



How to Promote Clusters: Policy Experiences from Latin America

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Summary. — In this paper we propose to differentiate between three types of clusters when it comes to formulating cluster-oriented policies in Latin America. *Survival clusters of micro- and small-scale enterprises* owe their existence more to unfavorable macroeconomic conditions and less to entrepreneurial competence and dynamism. Their competitive potential is limited. Support measures should mainly aim at improving the conditions for survival since these clusters are important in creating employment opportunities. The impetus should be to break through the low skills/low investment vicious circle. *More advanced and differentiated mass producers* have been flourishing in the import-substitution era but are coming under enormous pressure with the transition to open economies. In these clusters the main challenge is to create an environment that stimulates and supports learning, innovation, and constant upgrading. *Clusters of transnational corporations* are typically dominated by foreign firms not only at the final assembly stage but also in parts production. These clusters often are showcases of best-practice manufacturing; this can be used to stimulate the upgrading of domestic firms, notably by involving them in the supply-chain of transnationals. © 1999 Elsevier Science Ltd. All rights reserved.

1. INTRODUCTION

Clustering seems to enable firms, especially small and medium-sized enterprises (SMEs), to grow and upgrade more easily. SMEs may even become players in world markets if a high degree of interfirm specialization and their proximity to other firms performing complementary functions offset the disadvantages of being small. Clusters often create positive externalities which help managerial and technical learning. Empirical evidence shows that clustering is especially common among traditional small-scale and labor-intensive activities. Upgrading these activities contributes to a more balanced firm size structure and a more labor-intensive growth pattern. These features of clustering have attracted the interest of

policymakers in developing countries and development assistance agencies. Recently, numerous bilateral and multilateral agencies (including the World Bank, UNIDO, UNCTAD, and ILO)¹ have begun to recognize the benefits of clustering and to reframe their SME and private sector development programs.

This article focuses on Latin America and develops two arguments to advance the ongoing debate on clusters and cluster-related policies. First, industrial clusters in Latin America are very heterogeneous, and they are

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quite different from those stylized role models which have influenced the academic and policy discussion in Europe and North America.² We identify, for Latin America, three ideal type clusters, each having a different genesis, firm structure, organization principles, development trajectory, opportunities, and bottlenecks. Second, as development opportunities and bottlenecks differ, each type of cluster requires a tailor-made policy approach. This may appear obvious. In practice, nevertheless, cluster support in Latin America often proceeds on unrealistic assumptions about development potentials of (groups of) firms and clusters, ignores the specific logic guiding entrepreneurial decision-making, and understates the inertia of the local sociocultural milieu, thus failing to design adequate policies.

The paper is structured as follows: In Section 2 we will specify the term "industrial cluster." Section 3 addresses the justification for cluster-related policy interventions. In Section 4 we present a typology of Latin American clusters. In Sections 5–7 we discuss the main characteristics and possible policy interventions in three different types of clusters. In Section 8 we draw some conclusions for policymakers as well as for future research. A good part of the paper is based on our own field research and advisory work but we also draw extensively on the work of other researchers.

2. CONCEPTUAL ISSUES

There is no generally accepted definition of industrial clusters. The term is used quite indiscriminately for a broad range of business arrangements. In its broadest sense, the term "cluster" only depicts local concentrations of certain economic activities. What makes clusters so attractive for policymakers however are the opportunities for collective efficiency (Schmitz, 1995a) emanating from positive external economies, low transaction costs, and joint action. Pure agglomerations of unrelated firms do not give rise to collective efficiency. Most definitions of clusters thus add some ingredients to the basic notion of spatially concentrated firms and focus on external effects and interaction:

—positive external effects emanating from the existence of a local pool of skilled labor and the attraction of buyers;

—forward and backward linkages between firms inside the clusters;
 —intensive information exchange between firms, institutions, and individuals in the cluster, which gives rise to a creative milieu;
 —joint action geared to creating locational advantages;
 —the existence of a diversified institutional infrastructure supporting the specific activities of the cluster;
 —a sociocultural identity made up of common values and the embeddedness of local actors in a local milieu which facilitates trust.

Given the complexity of patterns of interaction in clusters and the emphasis of cluster literature on "soft," nonmeasurable variables—such as trust, social embeddedness, or creative milieu—it is impossible to formulate a precise definition of clusters or to draw a clear-cut borderline between pure agglomerations and complex clusters with strong externalities. In the real world, even the simplest industrial agglomerations, such as Export Processing Zones (EPZs) in developing countries, where no forward and backward linkages exist at all, will generate some very basic externalities, e.g., contribute to the formation of a specialized local labor pool or augment the demand for certain complementary services. The notion of clustering therefore refers to a variety of industrial agglomerations.

We propose an operational definition of clustering based on measurable variables: A cluster is a sizable agglomeration of firms in a spatially delimited area³ which has a distinctive specialization profile and in which inter-firm specialization and trade is substantial.⁴ This excludes agglomerations of the EPZ-type, as these do not build upon intensive linkages. In our understanding, those local business networks in which a dense social fabric based on shared cultural norms and values and an elaborate network of institutions facilitate the dissemination of knowledge and innovation, constitute a specific type of cluster and may be termed "industrial districts"⁵. The above-mentioned qualitative features considerably augment the performance of clusters. Scarcity of entrepreneurial spirit, barriers to information-sharing, lack of trust, and similar "soft" constraints often constitute the main bottlenecks for cluster development.

3. A TYPOLOGY OF LATIN AMERICAN CLUSTERS

Clustering implies a continuum. Moreover, clusters as well as their environment are constantly changing, so that each cluster has a specific, open-ended trajectory. Clusters should hence be interpreted as dynamic systems. This is especially relevant in the case of Latin American clusters, where we can observe far-reaching structural changes in response to the economic liberalization of the 1980s and 1990s. Any typology therefore implies the risk of oversimplifying matters. Nevertheless, and being well aware that not every existing cluster will fit neatly into one of our categories, we consider it useful to distinguish the following three ideal type clusters. This distinction helps to identify some specific policy packages as well as some widespread policy errors resulting from an uncritical, one-size-fits-all approach.

