor markets where firms obtain their inputs, labour, skills and technologies. Given the right prices for inputs and outputs, therefore, they pick the appropriate techniques for their national factor endowments. Any intervention by the government that affects these prices must (by definition) be distorting and inefficient.

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Since developing countries import industrial technologies, an additional set of assumptions is made about the international technology market. Thus, the purchase of technology is just like that of a physical product: there is a given market price based on perfect information about the product and its competitors, and technology is sold and bought as in any other well-functioning market. Once bought, all firms can immediately use technologies with the same degree of efficiency (and all at "best practice" levels). There is no need for further effort, investment or learning. In this setting, technical inefficiency can only be due to managerial slack or incompetence, and can only exist if governments intervene to create barriers to trade or competition. *Ergo*, the removal of such barriers will restore efficiency without a significant lag.

Where "learning" effects in absorbing new technologies are admitted, a simplified view is taken of the learning process. The learning curve is believed to be fairly short and predictable, confined to 'running in' a new plant until it reaches capacity and the benefits of passive learning by repetitive activity are realised. It is generally assumed that such costs are relatively trivial and similar across industries. Firms know what to do to reach best practice levels, and can predict with confidence the learning period, outcomes and costs. Given perfect capital markets, they can finance the learning process themselves. There is consequently no need for governments to support the technology search, purchase or absorption process.

Firms use technologies as individual units, essentially in isolation. There are no linkages between them apart from anonymous market transactions, and no externalities resulting from individual efforts to generate skills and information. There is therefore no need to co-ordinate investment decisions across activities that may have intense supply linkages. No set of activities can be more significant for industrial development than others by having more beneficial externalities; so there is no question of promoting strategic sectors. Finally, since markets are perfect there is no need to foster institutions to provide for special financing, technological, informational or skill needs of industrial enterprises.

Simplified as it is, this view of the technological process is central to the structural adjustment approach. Its expectations are that with immediate and sweeping policy reform, efficiency will be achieved in a static sense, which in turn will lead to dynamic growth. No existing activity that is efficient will die out. None that is inefficient will survive, and its demise will release productive resources for others — there are no "in-between" activities that need time to restructure because of requirements of technological learning. New efficient activities that were 'suppressed' by past interventions will now emerge and lead investment and production in domestic and export markets. This is supposed to be the lesson of the success of East Asia.

Since markets are assumed to be equally efficient across all countries, moreover, the design of adjustment packages does not need to take into account differences in levels of development of markets, institutions and capabilities. The supply response of industry is expected to be similar across countries, the only difference

lying in different natural resource and capital-labour endowments (more recently human capital endowments are included, but the impact of skills for the design of SAPs has not been analysed). This is why the contents of the standard SAP tends to be very similar across countries, and, where the government is in a weak bargaining position, (as in many Sub-Saharan African countries) or is itself strongly committed to liberalisation (as in East Europe or some Latin America countries), tends towards the "ideal" of rapid, sweeping and non-discriminatory opening up of the economy.

### III.c. A Structuralist View of Industrial Development and Reform

Many of the factors accounting for weak industrial performance in SSA are *structural*, and economic liberalisation *per se* will not resolve them. The main ones are a weak base of technical and managerial skills, poor infrastructure, lack of technological capabilities and institutions, and an uncompetitive local supply structure. *These problems have to be addressed directly as industrial restructuring is undertaken.* Factor markets and institutions are not developed to the extent that simply "getting prices right" will be enough to catalyse the development process in African countries.

It is therefore worth considering an alternative approach to understanding the real impact of SAPs in Africa. This is now called the "technological capability" analysis of industrialisation.<sup>6</sup> Its basic arguments are as follows. Technologies are not fully known or freely available to all firms. To locate and obtain new technologies is a difficult and costly process. Once obtained, the process of gaining technological competence (using imported technologies at near 'best practice' levels of efficiency) is not instantaneous, costless or automatic, even if the technology is well diffused elsewhere. Technology is not perfectly transferable like a physical product: it has many 'tacit' elements that need the buyer to invest in a further process of building up firm-specific assets or capabilities. This can be risky and unpredictable, and involves developing new skills, both managerial and technical, and searching for technical information and solutions. The process of becoming capable often itself has to be learnt: in developing countries new firms often do not know what their deficiencies are, how to go about remedying them, and what the likely costs and duration of the efforts are likely to be. The development of competitive capabilities may be costly. It is certainly risky and prolonged, depending on the complexity and scale of the technology.

Technological learning does not occur in isolation. It involves interactions with other firms and institutions: apart from physical inputs, it calls for various new skills from the education system and training institutes, technical information and services, contract research facilities, interactions with equipment suppliers and

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<sup>6</sup> S. Lall, "Technological Capabilities and Industrialization". *World Development*, 1992.

consultants, standards bodies, and so on. The setting up of this dense network of co-operation needs the development of special skills. This constant and uncertain process of learning differs radically from the standard neo-classical model of firm development, and leads to different policy implications.

Industrial development is not just about starting new activities. As economies progress and mature, it involves 'deepening' in any or all of four forms — technological upgrading of products and processes within industries, entry into more complex and demanding new activities, increasing local content, and mastering more complex technological tasks within industries (from those relevant to assembly to those needed for more value-added activity, adaptation, improvement, and finally design, development and innovation). Each involves its own learning costs. These costs differ by activity, rising with the sophistication of the technology, the extent of linkages and the level of technological capabilities aimed at. Progressive deepening is to some extent a natural part of industrial development, but it is not inevitable. Its pattern and incidence can differ greatly, and, given intrinsic market failures in moving into more difficult technologies, may depend on the *strategies* pursued by the government.

