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**Linkage Programs to Strengthen Local
Companies in Developing Countries**

Joseph Battat
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Abstract

Foreign direct investment in developing countries has increased dramatically in the last ten years. As a result, many developing countries have begun to search for ways to increase the benefits from such investment. One of the ways is through increased backward linkages between foreign controlled companies and local firms. In the process, many countries have recognized that protectionist policies and local content programs previously used to force foreign companies to buy local inputs do not work well in

the changed international environment. This study examines and compares the recent experiences of a number of developing countries in encouraging backward linkages. It argues that: a) economic liberalization helps rather than hurts domestic suppliers, including SMEs; b) institutional support focusing on upgrading the capabilities of domestic suppliers is critical; and c) promotional programs combining public and private resources can accelerate linkage development.

Introduction

The term "backward linkage," as used throughout this paper, refers to the purchasing of goods and services from locally owned suppliers by companies controlled by foreign firms. This paper discusses in particular the relationship between local suppliers and foreign companies operating in developing countries.

As a consequence of the extraordinary increase in foreign direct investment (FDI) in developing countries over the last fifteen years, those countries have become increasingly anxious to strengthen backward linkage in their economies.¹ FDI in other words, is increasingly being seen by governments in developing countries as an instrument for stimulating improvements in the products and services of local suppliers. It generates additional economic activity and income, transfers technological and management skills to these countries, and gives many of their local suppliers a foothold in international markets that may eventually enable them to compete worldwide for other customers.

Meanwhile, some foreign producers operating in developing countries have become increasingly interested in cooperating more intensively with local suppliers. Because of their geographical proximity to the manufacturing plant, local suppliers can offer the advantages of quicker delivery and reduced transportation and inventory costs. At the same time, interaction between the managers of the principal and supplier plants on such matters as design and quality control can be enhanced. Especially, if a foreign-invested firm is confronted by steeply rising

prices or other problems when it buys from its traditional suppliers outside the country, it may find it advantageous to help develop new suppliers within its host country.

Backward linkage between foreign controlled firms and local firms has traditionally not been strong in most developing countries. This has often disturbed governments in developing countries, who believe that the dramatic increase in FDI in recent years should, by and large, lead to comparable increases in local sourcing by foreign-owned producers.

Indonesia, Mexico, the Philippines, and Thailand, for example, have all been quite successful in attracting inflows of FDI, as shown in Table 1.

Initially, a large proportion of the FDI flowing to these four countries was used to increase the manufacturing of final products for the domestic market. Now, however, many foreign firms in these countries are making products that are sold both locally and abroad. In Indonesia, for instance, the electronics sector (with substantial foreign investment) has grown rapidly in recent years. Between 1989 and 1993, the value of Indonesia's electronics product exports rose at an average annual rate of 74 percent, reaching \$1.2 billion in 1993. Similar patterns can be traced in the electronics and electrical appliance sectors of the Philippines, and in Mexico's electronics and automotive sectors.

The ability of all four countries to attract increasing amounts of foreign investment and to become the home of new industries can be traced to their shift over the last decade from

Table 1 FDI Inflows to Indonesia, Mexico, the Philippines and Thailand, 1981–1994*(Millions of dollars, Annual Average)*

<i>Economy</i>	<i>1981–1985</i>	<i>1986–1990</i>	<i>1991–1993</i>	<i>1994^e</i>
Indonesia	236	599	1753	2450
Mexico	1166	2606	5009	6000
Philippines	63	493	511	1000
Thailand	279	1188	1948	2355

e — estimated

Source: UNCTAD, Division on Transnational Corporations and Investment, based on International Monetary Fund, balance-of-payments data; estimates from the Organization for Economic Cooperation and Development.

inward-looking development strategies to outward-looking strategies marked by the elimination of trade barriers and the adoption of other forms of economic liberalization. And in all four countries, some domestic companies have become valued suppliers of intermediate manufacturing inputs to foreign-invested companies in their countries. Some have even succeeded in becoming direct exporters.

Even in these countries, however, backward linkage has remained weak. In Indonesia, foreign-owned producers of consumer electronics buy only about 25 percent of their intermediate inputs from local suppliers. In the Philippines, foreign car assemblers depend on local suppliers for less than 15 percent of their intermediate parts needs.² In Mexico, the *maquiladoras*, companies producing mainly for export markets, buy less than 2 percent of their inputs from Mexican companies.

Foreign companies typically complain that the goods and services offered by local suppliers in these and other developing countries remain for the most part uncompetitive in terms of quality and price with those offered by their traditional suppliers. Moreover, foreign interests often assert that local suppliers are unresponsive to requests that they improve the quality and prices of what they offer. In extreme cases, the operations of foreign companies and their backward linkages with traditional suppliers that are located in foreign countries result in economic “enclaves” that have little connection with the economy of the country where the operations are being conducted.

In the past, the desire to increase backward linkage often led governments in developing

countries to impose import restrictions and local content requirements on parts and components as a way of forcing foreign companies to procure locally. In most cases where such measures have been used, however, they seem to have done little to assist the growth of domestic suppliers. Instead, these forms of protectionism have often shielded domestic suppliers from the competition of the world market, thus encouraging economic inefficiency and a general deterioration of technological and management skills.

In some industries, protectionism has made it impossible to achieve the economies of scale necessary to reduce the prices of local suppliers. As a consequence, foreign-owned companies that have agreed to meet local content requirements have found themselves in the position of purchasing local goods and services of lower quality at prices higher than they would have paid to foreign suppliers. Foreign firms that have been unwilling or unable to accept the low quality of local supplies because of competitive pressures have then sometimes been forced to make investments in in-house production, which is usually quite costly.

Having recognized the failure of protectionist policies in recent years, numerous governments in developing countries have taken bold steps toward economic liberalization. One of these steps has been to encourage the strengthening of backward linkage by using the proverbial carrot instead of the stick. Import restrictions have been relaxed and local content requirements have been abandoned. In their place, some governments have adopted programs designed to bolster the productive capabilities of local firms that sell to foreign-owned plants.

The immediate impact of these reforms, however, has not been the same in all countries. While liberalization has rewarded some countries by forcing domestic suppliers to become more competitive in world terms, it has hurt other countries by exposing potentially productive domestic firms to the intense pressures of trying to compete with foreign firms that already have adapted to market demands in the world economy. This result has been seen especially in countries where economic activities are still constrained by other problems, such as capital scarcity and unstable real exchange rates.

This paper will refer frequently to a handful of developing countries and regions that have attracted widespread attention for their success in encouraging the growth of backward linkage. They include Singapore, the Republic of Korea, Ireland, and Taiwan (China). These four economies have made remarkable strides in developing backward linkage. They have gradually abandoned protectionist measures and made persistent efforts to upgrade domestic supply capabilities by providing institutional support for the creation of potential world-class suppliers at home. Their governments have made special efforts to maintain strong market incentives and to integrate public and private resources in alleviating constraints in technology acquisition, worker training, and financing. Three of them have also initiated special programs that work closely with both foreign investors and domestic suppliers in promoting mutually beneficial linkages between the two parties. The experiences of these economies have suggested a new approach to the problem of weak backward linkage that may also be applicable to other developing countries.

This paper is based on the results of research and advisory work conducted by the Foreign Investment Advisory Service (FIAS) in a number of countries around the world. The paper also benefitted from discussions at an Asian High-Level Roundtable in December 1994 organized by FIAS with the funding support of a UNDP regional program in Asia and the Pacific and the ASEAN-Canada Fund.

Chapter 1 outlines the basic concepts and context related to backward linkage. It reviews the

fundamental impact of today's swiftly evolving international economic environment on the development of backward linkage in developing countries.

Chapter 2 addresses a number of policy issues, particularly restrictive trade and industrial policies, that have had (and often still have) negative effects on the growth of backward linkage. It is argued in this chapter that history clearly demonstrates that regulatory policies based on protectionism are not a sound approach to improving backward linkage. Trade liberalization and abandonment of local content rules may create pressure, and sometimes pain, for local supplier industries, but they also create new opportunities that allow, and indeed push, domestic suppliers to become internationally competitive.

Chapter 3 discusses the importance of institutional support, both public and private, for upgrading domestic supply industries in developing countries. Through an analysis of relatively successful programs, the chapter identifies three areas—technological improvement, managerial training, and financing—where major support services provided by coordinated public and private institutions have been highly beneficial in strengthening domestic suppliers, especially small and medium-sized enterprises.

Chapter 4 further explores the non-regulatory role of government in encouraging backward linkage by focusing on specific programs that have been created to promote backward linkage in Ireland, Singapore, and Taiwan (China). The chapter examines the objectives, approaches, institutional settings, and impact of these programs on actual backward linkage formation.

Notes

1. The average flow of FDI to the developing countries in the period 1980–85 was \$12.6 billion. By the period 1992–93, average FDI had jumped to \$51.8 billion, and by 1994 was estimated at \$70 billion. United Nations, *World Investment Report 1992*, New York, 1992, Appendix Table 1, p. 312; and World Bank, *World Development Report 1994*, Table 5.1, p. 92.

2. Many companies have met the 40% local content requirement set by the government. A large proportion of the "local content" reached, however, is produced in-house and has nothing to do with local suppliers.

1

The Concept and Context of Backward Linkage

Although discussions of backward linkage are by no means a new subject, the meaning of the term has changed in the last few decades as the international economic context has been dramatically transformed. To understand current policy discussions on backward linkage, a review of the changed concept and context is in order.

Definitions of Backward Linkage

The term “backward linkage” has been defined in various ways in the past by different analysts. Some still use it in a very broad sense to cover the entire impact of foreign investment on a nation’s economy through its effects on national income, balance of payments, the industrial infrastructure, and other sectors through spill-overs.¹

More commonly today, however, the term is used in a narrower sense to refer to *inter-firm relationships in which a company purchases goods and services as its production inputs on a regular basis from one or more other companies in the production chain.*

Among industrialists and policy makers, discussions of backward linkage often are marked by the use of such alternate terms as “procurement,” “subcontracting,” and “local sourcing.” Each may refer to a different form of backward linkage. Chart 1 differentiates backward linkage from other relationships between firms. It also shows the different forms that backward linkage may take.

As seen in the Chart, a company links itself with others through a number of important relationships:

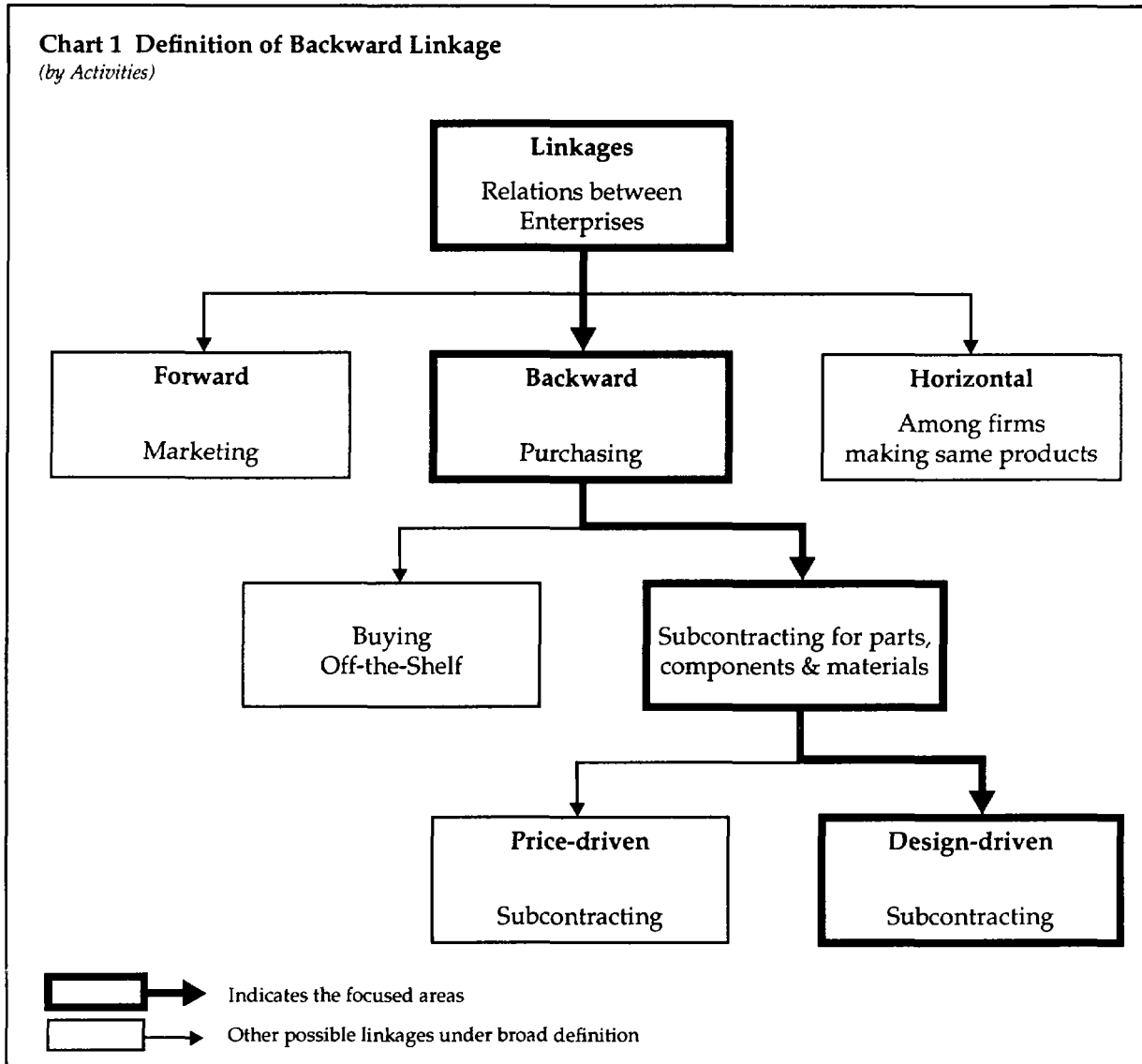
- the *forward* relationship that refers to the marketing of final products, including the after-sale services;
- the *backward* relationship that refers to the purchasing of inputs, including parts, components and raw materials; and
- the *horizontal* relationship that can be cooperation or competition with other companies that produce similar products.²

When purchasing inputs, a manufacturing company may buy existing products “off-the-shelf” or it may enter into contracts with producers of specialized inputs. The former practice typically occurs when the producer uses relatively simple and standardized components, while the latter is more typical when final products include inputs custom-tailored to the needs of the final producer. Subcontracting for the production of specialized inputs requires more regular and intensive inter-firm relationships.