- (a) Most frequent are *survival clusters of micro and small-scale enterprises* which produce low-quality consumer goods for local markets, mainly in activities where barriers to entry are low. Firms in these clusters display many characteristics of the informal sector, with productivity and wages being much lower than those of medium- and large-scale enterprises. The degree of interfirm specialization and cooperation is low, reflecting the lack of specialists in the local labor force as well as a fragile social fabric.
- (b) Some clusters are made up of *more advanced and differentiated mass producers* which for the most part prospered in the import substitution period and mainly produce for the domestic market. They typically comprise a heterogeneous mix of enterprises ranging from petty producers to large Fordist industries. Trade liberalization forced these clusters to face international competition and induced far-reaching structural change.
- (c) *Clusters of transnational corporations* (TNCs) exist in technologically more complex activities, such as the electronics and auto industries. These clusters are dominated by large branch plants of world-class manufacturers and usually serve both national and international markets. They typically have few linkages with domestic SMEs and institutions. They comply with the criteria of a cluster because—in contrast to simple assembly plants (e.g., in the clothing industry)—they include several stages of the value chain and derive competitive advantages from local external economies.

These three ideal types do not capture the whole range of industrial agglomerations existing in Latin America. Others exist which display at least some attributes of clusters. There are clusters in resource-based industries, e.g., agroindustry, the petrochemical and metallurgical industries, and the pulp and paper industry, especially in the larger countries. Examples are the poultry industry in Santa Catarina, the petrochemical industry around Cubatão and Porto Alegre, or the agglomerations of metallurgical firms in Pará (all in Brazil) or in Ciudad Guayana (Venezuela). They often revolve around one or several large corporations. In agroindustry, the core firms tend to be national or transnational private corporations, while the petrochemical and metallurgical industries are often dominated by state enterprises or parastatals. Some of these corporations have diversified into related manufacturing industries and services.⁶ The tendencies toward privatization of state monopolies and liberalization of investment rules are now giving rise to more differentiated business arrangements, including outsourcing, foreign acquisitions and joint ventures. This is likely to lead to the emergence of more complex and interactive clusters. Resource-based clusters are economically very important. Nevertheless, they are very heterogeneous, and it would thus go beyond the scope of this article to attempt to define ideal types and discuss sets of policies adequate to them.

4. SURVIVAL CLUSTERS OF MICRO AND SMALL-SCALE ENTERPRISES

(a) *Characteristics and development potentials*

Many Latin American clusters consist almost exclusively of micro and small firms in activities with low barriers to entry, such as production of garments, shoes, furniture, and auto repair. Often these firms cluster in poor areas, where open or disguised unemployment is high, either in small towns of rural areas or on the outskirts of big cities. Examples of the former are the shoe clusters in San Mateo Atenco and San Francisco del Rincón in Mexico as well as furniture-making in Sarchí in Costa Rica; examples of the latter are metal and repair workshops in Takora (Lima), and garments in both Gamarra (Lima) and Netzahualcoyotl (Mexico City).⁷ The size of these clusters varies

greatly, ranging from a few hundred to several thousand small firms.

The proliferation of such firms in poor environments can be explained by what Mead calls "supply-driven" employment growth (Mead, 1994, p. 1882). As there are insufficient employment opportunities in the formal sector, new entrants to the labor market and "downsized" employees from formal sector firms have to generate some sort of self-employment or look for jobs in informal workshops in their neighborhood. Most of these persons do not have substantial savings at their disposal. In addition, even if they sometimes have admirable handicraft skills, they typically do not master modern management techniques and lack the ability to organize and continuously improve production in a systematic way. Their self-employment often represents a survival activity that sustains people temporarily rather than reflecting economic dynamism.

Why are these survival activities spatially clustered? In Mexico, for instance, it is striking how certain small towns specialize in the production of particular garments: sweaters in Santiago Tangamandapio, men's shirts in Tehuacán, pants in Almoloya del Río, etc. (Hanson, 1991, pp. 41–63, Wilson, 1991, p. 23). Surveys of small shoe and garment producers in Costa Rica, Honduras and Mexico⁸ show that the main reason is a business culture based upon imitation. All these clusters can be traced back to a pioneer entrepreneur who learned the relevant craft elsewhere, started a business, and trained family members and other employees. Once these persons had acquired the necessary skills and gathered some seed capital, they launched their own business in the same industry. Vocational schools are often beyond the reach of the poor, especially in rural areas and shantytowns. Informal apprenticeship is therefore the main mechanism for learning a craft. The self-employed will often do business in their hometown or suburb, where they may possess a humble building or a plot of land, and family and friendship ties can be used for sourcing, marketing, or to meet temporary labor shortages. Any moves to other locations may also be restricted due to social norms and values which may, for instance, tie female entrepreneurs to their families (Wilson, 1991, p. 157). As a result, the number of microenterprises making up such survival clusters increases.

Clustering of micro and small-scale enterprises entails some positive externalities.

According to our surveys and a study conducted by Visser (1997), most relevant are

- information spillovers concerning sourcing, marketing, and product design of competitors;
- the availability of a semi-skilled labor force, due to the fact that many inhabitants are being involved in the main cluster activity, sometimes even since childhood. Although no elaborate skills are required to *enter* the business, an experienced workforce increases the viability of firms;
- easy access to raw materials and machinery because specialized traders set up in the cluster due to economies of scale;
- lower search costs for customers, because once a cluster has gained a reputation as a production center for certain goods, intermediaries come from all over to these places where they can choose between hundreds of producers and styles.

Other typical features of clusters, such as a high degree of specialization and interfirm cooperation and strong socioeconomic ties, often do not apply to clusters of micro and small-scale enterprises. Our own research as well as the other case studies cited in this section show that specialization among these firms is generally much less developed than in clusters in the formal sector and is mainly restricted to the horizontal division of labor. Some furniture makers, for example, may produce table legs and others drawers. The clusters only include few stages of the value chain and lack a specialized business service sector. The reason can be inferred from the characteristics of microenterprise development described above: Most forward and backward linkages and complementary services require professional skills and/or high initial investments. In the case of the textiles-garments commodity chain, for instance, the production of textiles and accessories, the design of fashionable clothes, automated pattern cutting as well as marketing involve economies of scale, modern equipment and specialized know-how. In addition, the majority of producers are restricted to the low end of the market because product quality is usually poor, and firms do not have the means to invest in advertising or provide after-sales services.