Industrial progress in developing countries depends essentially on how well firms manage this complex process of technological development. Technological development does not mean innovating new technologies but, at least at the start, efficiently using imported technologies. The process of capability development may face various *market failures*. Free markets may not, in other words, give correct signals to resource allocation between simple and difficult activities or between investments in importing technology and internal technological effort. The first is basis of the classic case for infant industry protection: *in the presence of learning costs, a latecomer to industry necessarily faces a disadvantage compared to those that have undergone the learning process*. Given the externalities, linkages, unpredictability, lack of information and capital markets imperfections that are endemic to developing countries, exposure to full import competition can abort entry into activities with relatively difficult technologies.

Thus, protection may be necessary to induce entry into activities with relatively difficult learning processes that may be in a country's longer term comparative advantage. However, protection is a dangerous tool, as the long experience of import-substituting industrialisation shows. It may take away the incentive to invest in efficient learning, and protracted protection may give rise to distorted or little learning, inefficiency and lack of industrial dynamism. Protection penalises consumers or industrial customers, and can be a major deterrent to export growth. Efficient industrial-policy requires that protection be *limited* in extent and duration, and that its deleterious effects be *offset* by measures to force firms to invest in developing their technological capabilities, and by containing its effects so that export activities are not handicapped. The most effective way to do this is to combine domestic protection with strong export-orientation, providing a

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cushion for learning along with incentives to be fully competitive, and letting export activities operate in an effective free trade regime as far as their access to inputs is concerned. This particular design of protection to infant industries constitutes the crucial difference between 'classic' import-substituting regimes, which promoted some learning but distorted its direction and dynamism, and the aggressively export-oriented regimes of East Asia, that combined extensive and variable protection with powerful push to their firms to enter world markets (see Box 1 on Korean industrial policies).

The insights yielded by the technological capability approach to industrial development can be applied to structural adjustment. Inefficient interventions result in truncated and distorted learning, and reform is clearly needed in 'classic' import-substituting regimes. However, rapid exposure to import competition can kill off activities that are potentially competitive but are not given the time or the resources to complete their learning process or to "unlearn" past distorted learning and become competitive. There is a costly learning process involved in *adjusting* to competition if past interventions have been excessive and have not created the environment for healthy learning in industry. Reforms have therefore to be gradual, based on relearning needs and guided by an overall strategy.

Since learning costs differ between activities, interventions and liberalisation have to be *selective* rather than uniform. This goes against the basic neo-classical tenet that protection should never be discriminatory, based on its simplified view of passive and uniform learning across activities. In simple activities the need for protection may be minimal, because the learning period is relatively brief, easy to get information on, and predictable. In complex activities, with large scales, advanced information and skill needs, wide linkages and intricate organisations, by contrast, the learning process could spread over years, even decades. These may never be undertaken (unless there is a strong natural resource cost advantage) unless protection is given.

Since the factor needs of technology development, as for new skills and information, also differ by activity, interventions in factor markets have to be *integrated* with interventions to protect or promote activities. Factor markets often fail in developing countries, and in one of the main concessions to the need for policy in the field of education, the World Bank agrees that interventions are necessary. However, it regards such interventions as "market friendly" because they do not discriminate between activities. While this is true of a part of education at the basic levels, interventions in higher education and training can be highly selective if they are geared to the specific needs of industries being targeted for promotion. For instance, a government setting up an electronics industry has to target the training of electronics engineers and technicians — this is exactly what the NIEs of Asia did — if its overall policy is to succeed. The identification of "market friendly" interventions with education and technology is untenable, since such interventions can be highly selective.

### Box 1: Korean Industrial Strategy

Korea's record of growth, export development and industrial diversification and deepening is one of the most impressive in modern economic history (even more so than Japan's in view of the shorter period and Korea's poorer initial conditions).<sup>7</sup> Its government intervened extensively, both functionally and selectively, in practically all product and factor markets. It offered high, variable and prolonged periods of protection to selected activities, while forcing those that approached competitiveness to export significant parts of their output by making all their privileges dependent on export performance. It directed domestic investible resources to infant industries, and deliberately fostered the emergence of giant private conglomerates (the chaebol) that could cope with the cost and risk of starting heavy industries and entering export markets under their own brand names.

The Korean government invested heavily in education, and selectively promoted technical education. It induced firms to train employees with a levy of 5 percent of payroll, refundable if employers launched approved training schemes. It invested directly in R&D and technology infrastructure institutions, partly by sponsoring national technology projects.<sup>8</sup> At the same time it undertook various measures to induce and enable local firms to develop their own research capabilities, and so reduce the country's dependence on foreign sources of technology. Despite the rapid growth of government R&D expenditures, private investments in R&D rose even faster and over 60 percent of the 2.1 percent of GDP spent on research in Korea (the highest in the developing world and higher than most developed countries except for the top five technological leaders) comes from the private sector today.

Perhaps the most interesting aspect of Korea's industrial success is that it was largely based on indigenous enterprises rather than on technology transfer via direct investment. The Korean government was until recently highly selective on foreign direct investments, and in some instances induced Japanese firms to sell out to the chaebol after some years in the country. In technological terms the strategy called for far more domestic skill and technology creation than one that set up the same range of industries but with a heavy reliance on direct foreign investment. Korea's investments in education and R&D, and the fostering of the giant chaebol, were a necessary part of its national strategy, driven by the objective of being efficient in world markets.