Depending on the buyer company’s corporate strategy and its product’s characteristics, subcontracting can be either price-driven or design-driven.³ In the first case, which used to be the norm among U.S. firms, the buyer company prepares specifications for the parts and components it needs and sends its specifications to a list of subcontractors, who submit bids to supply the

Chart 1 Definition of Backward Linkage

(by Activities)



parts and components, primarily on the basis of price.

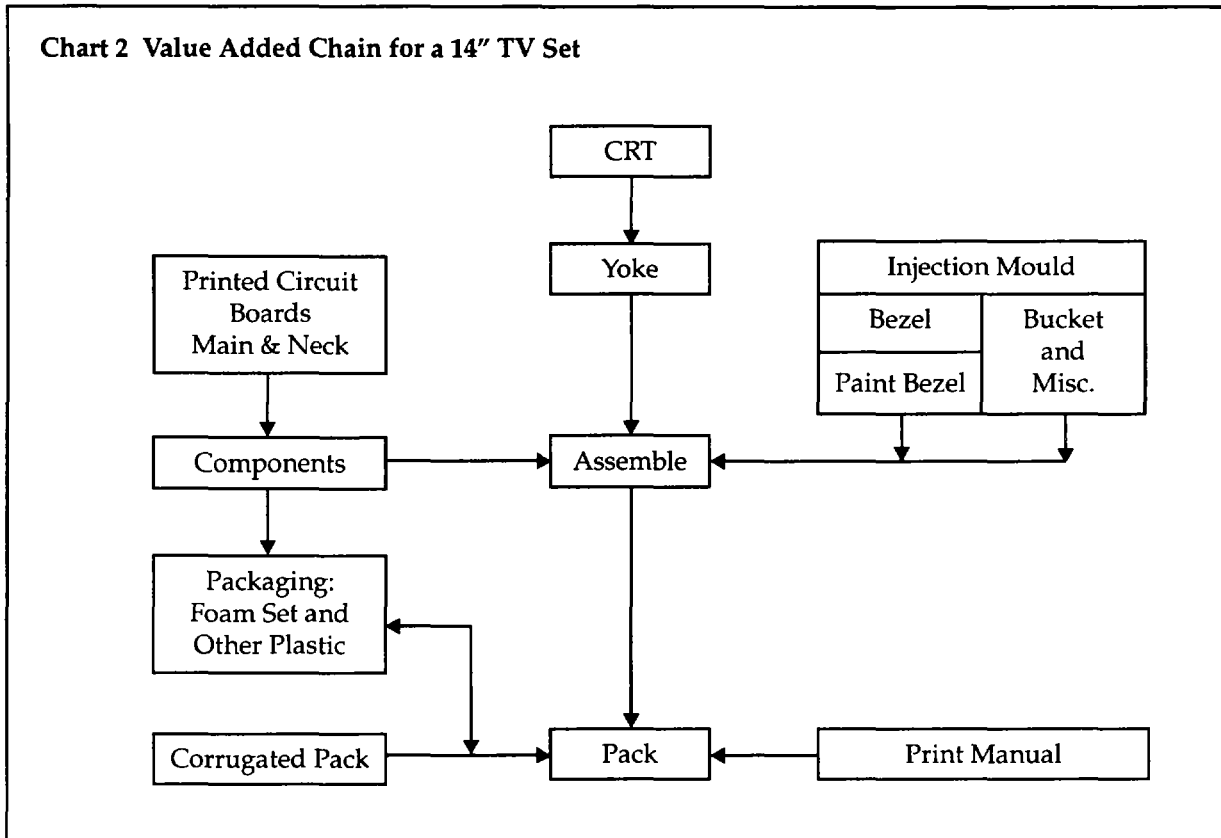
More recently, rapid changes in design and technology have made it necessary to make more frequent modifications of inputs at all stages of production. In such cases, subcontracting based on a long-term consultative or networked relationship becomes more desirable. Subcontracting of this type has been relatively common among Japanese firms for some time. While price competitiveness is still important, the ability of the supplier to react quickly to the manufacturer's changing design and production needs has often become an even more crucial factor than price.

This form of backward linkage is of particular interest to developing countries because it makes the relationship between suppliers of inputs and

the company purchasing the inputs more stable than the relationship between suppliers of off-the-shelf goods and the purchasers of such goods. This stability, in turn, helps suppliers to make better planning and technological decisions. The relationship typically requires intensive interchange between buyers and suppliers, and encourages technology transfer, managerial training, and the sharing of market information between suppliers and buyers. It also encourages suppliers to become more responsive to the needs and requirements of buyer companies.

Although backward linkages exist in almost all commercial activities, they are probably most common in manufacturing industries. Chart 2, which shows the inputs involved in final production of small black-and-white TV sets,

Chart 2 Value Added Chain for a 14" TV Set



indicates how assembly line manufacturing industries are particularly dependent on components, parts, and materials from other suppliers at different stages of the production process.

The likelihood of backward linkage appears to be strongest when the final product requires various types of manufactured components (such as metal, plastic, rubber, and glass products needed to assemble automobiles), or involves specific manufacturing skills or technologies (such as casting, machining, plastic injection, plating, or metal or plastic printing). When in-house production of such components is not possible or is too costly, dependence on out-sourcing is inevitable.

Empirical studies suggest that industries where the prospects for backward linkage are the greatest include the automobile industry (requiring parts and components constituting 70 percent or more of final sale value), machinery and precision instruments involving primarily assembly activities (50 percent or more), and the consumer electrical and electronics industries (40 to 50 percent). The food processing industry is also highly dependent on backward linkages for its agricultural ingredients. Other industries

that generate upstream linkages include textiles and pharmaceuticals, which have shown subcontracting shares valued at 5 to 10 percent of final sales. On the other hand, industries that process raw materials, such as the metallurgical and petrochemical industries, rank among the lowest in backward linkages.⁴

The Current Trend in Industrial Production Restructuring

In years past, the traditional practice of companies in most manufacturing countries throughout the world was to make all the key components used in the manufacturing and assembly of its products within the company itself (i.e., "in-house"), and to buy non-crucial parts off the shelf from outside suppliers. This was thought to serve the firm's purposes by protecting its technology from competitors while forcing suppliers to compete with each other on the basis of price and quality. Many companies, in fact, still subscribe to this philosophy and operate accordingly.

Japanese automakers were among the first to see the wisdom of strengthening backward linkage and to apply that philosophy to the

organizational structure of their own industry. What then came into existence was a new system of industrial production, which is now usually referred to as the *keiretsu* system. Quite different from "off-the-shelf" purchasing or subcontracting based on price competition, this system is deliberately intended to facilitate long-term partnerships between large assembly firms and their multiple suppliers. The system emphasizes vertically structured networks among individual firms that concentrate on different tasks in a closely connected production process. Firms specialize in different areas of production while becoming more dependent on each other's activities.

To make the system work, both contractors and subcontractors must be open and responsive to each other's needs and requirements. The system allows participating firms to remain independent entities, but they must always keep in mind that their profitability depends as well on the good performance of other entities involved in the production chain, and on harmonious relationships among all the firms involved in the chain of production.

The *keiretsu* system has proven to be cost effective. Assemblers and suppliers, by concentrating on their specialized area of production, become more efficient. With greater vertical organization of activities, assemblers have been able to minimize in-house manufacturing tasks and thus to reduce capital investment. Contractors that work closely with subcontractors in nearby regions have been able to adopt more advanced logistical measures, such as "just-in-time" delivery, which minimizes the amount of storage space, capital, and other resources tied up in inventory. Parts and components producers, as subcontractors, have been able to gain steady clients while minimizing their marketing costs. Moreover, they often receive valuable market information, managerial training, and other forms of technical assistance from their clients. The system amplifies economic benefits for smaller supply firms, which would otherwise be disadvantaged by weak marketing capability and thus be less able to exploit their advantages of low overhead costs and high flexibility.

Because of its success, the *keiretsu* system has been gaining ground throughout the world in both the automobile manufacturing industry and in other industries as well.⁵ Among manufacturing industries, especially, the term "flexible factory" is increasingly used to refer to close

cooperation among autonomous but mutually interdependent firms, each of which specializes in distinct phases of a single production chain.

Following the example of their Japanese competitors, more and more American and European firms have adopted this approach, thus reducing the number of suppliers on which they depend while strengthening their relationships with the suppliers they still use. In a matter of three years, for instance, the Ford Motor Company cut the number of its suppliers by 45 percent, 3M cut its suppliers by 64 percent, and Motorola ceased doing business with 70 percent of its traditional suppliers. Today, America's General Motors Corporation and Germany's BMW even involve their suppliers in the process of designing new vehicles.⁶

Rapid technology development and increasing global competition are increasing the pressure for vertical inter-firm cooperation. Business leaders have become aware of the increasingly broad spectrum of available technologies and also have learned that they do not need to be experts in all of these technologies. Instead, in many cases, companies have found it more profitable to specialize in a specific application.

Moreover, as specialization becomes the trend, small supplier companies are increasingly becoming the foremost experts on many core technologies. They have become a leading source of new ideas as well as sellers of inputs to the largest companies. It is, indeed, through networking with such small companies that many of the largest global companies are successful today.

The Globalization Trend

Earlier discussions of backward linkage by development economists are briefly summarized in the box on the next page. The primary concern of developing countries in the 1950s and 1960s was a redistribution of economic gains between multinational investors and host economies. The central theme, accordingly, was how to increase the local value added generated by foreign investors for the host country. Moreover, backward linkage was seen as something that was most likely to happen *within* the host country, since production at that time was mostly separated by national borders.

Many of the premises of the earlier approach have now become obsolete. In practice, the search of many developing countries for economic

Box 1 Backward Linkage Perceived by Pioneers of Development Economics

In a seminal paper published in 1950, H.W. Singer criticized FDI in developing countries because of its then heavy concentration in extractive industries which had few linkages, either backward or forward, to the rest of the economy. Because of the lack of "secondary multiplier effects" in the host country, FDI in mining and agriculture could be regarded in economic terms simply as "an outpost of the economies of the more developed investing countries" which provided the inputs and processed the outputs of the foreign enterprise. Only foreign investment in manufacturing could provide the stimulus for other industries in the production chain as well as "growing points for increased technical knowledge, urban education, and the dynamism and resilience that goes with urban civilization."¹

Similarly, in his famous 1956 article, "The Take-off into Self-Sustained Growth," W.W. Rostow accorded a crucial place in the early development of today's advanced industrial economies to "leading sectors" and their backward stimulus to "supplementary growth sectors." In the latter sectors, "rapid advance occurs in direct response to—or as a requirement of—advance in the primary growth sectors; e.g., coal, iron and engineering in relation to railroads." Rostow suggested the use of Leontieff input-output models as a way of tracking linkages "many stages back into the economy."²

The fullest analytical treatment of sectoral interdependencies in developing economies was

provided by Albert Hirschman, who is credited with having fathered the terms "backward and forward linkage." Hirschman attributed more importance to backward than to forward linkages, particularly emphasizing derived demand as an inducement mechanism for supplying through domestic production the inputs needed in non-primary economic activities. He even went so far as to rank illustratively various sectors of an economy in terms of the strength of their interdependencies, relying for this purpose on input-output relationships constructed for developed countries by Chenery and Watanabe. On the basis of a measure of backward linkage for each sector consisting of the proportion of inter-industry purchases to total production, Hirschman confirmed the Singer thesis of low backward linkage in primary production and high backward linkage in manufacturing.³

By stressing both weak backward linkages and declining terms of trade in the production of primary materials, a strong case was made in the development literature of the 1950s for a strategy of development that encouraged manufacturing. This view was reinforced by the conviction that only in manufacturing could producers enjoy high demand-elasticities with respect to both price and income as well as increasing returns to scale in production. As put by Rostow, only by learning the tricks of manufacture "can that old demon, diminishing returns, be held at bay."⁴

1. H.W. Singer, "The Distribution of Gains between Investing and Borrowing Countries," *The American Economic Review*, Vol. XI, May 1950, pp. 475-476. It could be argued that the large government revenues in the form of taxes and royalties typically derived from the export of minerals and other primary products could be used to finance self-sustaining development in other sectors. But this assumes a degree of rationality and competence in government decision making and intervention that has proved all too uncommon.

2. W.W. Rostow, "The Take-off into Self-Sustained Growth," *The Economic Journal*, vol. xlvi, London, March 1956, pp. 43-44.

3. Albert D. Hirschman, *The Strategy of Economic Development*, Yale University Press, New Haven, 1958, Chapter 6.

4. *Ibid.*, p.48.

independence led to unwise use of both human and natural resources, inefficiency, and unsustainable growth patterns. As a result of the rapid expansion of international trade and investment, the world market has become more integrated, and the belief in independence has been gradually replaced in a majority of the developing countries by a realization that current economic trends strongly favor interdependence among the nations of the world. Since the 1980s, especially, there has been a resurgence of interest in the developing world in attracting FDI as a way

to acquire the capital, technology, and management know-how needed for development.