Since all are engaged in more or less the same activities for the same markets, and since copying from other survival firms inside the

cluster is the main mechanism for transferring knowledge, little upgrading occurs. Formal-sector clusters usually include some modern, highly efficient firms, with managers who hold university degrees, engineers trained at vocational schools and universities, some firms with international business contacts, etc. Hence there are many sources of innovation, and these innovations may be transmitted as external economies or through deliberate cooperation inside the cluster. In micro and small-scale enterprise clusters, these learning mechanisms are often missing for two reasons: First, most microentrepreneurs are embedded in a social environment which is largely delinked from the business community of the formal sector. Thus they do not have access to modern firms which use advanced management practices and could serve as benchmarks. Second, it is much more difficult for a skilled artisan with a low level of school education to “imitate” good accountancy or strategic management than to copy a garment design. As a result, the clusters are far from being centers “of knowledge creation, inventiveness, entrepreneurial capability and information dissemination” (Amin, 1994, p. 65), which are characteristics of competitive clusters with strong externalities.

Another feature often observed in survival clusters is a lack of trust between entrepreneurs and the low willingness to cooperate resulting from it. Exchanges with one another are mainly limited to spot transactions. It is striking to see, for example, how firms inside a cluster buy inputs individually, although prices per unit would be much lower if they were purchased jointly. Our surveys of shoe and garment producers (Altenburg and Gómez, 1995, Altenburg *et al.*, 1998) showed that firm owners act perfectly rational when they do this:

- the culture of imitation makes entrepreneurs reluctant to share any kind of information;
- opportunistic or even predatory behavior may pay off, because many firm owners perceive their business as a survival activity to sustain them until a better opportunity arises. The average life span of microenterprises is relatively short, and especially traders appear and disappear rapidly. In such an unstable environment there is little incentive to invest in long-term commitments and a good reputation. Especially in shantytowns with a high turnover of migrants and microenterprises social control does not work properly, and exit costs are as low as entry costs. Our firm interviews revealed many cases

of fraud and theft when microenterprises tried to cooperate among each other;

- transactions are being organized in an informal way, and there are no legal mechanisms to compel business partners to meet their liabilities. This is due to the fact that entrepreneurs do not know about contractual provisions and have no access to legal advice. Moreover, most micro and small-scale enterprises are not registered and lack collateral. In these circumstances it may be wise not to depend on other firms;

- in a situation of almost constant excess supply and underutilization of production capacities, firms which have received an order often prefer to produce everything in-house rather than subcontracting to specialized firms.

Low trust and poor contract enforcement mechanisms thus compromise the potential to reap the benefits of clustering. Although some positive externalities automatically accrue to clustered enterprises, in the case of survival clusters these effects must be weighed against considerable disadvantages. Positive externalities of clustering reduce the barriers to entry for new firms, thus contributing to create an excess supply of the clusters' main product. In a low-skill environment this leads to ruinous competition instead of giving rise to rivalry-driven upgrading as observed in innovative, dynamic clusters.

The problem is that trade liberalization restricts the scope for protracted learning processes. As long as Latin American governments pursued highly protectionist trade policies, petty producers could survive with a modest income, even though productivity remained below the national average. Today tariff reductions are jeopardizing the survival of many firms and perhaps entire clusters. This is especially true for tradables such as garments and shoes, where competitive imports have driven a great number of microenterprises out of business.⁹ In other activities small firms are more likely to survive because they benefit from natural protection (e.g., services or processing of perishable food).

(b) *Policies*

In terms of total employment, clusters of micro and small enterprises are probably the most important type of industrial agglomerations, and they are probably more in need of support than other, more competitive ones (Knorrinda, 1997, p. 5). Although the above

analysis has shown that the former do not display the highly dynamic and innovative properties of advanced clusters, their contribution to employment and income generation justifies support.

SME policy may aim at strengthening either the competitiveness of individual firms or the milieu underpinning entrepreneurship. Cluster policies generally focus on the latter, such as the provision of sector-specific services, support of collective action or information dissemination. In the case of survival clusters, the deficiencies of the socioeconomic milieu are nevertheless intertwined with pronounced problems of inefficiency at the firm level. An adequate mix of general SME support and specific cluster policies is therefore necessary. In some cases it may be useful to link support for individual firms to cooperative behavior. A good example is financial services for micro-enterprises which build on group guarantees rather than tangible collateral (Rhyne and Otero, 1992). Another example is training courses for SME owners which include visits to more advanced firms or to fairs in order to show how production can be improved.

Since networking is scarcely developed in survival clusters, firms fail to harness many of the potential advantages of clustering. Policymakers and practitioners should therefore seek first to raise the awareness of this fact. An important starting point would be to encourage the establishment of a local stakeholder dialogue to identify economically viable projects of collective action in fields where economies of scale are relevant, such as joint purchasing of raw materials or hiring of consultants. As the examples set forth below show, network brokers can be very helpful as catalysts and moderators. Yet they should avoid pushing their own ideas too hard and thus eroding the ownership of the participating entrepreneurs. It is also important to understand that problem definition is a first important outcome of joint action, and not just its starting point. Apart from fields of collective action, the dialogue may lead to the identification of key missing links in the local production system, such as fashion design or marketing agents in a garment cluster. The network broker may subsequently help to develop these missing links by transmitting organizational know-how and linking network firms up with support institutions. Public policy may also promote smoothly functioning pilot projects as showcases for the advantages of interfirm cooperation.

In Honduras, for example, UNIDO organized a dialogue between groups of microentrepreneurs to identify common problems which might be resolved in a joint effort. For example, a group of furniture makers identified the need to acquire a wood drier, because the traditional practice of working humid wood created severe quality problems. UNIDO then facilitated credits for the group to buy the wood drier. The dialogue also helped to build trust among a group of rather individualistic wood-working microentrepreneurs and encouraged them to specialize in complementary tasks in order to achieve economies of scale.