How did Korea liberalise? The first SAP was launched in 1980 and the second in 1983, after the country ran into macroeconomic problems at the end of an intensive heavy industry drive. A number of quantitative restrictions were replaced by tariffs, which were gradually lowered over time. The government did reduce its role in the economy as markets developed and enterprises became more competent to hold their own in international markets. However, the process was gradual, allowing enterprises time to restructure, announced well in advance and offset by a number of measures that allowed the government to exercise considerable control on resource allocation and the development of new infant industries. As a result there was no major disruption felt by the industrial sector. Even today, nearly a decade and half after liberalisation started, the Korean economy has a large role for government direction, but the direction is exercised in more indirect ways than before. It remains far from the SAP "ideal" of a liberal economy driven entirely by market forces.

The entry of foreign investors is one way of bypassing this problem of setting up competitive industries in the absence of local technological capabilities. However, the entry of TNCs itself requires a base of technical and management skills if the trade regime is liberal and new facilities have to face the full force of international competition. Simply waiting for FDI to drive industrial restructuring and growth in an open trade and investment regime is unlikely to push the process much beyond simple resource-based activities. The recent surge of FDI in the developing world has tended to bypass SSA while growing rapidly in other parts of the developing world.

To conclude on policy reforms needed to stimulate industrialisation, reform is certainly necessary. The old strategies of highly protected, inward-oriented industrialisation led by public enterprises, with political interference, low levels of technical and managerial skills and soft budgets, are bankrupt. They have to be

<sup>7</sup> Korea's manufactured exports grew at 27.2% per annum during 1965-80 and at 12.9% during 1980-90, compared to Hong Kong's 9.1% and 6.2%, Singapore's 4.7% and 8.6%, and Taiwan's 18.9% and 10.3% (*World Development Report 1993*, and official Taiwanese statistics).

<sup>8</sup> Government involvement in Korean R&D is growing rather than diminishing, as the country pushes into more and more difficult areas of industry. The latest data released by the government show that it plans to spend \$1 billion over the next 14 years on biotechnology alone, and, along with the private sector, a total of \$50 billion on 11 "national projects" covering biotechnology, new materials, fine chemicals, satellite rockets, aircraft, maritime technologies and basic research. The promotion of national projects has been an important tool of industrial targeting in Korea in recent years.

replaced by outward looking strategies in which the private sector plays a major role and in which market forces basically guide economic activity. But reform should not be abrupt and sweeping. It should be guided by a clear strategy based on remedying market failures in industrial restructuring and further development. The strategy should be developed jointly with the private sector, and should be pre-announced so that enterprises know well in advance the advent of international competition. It should retain a strong role for the government, but this role should be very different from what it was previously. Thus, while accepting the need for adjustment, the approach adopted should be different from the "ideal" SAP of the World Bank.

None of this is easy to do, but development is not an easy business. Just "getting prices right" as proposed by the World Bank cannot overcome the disadvantages that developing countries face in industrialisation. Perhaps the most difficult part is to develop the government capabilities to intervene, but here too the East Asian countries offer useful lessons. This analytical and empirical background now allows the impact of SAPs on African industry to be analysed with greater depth and precision.

#### IV. Structural Adjustment and Industrial Performance

The World Bank's study of *Adjustment in Africa* starts with the words "In the African countries that have undertaken and sustained major policy reform, adjustment is working." It goes on to argue that the beneficial impact of adjustment has been

**Table 2: World Bank Findings on Manufacturing Growth in Adjusting African Countries<sup>9</sup>**  
(Median growth rates for groups)

Policy Group	1981-86 (%)	1987-91 (%)	Difference
Large improvements	-0.3	4.4	5.8
Small improvements	4.2	5.6	1.2
Deterioration	5.0	5.8	1.1
All countries	3.0	5.5	1.9

particularly marked in industrial and export growth. The World Bank's sample consists of 29 countries in Sub-Saharan Africa that have undergone SAPs. Since many of these adjusting countries have not yet implemented fully the policy reforms recommended, the report divides them into three groups to assess the effects of SAPs: 6 with "large improvements" in macroeconomic policies, 9 with "small improvements" and 11 with a "deterioration" (3 are unclassified). Changes in growth performance, in GDP, exports, industrial production and agriculture are all assessed with reference to these categories, and are separated between a pre- and post-adjustment period (1981-86 and 1987-91 respectively). The first group is taken to show the effects of adjustment most clearly and the third the least, while the differences between the second and the first periods are taken to show the effect of adjustment within groups. Table 2 shows the main findings as far as manufacturing is concerned.

<sup>9</sup> Table A.21 of World Bank, *Adjustment in Africa*, 1994.



[REDACTED]

The table shows that on average countries with the most adjustment have enjoyed the largest *improvement* in manufacturing performance (the last column in the table), and those with the least have the least improvement. This shows, according to the World Bank, that *SAPs are good for industrial growth*. No similar calculation is done for manufactured exports, since export data relate to total exports — so there is no examination of this element of SAPs as far as industry is concerned. While these findings appear to support the World Bank position on the benefits of SAPs for industry, the following points need to be made about the calculation and the conclusions:

➤ First, the groupings according to improvements (large or small) and deteriorations in policy have little or nothing to do with adjustment. They are based entirely on macroeconomic policy and *not* on adjustment in the sense of “getting prices right” by import and other forms of liberalisation. If they show anything, it is that improving internal and external balances is conducive to growth. The impact on resource allocation in response to market orientation cannot be assessed.