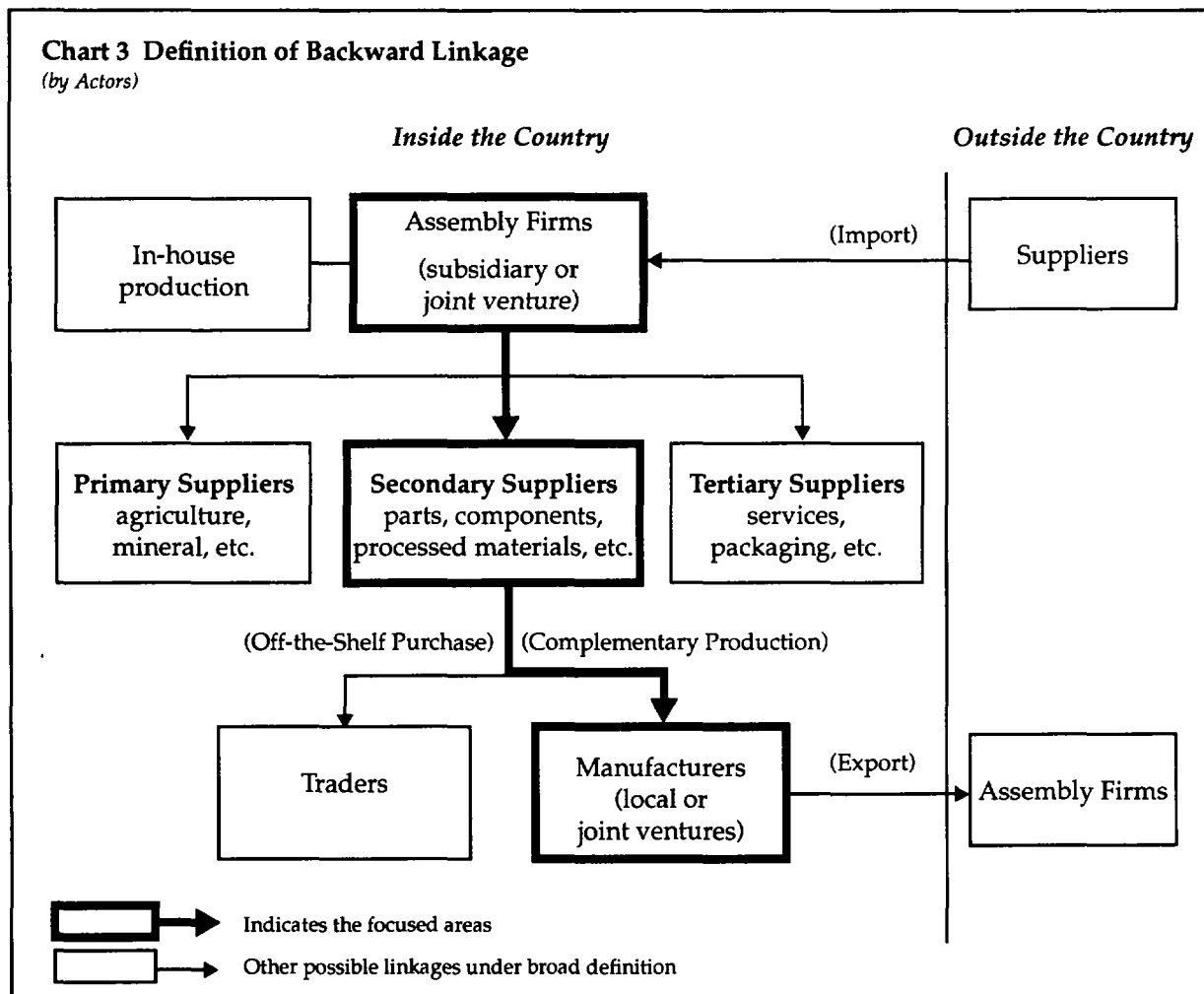
As inflows of foreign capital and goods have become accepted as an important resource for domestic growth, developing country governments are coming to see backward linkage as a vehicle for advancing the mutual interests of foreign investors and local economies. The central concern has become how to increase the size of the economic pie through enhanced industrial efficiency rather than how to divide the existing pie. Moreover, it is recognized that globalization

and interdependence affect industrial sourcing just as they do industrial marketing and the selection of investment location. As national trade and investment barriers come down, multinational companies are able to choose the best suppliers and subcontractors on a worldwide basis. Competitive pressures force them to choose only the best. Backward linkage is no longer something that host governments can force on multinational corporations (MNCs) operating within national borders.

The critical role of backward linkage *within* countries can no longer be fully understood without recognition of the growing role of backward linkage *across* countries. International trade and investment today increasingly reflect linkages between corporations producing goods and services in one country while purchasing parts and components from suppliers in other countries. An "American" automobile today

may be designed in Japan, assembled in Mexico, and consist of parts manufactured in Taiwan (China), Brazil, the United States, and several other countries. As production is thus "globalized," firms are choosing producers of each separable operation in a production chain in the most advantageous location, whether in facilities of their own affiliates or in facilities owned by subcontractors or independent suppliers elsewhere in the world.

This trend toward globalization has strong implications for backward linkage in developing countries. As Chart 3 indicates, to become successful suppliers to foreign-invested manufacturers operating within their national borders, local suppliers of the host country now have to compete against suppliers overseas. As international competition intensifies, domestic companies must dare to seek out international challenges in order to win international opportunities.



Unless the former are able to prove themselves to be *internationally competitive*, they are not likely to win major clients among foreign firms.

On the other hand, local suppliers that succeed in serving foreign investors operating within their country often find that they have made the first step toward the demanding international market. Many will eventually develop a capacity to directly supply other clients overseas.

Michael Porter's study⁷ of the patterns of competitive success in ten industrial countries (including the United States, Japan, and eight European Union countries) concluded that strong, capable local support industries are one of the four major factors that determine a nation's competitive advantage. Porter also found that economic openness was essential for the creation of capable domestic suppliers:

"The nation's companies benefit most when the suppliers are, themselves, global competitors [and] it is ultimately self-defeating for a company or country to create 'captive' suppliers who are totally dependent on the domestic industry and prevented from serving foreign competitors."⁸

In short, developing countries today are confronting a new challenge. They have greater

opportunities to develop backward linkages, thanks to the dynamism of globalization; but, for the same reason, the demands of the marketplace are becoming more rigorous than ever. Only by succeeding in meeting these demands will developing countries be able to benefit from today's increased opportunities.

Notes

1. Lall, S. and P. Streeten, *Foreign Investment, Transnationals and Developing Countries*, (London: MacMillan, 1977).

2. An example of the horizontal relationships is "capacity subcontracting," often seen in such industries as apparel. In this relationship, a manufacturer facing excessive orders may subcontract part of the orders to another manufacturer who makes the same products. Such a subcontracting relationship tends to be seasonal and irregular.

3. For a first-hand and detailed discussion on the "price-driven" and "design-driven" subcontracting, see Michael H. Best, *The New Competition: Institutions of Industrial Restructuring*, (Padstow, Cornwall, Great Britain: T.J. Press, 1990).

4. See Halbach, Axel J., *Multinational Enterprises and Subcontracting in the Third World: A Study of Inter-Industrial Linkage*, Working Paper No. 58, (Geneva: International Labor Office, 1989).

5. The system is spreading even into service areas such as hotels, hospitals, and retail businesses.

6. "Tying the Knot," *the Economist*, May 14th, 1994, p. 73.

7. Michael Porter, *The Competitive Advantage of Nations* (New York: Free Press, 1990).

8. *ibid.*

2

The Failure of Traditional Policies

Even though policy makers in most developing countries are well aware of the changing trends in the world economy, they continue to be wary about what may happen if they eliminate traditional protectionism in favor of liberalization and deregulation. Many fear that rapid liberalization may damage domestic firms, especially small and medium-sized operations. Some also remain skeptical that foreign companies in the private sector can in fact be trusted to encourage the growth of backward linkage through the use of the market. These concerns have slowed the pace of reform in many developing countries where the need for change has become clear and unequivocal.

This chapter takes a close look at policies that have been commonly used by developing countries in the past to strengthen backward linkages. It examines import restrictions and local content requirements, and explains why such protectionist policies need to be changed as a result of new international circumstances. It also looks at other impediments, such as those related to fiscal policies, which also have to be removed in order to facilitate the growth of backward linkage.

Trade Policies

Trade policies have been widely used in the past by developing countries to support their industrial policies. For a long time, the general belief was that if developing countries were to achieve industrialization, border protection was essential to bring about the replacement of foreign manufactured imports with domestic products.

The early stages of this strategy consisted of imposing steep tariffs and highly restrictive quotas on imports of consumer goods. Sometimes, foreign companies were encouraged to set up plants behind the tariff walls, thereby enabling them to reap the benefits of selling goods to a captive domestic market.

While intermediate inputs for consumer goods, including parts, components, and processed materials, were initially allowed to be imported, attempts were made to induce domestic production of intermediate inputs by raising tariffs and placing other import restrictions on imported inputs. When this happened, however, the producers of the final products were penalized. If steelmakers in Brazil, India or Pakistan, for instance, won protection for their products, automakers in those same countries found themselves at a disadvantage in world markets.

Effective levels of protection, moreover, were determined through a bureaucratic process in which success was dependent not on economic arguments but on the persuasive powers of lobbyists intent on preserving the economic health of their clients, regardless of what happened to society at large.

On a higher intellectual plane was the venerable "infant industry" argument. This argument ran as follows: high-cost domestic producers, having started in business long after their counterparts in industrial countries, needed time to master the technology, learn the business, and achieve the economies of scale that over time would permit them to lower unit costs and prices and thus compete with established producers. In

theory, local private investors could be expected to finance short-term losses in the new industries when the prospects for good long-term profits were favorable. However, unlike the situation in the industrial countries, where venture capitalists were relatively easy to find, the capital markets in most developing countries were underdeveloped, and risk capital was hard to come by. Until the infant industry matured, the argument went, government support was thus a necessity.

Support for the "infant industry" concept was bolstered by the writings of such economists as Hans Singer and Raul Prebisch, who argued that if developing countries did succeed in building manufacturing industries capable of competing in world markets, they would find their access to markets in the industrial countries blocked by tariffs, quotas, countervailing duties, and other regulations. In other words, government support for manufacturing industries would have to be permanent, since the only reliable markets for these products would be a country's own sheltered domestic market.

In practice, however, protection of infant industries in the domestic market did not prove successful in most countries. The high cost of the macroeconomic distortions induced by protectionist regimes has been well documented. Although support for import substitution did allow a chosen industry to grow faster than the domestic demand for its manufactures, thus making the industry appear to be a "leading sector," this approach is only possible for a limited period of time, after which the country runs out of practical import-substitution possibilities. Thereafter, only increased exports will allow an industry to grow more rapidly than any increase in domestic demand. By then, however, the country will have been burdened with a sheltered, high-cost industrial structure incapable of competing on world markets.

This has been especially true in countries with relatively small domestic markets, but even large developing countries have reached the limits of this approach. In India, for instance, the result of infant-industry protection and an unusually comprehensive and restrictive regulatory regime in domestic markets was a high concentration of economic power in the hands of a few large firms, coupled with a decline in India's total factor productivity of more than 1 percent annually between 1966 and 1980.¹ In the meantime, the country's technological progress lagged far behind the rest of the world.

Another argument for the erection of trade barriers that has been made in some developing countries is that protection is essential to fostering certain industries that are deemed to be "strategically important." This argument has led many countries to invest large amounts of public resources in the establishment of large, final-stage assembly industries. The expectation was that these industries would act as catalysts in the development of a wide range of domestic industries, especially producers of intermediate products.

In most cases, however, these government-supported large industries have not lived up to expectations. Instead, many of them have been cost-ineffective while squeezing out smaller intermediate industries which probably could have made better use of the available resources. In the Philippines and Indonesia, for instance, government policies for a long time favored large-scale producers of import substitutes of finished products while neglecting intermediate good industries. The policies of the two countries have resulted in a conspicuous phenomenon that is sometimes called the "missing middle," where one sees an oligopolistic structure dominated by a relatively small number of large producers of end products, leaving the large number of small and medium enterprises (SMEs) in intermediate industries chronically struggling against discriminatory treatment, especially when they need financing and raw materials.²

In the Philippines, for instance, current government policies strongly discourage industries in the Manila area, where the majority of supply industries are actually located. Many of the SMEs in the Manila area have been in the business of metal working or plastic injection for as long as their large clients, the assemblers of electrical appliance and electronic products. Unlike their clients, however, these SMEs are undercapitalized and poorly managed, and are using aging technology and equipment. Today, some of them are actually operating at half the capacity of the 1970s.

Protection also appears to hurt the companies that in theory were to be helped by protection. This happens for two main reasons. First, protection gives the products of protected producers an advantage primarily in the domestic market while shielding the producers from international competition. This means that the protected companies have little incentive to strive for further

technological and managerial improvement. Over time, this favoring of the status quo dampens their competitiveness in the world market.

That was the fate of both the automotive assembly industry and television assembly industry in the Philippines. Both industries, established with government assistance in the early 1950s and given continued government protection, declined after several decades as a result of deterioration in product quality, increases in production costs, and an apathetic attitude toward technological and managerial improvement among assemblers and suppliers alike.

Second, protection constrains production volume because it encourages companies to be responsive only to domestic demand. This is harmful to the growth of many assembly plants and particularly hurts the development of parts and components industries. A company that produces rubber inserts for automotive windshield wipers, for example, must turn out at least 100,000 pieces per month to survive in the world market, where it may be competing against a Japanese outfit that makes 7.5 million pieces per month. If limited to the domestic market only, such a domestic wiper blade producer could hardly survive, let alone grow into a competitive enterprise. Even in developing countries that have relatively large domestic markets, such as China and Indonesia, a major obstacle for domestic auto parts producers has been small orders from domestic auto assemblers, whose home market is limited.

Local Content and Trade-Balance Measures

Many of the foreign manufacturers invited to set up operations behind the tariff walls of developing countries were initially allowed to import intermediate inputs in the production of final consumer goods, on the assumption that such imports would be autonomously replaced by local sourcing.

Soon, however, many foreign companies became subject to government requirements that limited their freedom to use imported supplies and forced them to speed up the process of "localizing" the production of intermediate inputs. Such requirements typically include local-content requirements and trade-balancing requirements.

Local-content requirements specify that some percentage or absolute amount of production inputs must be purchased from local sources or

be produced domestically. In the Philippines, for instance, foreign car assemblers are required to have at least 40 percent of the total inputs (based on costs) locally made. In some cases, such as in China, a list of specific parts and components may be issued by governments for mandated "localization."

Trade-balancing requirements typically limit the investors' imports to some proportion of the amount of goods exported by them. In China, for instance, foreign companies in almost all industries have been required to own sufficient amounts of foreign exchange obtained through exporting to cover their foreign exchange needs for imported parts and components, as well as the dividend repatriation need.

In the Uruguay Round of negotiations on the General Agreement on Tariffs and Trade (GATT), such requirements were called "performance requirements" or "trade-related investment measures" (TRIMs). TRIMs were included on the GATT agenda because it was generally recognized that local-content and trade-balancing requirements were the functional equivalent of quantitative restrictions on imports, and that they therefore distorted the level and pattern of international trade and investment by causing inefficiencies in the worldwide allocation of resources. They were also included as subjects of negotiation on grounds that they were inconsistent with Articles III and XI of the GATT.