Nevertheless, in the early phase of the same UNIDO project several initiatives aimed at collectively creating specialized services among groups of microentrepreneurs failed due to opportunistic behavior on the part of its members. Sometimes a group of entrepreneurs stuck together only as long as it could expect material benefits from the project. The creation of a sales cooperative did not succeed because some entrepreneurs misused this effort as a means of ridding themselves of stocks of bad quality products; others felt that the sales personnel favored certain members of the group.¹⁰

Such failures reflect two common errors in SME assistance. The first is that the project provided generous incentives without stipulating commitments on the part of the beneficiaries. As long as the participating entrepreneurs are not personally liable for project failures, they will pretend to be interested in many activities which in reality they do not need. The history of SME assistance provides many examples of donors financing specialized services which do not meet the demand of the target group, e.g., market information systems or sophisticated testing facilities. The second error concerns the wishful thinking that cooperatives (or public agencies) are the most adequate vehicle to provide services to small enterprises. Especially in areas which are crucial to the performance of the participating firms, such as sales, it is often better to encourage private-sector firms to supply the services required.

A positive example of how to promote cooperation of SMEs in Latin America is provided by the *Proyectos de Fomento* (PROFOs) in Chile. PROFOs are based on three-year contracts between a group of five or more SMEs (excluding microenterprises) and a public or private support agency serving as a network broker. The groups receive subsidies

for joint activities, such as market surveys, feasibility studies or participation in trade missions and fairs. The subsidy is channeled through the participating agent and may reach 70% of the total cost, with a ceiling of US\$ 75,000 per year. In the first development stage of a PROFO, a network broker promotes the idea of collective action, helps to build up the group of enterprises, supports the formulation of project proposals and helps to apply for public funding. The main objective of the second stage is to consolidate trust relations between members of the group and define rules of interaction. In the third stage, the group becomes independent of public support and starts to operate like any other private-sector firm.

Although the initiative to associate is implemented in a top-down manner, the results have been satisfactory. In 1996, some 3,700 firms participated in 250 PROFOs (Dini, 1996, pp. 10–15). Since most firms were joined in the mid-1990s, the PROFOs are now at a point where many of them are entering the last stage, at which public support is phased out. The coming years will show how sustainable the newly formed associations are. Even if it the program proves to have created a large number of lasting interfirm cooperations, the PROFOs are no panacea, because the program is quite expensive. Many Latin American governments may not be willing to invest so much in SME associations.

Chilean SMEs have been enthusiastic about PROFOs because of two factors: first, the program focuses on brokerage to build trust and identify common interests; second, it provides substantial financial incentives. The Mexican program to develop *empresas integradoras* has been much less successful because it lacks these two ingredients.

Mexico's *Empresas Integradoras* Program was launched in 1993 to promote the association of small enterprises. *Empresas integradoras* are corporations owned by groups of small enterprises which provide services to their members, e.g., joint purchasing or marketing. Participating firms receive three types of incentive: first, a preferential tax regime; second, easy access to development bank loans; and third, preferential access to training programs (Alba Vega, 1997). In 1996, after three years of aggressive promotion of the program as one of the main pillars of Mexican industrial policy, only 72 *empresas integradoras* had been registered in the manufacturing

industry.¹¹ Many of these had already been cooperating before, so the program did not trigger their association but rather formalized it. Many entrepreneurs interviewed stated that the *empresa integradora*, aside from requiring bureaucratic registration procedures, did not really provide incentives: first, tax deductions are irrelevant for many micro and small-scale enterprises because they evade taxation anyway. On the contrary, official registration would increase their visibility for public authorities, which many firms consider a threat. Second, even for *empresas integradoras* development bank loans were almost impossible to obtain due to complicated procedures, high collateral requirements, and high interest rates, especially after the peso crisis. Third, access to and funding of training courses can be obtained quite easily by individual firms as well (Altenburg *et al.*, 1998, p. 99).

5. MORE ADVANCED AND DIFFERENTIATED MASS PRODUCTION CLUSTERS

(a) *Characteristics and development potentials*

This type of cluster typically consists of several tiers of firms, ranging from petty producers to medium and large firms with good managerial and technological capabilities. They grew during the import-substitution era. Their production is mostly restricted to standardized consumer goods for mass markets (textiles and garments, footwear, furniture). Some of the clusters are specialized in a very narrow range of products, for instance, home textiles and knitwear in Itajaí valley (Brazil), men's leather footwear in León (Mexico), and ladies' leather footwear in Sinos Valley (Brazil) and Guadalajara (Mexico). Other clusters cover a somewhat broader spectrum, like the electromechanical/metal engineering cluster around Joinville (Brazil). There is usually little innovation (except for supplier-driven innovation, e.g., through new machinery or improved inputs), and the research and development (R&D) effort of such firms is negligible; under import substitution, running imported machinery and licensing or copying products from industrialized countries was a sound base for business. Some of the firms are integrated into global commodity chains (e.g., shoes in Sinos Valley, home textiles in Itajaí Valley, or furniture for the Swedish TNC Ikea in the cluster around São

Bento do Sul, Brazil), but mainly in price-sensitive product ranges. This makes them highly vulnerable in foreign markets.

In such clusters there is much less specialization and interfirm cooperation than in clusters in advanced countries; the passive advantages of clustering prevail here.¹² Firms show a high level of vertical integration, informal cooperation (e.g., sharing of equipment) is rare, and business associations are not particularly strong. These features can again be traced back to the ISI framework (Meyer-Stamer, 1998). First, as there was little competitive pressure, there was no penalty on lack of specialization advantages. Second, as the size of the domestic market was limited and exports were constrained by an anti-export bias in economic policy as well as by a lack of competitiveness at the firm level, diversification rather than specialization was the most important way to expand output. Third, the ISI strategy was inherently intertwined with unstable macroeconomic conditions (due to frequent foreign exchange crises and high inflation). Especially in times of crises and stabilization programs, firms tried to shift the cost of adjustment to their suppliers and customers. An enormous increase of renegotiation of contracts was the result. As this caused transaction costs, firms had an incentive to minimize transactions, for instance by relying as little as possible on suppliers (de Wit and van Dyk, 1996; Addis, 1997). Macroeconomic instability contributed to stimulating vertical integration through high uncertainty and transaction costs, and it in turn created a low-trust environment. In other words, it was more than the lack of reliable suppliers and subcontractors, something that is very common in latecomer industrialization, that hampered interfirm transaction and cooperation in import-substituting economies.