➤ Averages for groups have no statistical significance if individual variations within the groups is larger than the variations between groups. A simple test for significance would have resolved the deficiency, but is not provided by the World Bank. A significance test was made on the data provided in the World Bank study for differences between each of the three groups as well as for all improving countries together *vis à vis* deteriorating countries. This test shows that there are *no* significant differences between any of the groups in manufacturing growth rates either in the first period or the second, or in the differences between the periods (the crucial variable). The only two exceptions are the deteriorating group relative to the large improvements group and the two improving groups together: it has statistically significant higher growth rates in the first (pre-adjustment) period.

➤ The deteriorating policy group has higher manufacturing growth rates in *both* periods than the other groups (though the latter difference is not significant), and the large improvement group has the lowest growth rate in the latter period of adjustment. The lower improvement of the deteriorating group could thus simply be due to the fact that it already had a higher rate of growth. The conclusion seems to be adjustment as such had no special effects on manufacturing growth, and that the differences in growth rates were caused by other factors.

The evidence presented by the World Bank suggests, therefore, that it is wrong in concluding that SAPs had a stimulating effect on industrial growth. The statistical methodology is faulty and, even if it were not, the data provide no way of tracing the real effects of liberalisation as opposed to stabilisation.

Various indicators of industrial performance in Africa were recalculated using more recent data. The coverage was extended to 50 countries in Africa, including 5 in North Africa and 16 in Sub-Saharan Africa that had not undergone adjustment. The grouping of adjusting countries by improved or deteriorating policies was based on the World Bank study. All the countries with “improved” policies were grouped together, since the differences between the large and small improvements subgroups was not statistically meaningful. The periods used were also slightly different. A longer overall period, 1980-93, was taken, with the later subperiod taken to be 1990-93 to capture the more recent effects of policy reforms (the World Bank's period of 1987-91 may not have captured the impact of reforms in a number of countries that started

adjusting the late 1980s ). Table 3 shows the rates of growth for manufactured exports and manufacturing value added for the period as a whole and for the more recent period in which adjustment has taken place. What are the main findings?

**Manufacturing Growth:** The North African countries have the highest growth rate overall, but their increase is concentrated in the early period; in the 1990s their growth drops significantly. A similar trend is evident for the non-adjusting and policy deteriorating countries, but the non-adjusters manage to retain a positive growth rate in 1990-93 while the deteriorators suffer negative rates. By contrast, the policy improving countries raise their growth rates in the 1990s. A T-test shows that their growth is significantly higher than the policy deteriorating countries in 1990-93. None of the other differences is statistically significant.

Period	
1980-83	1990-93
2.7	4.4
1.6	-1.7
2.1	0.1
3.8	0.3
1980-82	1988-92
2.8	9.4
4.7	10.0
-8.3	-15.8
11.2	6.2

There is therefore some reason to conclude, in line with the World Bank, that countries with policy improvements do better than those with policy deterioration. However, *this proves nothing about the impact of adjustment proper*, since the groupings only reflect macro-management. And even the statistical significance does not establish causation, since a number of important possible influences on manufacturing growth are not taken into consideration. To see whether it is really the liberalising countries that are growing more rapidly, it is interesting to look at *identity* of the policy-improving countries that have enjoyed high rates of MVA growth in 1990-93. Of the 15 countries in this group, only 5 had annual increases in MVA of around 4% or more: Burundi (5.7), Kenya (15.5), Mauritania (6.8), Nigeria (4.6) and Uganda (8.1). Of these, Nigeria and Kenya dominate the whole group of policy-improving countries, accounting for 75 percent of total MVA of this group. *Neither* of these countries is considered by the World Bank to have implemented import liberalisation properly; both have reversed their trade reforms while their industrial sectors still have moderate tariff protection. If they are excluded from the group total, the rate of MVA growth in 1990-93 falls to around 0.1% per annum, which is virtual stagnation and not significantly different from the non-adjusting countries. There is no direct evidence to conclude that liberalisation has boosted industrial growth in Sub-Saharan Africa.

**Manufactured Exports:** The total value of manufactured exports in 1992 by all the countries together was \$8445 million, of which the North African countries accounted for \$6236 million (74%), leaving the

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Sub-Saharan countries with only \$2209 million.<sup>10</sup> Of this total, the policy improving countries accounted for \$1180 million, policy deteriorating countries for \$983 million and non-adjusters for \$46 million. Sub-Saharan countries that did not undergo adjustment performed worse than all the others, and did much worse in the 1990s than earlier. The best performers for the period as a whole were the North African countries, while in the later period the best was the deteriorating policy group of countries. Both the improving and deteriorating groups of adjusting countries improved their manufactured export performance. T-tests show that the only significant group differences are between the non-adjusting countries both groups of adjusting countries in the 1990s. Thus, even differences in stabilisation between the two groups of adjusting countries does not show the predicted effect on exports. In anything, the deteriorating countries do better.

*Wages and Productivity:* UNIDO data on industrial wage and productivity (value added per employee) levels show that the non-adjusting countries continue to perform poorly in both respects, with productivity and wages declining over 1980-90. The best performer is the deteriorating policy group, with the highest rate of increase in wages and the second highest in productivity. The policy improvement group has lower improvements in both. Statistically there is no significant difference between the groups but the deteriorating group almost reaches significance levels. The quality of the adjustment thus does not seem to raise the quality of productivity or the wage levels; if anything, the impact is negative.