Article III requires that imported goods receive national treatment in terms of internal taxes and regulations. It thus prohibits the use of internal regulations to discriminate in favor of domestic production. More specifically, the article proscribes any internal regulation that "requires, directly or indirectly, that any specified amount or proportion of any product which is the subject of the regulation must be supplied from domestic sources." This language would in itself appear to rule out local-content or trade-balancing requirements.

In addition, Article XI mandates a general prohibition of quantitative restrictions on imports. Such restrictions are regarded as functionally equivalent to performance requirements.

The Uruguay Round prohibited GATT members from applying any TRIM that was inconsistent with the provisions of the two Articles unless it can be justified under GATT exceptions. The agreement is explicit in citing local-content and trade-balancing requirements as falling within the scope of this prohibition.³

All TRIMs inconsistent with the Agreement were to be reported within ninety days, and were then to be eliminated within specific periods: two years for developed countries, five years for developing countries, and seven years for least-developed countries. However, a developing country experiencing difficulties in eliminating a TRIM may have the transition extended by the GATT Council for Trade in Goods. Moreover, recognition is given to the right of developing countries to apply TRIMs temporarily in order to safeguard the balance of payments or to protect an infant industry.

The key word for the use of TRIMs during the transitional period is "temporary." The Agreement puts all countries that are still using TRIMs under pressure to move away from such measures.

Although systematic and comprehensive data on the extent of the use of TRIMs do not exist, a 1989 survey by the Office of the United States Trade Representative (USTR) found them to be quite extensive (see Table 2) around the world. On the basis of the USTR survey and other attempts to document the prevalence of TRIMs, a study sponsored by the United Nations Centre on Transnational Corporations⁴ arrived at several conclusions:

First, TRIMs involving local-content requirements have been concentrated in specific sectors, mainly the automotive, chemical and petrochemical, and computer/informatics sectors. Although TRIMs exist in both developed and developing countries, they are more common in developing countries. Even places like South Korea and Taiwan (China), which are generally considered to be open to international trade, have at times adopted such policy instruments.

Another significant finding of the UNCTC study is that many of the TRIMs, although officially on the books, have not been applied in practice. A clear example can be found in the experience of the automotive industry in Morocco. In the 1950s the government established local-content requirements of 42 percent for the industry. By the 1960s, however, the target had not been realized, and final decisions regarding the origin of inputs were largely left to domestic producers.⁵

Moreover, in a large percentage of the cases where local-content requirements have been applied, the measures became redundant in the sense that the firms planned to develop local suppliers anyway. This seems to have been the

Table 2 Local-Content Requirements in Middle Income And Less Developed Countries

1.	Argentina	Automotive
2.	Chile	Automotive
3.	Colombia	Automotive (+ Trade Balancing) Telecommunications Electronics (+ Trade Balancing) Aircraft Capital Goods
4.	Ecuador	Automotive
5.	Egypt	All Industries
6.	Ghana	All but Mining/Petroleum/ Extraction
7.	India	All Industries
8.	Indonesia	Automotive, Pharmaceutical
9.	Ivory Coast	Capital Goods
10.	Jamaica	All Industries
11.	Kenya	All Industries
12.	Korea	All Industries
13.	Malaysia	Automotive
14.	Mexico	All Industries (+ Trade Balancing, Automotive, Pharmaceutical)
15.	Morocco	Automotive
16.	Pakistan	Electronics Consumer Goods Transportation Agricultural Equipment
17.	Peoples Rep. of China	All Industries
18.	Peru	All Industries
19.	Taiwan (China)	Automotive Industries
20.	Thailand	All Industries
21.	Turkey	Selected Industry
22.	Uruguay	Automotive (+ Trade Balancing)
23.	Venezuela	Automotive (+ Trade Balancing) Tobacco

Source: United States Trade Representative, *TRIM Survey*, 1989.

case in India in the 1970s. The presence of stringent administrative regulations on the type and quantities of items to be bought locally and the establishment of special incentives to develop SMEs, especially in backward areas, only induced foreign firms that were final assemblers to rely on local suppliers for technologically simple inputs, which over time would have been contracted out anyway.

It was also noted that foreign auto assembler in the Philippines who had met the government requirement of 40 percent local content have mainly done so by establishing in-plant production facilities, which has had little impact on local supplier industries.

Despite various mitigating circumstances, TRIMs do create disincentives to foreign investment and the cost paid by the host country for such requirements seems to be high. Taken by themselves, they reduce the foreign firm's return on its investment by forcing it to purchase high-cost domestic supplies, or to utilize expensive in-house production, or to try to sell high-cost exports. If foreign investment is to be attracted despite these disincentives, there must be compensatory incentives in the form of protection for the firm's output, or fiscal incentives in the form of tax concessions or cash grants.

During the 1970s and early 1980s, for example, the Philippine government held a so-called "localization drive" aimed at saving foreign exchange and stimulating supplier industries. Foreign assembly firms were compensated with the continuation of high protection on the domestic market. This shield against import competition allowed foreign firms operating domestically to lower the quality while raising the price of their products sold in the domestic market. It was domestic consumers who paid the costs.

Local content requirements imposed in some developing countries on foreign investors have, in some cases, increased the proportion of their local sourcing, but, again, the cost paid by those economies seems to be high. Auto parts producers in Mexico and Brazil, for instance, were given protection for decades, and they became world-competitive exporters only after government policies were turned toward economic liberalization and the reduction of domestic protection.

In most other countries, local content requirements have caused lowered quality standards that are only tolerable in the domestic market. As with other protectionist measures, local sourcing under such circumstances gives little incentive to local suppliers to enhance performance through improvements in technology and management. In Indonesia, for instance, export-oriented foreign firms in the electrical appliance industry have encountered great difficulty in finding domestic suppliers of metal and plastic parts that meet their requirements. Part of the reason is that the domestic suppliers are more interested in selling their parts to clients who are oriented primarily toward the domestic market. A shift toward catering to export-oriented clients would require substantial technological and management upgrading, which in turn would require significant new investment—a risk that many

domestic suppliers are unwilling to take. As one supplier aptly put it, "Why should we bother as long as equivalent or higher returns are available from the domestic market?"

It is sometimes argued by developing countries that performance requirements should not be viewed as undesirable simply on grounds that they change the patterns of trade and investment that would prevail in the absence of government intervention. In addition to the usual infant industry arguments for protection, these requirements are seen as equitable and efficient measures to offset market imperfections associated with the operations of MNCs that impede the growth of developing countries.

Among those market imperfections is cited the possibility that foreign affiliates may import more and export less than would result from the unimpeded working of market forces. Excess imports may result from centralized procurement practices, traditional suppliers' relationships, or previous commitments to plants located elsewhere. At the same time, exports may be constrained by a global company strategy that discourages sales abroad in competition with sales by affiliates of the same firm in other locations. Local-content and trade-balancing requirements are therefore regarded as mechanisms for overcoming those distortions.

These views are at least partly outdated in the rapidly changing international economic environment. As discussed in the previous chapter, more and more foreign investors now prefer to rely on nearby suppliers in the countries where they are operating, if they can get the price, technology, and quality control they need. In Asia, in particular, some countries have good opportunities to develop backward linkage because of a rapid rise in the prices charged by their traditional sources of supply—that is, Japan and the newly industrialized economies (NIEs). This has led many foreign investors to look for less costly sources within the region. In some countries, such as Indonesia and the Philippines, many foreign companies are eager to see an expansion of local sourcing, and some are already making great efforts to develop their own local subcontracting networks.

Many, however, have thus far been frustrated by an insufficient response from local suppliers. The urgent need in these countries, therefore, seems to be to upgrade domestic supply capacity to meet the already existing demand from MNCs.

Fiscal Policy and Administration

In addition to the trade barriers and TRIMs that are deliberately used in attempts to strengthen backward linkage, certain fiscal policies and their administration have had a detrimental impact on backward linkage, though not necessarily by direct intention. To create a policy environment that is conducive to backward linkage development, these policies must be addressed in the context of broad tax reform.

One major tax policy that discourages backward linkage in developing countries is the turnover tax or business tax levied on the full value of products and services transacted between firms. Such taxes are sometimes preferred by governments because they are relatively easy to administer. However, the cascading effect of these taxes raises the tax liabilities of firms as parts and components move through the production chain from independent suppliers to final assembly. Thus, they impede backward linkage while favoring imports of parts and components or backward and forward internalization of production.

Because of this, some governments have in recent years introduced a value-added tax (VAT) as a more preferable form of tax. Indonesia, for instance, introduced as part of the 1985 tax reform the VAT in the manufacturing and construction sectors, and replaced the previous sales tax. The main purpose was to avoid taxation of full value at each stage of the production chain. Likewise, the government of Thailand found its business tax an impediment and replaced it with a VAT when the rapidly increasing stock of FDI in the early 1990s opened new opportunities for promoting backward linkage.

Many countries offer fiscal incentives to exporters, including tariff reduction or exemption on imported inputs or capital equipment, and various tax benefits, such as exemptions on corporate income tax. To encourage the exporters to use larger amounts of locally provided inputs, some governments, such as that of Indonesia, also exempt them from the VAT. These incentives, however, are usually available to direct exporters only. Indirect exporters—for example, parts and components suppliers whose clients are exporters—often cannot take advantage of these benefits.

A similar situation existed in a number of countries interested in promoting backward linkage, including Egypt, Kenya, the Philippines,

and Thailand. To remove this impediment, some countries, such as Thailand, have extended the available incentives for exporters to indirect exporters.

Tax administration and the administration of incentives have also sometimes been a major impediment to backward linkage. Poor design and bureaucratic hurdles have created delays and raised transaction costs to firms engaged in backward linkage. In Indonesia, the procedures for claiming VAT refunds are complex and time consuming. Small companies, in particular, find the refund process too difficult to be worth the effort. Unless improved, the administrative delays and hassles will continue to raise transaction costs and dilute the effectiveness of tax incentives to firms entering into backward linkage relationships.

Other Methods

Developing countries also have tried other methods of encouraging backward linkage. In 1992, for example, Indonesia introduced a so-called “Foster father program” that obligated all large firms, foreign and domestic, to spend up to 5 percent of their annual profits to aid local suppliers of goods and services in the immediate geographical vicinity of the plants of the large companies. In consequence, many foreign firms in Indonesia have become unwilling “foster fathers.” They have complained that they get little in return for the money they are compelled to spend, some of which goes to smaller firms who otherwise have no connection with the large firms.

Another program based on geographical principles has been in effect for a long time in the Philippines. There, the government adopted a policy intended to increase the numbers of local suppliers located in remote areas. Large firms were offered various incentives to make purchases from suppliers in designated areas far removed from the operations of the large firms. These efforts have borne little fruit, since the large firms naturally prefer to work with suppliers close by.

Conclusion—A Better Policy Framework

In recent years, more and more governments in the developing world have begun to see it in their fundamental economic interest to open up domestic markets and encourage economically

efficient backward linkage through competition. It is recognized that the most effective motivating situations requires the combination of threats and rewards. Like most human beings who enjoy quiet lives if they can live that way, in no country in the world will the majority of companies exert the energy and take the risks needed to remain competitive unless they are forced to do so.

Developments in Ireland, Singapore, South Korea and Taiwan (China) have pointed in a new direction. Their encouragement of backward linkage since the 1980s has been consistent with an economic development strategy that is outward-looking and market-oriented. Protectionist measures, of which TRIMs are an example, were phased out in favor of measures focused on enhancing the competitiveness of domestic part and component suppliers. These measures, as will be examined in more detail in the next chapter, promoted backward linkage more effectively, though perhaps indirectly. They succeeded in narrowing the gaps between foreign investors and local supplier companies, and rendered intermediate products provided locally attractive for producers of final goods on the basis of purely cost and quality considerations.

This new direction has been appreciated by other countries. Indonesia, the Philippines, Mexico and Thailand have recently followed suit and abandoned the use of local content requirements in most sectors. These countries have seen positive results in encouraging backward linkage after taking steps toward trade reforms. In Mexico, it is observed that the recent opening of the economy to competition, and the curtailment of protected markets in particular sectors such as auto parts and electric and electronic components served as the necessary "sticks" to increase competitiveness in the country. In the

Philippines, likewise, dramatically lowered protection on the electrical appliance and electronics products in the late 1980s spurred a rapid growth of the industries, of both final and intermediate products.

The increasing openness has increased competitive pressure on backward linkage development. Goods and services must be offered at more competitive prices, with more assured quality levels, and with more assured adherence to scheduled times of delivery. Moreover, since firms are now more exposed to import competition, they have to be more sensitive to technical changes, product standardization, and managerial improvements. Under such a pressure, a group of domestic companies in all four countries are beginning to compete aggressively to supply intermediate manufactured goods to other companies in their countries. Some even have succeeded in developing themselves into direct exporters.

Notes

1. The World Bank, *World Development Report 1991: The Challenge of Development*, p.79.

2. See The World Bank, *The Philippines: An Opening for Sustained Growth*, April 1993, pp. 182-184; and The World Bank, *Industrial Structures and the Development of Small and Medium Enterprise Linkages*, ed. by Saha Dhevan Meyanathan, Washington, D.C., 1994; pp. 98-99.

3. GATT Secretariat, "An Analysis of the Proposed Uruguay Agreement with Particular Emphasis on Aspects of Interest to Developing Countries," MTN.TNC/W/122, 20 November 1993, Geneva, Switzerland, p. 58.

4. Theodore H. Moran. *The Impact of Trade-Related Investment Measures (TRIMs) on Trade and Development: Theory, Evidence, and Policy Implications*. United Nations, Centre on Transnational Corporations, 1990. New York, New York 10017.

5. United Nations Center on Transnational Corporations, *Transnational Corporation Linkages in Developing Countries: The Case of Backward Linkages via Subcontracting*, United Nations, 1981.

3

Institutional Support for Backward Linkage

Policy liberalization is a necessary condition for developing efficient backward linkage, but it alone may not be sufficient to foster a wide base of capable suppliers in most developing countries. This chapter focuses on the subject of institutional support, both public and private, for the development of backward linkage in developing countries. It does not deal with the issue of improving a country's physical infrastructure, although such improvements are often equally important to the growth of domestic supplier firms.