Mass-production clusters entered into a period of profound structural change after the process of opening up to the world market in the 1980s and early 1990s.¹³ The adjustment process led to high rates of exit and entry, the latter especially through the appearance of foreign investors who took over local firms to gain a foothold in a market which recently became dynamic. Some local firms, however, show their growth potential and play a crucial role as agents of change. Although increased competition has led to considerable efforts to modernize production facilities, there is still little indication of upgrading to knowledge-

tensive production, i.e. of any move from the price-sensitive to the design-, quality-, and innovation-sensitive market segment.

Firms in these clusters initially pursue two main strategies¹⁴ to improve their competitiveness by cutting costs. First, they streamline their internal operations, cutting the workforce on a massive scale and introducing new management techniques to rationalize their operations (Lavinias and Nabuco, 1995; Fleury, 1995). Second, they start to outsource, especially in noncore activities such as maintenance, training, and generic services (such as transport, security, cleaning, and cafeteria) (Meyer-Stamer *et al.*, 1996, Reinicke, 1997).

The key challenge for these firms is to come to terms with a sandwich situation: From the bottom, there is the competition from low-price, low-quality producers in the domestic informal sector and from abroad (especially from East Asia). At the top there are the established manufacturers with well-known brandnames, mostly from advanced industrialized countries, which dominate marketing channels and benefit from well-developed locational advantages. Firms in mass-production clusters have basically two options. Either they succeed in upgrading toward knowledge-intensive production or they succeed in conducting dramatic and constant improvements of their production efficiency so that they can survive in the price-sensitive segment. The only other alternative is to exit their industry.

(b) *Policies*

The key issue in policy interventions is to stimulate firms to go beyond incremental adjustment efforts, i.e. to embark on a profound process of upgrading to deal with the sandwich situation. The following policy proposals mainly address one question: How to create an environment that stimulates and supports learning, innovation, and constant upgrading as this is the most promising option to secure the viability of what thus far are mass production clusters.

A main theme of this section is the changing role of business associations. To meet the demands of globalized competition, intrafirm efforts are not sufficient. The business sector has to be able to organize collective action for self-help, and it must be able to articulate its demands *vis-à-vis* political actors. This places great demands on business associations, both in

terms of service provision and lobbying. It implies a fundamental upgrading process and the creation of a learning organization. Key features are a professionalization of business associations (e.g., employing more and better qualified professionals) and the implementation of mechanisms to ensure ongoing organizational development.

(i) *Environment for private business*

Firms often suffer from a regulatory framework which imposes high cost and time on relationships with government authorities. Nationwide reform may not be realistic, at least not in the short term. In contrast, at the local level, i.e. within a cluster, there is usually considerable latitude to change the attitude of local government toward local firms from one of negligence to one of commitment. Practical measures include establishing permanent consultation mechanisms between the local business community and local government, removing unnecessary regulations and rectifying bureaucratic procedures, setting up one-stop or first-stop agencies, and better training and meritocratic recruitment of local civil servants. Experiences from advanced countries indicate that it is useful to initiate a local strategy formulation effort that involves government, the business communities, and other important stakeholders (OECD, 1996, 1997). The same may be feasible at the state/province level.

(ii) *Stimulating interfirm cooperation*

A mass-production cluster will usually host a number of competitive firms, perhaps even world-class manufacturers. In other words, there are firms which could play the role of demonstrators and multipliers of best practice. The question is why such a demonstration effect has not occurred in the past? There are two answers. First, there was no necessity for many firms to attain best practice, as they could thrive in a closed, uncompetitive market despite being far removed from best practice.¹⁵ Second, internationally uncompetitive firms often were not aware of their problems.

Creating an awareness of the necessity for substantial improvements is a crucial precondition for intensified interfirm cooperation. Firms that have acted in an isolated manner in the past will not easily switch to a mode of close cooperation—not only because of lack of trust but also since cooperation may involve high transaction costs. They may begin to cooperate

more intensively if they see the advantages of cooperation, and if they are forced out of their traditional behavioral disposition. The latter may come about through a profound crisis which questions the traditional business practice; but even a crisis may not be sufficient. One important instrument in making firms aware of their deficits is benchmarking, preferably based on a methodology that allows comparisons with firms elsewhere. Benchmarking can have an eye-opening effect, raising awareness for the necessity of stronger efforts to build competitive advantages. Moreover, a joint benchmarking exercise may itself be a first step toward more intense exchange between firms on technical issues, e.g., if employees from different firms are jointly trained in benchmarking techniques.

In the textiles and garment cluster in Itajaí valley in the northeastern part of the state of Santa Catarina/Brazil, a benchmarking exercise was conducted in 1997. At that time most firms were under severe competitive pressure for the first time, and some suffered huge losses. Having been hostile to cooperation in the past, firms became more open-minded, also because a leading local industrialist assumed the role of an agent of change. The state-level federation of industries invited a benchmarking specialist from the International Institute for Management Development (IMD, Lausanne/Switzerland) to train local consultants in IMD's benchmarking methodology, which had been used in a number of European countries. Seven local firms were involved in this benchmarking exercise, which showed that they were roughly as competitive as the laggards in the European sample. It also showed that the firms in Santa Catarina which were pursuing adequate strategies often failed to implement them in such a way that they delivered the expected results. Having recognized their failures, the firms involved intensified and redirected their effort to upgrade; further firms requested benchmarking exercises.¹⁶

Promising areas of intensified interfirm cooperation are fields like environmental protection (Meyer-Stamer, 1997b), measurement and testing, or education and basic vocational training. These are areas where firms in the past often tried to advance individually but then began to recognize the advantages of collective action. Less promising are, at least initially, when trust between firms may be low, cooperation efforts in core activities such as technology development, design, or marketing.