In conclusion, this analysis of recent data does not suggest that adjustment has improved significantly the industrial performance or competitiveness of Sub-Saharan Africa. The World Bank study is thus overly sanguine about the effects of policy reform, and its use of the data leaves much to be desired. A better way to analyse the impact of structural adjustment *per se* would be to look in detail at *the experience of a particular country that has undergone substantial reform* to its trade and industrial regime, and to focus on the impact of this form of liberalisation. Such a country is 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 in terms of liberalisation (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.<sup>11</sup> The *African Development Report 1994* presents a full analysis of the reforms undertaken in various spheres: massive devaluation in the exchange rate, from 2.75 cedis to the

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<sup>10</sup> Data for manufactured exports are taken from the World Bank, *World Development Report 1994*. Figures for exports are missing for a number of countries, especially in the non-adjusting group.

<sup>11</sup> World Bank, *Adjustment in Africa*, p. 67.

dollar in 1982 to 920 cedis to the dollar in early 1994; removal of quantitative restrictions on imports and lowering of tariffs to a relatively uniform 10-25 percent range (only luxury products are at the high end of this range); reduction of corporate taxes to 35 percent and in capital gains tax to 5 percent; removal of price controls and subsidies; abolition of credit ceilings and guidelines; privatisation of state owned enterprises; revision of the investment code; incentives for exporters and investments in infrastructure.<sup>12</sup>

Ghana started its policy reform with an Economic Recovery Programme in 1983. In the initial stages, as far as manufacturing was concerned, this involved freeing up the allocation of foreign exchange for intermediate inputs and spares. There was no direct import competition to Ghanaian industry at this stage. 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 liberalisation 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. 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,<sup>13</sup> which allowed the economy to finance imports and to revive domestic demand.

What was the response of the industrial sector to the liberalisation and aid inflows? The initial impression is that manufacturing growth did fairly well. The World Bank study shows that the *average* growth rate, which was negative in the first half of the 1980s, rose to 4.5 percent per annum over 1987-91. 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. The rate of growth was 12.9 percent in 1984, 24.3 percent in 1985, 11.0 percent in 1986, and 10.0 percent in 1987. However, as liberalisation 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 percent in 1988, 5.6 percent in 1989, 1.1 percent in 1990, 2.6 percent in 1991 and 1.1 percent in 1992 (see chart below).

This performance does not suggest that Ghanaian manufacturing responded well to liberalisation. Employment in manufacturing fell from a peak of 78,700 in 1987 to 28,000 in 1993.<sup>14</sup> There has been a rise in the number of small enterprises, but this is in low-productivity activities aimed at very local markets and does not bode well for longer-term growth and competitiveness. Foreign investment has not increased after

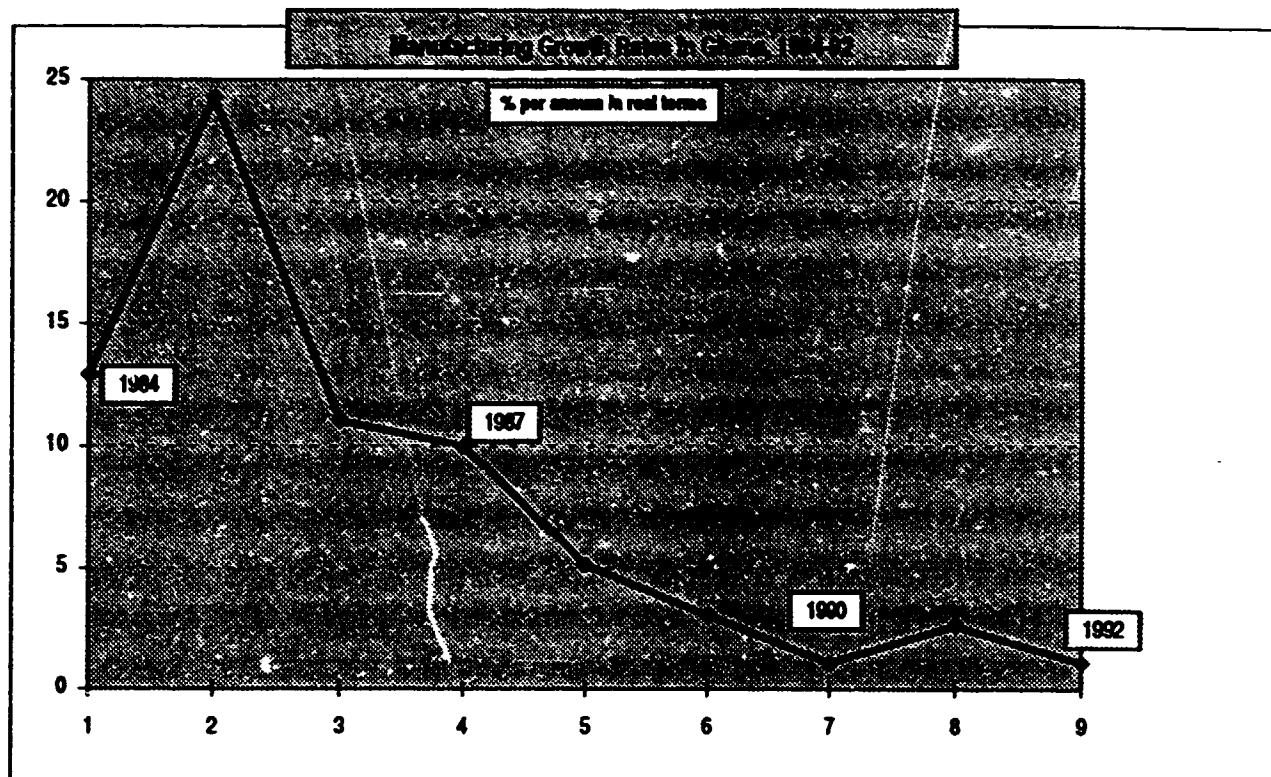
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<sup>12</sup> African Development Bank, *African Development Report 1994*, pp. 57-62.