The Need to Strengthen Domestic Suppliers

The relatively low level of local sourcing by foreign companies has often been attributed to the unwillingness of those companies to use local inputs. Investigations among foreign firms do reveal a certain amount of such an unwillingness, for a number of reasons. Many foreign-invested companies, for instance, prefer suppliers that are owned by, or affiliated with, the same company. Some technologies are not easily available on the market for local supplier companies to acquire. For some intermediate goods there may be scale economies which impede the existence of efficient multiple sources.

A more important reason cited by most foreign firms, however, is the significant technological and managerial gaps between the foreign firms and the local supplier companies, which prevent the latter from meeting the needs and requirements of the former. In general, foreign firms

have complained about the lack of adequate response from local suppliers to the following requirements:

- competitive price,
- quality control (low defect rate),
- time of delivery (keeping promises),
- flexibility and speed to change designs/production,
- ability to design parts and components, and
- long-term commitment.

The inability of domestic suppliers to meet these requirements is a particular problem for export-oriented foreign investors, or the investors whose domestic market is no longer protected by import restrictions. In these situations, the investors themselves have to compete in the rigorous international markets, and they cannot afford to accept locally provided intermediate goods and services unless those goods and services can meet the international standards. In the late 1980s, for example, a number of companies from Japan and Taiwan (China) first examined the Philippines as a possible site to relocate their sources of supplies. After some attempt with local firms, which proved to be strenuous and futile, they shifted the effort to Malaysia and Thailand instead.

For those countries that have seen a rapid accumulation of FDI stock as a result of economic liberalization in recent years, there is

clearly an enlarged potential of local sourcing by the foreign companies. To realize this potential, however, still requires major progress in narrowing the gaps between the multinational buyers and domestic suppliers. For the countries that are determined to move toward an open economy, moreover, the gap can only be filled through upgrading the technological and managerial capability of the domestic suppliers to the internationally competitive standards, rather than downgrading the needs and requirements of the foreign investors to accommodate the current level of domestic capabilities. The opportunity for those developing countries to develop backward linkages is greater than ever, but the challenge they are facing is also unprecedented.

The Institutional Role of Foreign Firms

In the past, governments in developing countries have often argued that foreign-owned companies operating in their countries should take upon themselves a large part of the task of assisting in the development of local suppliers. And, often, when MNCs have declined to play such a role, developing country governments have sought to force them to do so through the various means discussed in the previous chapter—often, without much success.

In 1989, for example, Halbach published a study showing the results of a survey of 112 multinational enterprises on the topic of subcontracting in developing countries.¹ The survey found that financial assistance by multinational firms to local subcontractors was rare, and that most of the technology transfers from multinationals to local companies took the form of design provisions and quality control. Improvements in the production process of the local companies remained the responsibility of those companies, who, in fact, often had better technical expertise than their customers. The study also contended that the decisions of the multinationals on assistance were based on stringent cost/benefit analysis.

Today, however, the trend toward the globalization of production is gradually shifting the attitudes of the managers of foreign-owned plants in developing countries. Increasing numbers of them are coming under strong pressure to buy from the most competitive suppliers, regardless of ownership. This pressure is arising from various new trends in business, such as “just-in-time” inventory management and much more frequent changes in product specifications.

Recent FIAS interviews of representatives of foreign-owned firms in Indonesia, Mexico, the Philippines, and Thailand have revealed a notable willingness on the part of those firms to utilize nontraditional sources of parts and components. In all cases, however, the foreign firms used fairly stringent criteria in selecting local subcontractors, and transfers of technology and management skills only took place after a close relationship between buyer and supplier was established.

The FIAS interviews have also revealed that it is uncommon for foreign investors to provide financial assistance to local suppliers when the countries involved are themselves facing severe financial constraints. Most of the multinationals involved in the interviews were unwilling to help local suppliers financially, and, contrary to common belief, most suppliers did not look for such assistance. Interviews with the representatives of 13 multinational assemblers and eight local subcontractors in the Manila area, for instance, showed that advance payments by the assemblers to their suppliers were rare. Instead, it was subcontractors who financed the assemblers by allowing them credit for 30 to 60 days instead of requiring immediate payment.

Technological assistance to local subcontractors also seemed limited. Most technological assistance that did occur was in the area of quality control, whereas technology transfers from the large foreign firms that affected the subcontractors’ production processes were unusual. In most cases, foreign firms provided local companies with designs and specifications for the parts required, sent engineers to the subcontractors’ plants to inspect production facilities, and, from time to time, helped solve special problems in quality control. In a number of cases, foreign companies helped the subcontractors with necessary tooling and material testing that were either too expensive or not available locally. Several foreign firms provided subcontractors with management training when it was needed for quality control purposes. However, more substantial technology transfer, such as those directly involving production processes, was rarely found.

An important limitation on technology transfer in these cases was the low technological level of local firms. Where the gap between foreign and local firms appears to be significant, technological transfer becomes more difficult. Also, many of the needed public facilities, such as

inspection, testing and calibration, are so underdeveloped in the host countries that the provision of most of the required services would place the burden mainly on the foreign companies.

The reluctance of foreign assemblers to provide technological help in improving their suppliers' production processes can also be attributed to the fact that they often do not have the special knowledge and expertise required by the production of parts and components. To help upgrade the technical capability of local subcontractors in such cases would mean involving companies in their home country that make similar products. The cost of doing this is very high.

Finally, foreign companies are unwilling to bear the various costs when the subcontractors are not enthusiastic themselves about the required improvements. In a few cases in the Philippines, for example, the foreign assemblers had offered advice and suggested third sources of information and assistance, only to be met by an apathetic response from subcontractors who were either limited in vision or constrained by their financial capacity.

These findings should be meaningful to policy makers in developing countries. Obviously, MNCs provide only one, although significant, source of assisting domestic suppliers. This source can be most effectively tapped if the domestic partners take strong initiatives for self-help, to demonstrate a sincerity and ability to strengthen themselves. In the meantime, upgrading domestic suppliers requires not only the efforts of companies, but also comprehensive public support, especially in such areas as financing, technology and training. Instead of pressing or inducing foreign investors, therefore, host governments should pay more attention to the necessary measures aimed at enhancing the consciousness of domestic suppliers and providing necessary support to companies that want to upgrade themselves. These measures will reinforce the contributions by foreign companies, as they will make local suppliers more attractive partners in the eyes of the foreign firms and, indeed, make the countries much more attractive environments in which to conduct subcontracting business.

Institutional Assistance for Small and Medium Enterprises

Although supplier industries include enterprises of all sizes, most of them are not large. In devel-

oping countries, they are typically found in the upper size range of SMEs. For this reason, the issue of how to strengthen domestic suppliers inevitably becomes intertwined with the issue of how to support SMEs.

Many governments in developing countries believe that the weakness of their domestic suppliers is inherent in the fact that the majority of them are SMEs. Another common belief in these countries is that domestic SMEs are easily victimized when an economy is liberalized because they are unable to compete with the larger and much more advanced international companies.

The belief that SMEs are bound to be victimized by economic liberalization is incorrect. A number of economies have succeeded in developing backward linkage in an open and market-oriented environment by taking steps to develop capable suppliers among their domestic SMEs.

This approach has characterized the industrialization process in Taiwan (China), where SMEs have been the driving force behind industrialization for the past four decades. Today, SMEs account for over 97 percent of all business establishments on the island, ship about two-thirds of its total exports, and employ about 60 percent of the working population. SMEs are active subcontractors to many large foreign companies operating either on the island or around the world. In Japan, an industrialized country that also has a highly developed subcontracting system, about 65 percent of all manufacturers are small and medium subcontractors, and their numbers exceed 80 percent in manufacturing sub-sectors such as textiles and apparel, general and electrical machinery, transportation, and precision machinery.²

The trend in the Republic of Korea has also been an expansion of SMEs. During the early days of industrialization in the late 1950s and early 1960s, the government adopted a strategy of creating large industrial conglomerates called *chaebols*. By the 1980s, however, the Korean government discovered that it could best achieve greater economic efficiency by creating a better balance between large enterprises and smaller supply firms.

A recent study of Korea's industrial structure and SME development revealed that the share of SMEs in Korea's manufacturing employment rose from 37.6 percent in 1976 to 51.2 percent in 1988, and their share in the country's manufacturing value added rose from 23.7 to 34.9 percent during the same period.³ Many small but capable

subcontractors have emerged in recent years to play an important role in supporting large conglomerates, such as Samsung and Gold Star.

A somewhat similar course of development occurred in Singapore. Initially developed as a largely *entrepôt*-based economy, Singapore has successfully transformed itself into a newly industrialized economy. The relative contribution of the manufacturing sector to the national economy increased from 11.4 percent of GDP in 1960 to 29.1 percent in 1990. While the Government of Singapore aggressively tapped the resources of large foreign companies during the transformation, it also adopted a balanced policy of supporting viable and innovative domestic SMEs. Today, domestic SMEs account for about 90 percent of the country's total number of business establishments, 44 percent of its employment, 24 percent of its value added, and 16 percent of its direct exports. In the manufacturing sector, SMEs are most actively involved in plastic products, electrical and electronic products, and transport equipment, often as providers of the ancillary support services and subcontracting work required by MNCs.⁴

The successful strategies of Korea, Singapore, and Taiwan (China), have gone beyond economic liberalization measures. The governments of those economies have continued to provide infrastructural support, both physical and institutional, to domestic industries, especially the SMEs. Efforts have been particularly made to integrate in technological, manpower training, and financing support, which the market by itself might not provide in its early stage of development.

Moreover, by insisting on the principle of mutual benefits, these governments have successfully tapped the foreign investors operating in their economies, as well as other private institutions, as valuable sources of the assistance to domestic suppliers.

The Role of the Government

The strengthening of domestic suppliers is justified on several grounds. Public support is especially important for SMEs, which make up the majority of actual and potential supplier companies in developing countries. Unlike large firms, SMEs are less able to develop and maintain in-house capabilities to meet their technical and managerial needs. Rather, their efficiency is best advanced when they are allowed to use their available resources on specialized production,

while depending more on outside sources for needed technical and commercial services.

Compared with large firms, SMEs also face more difficulties in acquiring necessary financing, since commercial banks in developing countries—underdeveloped and facing performance constraints themselves—either are reluctant to lend to small companies or charge higher interest rates for such financing. Because of this constraint, many small but otherwise viable projects might fail without government support.

In countries where backward linkage programs are vigorously implemented and become successful, the government often makes good use of existing SME programs and, at the same time, supplements and reinforces the SME programs through the implementation of backward linkage programs.

But it is also important to recognize the differences between strengthening domestic suppliers and generally supporting SMEs. While the two share a common final goal, each has specific objectives and requires different approaches. SME policies in most developing countries, for instance, often contain strong social and political objectives, such as relieving urban unemployment or alleviating rural poverty. The main beneficiaries targeted by the SME programs, accordingly, may be the poorest and neediest among the population.

Backward linkage programs, on the other hand, are most relevant when used to increase industrial efficiency, and the sectors targeted are ordinarily manufacturing sectors. To succeed, the programs must target a much more narrow set of companies that can be among the country's most capable and committed SMEs.

"Public support" does not mean only support from the government. To the contrary, many support services can be best delivered by non-government institutions, including academic, non-profit, professional, and commercial organizations. Foreign investors participating on the basis of their own interests provide another important source of assistance needed by domestic suppliers. Finally, supplier companies themselves, while being the intended beneficiaries, are also crucial contributors to the supporting system. Their participation in the design, operation, management, modification of the various supporting programs—and bearing part of the cost—will help make such programs work.

The role of the government, in this context, is becoming more complex than heretofore. It is no

longer simply the role of regulator, but one of organizer, coordinator, assistant, and partner. Success in such a multifarious role requires major changes in attitude and the accumulation of new skills by government officials. Devotion, creativeness, and a willingness to learn from mistakes are often crucial assets.

Korea, Singapore, and Taiwan (China), illustrate how governments have played this new role successfully. The SME programs developed by those governments have been quite diverse. However, they all have been quite significant in three major areas: technology upgrading, manpower development and managerial training, and financing. Some common elements and characteristics of these programs are worth special attention.

Upgrading of Technology

All three governments have recognized that the upgrading of technology is the major key to enhancing the international competitiveness of domestic supplier industries.

As a result, all three have established central institutions to shepherd advances in technology and to provide technological services that SMEs can seldom perform themselves, such as the testing of materials, inspection and certification of quality control standards, calibration of measuring instruments, establishment of repositories of technical information, patent registration, research and design, and technical training. In addition, technical consulting services and customized troubleshooting services have been established that are especially useful to SMEs.

Singapore's main provider of technological assistance is the Singapore Institute of Standards and Industrial Research (SISIR), which is profiled in Box 2. The counterpart in Taiwan (China), is the Industrial Technology Research Institute (ITRI). In Korea, the Industrial Technology Information Center (ITIC) plays a pivotal role in pooling together a series of government and private technology support institutions.

Some of the technological services provided by public agencies are free, especially when general information or educational services are needed by SMEs. Other services, such as testing, calibration, and repair, are only provided if the users are willing to share the costs, although the government may provide subsidies to enable companies to use such services, especially if they are new companies. Custom-tailored services are

typically provided on a fee basis. Apart from the services which they themselves provide, either at their headquarters or at branches throughout the country, these institutes work closely with academic, nonprofit, and private commercial firms to provide needed technological services and advice.

Thanks to the fees it charges for certain services and the fine quality of those services, which have attracted many users, SISIR is today a self-financing institution. ITRI too has shifted away from dependence on the government budget and generates a large part of its income from contract work for users.

Manpower Development and Managerial Training

Human resource development is as important as technology improvements in enhancing the quality and productivity of SMEs. In some fields, such as quality control and automation, human resource development and improved technology are directly linked. In others, such as accounting, inventory handling, and marketing, management concepts and systems are undergoing revolutionary changes, largely due to high-technology advances in computers and telecommunications. SMEs in developing countries, moreover, are typically disadvantaged by their limited skills in management and marketing. Owners of such SMEs often have excellent engineering backgrounds, but usually need to broaden their skills in general management.