Only after a certain period of successful cooperation experience in peripheral activities will the trust emerge that is the precondition for cooperation in core activities.

(iii) *Information and advisory services*

The environment in an open economy tends to be highly turbulent due to increased competition and technological dynamism. Firms increasingly depend on up-to-date information on technology, markets, and regulations. This is an area in which service providers, business associations, and state promotion agencies can play an important role.

In Santa Catarina, the state-level federation of industries has set up information and advisory services, mainly in two areas. First, there is the International Trade Center which has on-line access to national and international databases and is a participant in several international programs (e.g., UNCTAD/ITC Tradepoint program). The center offers current and detailed data on trade statistics and foreign markets as well as access to specialized information. Moreover, the federation began early on to observe the international establishment of the ISO 14000 standards on environmental management, and it has constantly kept local firms informed about it. One result was that local textiles firms were among the first Brazilian companies to be certified. The Santa Catarina experience also shows however, that it is important to cultivate the local demand for this kind of services. For example, the International Trade Center is not adequately utilized by local firms (Meyer-Stamer *et al.*, 1996).

(iv) *Training*

A common problem in mass production clusters is the inadequate match between supply and demand of training. As demand for qualified workers usually far exceeds supply, the labor market will often not operate adequately as a signaling device for training institutions—most of the graduates find jobs, but it is not clear whether the institutions are offering the qualifications that are most critical, or whether firms are so desperate that they accept applicants even if their specific qualification is only remotely relevant for a job. One way of overcoming this dilemma may be to find other means of articulating supply and demand; business associations may play an important role in organizing exchange between firms and training institutions. In particular, they can make sure that training institutions

offer the kind of qualification that firms need most.

Jaraguá do Sul, part of the metalmechanic/electromechanical cluster in the northeastern part of Santa Catarina, provides an interesting example. The local Chamber of Industry and Commerce had well-established communication channels with training institutions. For instance, in the early 1990s it managed to persuade the federal polytechnic (ETFSC), located in the capital, a three-hours drive away, to set up two training courses in the town. In 1996 the governing board of the Chamber noticed that communication with the local SENAI vocational training school had deteriorated with the advent of a new director. After attempts to invite the director for a discussion with the board on how to organize communication failed, the Chamber successfully put pressure on the SENAI administration to appoint a more cooperation-minded director to enable it to better articulate the demands of firms.¹⁷

(v) *R&D and technology*

Creating a supportive infrastructure for R&D and technology institutions in a cluster is a good idea in principle, but not necessarily in practice. On the one hand, there can be little doubt that firms need technological support to become internationally competitive. On the other hand, however, just creating support institutions and expecting that firms will use them is not realistic. A realistic strategy instead involves a step-by-step approach. A first step can be to stimulate cooperation between firms and existing technology institutions. Even in clusters without a well-developed technological infrastructure there will usually be some measurement and testing facility, or a local technical college that can offer services in this area. Firms may not know about such offers, or may suspect that such institutions are incompetent, or may not know how to deal with such institutions. At the same time, institutions may also have unrealistic expectations about the kind of services firms need (e.g., high-tech long-term research rather than basic testing services), may suffer from regulations which complicate interaction with firms, and may be weak when it comes to marketing what they have to offer. Establishing communication between firms and technology institutions is thus the main element of the first step. In the second step, it will be crucial to deal with misunderstandings and conflicts that may arise

as cooperation is actually taking place; business associations may play an important role as moderators and facilitators in this respect. Only after firms and institutions have learned to understand the other side's rationale and mode of action, adapted their own mode of action, and built trust, does it make sense to move to the third step of establishing more ambitious cooperation projects and to consider founding new institutions, for instance in fields like technology extension, product and process R&D, logistics, and design.

For example, in the ceramic tile cluster around Criciúma (Brazil), firms created—together with the state's Federation of Industries (FIESC), and the Federal University of Santa Catarina (UFSC), and with some financial support from the state—the Center for Ceramics Technology (CTC), modeled after a similar institution in Spain. An important element of support was the relocation of a specialized laboratory from the Federal University of Santa Catarina (UFSC) in Florianópolis to Criciúma. Initially, CTC will mainly test and certify inputs and products. In the mid-term it is supposed to become involved in genuine technology development, for instance new process technologies or use of new input materials (Meyer-Stamer *et al.*, 1996).

6. CLUSTERS OF TRANSNATIONAL CORPORATIONS

(a) *Characteristics and development potentials*

Clusters of transnational corporations exist in technologically more complex activities, such as the electronics and auto industries. These clusters are dominated by large branch plants of world class manufacturers and usually serve international markets. Final assembly as well as the production of most parts and components require the use of robots and other state-of-the-art technology. Technological mastery of these processes is difficult to achieve, and economies of scale are substantial. Consequently, barriers to entry are generally too high for local firms, which inhibits their integration into the cluster. If any inputs are sourced locally, this is largely limited to simple items such as packaging material, printed manuals or some moulds and dies. For more complex parts, the large assemblers which constitute the core firms of the clusters instead encourage established suppliers from their home countries to build up

production facilities close by the location of the Latin American branch plant. This reflects the increasing centralization of design and standardization of products at the global level, but also the lack of internationally competitive manufacturers among Latin American SMEs. The resulting low degree of embeddedness in the local business community constitutes one of the main differences as compared with clusters in Europe or the United States. Another difference arises from the fact that TNC clusters in Latin America carry out almost exclusively standardized operations which—although sometimes highly complex—do not require a creative local milieu that supports innovations. R&D are carried out in the parent companies abroad and designs are transmitted to the production sites in Latin America.