<sup>13</sup> *Ibid.* Table 27.

<sup>14</sup> *African Development Report 1994*, p. 61.

the adjustment, and most of it is concentrated in primary activities rather than in manufacturing. Domestic private investment has not picked up sufficiently to dynamise the manufacturing sector.



As far as exports of manufactures are concerned, the expectation was that they would grow and diversify rapidly under the new incentive regime. The data show that 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 from new products or producers.<sup>15</sup> 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.<sup>16</sup> 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.

<sup>15</sup>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.

<sup>16</sup>In wood products, for instance, some 95% of furniture exports come from *one* foreign affiliate, while scores of local manufacturers operate with such low efficiency and poor quality that they cannot enter world markets. Most of their exports continued to be of builder's products, the lowest category of wood manufacturing.

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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 industrialisation, 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 liberalisation could stimulate them to reach world levels. The adverse impact of liberalisation 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 localised products, and larger enterprises protected by high transport costs or based on processing of local raw materials.<sup>17</sup>

Such low technology "entry level" manufacturing activities as garments and footwear, where Ghana should be developing a competitive edge, have been unable to survive the import threat. It is particularly relevant to reiterate that, despite very low wages, cheap labour has not so far emerged as a source of comparative advantage to Ghanaian industry. Conventional wisdom suggests that this should be the main source of comparative advantage in manufacturing for newly industrialising countries. What this ignores is that even the ability to compete internationally in low-technology labour-intensive industries requires a level of productivity and managerial and technical skills that is presently lacking in Ghana. The few relatively well managed firms that exist are largely foreign owned; among local enterprises the better ones have entrepreneurs that are well educated. The typical local firm, on the other hand, has entrepreneurs with low education, a poorly skilled workforce and no methods for raising their technological capabilities. Most lack the ability even to perceive and define their technological problems.

The standard theory underlying SAPs does not offer an explanation for this phenomenon, since it ignores the need for technological capability development in becoming competitive and the need to overcome market failures in this process. The technological capability approach, by contrast, focuses on this process and so offers a much better explanation. The development of technological capabilities in Ghana in the adjustment period has been analysed recently in a study financed by the World Bank.<sup>18</sup> The generally low level of the capabilities and skills needed to upgrade manufacturing to world levels has meant that rapid liberalisation, unaccompanied by supply side measures to develop skills, capabilities and technical support, has led to significant deindustrialisation. The kind of growth of new activities that is taking place is insufficient to

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<sup>17</sup> Apart from the enclave operation of aluminium processing or protected activities like government-owned petroleum refining, these include some food processing, furniture, cement, simple metal products, and uniforms for the army or schools.

<sup>18</sup> S. Lall, G. B. Navaretti, S. Teitel and G. Wignaraja, *Technology and Enterprise Development: Ghana Under Structural Adjustment*, London: Macmillan, 1994.

provide a large momentum to exports or production to Ghana. Clearly, a simple reliance on market forces under structural adjustment will not transform it into a "new NIE" along the lines of East Asia.

Exposure to market forces in these conditions may actually 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 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. As the next section argues, the process of developing technical and managerial capabilities must accompany industrialisation, and this is inevitably a slow and gradual process. And simply building up a stock of skilled manpower will not be enough to dynamise industrialisation: where costly learning processes are involved, there has to be some protection of these processes. This detailed case study approach thus shows clearly the problems that African countries can expect to encounter in reforming their policies and developing their industrial sectors.

## V. Policy Implications

The future of industrial development in SSA is bleak if present trends — rapid technological change and intensifying competition on the one hand, and the imposition of rapid liberalisation without adequate safeguards and supply side measures on the other — continue and there is a weak response on the part of industrial enterprises. The emerging "rules of the game", under the aegis of the major multilateral organisations, the new Uruguay Round trade agreement and pressures from bilateral aid donors, are leading to some improvements in policies, but this is accompanied by many costs. In effect, it is forcing African industry back into its static comparative advantage in low skill and low productivity activities, and continuing its marginalisation from the mainstream of industrial development. These rules are also enforcing a renunciation of the tools of industrial policy employed by the most successful NIEs of East Asia. This may well be a recipe for slow growth or stagnation, since the structural weaknesses of African enterprises may hold back the dynamic production and export response on which the success of adjustment is predicated.

There is no doubt that all governments in Africa accept the case for liberalisation in the long term. They realise that a fuller participation in the international economy is imperative for development, and that they need to attract foreign investment and become competitive. What then should be the policy directions for SSA in the future? These can be considered separately for the incentive and supply-side factors.