In Taiwan (China), the China Productivity Center (CPC) has played a leading role in providing technical and managerial training for SME owners and workers since 1955. The CPC now employs about 600 professional staff members who teach courses attended each year by between 60,000 and 80,000 people. The CPC also consistently collects new information on technical and managerial subjects and disseminates it through libraries, conferences, seminars, and consultation.

The CPC's National Quality Promotion Program was instrumental in persuading SMEs to switch from a production or cost-driven operational philosophy to a customer-oriented philosophy. Its programs have helped firms improve their efficiency while reducing inventory costs dramatically through the use of electronic data interchange (EDI) systems, electronic order systems (EOS), point-of-sale systems (POS), and other advanced methods.

Box 2 The Singapore Institute of Standards and Industrial Research

The Singapore Institute of Standards and Industrial Research (SISIR) is a good example of government effort to support domestic industries through technological assistance. A national institute established by the government, the mission of SISIR is to facilitate raising the competitiveness of local industry by promoting industrial standards and upgrading the level of quality and technology. The institute houses a blend of technical skills and facilities that includes "hard" technology (comprising applied research, product/process design and development, and testing and evaluation) and "soft" technology (including standardization, certification, calibration, quality improvement consultancy and training, quality assessment and inspection, laboratory accreditation, patents/licensing and incubation).

To fulfil its mission, the institute has a professional team of more than 550 engineers, applied scientists and support staff, many of whom are specialists in their fields. Its in-house capabilities are complemented by a wide network of collaborative linkages with institutions of higher learning and other leading R&D establishments and standards authorities worldwide.

SISIR operates in a business-like way. Its facilities and services are easily accessible to companies with

various industry needs. The incubator scheme of the institute, especially, allows small and medium enterprises or innovators to make use of the institute's space, equipment, and technical advice. It has some common facilities that allow firms to do research and development which they otherwise would be unable to do on their own. Its Technology Upgrading Center, in the meantime, helps hundreds of small and medium enterprises, on a one-to-one basis, to diagnose problems, identify the technical and financial needs for improvement, and provide the recommended services if such services are available at SISIR. If not, the institute can make reference to other sources of expertise.

An important principle of SISIR's operation is that it provides no free hand-outs. SISIR expects companies using its services to pay at least part of the costs, based on the belief that the impetus for growth comes in the form of sharing between the government and the private companies. Charging service fees also forces SISIR to be constantly aware of the quality of the services it provides. Finally, it enables the institute to be at least partly self-sufficient rather than wholly dependent on government budgets.

Government training programs for SME workers are also important in Singapore and Korea, notwithstanding the fact that large private companies employ the bulk of the work force in both countries. Korea's Small and Medium Industry Promotion Corporation, for example, provided assistance of various kinds to about 17,000 SMEs in 1993, with educational programs being the leading type of assistance. The governments of Singapore and Korea, moreover, have played a leading role in introducing ISO 9000 standards and factory automation, and in helping SMEs to install and implement the new systems through massive training and consulting services. These training programs have often required a significant amount of public funding, particularly in their early stages, but SME participants are often required to pay fees as well. Cost sharing has proven to be an important mechanism to assure that companies take the training programs seriously. Over time, as more and more companies come to value the programs, many of the programs start to generate enough revenue to support themselves. The CPC of Taiwan (China),

for instance, initially was wholly financed by the government. Today, it is largely self-sufficient because of its thriving consulting and training services.

Financial Assistance

Technology and management upgrading will not be successful unless it can be financed with both equity and loans. Developing and implementing new technology is not only expensive but also risky. Researching the markets, gathering information about technology, buying the machinery, training the workers, educating the managers, securing the customers, perfecting the process—these things cannot be financed by loans alone, but require risk capital.

Capital in general is scarce in most developing countries, and even in Singapore, Korea, and Taiwan (China), private financiers are reluctant to extend loans to existing SMEs, let alone new small enterprises. To encourage technical and managerial upgrading, and the establishment of new firms, the governments of these countries

have established various financing schemes for such purposes. They include subsidized credit, tax incentives, and guarantee funds. In Singapore, for instance, 13,000 SME projects have received funding assistance totaling three billion Singaporean dollars under the government's Local Enterprise Finance Schemes (LEFS).

All three governments have used regulatory mechanisms to some extent to obligate commercial banks to allocate a certain proportion of their credits to SMEs. In the 1970s, for instance, the Central Bank of Korea required state-owned commercial banks and local banks to allocate 30 and 70 percent, respectively, of their total new credit to SMEs. These requirements were gradually increased to 45 and 80 percent, respectively, by 1992, before they were abandoned as a result of financial liberalization in late 1993.

In administering these financial programs, these governments have given priority to innovative and promising entrepreneurs. It has been made clear that the purpose of such financial assistance is not just to help SMEs survive but to help them compete more effectively. Stringent criteria, based on demonstrated ambition, ability, and commitment, are used to select eligible borrowers.

Often, export-oriented activities are given top priority. In Korea, this explicitly includes "indirect exporters"—producers of parts and components that are supplied to large exporting companies. Moreover, most of the lending programs emphasize credit worthiness, as shown by timely repayment.

Even though subsidized financing has been helpful to many small and medium-sized entrepreneurs, it is not without a high cost to the public. Also, subsidies to exporters have become less popular today due to the pressure from the importing countries that are resorting to countervailing duties. The cost in administration of subsidies can be a problem as well. A case study of Korea reveals that most SMEs have preferred to obtain private financing when they could, even when government programs offered considerably lower interest rates, larger loans, and longer repayment terms. This preference apparently stems from borrowers' reluctance to deal with governmental "red tape." All this implies that the best option for SME financing lies in fundamental improvement in the capital market itself. It also explains why subsidized loans are gradually being replaced in Korea by innovative schemes such as guarantee funds and venture capital funds based on the concept of "risk-sharing."

All three governments also provide extensive training and consulting services to help SME managers improve their financial planning and management abilities. An outstanding example of this is the Korean Technology Banking Corporation (KTB), which is described in Box 3. A major state-owned financing institution, KTB not only offers SMEs extensive financing but also provides overall support services, such as information and advice on public stock offerings, business planning, and corporate strategies. KTB has also introduced legal and tax accounting consulting services to provide the SMEs with hands-on solutions to legal and tax accounting problems free of charge.

The Importance of Coordination

Better technology, training, and financial assistance each play an important role in upgrading domestic supply industries, but the key to success is good coordination of these tasks. A survey of SMEs in Korea has shown that SMEs that have received help from one government program, such as technical support, have also made greater use of other government support programs. This suggests a coherence among the various government programs. The same survey also shows that SMEs aimed at expanding exporting activities (including indirect exporting) are more active in seeking technical and financial assistance.⁵

In Singapore, the government has long emphasized the concept of comprehensive support through institutional coordination for local enterprise development. The SME Master Plan announced by the government in 1989 contained guidelines for promoting technology, business development, human resource management, productivity, fiscal incentives, low-interest financing, and grants to local companies. To implement the plan, the government adopted a multi-agency approach which emphasized the need for diversified support services to local enterprises.

Chart 4 shows the multi-agency network and how various key agencies with specialized mandates have been integrated into this network. The lead agency is the Singapore Economic Development Board (EDB), which works hand-in-hand with a range of specialized agencies, including SISIR, the National Productivity Board (NPB), and the Automation Applications Center (AAC), among others. Altogether, more than 60

Box 3 KTB's Assistance Programs for SMEs

KTB, the Korean Technology Banking Corporation, was established in 1981 by the joint efforts of the government and industrial firms. The government provided direct equity investment (one-third of the total), as well as loans and also guarantees for borrowing money from abroad. Both the World Bank and the Asian Development Bank provided loans. In spite of this major government support, KTB was established as an autonomous institution so as to avoid bureaucratic public-sector constraints on efficiency.

Later in the 1980s the government stopped support and shifted to mutual cooperation and indirect support. The government's share of equity has fallen to 15% and is projected to fall to only 10% in the near future. Today KTB's shareholders include over 50 private corporations.

KTB provides its client companies with one-stop service, including a wide range of financial instruments such as loans, direct equity investment, equipment leasing and factoring. This reduces the time and burden for SMEs who otherwise would have to contact several financial institutions for different financial services.

KTB's financing reflects a partnership concept rather than the conventional commercial bank borrower-lender relationship. This means that KTB shares the risks and the profits together with the SMEs. KTB participates as a shareholder together with the project sponsors. KTB also uses what are called conditional loans; if the project succeeds the sponsors pay royalties on sales instead of fixed interest and principal repayments. If the project fails the sponsor does not have to repay the loan. KTB provides funds from the start-up phase to the time when the SMEs list their shares in the public stock market—just as parents take care of their children from infancy through marriage. Its operations are similar in many ways to those of venture capital corporations.

KTB gives assistance to SMEs on commercial terms. KTB's commercial criteria include techno-

logical feasibility, markets, and profitability. The final and most important criterion is management; the capability of the sponsors to implement the project successfully. SMEs face many obstacles and difficulties which the management must overcome.

The KTB appraisal of a project is done by a two-person team, composed of one officer with financial expertise and one with an engineering background. Financial officers tend to emphasize only profitability, while those with engineering backgrounds tend to emphasize technology. So these two-person teams, working together, can do a balanced appraisal of the project.

KTB prefers that its clients emphasize R&D in the later phases of their development, because there are more chances of success. However, in cooperation with the government, KTB also may grant concessionary, low interest rate loans for R&D in earlier stages.

KTB clients tend to be technology-oriented SMEs. But technology is an important problem for all SMEs. Technology is KTB's main mission. Without technology the SMEs cannot succeed. So KTB serves as an intermediary to identify appropriate technology and transfer it to the SME. This technology may come in part from national institutions or from abroad. Recently more and more large Korean corporations have the technology needed, and so sometimes KTB arranges the transfer of technology from these big corporations to the SMEs. KTB helps to link its clients with appropriate research institutions, whether foreign or domestic, and also with other financial institutions when needed.

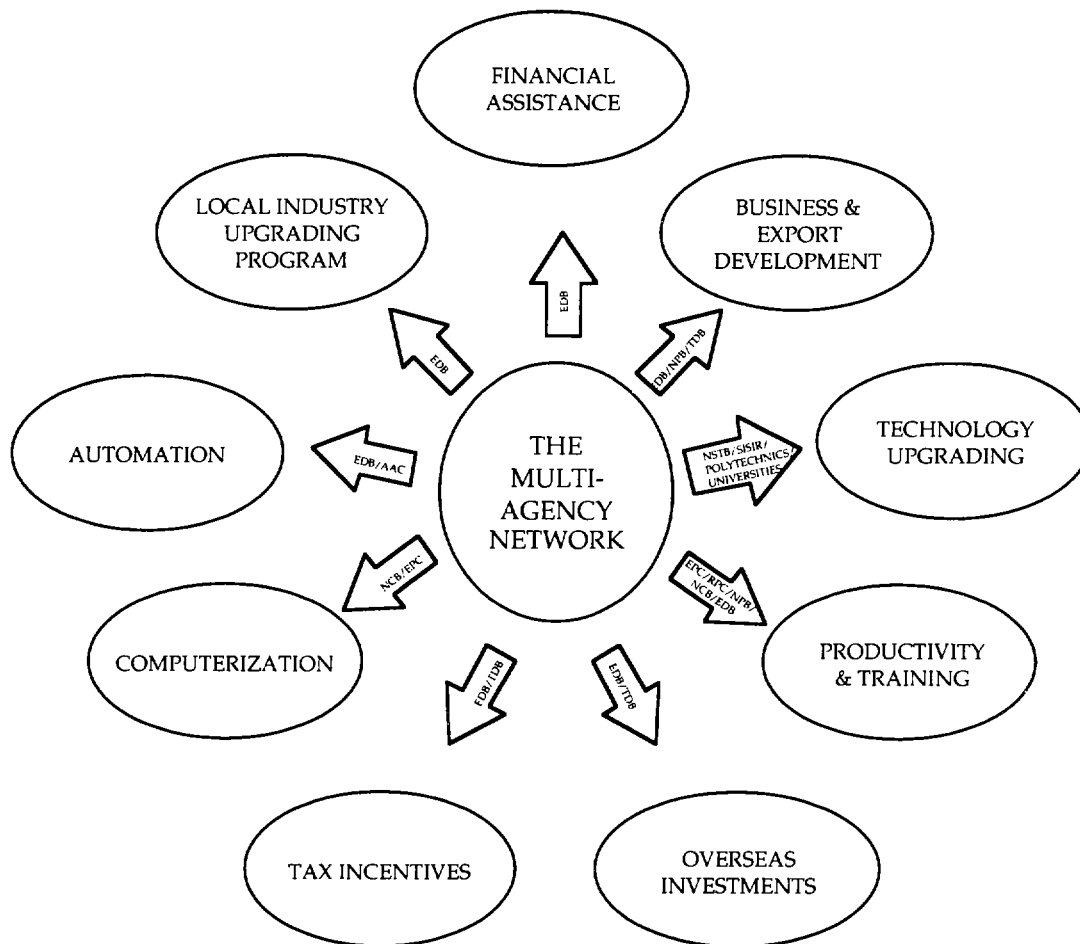
For SMEs, manpower training and marketing are just as important as finance. KTB established training institutions as well as a management consulting facility to provide consulting services to the SMEs. Another important thing is information—about technology, about markets, about manpower. KTB stores such information in data bases; it is planning on establishing a technology financing center, early in 1995, to link companies with foreign and domestic research and financial institutions.

government programs are being implemented, each planned and designed by EDB in consultation with one or more other specialized agencies. The implementation of these programs is coordinated by the Enterprise Development Division (EDD) of EDB.

EDB also works closely with private sector organizations, including banks and financial institutions, the chambers of commerce and

industry, trade and industry associations, MNCs, consultants, and tertiary institutions. One example of this is the Local Enterprise Finance Scheme (LEFS), which provides low-cost, fixed-rate loans to companies and is administered jointly by EDB and 34 banks and financial institutions. Likewise, the Local Enterprise Technical Assistance Scheme (LETAS), which assists companies in need of external experts or consultants to help

Chart 4 Singapore Government Development Assistance for Local Enterprises



Legend

AAC	Automation Applications Centre	NSTB	National Science and Technology Board
EDB	Economic Development Board	RPC	Retail Promotion Centre
EPC	Enterprise Promotion Centres Pte Ltd	SISIR	Singapore Institute of Standards & Industrial Research
NCB	National Computer Board	TDB	Trade Development Board
NPB	National Productivity Board		

with technical trouble-shooting or upgrading, combines private consultancy services with government financial assistance (which may cover 30-70% of the cost).