Transnational clusters thus neither emanate from small domestic firms nor do they build upon local artisanal or industrial traditions. Their origin is external to the region, the starting point being a substantial investment in one or several branch plants of transnational companies. The first investors originally choose the location for traditional locational advantages such as proximity to market, availability and low cost of labor, fiscal incentives, transportation and telecommunications infrastructure. Some locations are literally greenfield sites endowed neither with a diversified business structure providing parts and services nor advanced factors such as specialized technical schools or research centers. For example, several auto assembly and motor plants running very complex operations have been transplanted to small, scarcely industrialized towns in Northern Mexico (Wong-Gonzalez, 1992, p. 176).

There are two reasons why the number of firms in the new production site may multiply and grow. First, additional investors producing similar goods may invest nearby if the pioneer firm performs well, thus showing that there are no major problems with the labor force, transportation, local authorities etc. Moreover, the location may capitalize on some positive externalities arising from the pioneer firm, including the formation of a local pool of trained labor, or the accumulated experiences of local authorities and business associations concerning their cooperation with foreign investors.

Second, for some industries it is much more efficient to have the production of parts and components in the vicinity of assembly plants.

In particular flexible production methods, including just-in-time systems require that certain suppliers be located close to assemblers. The location will thus start attracting component suppliers and complementary service firms, especially as the output of the core assembler or an agglomeration of such plants rises. Due to globally unified quality standards, considerable economies of scale and the highly specific know-how required for production, these complementary firms will often again be global players. In past decades, this process was contained by restrictions on foreign equity, local-content requirements and other protectionist policies in all major Latin American countries. The process of transnationalization of export-oriented clusters thus received a strong impetus as trade and investment rules were progressively liberalized since the late 1980s. For example, both Mexico and Brazil introduced far-reaching reforms to their investment laws in 1989 and in 1990.

With flexible production systems requiring spatial proximity to enable firms to cooperate intensively, and national policies being liberalized, production sites of large firms increasingly develop the attributes of clusters. Since investments of suppliers are induced ("follow sourcing"), the cluster involves more stages of the value chain and interfirm cooperation increases, because flexible production systems require a sophisticated coordination of material flows, delivery times, quality control, etc. Moreover, the dynamism of the cluster induces local governments as well as business associations to build up supporting institutions and target specific policies to the evolving clusters. These features distinguish TNC clusters from simple agglomerations of foreign investments such as those existing in export processing zones. The latter are usually confined to the final assembly stage, and interfirm cooperation is almost nil.

The most striking examples of TNC clusters can be found in the auto industry, for example in Puebla, Ramos Arizpe and Aguascalientes in Mexico (Wong-Gonzalez, 1992, p. 174), and in Curitiba, Resende, and Juiz de Fora, Brazil (Humphrey, 1998, p. 20). Another large and diversifying TNC cluster exists in the computer and telecommunications industry in Guadalajara, Mexico. Recently, similar clusters have also emerged around three Intel microprocessor plants in Costa Rica. In Tijuana, Mexico, and Manaus, Brazil, large-scale assembly of television sets has induced the establishment of plants producing color picture tubes and other

important inputs locally. Another example is the Textile City project in Cuernavaca, Mexico, where the US textile producer Guilford Mills, Alfa (Mexico's largest industrial enterprise), and DuPont, among others, will join forces to create a mammoth industrial park for textile and apparel industries, complete with training center and a demonstration apparel factory (Gereffi, 1997, pp. 11–12). The following examples may serve to further elaborate on the characteristics of such clusters:

(i) *Auto industry around Puebla*

Automotive component companies have formed a cluster near the Mexican town of Puebla, where Volkswagen maintains a large assembly plant. This plant was established in 1964 to produce cars for the growing domestic market. Due to local contents requirements, restrictions on foreign equity, and other policies aimed at deepening import substitution, the degree of domestic procurement was high. Production nevertheless remained highly dependent on technology licensing and joint venture partners from abroad. Output was almost exclusively sold in the domestic market. The plant produced outdated models, such as the Beetle, so that technology requirements differed completely from Volkswagen plants in competitive markets. Some R&D was carried out in Puebla to adapt cars to specific local requirements. Performance of Mexican suppliers was sufficient, since Volkswagen required only simple parts, and competitive pressure in the domestic market was less pronounced than in international markets. Mexican producers of automotive components usually produced for several of the large assemblers in Mexico, so clustering around the Volkswagen plant in Puebla was not accentuated.

During the 1990s policies for the automotive industry were gradually liberalized, phasing out local content requirements, relaxing regulations of foreign investment, and removing import restrictions for passenger cars and parts. These changes as well as the establishment of NAFTA initiated a far-reaching transformation of the Mexican auto industry. While a few years ago the lion's share of passenger car production was sold locally, in 1996 about 80% of output was exported. Like all other car producers, Volkswagen invested heavily in the modernization of production facilities.¹⁸ As the companies switched their strategy from production for a closed national market to the competitive NAFTA market, the range of models was updated. All

Mexican models are fully designed at German headquarters and based on a limited number of platforms in order to achieve a high level of standardization at the global level. Even the New Beetle, which is produced only in the Mexican plant, was completely developed in Germany and the United States. Neither the Puebla plant nor the Mexican affiliates of Volkswagen's suppliers have any significant R&D facilities.

Due to the worldwide standardization of models, Volkswagen had to replace many established national suppliers of the import substitution era with global suppliers.¹⁹ Most of the latter are foreign owned, some are associated with local partners. Most newcomers have settled in industrial estates near the Volkswagen plant. In several cases the newly established global players have already outcompeted the previous suppliers, while in others Volkswagen prefers to maintain two or three suppliers in order to enhance competition and avoid dependence on single suppliers. As a result of this transnationalization of the supplier base, the competitiveness of the whole industry is rising, while the number of Mexican firms involved in the cluster is on the decline (Altenburg *et al.*, 1998, p. 37). Similar tendencies toward the transnationalization of the supplier industry have been reported for other major auto clusters in Mexico and Brazil.²⁰