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As far as the *incentive system* is concerned, the analysis of the capability development process suggests that the East Asian model of adjustment is the best way to proceed. This involves 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 envisaged by the "ideal" SAP. The speed of liberalisation is based on a realistic assessment of which activities are viable in the medium term, with the process geared to the learning and 'relearning' needs of various activities. The strategy is developed in collaboration with the industrial sector, and is pre-announced so that enterprises have time to adjust. Once announced, however, it is imperative to stick to the programme so that there is no chance of backsliding and allowing inefficient performers to survive indefinitely.

In this entire process the government retains considerable 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 liberalisation, 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 liberalisation.

It cannot be too strongly emphasised that to recommend a more gradual and nuanced strategy of liberalisation is *not* to suggest that African countries 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. Even with well-designed adjustment policies, the outcome cannot be expected to be identical to that of East Asia, since the initial conditions, capabilities, market size, location and infrastructures of Asian and African countries are very different. An important factor to take into account is that many African governments do not at this time have the capabilities to mount effective interventions in support of industrialisation. 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. The development of such capabilities must in fact be one of the intrinsic components of structural adjustment policy.

Coming now to the *supply side measures* to improve the response of industry to adjustment, perhaps the most important measure is to create better *human resources* for industrialisation. The importance of skills to industrial competitiveness is universally recognised, and there is considerable policy discussion in the



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developed countries about means of raising and improving human capital formation. The NIEs are also very conscious of this problem, and the "new NIEs" are urgently considering how to relieve pressing skill shortages. In Sub-Saharan Africa this problem is surprisingly absent in the discussion of reform and liberalisation, and in the design of SAPs it does not seem to figure at all. This is despite the attention paid to "capability building" in many pronouncements by multilateral institutions in recent years. Liberalisation does not address any of the skill shortages that may be affecting the efficiency of African industry, yet many existing industries may become competitive if their human resource were improved.

The design of SAPs should include education and training as an *integral* part of the restructuring process. This would strengthen the case for a more gradual opening up to international competition, with careful selective policies to develop skills in the most important industries and in areas of potential comparative advantage. It is important to note that a certain amount of capability development has already taken place in the industrial sector, and this is a valuable resource that should be conserved rather than dissipated by a shock therapy that leads to massive deindustrialisation. Technological capabilities reside in *groups* of skilled and experienced persons rather than in individuals, and the destruction of enterprises means that the stock of accumulated knowledge is effectively destroyed even if the individuals concerned stay in the country. This important feature of industrialisation is ignored by SAPs but forms a vital part of the policy approach of the East Asian NIEs.

Apart from the development of skills, there are other supply-side measures needed to ensure that the adjustment process evokes a healthy supply response. Among these are the development of the *science and technology (S&T) infrastructure* and the provision of *technical extension services* to industry, especially to small and medium enterprises (SMEs). The S&T infrastructure included such basic services as quality control and metrology, research and development, information on sources of technology and assistance in the purchase of foreign technology. In this context it is important to note that requirements of quality control have changed in the past two decades, and international trade in manufactured products increasingly requires stringent proofs of quality management.

The most important development in this area has been the International Standards Organisation's ISO 9000 standards in the European Union. This is becoming an important requirement for exporting industrial products to the EC, and is likely to become a vital element of export competitiveness for all developed countries. The ISO series is an extremely demanding set of procedures that lays down training procedures, division of responsibilities, quality audits, document control, statistical techniques, problem identification and tracing, testing and test equipment and corrective actions. It can apply to different parts of the production system, to research and development and to procurement. The promotion of ISO 9000 quality

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assurance standards is becoming a major objective of standards bodies in most developing countries, but the achievements so far are very uneven. A coherent policy to promote ISO 9000 requires the training of accredited inspectors who can certify the implementation of the standards, the fostering of national consultants who can help firms to achieve these standards, and the persuasion of firms to invest in the complex and often expensive process of achieving the standards. The advantage of the new ISO series is that it provides an enterprise with a ready set of definitions to what constitutes quality management, and gives clear guidelines on how to set up a quality system. Given the right technical support, therefore, it provides a strong impetus to quality upgrading and technology diffusion — managers have little choice but to meet the standards if they hope to compete in developed country markets.

The whole of Sub-Saharan Africa has less than 10 ISO 9000 certificates, while Singapore by itself has over 550. This illustrates graphically the competitive disadvantage that African industry labours under. Yet liberalisation by itself cannot force firms to the level of quality they need to survive in world markets. A concerted effort is needed by the government to strengthen standards and metrology institutions, to provide consultancy assistance to firms to obtain the certification and to mount a propaganda campaign to persuade firms to invest in this process. None of this is happening in most of Sub-Saharan Africa and certainly the SAPs have no provision for it.

As far as technical extension services are concerned, those that exist in much of Africa are largely ineffective in providing the kind of inputs that enterprises need to upgrade to competitive levels. The governments of even the most liberal NIEs played a much larger role in upgrading their enterprises, by providing financial and technical support, than the most interventionist government in Africa, and many of these services were extremely demanding in resources. It is also clear that such services should have formed intrinsic parts of SAPs if they were to have any long-term effect on industrial upgrading.

The same applies to policies to *promote technological activity and research support* for industry. There is minimal in-house research and development conducted by industrial enterprises in Sub-Saharan Africa. There is also very little interaction between the industrial sector and the technology infrastructure that exists in many countries to provide R&D and technical support to enterprises. Many of the research institutes are poorly funded, and so have inadequate equipment and unmotivated staff. They do not go out to search for and offer solutions to the technical problems of industry, preferring a more isolated existence. Much the same happens for technology information services to help local firms, especially SMEs, to locate and purchase foreign technologies. This is not a unique problem in Africa, but is common to many developing countries in other regions.