Taiwan (China), has taken a similar approach under the name "resource integration." As in Singapore, the system in Taiwan (China) emphasizes both specialized division of responsibilities and overall institutional coordination. A Statute for Development of Medium and Small

Businesses promulgated in 1991 is intended to coordinate public funding to help SMEs develop in technology, education and training, and marketing, among other areas. The statute also established a special SME development fund to finance various government assistance programs as well as to provide SMEs with financial assistance through joint efforts with private banks and financial institutions. The statute designated the Ministry of Economic Affairs as the authority

at the Central Government level to coordinate and monitor the use of this fund.

Visibility of Assistance Programs

In all three cases, the programs discussed in this chapter have achieved great public visibility gained through advertising, educational events such as conferences and seminars, large-scale meetings between public and private organizations, and word-of-mouth. SMEs in need of assistance of various kinds usually know where to go and how to get them, and they often have the luxury of choosing among various public and private agencies.

Also in all three cases, the governments have based their policies on long-term objectives, and the programs they announce to the public are backed up by sufficient financial and human resources. These policies and programs therefore usually exist for long periods of time and are able to build up credibility with potential users.

This is quite different from the situation found in many other developing countries, where multiple programs to support SMEs have been launched that are encumbered by complicated rules, an absence of effective coordination, and insufficient financial and human resources. Many programs, as a result, do not last long enough to be known to the public, let alone to win its trust.

Moreover, many of the SME support programs in developing countries are not designed to sup-

port the most promising enterprises, but rather to focus on the smallest, and the least advanced enterprises, or those operating in the most remote and least developed areas of the countries. In the Philippines, for example, most SME support programs exclude enterprises in the Metro Manila area. Yet those are the enterprises that have the best chance to become suppliers to assembler industries.

It is clear, therefore, that the SME support programs in most developing countries need to reexamine both their mission and their method of delivery support. In this regard, they can be guided by the coordinated approach of the institutions described in this chapter.

Notes

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3. Linsu Kim and Jeffrey B. Nugent, "Korean SMEs and Their Support Mechanisms: An Empirical Analysis of the Role of Government and Other Non-Profit Organizations," paper presented at the World Bank Conference on "Can Intervention Work? The Role of Government in SME Success," February 9, 1994, Washington, D.C., pp. 2-3.

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4

Linkage Promotion Programs

A number of countries have devised specific promotion programs to accelerate the growth of backward linkage. These programs are market-oriented, client demand-driven (clients being buyer firms, typically with foreign investment), collaborative and participative with active roles on the part of both buyers and suppliers, and comprehensive in the support provided to potential and actual suppliers.

Like SME programs, backward linkage promotion programs are set up to address market imperfections faced by local firms, particularly domestic SMEs. These firms may be interested in, or suitable for, backward linkage but may find it difficult to obtain market information, financial resources, and required technology.

This paper discusses three examples of this newer and more targeted approach: the Local Industry Upgrade Program in Singapore, the Central-Satellite Factory System in Taiwan (China), and the National Linkage Program in Ireland. Although these three programs share a common philosophy and common objectives, they also have their own distinct features.

Singapore's Local Industry Upgrading Program

The Local Industry Upgrading Program (LIUP) was established in 1986 by EDB in Singapore. The impetus for creating the program was that only 18 percent of the materials, parts, and components purchased the previous year by foreign investors operating in Singapore were sourced locally. The EDB's goal, in establishing the LIUP,

was to upgrade, strengthen, and expand the pool of local suppliers to foreign-invested firms, using the foreign investors as catalyst. This goal was achieved through a close collaboration between local suppliers and foreign firms. The foreign firms (called Partners) participating in the LIUP transfer technical, operational and managerial skills to their local vendors to help upgrade their business. In return, local firms strive to provide good quality and reliable goods and services at competitive prices. In this exchange, the EDB offers organizational and financial support to upgrade and develop local vendors.

An experienced engineer or manager from the foreign firm is seconded to the EDB for a period of two to three years, as a "LIUP Manager." The EDB pays his salary for this period. The LIUP Manager selects local suppliers for focused assistance. The number of selected suppliers has ranged from four to ten. The EDB and the LIUP partners agree on a set of focussed and broad-based assistance programs. This broad-based program includes courses and workshops conducted by foreign investors or by outside consultants to address general technical, managerial or operational issues faced by local suppliers.

The focused assistance program consists of a three-phase approach, that may be undertaken sequentially or concurrently. Phase 1 consists of raising the overall operational efficiency of the local firms, including their production planning and inventory control, plant layout, and financial and management control. In Phase 2, foreign firms introduce the local firms to new products

to be supplied by the local firms and new processes to be used in their production. The foreign-local firm collaboration reaches a new qualitative level in Phase 3, when the partners jointly conduct research and development for new products and processes.

Domestic firms selected as candidate local suppliers must satisfy numerous criteria imposed by the program. A firm must show a clear commitment to upgrading its operations, expanding production and meeting the standards of foreign firms. A minimum of 30 percent of the firm's equity must be domestic, and its fixed assets may not exceed S\$12 million.

After determining whether a firm meets these criteria, the LIUP assesses its suitability for the program based on its past overall performance, future plan of business, ability to make use of new technology, and ability to improve product or service quality while remaining competitive in terms of cost. Candidates for the program may already be selling goods or services to foreign-invested firms.

Thirty-two partnerships had been formed within the LIUP by early 1994, involving 180 of Singapore's domestic suppliers. Of the 32 buyer firms, 16 were US-based companies, 6 were European, 3 were Japanese, and 4 were Singaporean. The other three buyer firms were large government agencies. Electronics and electrical manufacturing industries were dominant (70 percent of the partnerships), followed by the service sector (9 percent).

According to the studies by the LIUP, the program has had an impressive impact on the suppliers, particularly in the earlier years of a partnership. The productivity of suppliers in that early stage rose by an average of 17 percent, while value added per worker went up by 13.7 percent.

In 1993, to help the program evolve in new directions, the EDB established an "LIUP Center" as an organizational umbrella for program activities. The goal of the center is to give LIUP managers more effective access to support programs for local suppliers, as well as to services offered by academic and research institutions. The Center fosters the development of capabilities within suppliers for higher added value activities, such as the design and development of parts and components. It is intended to extend the program to additional sectors, such as health care and marine technology, as well as to other countries. In other words, local suppliers in

Singapore will be assisted to become suppliers to affiliates of MNEs that are operating in other countries. Finally, the Center will provide an institutional platform for two or more LIUP Partners to work together on projects of common interest, such as the development of local prototyping capabilities.

The Center-Satellite Factory System in Taiwan (China)

In 1984, the Industrial Development Bureau (IDB) in Taiwan (China), formed a Center-Satellite (CS) Factory System Promotion Task Force to promote the concept of the CS factory system, to establish a framework for its development, and to upgrade satellite factories.¹ The task force also was responsible for promoting quality control circle activities, managing the National Quality Award, and setting up a regional service infrastructure.

In 1990, on the basis of the work of the Task Force, the CS Development Center (CSD) was founded. The CSD is concerned with upgrading industries in general, promoting the concept and development of the CS system, and engaging in training and exchange activities within and outside Taiwan (China). It continues to promote quality control circle activities and to administer the National Quality Award.

The purpose of the CS factory system program is to organize and integrate satellite factories that serve a central factory, to help all participants raise their productivity, to upgrade their management and technology, and to enhance their international competitiveness. In most cases, a CS program is intended to help strengthen already existing business relationships between a central industrial establishment and its satellites.

The CSD distinguishes among three types of CS systems. The first is a network of satellite firms supplying parts, components and services to a central firm for further processing or assembling. The second is a network centered around a firm which supplies its satellite firms with materials or semi-finished products for further processing. The third is a "horizontal collaborative network," often taking the form of satellite firms providing finished products to a central firm which in turn markets them or uses them for its own turn-key projects.

The CSD engages mainly in three types of activities:

- **Promotion:** The CSD identifies potential central firms, with or without FDI, and seeks to persuade them to establish a CS factory system. The CSD works with the central firm to develop a plan for the system, and works to interest satellite firms, upstream or downstream, in joining specific CS systems. It also assists the CS networks in formulating a division of labor, based on factories' skills and production capacities.
- **Aiding center firms:** The CSD helps the central firm realize the annual operational plan of the CS factory system, meet its objectives, reduce its operating costs, and improve product quality. To do this, the CSD offers assistance in restructuring and rationalizing the CS factory system, promoting harmonious working relationships within the networks, promoting quality assurance programs with member firms, and offering a wide range of vendor assistance and productivity enhancement programs.
- **Aiding satellite firms:** The center factory and the CSD play major roles in helping satellite firms upgrade their operations. Based on the operational strategy and plans of the center firm, an annual CS factory system plan is prepared, including production plans for each satellite firm (see Figure 1). Using evaluations of the capabilities of satellite firms, the center firm and the CSD draw up plans to help satellite factories achieve their respective production plans, upgrade quality, reduce operating costs, and improve delivery time. In addition, the center factory and the CSD help satellite factories develop quality control, cost accounting and delivery management systems, train key personnel, and raise their awareness of the best current management and technical practices through visits to plants on the island and abroad.

These new management practices include quality control circles (QCC), total productive maintenance (TPM), purchase improvement for cost saving (PICS), just-in-time (JIT) delivery, and group-wide quality assurance (GWQA). The CSD conducts, sponsors, or facilitates firms' access to a number of management training programs, some of which make use of foreign inputs and experience, particularly from Japan. The CSD promotes the adoption of international

product standards and helps firms to attain them. In addition, the CSD disseminates information on modern management techniques by publishing its own magazine, books, and research papers.

Since 1984, the CSD and its precursor, the original Task Force, have been instrumental in establishing 139 CS factory systems comprising 2,075 firms and accounting for over one-third of the value of the island's output in the manufacturing sector. These systems cover 23 different subsectors, including machinery and equipment, bicycles, metallurgy, aerospace, textiles and apparel, sport equipment and chemicals. Most of the systems are found in three sectors: electronics (41), metal engineering (19), and motor vehicles (18). In addition, 13 CS or quasi-CS systems have been established in the defense industry, in trading, and in the construction of turnkey factories.

Ireland's National Linkage Program

In the 1970s and early 1980s, Ireland attracted sizeable amounts of FDI. Procurement by foreign-owned firms from the domestic market was limited, however, and consisted chiefly of basic inputs with low added value. A government study found that domestic suppliers could not meet the quantity and quality requirements of foreign investors, in part because of diseconomies of scale within the small Irish domestic market, and in part because of weak technological capabilities. Moreover, the purchasing managers of the multinationals were unwilling to take the risk of buying inputs from domestic Irish firms with no record of producing and selling high-quality products.

To increase domestic procurement, the government had made various attempts to encourage stronger backward linkages, including the creation of a data base to match FDI firms' purchase requirements with potential domestic suppliers in the electronics industry and the establishment of a liaison service to help foreign affiliates identify potential local suppliers. The study found that these efforts had been weak and uncoordinated. Moreover, they did not address the key issue identified by the study—the need to bridge the technical, managerial, and cultural gaps between FDI firms and domestic suppliers.

The study suggested that the Irish government should adopt a proactive approach to enhancing backward linkage, and in 1983 a National Linkage Program (NLP) was established by a consortium

of five existing government agencies led by IDA.² The principal mission of the NLP is to help domestic vendors become reliable and price-competitive suppliers of high quality goods and services to large buyers at home and abroad. The key operational objectives of the NLP are to identify industry linkage potential within a selected group of sectors, help develop a set of domestic suppliers, and offer buyer support and development services.

On the buyer side, the NLP initially targeted the electronics industry. Its efforts then spread to the engineering, food and drink, health care, and consumer product sectors. On the vendor side, a number of sectors in which Ireland had strong capabilities were examined. These included printing and packaging, sheet metal production and finishing, automation equipment, electronics manufacture assembly and system testing equipment, mold and die manufacturing, light engineering, and food and fluid-handling systems.

The NLP performs the following functions:

- *market research*: to identify linkage opportunities between MNE affiliates, as buyers, and domestic firms, as potential suppliers;
- *matchmaking*: to work closely with individual suppliers and buyers to remove all possible obstacles and reach a subcontracting arrangement;
- *monitoring and trouble shooting*: to monitor the progress of on-going local subcontracting, and, with the consent of the firms involved, to act as a trouble shooter when problems occur;
- *business and organization development*: to provide advice and consultation services to help SMEs build their management, production, accounting, quality control and human resource systems, understand foreign firms' ways of conducting business, and develop business strategy and plans; and
- *broker for state assistance programs*: to help SMEs access state assistance programs to enhance their technical, financial and managerial capabilities.

The NLP targets domestic firms, using a "winner" strategy. Of the 5,000-odd SMEs within the targeted sectors, the NLP only works intensively with around one hundred firms, which offer the highest potential as suppliers. With these firms, the NLP works to resolve operational problems,

make use of all available assistance programs, conduct development activities, and enter into subcontracting arrangement with multinational affiliates. Other SMEs in the target sectors receive services of a more general nature.

The NLP is considered in Ireland to be an unequivocal success. Over the 1985 to 1992 period, foreign affiliates operating in Ireland increased their local purchases of raw materials from Irish £438 million to £811 million, and their purchases of services from £980 million to £1,461 million. In the electronics industry alone, the value of inputs sourced from within the country rose from 9 percent to 19 percent over the same period. More than 200 foreign affiliates and 83 suppliers have participated in the program. Of the latter, over 80 percent have achieved ISO 9000 registration or were close to doing so. On average, suppliers saw their sales increase by 83 percent, productivity by 36 percent, and employment by 33 percent. Several have become successful international subcontractors.

Similarities and Differences of the Three Programs

The three backward linkage promotion programs described here share common approaches, but also have many differences. These can be discussed under the headings of economic philosophy, balance between promotional activities and project development, use of targeting, relationship to other support programs and organization.

Economic Philosophy

All three programs use a market-oriented approach that is intended to remedy imperfections in market mechanisms while enabling the government to play the roles of broker, matchmaker, and facilitator. In contrast to local content requirements, this approach remains one of freedom of decision for both the domestic and foreign firms.