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Yet a strong and pro-active technology infrastructure can be extremely useful in upgrading the competitive capabilities of industry. Those countries that have been able to reorient their research institutes to serve industry and earn a larger proportion of their budgets from the sale of services have benefited from greater productivity and lower costs of importing and absorbing technology. In a period of adjustment to market forces, all such services need to be strengthened in Africa. The main thrusts here should be to select industry "clusters" that are of greatest importance to each country and concentrate infrastructure resources on identifying their most pressing technological needs and meeting them. Research institutes should be made to earn a larger proportion of their keep (40 percent is the figure most countries aim at) from the sale of their services. At the same time, their equipment and skills should be improved, and industry should be offered financial incentives to subcontract research to the institutions. In many East Asian countries the private sector is also induced to take a larger role in the management of research institutes and in formulating their strategies. There are clear lessons for African countries here.

The provision of *training* to industry is another vital area of supply side support in the process of structural adjustment. These services are weak in much of Africa, and enterprises themselves (apart from the major multinationals) invest little in training their employees in modern technologies. Even the multinationals train only to the level needed to achieve basic operational efficiency. The apprenticeship system that is prevalent in Africa is more geared to the transmission of traditional skills at fairly low levels of technological sophistication.<sup>19</sup> It is clear that the level of skills at all levels will need to be raised if African industry is to compete at home or overseas in a liberalised environment. This would need the improvement or setting up of specialised worker and other training institutes that are geared to evolving industrial needs, and greater in-firm investments in training.

As with R&D institutes, many developing countries in other regions are struggling to improve their industrial training systems. In Malaysia, for instance, the government is encouraging the setting up of industry-led training centres that earn practically all their money from selling training services to industry. The role model here, the Penang Skills Developer Corporation, receives little government funding, has private sector representatives on its Board, and aggressively seeks to learn what the skill needs of local enterprises are and devises courses to meet them. To encourage in-firm training, most governments impose a levy on larger firms (Korea levied 5 percent of payroll, but the norm is generally 1 percent) which is refunded to firms that undertake approved training programmes.

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<sup>19</sup> See S. Lall *et al*, *Technology and Enterprise Development*, 1994, on the deficiencies of this training system in Ghana.

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In Africa there is a great shortage of experienced trainers to staff and manage industrial training systems, and this is the first bottleneck that governments should address in the context of adjustment. SAPs should pay explicit attention to the need for foreign trainers to teach local trainers in the most pressing skill needs of industry, and to the need to set up viable local training systems in the longer term. The problem is once more of the shortage of human resources, and has to be tackled at source.

Finally, the need for *regional co-operation* in Africa is so widely accepted that there is little need to stress it in the context of economic liberalisation. The economic case for increasing regional trade and investment in countries that have small internal markets is overwhelming — this is the only way that industries can be set up at economic scales. However, integration moves have often failed to overcome political hurdles despite the compelling economic case, and it may be best to aim at more modest objectives of co-operation in specific aspects of industrial development. Needless to say, such co-operation has to be placed in the context of promoting intra-regional trade by the removal of official trade barriers and improvements in transport and communication services.

Many of the supply side measures noted above are “lumpy” (capital intensive), expensive and demanding in scarce human resources. Regional co-operation in setting up support systems for technology and training would greatly relieve the pressure on individual governments and allow for the sharing of experiences and knowledge. Some research and training centres can only be viable on a regional basis. While extension services necessarily have to be local, a *network* of such services over a region can reap various economies.

One important regional initiative that would help industrial restructuring would be an information and subcontracting exchange system that could help local firms to learn about sources of supply, skills, consultancy and technology from neighbouring countries. There is generally a lack of information on industrial capabilities in the region, and firms tend to seek sources in the developed countries rather than in neighbouring ones. While some of the larger firms and multinational affiliates in African countries may have better information on regional industries, the bulk of local firms do not. The existence of informal trade and migration does spread information, but this by its nature is patchy and constrained. There is a great need to overcome this information “market failure” to promote industrial upgrading.

Regional co-operation can also be useful in *importing technology*. The collection of information on sources of equipment and technology is an expensive business, and institutions to serve groups of countries could marshal more resources than those confined to (the smaller) economies. Once imported, the technology could be adapted to local needs by regional technology institutes, in the way in which the Taiwanese Industrial Technology Research Institute does for its myriad SMEs. This would be a highly skill-intensive task where the regional sharing of the cost and benefit would clearly make economic sense. The attraction of FDI can be

[REDACTED]

helped by regional efforts in several ways: by offering larger markets and resources, by mounting joint investment promotion campaigns, by inviting foreign investors into regional infrastructure projects (so called build-own-operate and build-operate-transfer, BOO/BOT schemes are becoming a popular way of financing infrastructure development in many developing countries) to serve larger areas, and by offering access to regional industrial information of the sort mentioned above.

Apart from these supply side measures, industrial strategy to promote promising industries and restructure existing industries may stand a better chance if conducted on a cross-country basis. The small size of most individual markets means that specialisation between countries would yield a more dynamic industrial structure than if each country attempted to reproduce what the others were trying. However, unlike past attempts to allocate industrial activities without a proper regard to efficiency and competitiveness, future attempts should be part of a carefully formulated strategy of export oriented industrial development where the state intervenes only to remedy market failures and not to replace market forces.