Market-oriented policies and measures that increase backward linkage enhance the domestic business environment and firms' capabilities to induce foreign companies to procure domestically. The domestic firms retain the benefits of additional localized production, including revenues, and the development and diffusion of technical, managerial and marketing competence. Moreover, the enhancement of domestic

support industries through backward linkages strengthen the attractiveness of the business environment to foreign investors.

In general, market-oriented approaches lead to financially feasible, though not always economically feasible, backward linkage. That is, some approaches may require government subsidy. Without a phase-out deadline, subsidies to help effect backward linkages would likely lead to economic distortions and the saddling of the economy with non-viable enterprises. Thus, even when adopting a market-oriented approach, backward linkage programs should be devised to minimize such occurrences.

Balance between Promotion and Project Development

Attempts to promote the concept of backward linkage also must deal with the practical issues related to the forging of specific linkages between two or more firms. While all three programs do both, the balance between these activities varies.

Promoting backward linkage is necessarily the first function they perform. The objective is to raise awareness of backward linkage benefits among potential buyers and suppliers, and to inform them of specific programs established to foster linkage. In addition, linkage programs do a sizeable amount of promotion within the government to build an environment conducive to backward linkage. They may also advocate the removal of policy, regulatory or procedural impediments to backward linkage.

Linkage programs typically emphasize the benefits that can be obtained from lower production costs and from the geographical proximity of buyers and suppliers. The prospect of developing domestic firms into high quality sources to supply the operations of the foreign firm outside the host country is often mentioned as a long-term potential benefit to foreign investors. For domestic firms, the potential benefits include larger revenues and profits, upgrading production technology, and greater capability for product design and development.

Linkage programs also identify specific linkage opportunities and match potential suppliers to potential buyers. They may work on the feasibility of such linkages by examining firms' business plans, spend lists³, and cost structures. They become involved in judging suppliers' capabilities and identifying areas for improvement. They recommend, and at times broker access to,

support programs that provide help in making such improvements and often help to subsidize the costs of these services.

One important thing that successful linkage programs do is to reduce the risks perceived by potential buyers and suppliers. These risks must be addressed in practical and concrete ways. For example, through training programs, potential suppliers are exposed to corporate thinking on production and supply strategies, including the importance of quality, cost reduction, and on-time delivery. Linkage programs may also help suppliers obtain financial assistance to increase their production capacity, acquire technology, and improve managerial abilities.

Linkage programs differ in how they balance their activities between promotion and project development. The CSD in Taiwan (China), sees the promotion of the CS factory system as one of its primary responsibilities and has invested sizeable resources in developing and delivering promotional packages to domestic and foreign firms. It sees the center factory as playing the primary role in establishing and structuring a CS system, and in helping satellite factories upgrade themselves.

Ireland's NLP, and to some extent Singapore's LIUP, attempt to play an important catalytic role on the transaction level. The NLP works closely with potential buyers to identify specific parts and components that may be supplied domestically, identifies potential suppliers, gets involved in negotiations, helps design support programs for suppliers, and, when necessary, engages in trouble shooting.

Targeting

All three programs target specific industrial sectors and certain types of firms as good prospects for backward linkage. The historical record shows that linkages, whether upstream or downstream, are most likely to occur in a relatively narrow band of sectors.

This is the result of technological and structural factors. It is these factors that determine whether opportunities for linkage exist at all, given the technologies used in production and on how production is structured. Process technologies, such as those used in the production of petrochemicals and glass, offer few opportunities for backward linkages. Production and services characterized by discrete, multi-stage activities and involving the use of a large and varied

number of materials, parts, and components, are more amenable to linkage. The automobile, electronics and footwear industries, and hotel services are, hence, good candidates.

Even within the sectors amenable to backward linkage, linkage has tended to be concentrated in a narrow subset of those sectors. As noted above, for example, 70 percent of the LIUP partnerships have occurred in the electrical and electronics industries. In Ireland, the NLP targeted a wider range of sectors than Singapore's LIUP did, while the targeting of sectors by Taiwan (China)'s CSD has not been as deliberate as practiced by either the LIUP or the NLP. On occasion, sector targeting has also been based on industrial policy, as in the case of biotechnology (an infant industry) in Singapore.

For sectors on the supplier side, comparative advantages and production capacity have been two main determinants of targeting. Typically, metal working, light engineering, production of plastic parts and components, and mold and die manufacturing are the targets. Within a subsector, targeting may be used to fill strategic gaps in technology or production capabilities. By matching foreign computer firms with local firms producing plastic cases, for example, the NLP was instrumental in introducing to Ireland the process of metallizing plastic cases to lower radiation emission, a process essential to the development of the country's computer industry. Sectors such as printing and packaging, liquid and fluid handling systems, accounting, and legal services enjoy a certain degree of natural protection or are not easily tradable, and have been also targeted at times.

In addition to targeting sectors, the NLP, CSD and LIUP have promoted linkages to certain types of firms. On the buyer side, the NLP and LIUP promote their program to foreign investors within the targeted sectors on the basis of the foreign firm's reputation, level of technology, potential volume of business and added value, and receptivity to the idea of linkage. The CS in Taiwan (China) targets both multinational and domestic firms as potential center factories. The criteria are similar to those mentioned above, with the addition that the center factory must be willing, with the support of the CSD, to spend time and energy to develop a CS system.

On the supplier side, targeted firms are chosen on the basis of size, ownership, and technical and production capabilities. Top management is seen as the most critical factor in the success or

failure of a linkage project, and gets the highest weight in choosing among potential suppliers. Their quality, vision and eagerness to improve their firms and participate in the linkage program are essential ingredients to successful linkages. The success and credibility of a linkage program are after all determined by how satisfied buyers are with their suppliers. The selection of suppliers becomes essential to the future of backward linkage. In Ireland, using the "winner strategy," the NLP has pre-sorted domestic firms into categories based on firms' capabilities and chances of success in a linkage program.

Foreign-firm Involvement in Supplier Upgrading

Transfer of technology and management know-how to domestic companies is an important objective of linkage programs. Buyer firms play a key role in such transfers. That role may range from diagnosis of a potential supplier's strengths and weaknesses to financial and logistical contributions to upgrading a particular supplier if that seems likely to provide benefits for the buyer in the long term. In the LIUP, foreign firms play a central role in supplier upgrading. For a period of two to three years, the almost exclusive responsibility of LIUP managers is to identify and select potential suppliers for their own firm, and to conduct detailed studies of the capabilities of the latter. The managers are also required to propose detailed programs to remedy suppliers' weaknesses. In the other programs, buyers work closely (but not as intensely as in the case of the LIUP) with the NLP and the CSD to identify areas in which remedial work is required to strengthen potential suppliers.

Similarly, the LIUP gives buyers a key role in upgrading the capabilities of a particular supplier. LIUP partners participate in the intense and focused upgrading programs designed for suppliers. They may be involved in developing and delivering these programs, with or without the collaboration of other agencies in Singapore. Such programs may call for the modification of suppliers' production operations, the training of technical personnel, the development of an internal capability for the design and development of parts and components, or the introduction and adaptation of a certain piece of technology.

The role of the buyers in diagnosing and upgrading the capabilities of potential suppliers in Ireland and in Taiwan (China), are significant, but it is not as structured or intense as that of

Singapore's. Instead, there is a tendency to rely more on national support programs.

Institutional Set-up of the Linkage Programs

The relationships of linkage programs to their sponsoring organizations tend to vary. The LIUP is housed organizationally and physically inside the EDB, and staffed with a small number of EDB's employees: two full-time staff with a part-time program director. They have established close working relationships with other EDB programs and with support programs outside the EDB, such as the National Computer Board, the Singapore Institute of Standards & Industrial Research, the National Productivity Board and the Enterprise Promotion Centers. LIUP's motto, "network system works," reflects the importance it attaches to working closely with other programs and schemes to advance its activities and to service its clients.

By contrast, Ireland's NLP is an autonomous organization, though enjoying a very close relationship with the parent agencies. It has a small professional staff, and, with the exception of its director, all are seconded to the NLP by the parent agencies. About half of the NLP staff workers are located outside Dublin so as to be closer to clients.

All three linkage programs use extensively the services of other agencies to support their own activities and the activities of firms involved in backward linkages. Yet, they do it in varying degrees. For example, unlike the LIUP and NLP, the CSD deals in-house with manpower and management training, research and publications, technology transfer and development, and the diagnosis of the capabilities of domestic enterprises, as well as other activities.

Linkage programs deal with a wide variety of subsectors and product lines. Consequently, staff members must be technically competent while yet being sufficiently generalist and strategically-minded to work on widely divergent matters. The staff also must be able to command the respect and earn the trust of high-level executives of the firms with which they deal. All three linkage programs seem to have attracted dedicated, experienced, high caliber professionals with a good understanding of linkage issues, industrial sectors, the general conduct of business and systems of government assistance.

In their daily operations, the linkage programs involve many government and non-government organizations across a variety of disciplines. The success of the program thus depends on the close

cooperation of these organizations in the design, formulation and implementation of linkage program policy and operations. It also depends on the presence of widespread political support.

In Singapore, two committees fulfill the inter-agency coordinating function. At the policy level, there is a Committee on Small Enterprise Policy chaired by the Minister for Trade and Industry and comprised of the Permanent Secretaries of selected ministries and the heads of statutory boards. On the working level, the SME Committee, led by the EDB, includes representatives from other government agencies. As mentioned before, Ireland's NLP is formed of a consortium of five government agencies, each one of which second one or more of its staff to the program.

Ireland's IDA, Taiwan (China)'s IDB, and Singapore's EDB have centralized decision making at the policy and supervisory levels, but most of the operational decision making structure is decentralized. For example, in Singapore, some of the program promotion activities, as well as client relations and services, are housed in business and trade associations. Singapore's SME assistance programs provide even a more striking example of decentralization. A number of programs have established "approved-in-principle" mechanisms, based on clearly stated conditions and criteria. This reduces any unnecessary intervention of central government units in routine operational decisions and allows a quicker response rate to SME requests.

Conclusion

All three backward linkage programs have similar philosophies and objectives, but each is distinct in design and structure. These differences lead to the conclusion that there is no single best model for such a program. The program simply must be designed to fit the characteristics of the country's economy and the specific objectives of its government.

All three programs operate in small, export-oriented economies. In such economies, physical distances are small, regional differences and organizational complexities are not pronounced, and the central, rather than the local, government is more likely to regulate the national economy.

These and other factors mean that the design and structure of backward linkage programs in larger economies may need to be substantially different from the ones studied in this paper. For an economy as large as those of, say, China,

Brazil, or Mexico, it might be better to establish multiple local programs, with perhaps a coordinating body at the central level.

Each of these three backward linkage programs has evolved over time, and it is important to realize that starting small with realistic objectives is the sensible approach. Difficulties and failures along the way should not be surprising.

Backward linkage programs are not SME programs. Rather, they use various SME programs, as well as other instruments, to assist a much more narrowly targeted set of companies. Companies targeted for such linkage programs naturally tend to be chosen from the strongest, most capable and most committed of all local firms, including the SMEs.

For this reason, they may be among the largest local companies, and often do not appear to be

among the neediest. SME programs often have a large social and political component, but that is not an important factor in specific backward linkage programs. To be successful and viable, such programs must build upon strength, pick the participants most likely to succeed, and help them attain the high standards expected by their foreign clients.

Notes

1. The emphasis on these so-called "center-satellite" relationships is primarily functional rather than spatial.

2. The five agencies were: the Industrial Development Agency; the Irish Science, Technology and Standards Institute; the Irish Export Board; the Shannon Free Airport Development Agency; and the Irish Industrial Training Institute.

3. Spend lists are lists showing what inputs are used in production, their quantities and costs.

Conclusion

Developing countries have always sought to increase the potential and actual benefits of FDI. In the past, many governments induced FDI through import substitution programs, and required foreign-owned firms to increase domestic procurement by means of local content requirements. Output was sold in the domestic market only, and consumers paid the costs through high prices and/or low quality. Producers, both foreign and domestic, were shielded from international competition and often failed to achieve economies of scale due to the limited size of the domestic market. Over time, their protected operations often (although not always) failed to develop a competitive edge in the world market, as their technology, management, and overall efficiency stagnated.

In most countries, moreover, regulatory measures used to force foreign companies to buy locally yielded only disappointing results, as the realized level of backward linkage generally remained low.

The recent trends of globalization of production and economic liberalization across the developing world have presented new opportunities and challenges to developing countries. On the one hand, they encourage—indeed, they are forcing—foreign firms to shift from traditional sources of supply to lower-cost suppliers in the developing host countries. On the other hand, this enlarged freedom to select suppliers worldwide makes their demands on local suppliers more rigorous than ever. Under the pressure of both the opportunities and challenges, many

host governments are re-examining their past policies toward backward linkage, and looking for ways that will enable them to play a more positive role in supporting backward linkage which benefits both foreign investors and domestic suppliers.

In the last ten years, a number of governments in the developing world have tried new approaches to promoting backward linkage. These governments have succeeded in formulating new policies, institutions and programs that have helped increase the competitiveness of domestic suppliers and the formation of backward linkage in their economies. Although the specific social and economic conditions surrounding the changes in these economies can be very different from those of other countries, their successful experience offer useful lessons to many developing countries with similar objectives.

The varied experiences of different countries all show that, to succeed, governments need to make efforts in three major areas. First and foremost, governments must provide an enabling business environment that encourages outward-looking and competitive development. This requires thorough-going removal of policy distortions, especially through trade liberalization and deregulation. Second, governments must emphasize the need to upgrade domestic supply industries, and must provide strong infrastructure, both physical and institutional, to support that need. This would require governments to work closely with private industries to identify

and supplement the areas where key supporting services are urgently needed but not sufficiently provided by the market. Finally, government may resort to special promotion programs to accelerate the development of backward linkage.

Such programs can be most successful if they work closely with both multinationals and domestic suppliers, reflecting their mutual needs and interests and incorporating their available resources.

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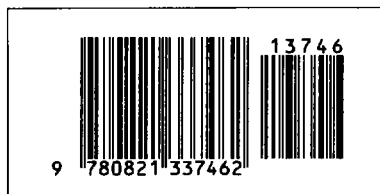
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