(ii) *Electronics industry in Guadalajara*

Guadalajara, Mexico's second largest city, promotes itself as being "Mexico's Silicon Valley." As a matter of fact, many important electronics manufacturers are operating in Guadalajara. IBM was the first large investor, establishing a PC assembly plant, while many other TNCs followed, including Hewlett-Packard, Motorola, NEC, Philips, and Siemens. These plants assemble and test printers, telephones, and other electronic devices. Three important characteristics distinguish Guadalajara from simple agglomerations of dislocated assembly plants. First, electronics corporations have transferred to Guadalajara not only simple assembly operations but also automated and technologically complex stages of production. R&D, however, is still being carried out in the parent plant. Production at Guadalajara only includes standardized, "mature" operations, and local innovations are limited to some incremental improvements concerning, for instance, human resource management or plant

layout. Second, Guadalajara is increasingly attracting internationally established contract manufacturers, such as SCI Systems, Inc. and Solectron, which provide a broad range of assembly services for brandname corporations. In the last five years, such follow-sourcing has increased notably, and additional suppliers of inputs are expected to invest in the cluster. Third, collective action on the part of cluster firms is increasing. There are two quite active business associations at Guadalajara which are used by electronics transnationals to exchange information, promote a "Silicon Valley" image, and lobby to convince local authorities to provide investment incentives for additional first-class suppliers from abroad. Furthermore, local government and business associations have set up a Supplier Development Program with substantial financial contributions from TNCs. Despite the latter effort, there are very few Mexican suppliers. The only exceptions are some minority equity shares in joint ventures producing simple PCBs and injection plastic products and a few SMEs providing packaging materials such as plastic bags, cardboard boxes, and printed manuals.²¹

(iii) *Electronics industry in Costa Rica*

The examples indicate that TNC-dominated clusters are especially important in large countries, mainly for reasons of scale of operations. Nevertheless, the emergence of a similar cluster revolving around Intel in Costa Rica shows that these clusters may develop in smaller countries as well. Intel's decision to select the country as one of its principal production sites for the assembly and testing of microprocessors is at present giving rise to a similar cluster. Intel's investments alone will total about US\$ 500 million and create more than 2,000 jobs in three plants. When the second plant is to be opened in mid-1999, Intel will export microprocessors worth US\$ 2.2 billion. As a consequence of this huge investment, several transnational firms supplying inputs to Intel are establishing themselves in the vicinity of the Intel plant, including Hewlett-Packard, Photocircuits Corporation and EMC Technology. According to the Investment Promotion Agency CINDE, another 15 "hi-tech"-firms have announced investments in Costa Rica, many of them suppliers to Intel and other electronics companies.²² Until now, the only input Intel sources locally is liquid nitrogen, and the company intends to produce this input itself in the future.

The above-mentioned TNC clusters make important contributions to industrial development. They create significant employment with a high proportion of skilled labor, and they invest heavily in training. Moreover, they are very important exporters. The Mexican auto industry, mainly consisting of five TNCs, contributes 20.2% to the country's exports.²³ Once Intel reaches its projected capacity in Costa Rica, the companies exports will contribute about 30% to the country's foreign exchange earnings. The export share of the Costa Rican electronics cluster is likely to rise even more as the cluster attracts other global players.

(b) *Policies*

The main weakness of transnational clusters derives from the low degree of technological spillovers involved, especially the failure to develop dynamic local entrepreneurship in knowledge-intensive areas. Cluster policies should therefore focus on developing competitive local suppliers of direct and indirect materials as well as services. This should be achieved by strengthening promising SMEs and inducing TNCs to upgrade them. Yet the disillusioning results of local-content and trade-balancing requirements in past decades shows that *forcing* TNCs usually leads to multiple inefficiencies and undermines the competitiveness of the cluster as a whole. Moreover, the WTO prohibits the application of such measures. One can distinguish three sets of policies to promote and deepen TNC clusters:

(i) *Attraction of additional foreign direct investment*

Apart from additional employment effects, more foreign affiliates investing in the cluster may contribute to deepening the local production system if new entrants invest in complementary activities, thus enhancing the division of labor along the value chain and strengthening positive externalities for already established firms. Intensified interfirm cooperation makes the cluster less vulnerable to the volatility of footloose investment.

Transparent and nondiscriminatory investment rules, a generally business-friendly policy framework and a properly functioning infrastructure are basics to attract foreign investment. Aside from that, many federal or state governments offer generous fiscal incentives and all sorts of open and disguised subsidies.

Although this may be justified in some cases, a never-ending subsidy race should and actually can be avoided if policymakers instead enhance the attractiveness of the cluster by strengthening interdependencies and investing in dynamic locational advantages such as a specialized workforce or R&D facilities. In addition, it is important to promote a given location abroad. This promotion activity may be selective and include targeting abroad industries with a promising potential for technological spillovers.

In Costa Rica, for example, the Foreign Trade Ministry developed a National Strategy to Attract Investments, which focuses on high-technology firms. President Figueres conducted meetings every two weeks with managers of foreign high-tech firms already established in Costa Rica. He visited the United States to meet with managers of potential investors of the targeted firms. To improve investment conditions, the government substantially increased spending on English teaching and computer training, developed a high-quality access to the Internet and created a business incubator for SME spin-offs from the technical university.

(ii) *Supplier development*

Although barriers to entry for suppliers are very high, and the tendency toward product standardization on the global scale makes it increasingly difficult to upgrade in TNC clusters, there is still some scope for developing domestic suppliers. In the auto industry, some large and medium-sized domestic suppliers are expanding in spite of the recent trend of follow sourcing. As the relations between auto producers and suppliers of systems and components increasingly build upon complex R&D partnerships, public policy should encourage domestic firms to upgrade their technological capabilities. Concerning the integration of new SMEs into the supplier network, interviewed purchasing managers of assemblers and first-tier suppliers named a range of low-tech items (e.g., stamped metal and plastic injection parts as well as products for the after-sales market) which they would acquire from local SMEs if they improved their quality standards and reliability. In electronics, entry barriers are extremely high for direct inputs, but at least imports of indirect inputs may be substituted. Local suppliers of such inputs benefit from lower transportation costs and shorter delivery times.

Although the short-term prospects of supplier development are largely confined to simple parts, components and services, Asian experiences show that such local producers may well upgrade technologically. This has, for instance, been documented for the electronics industry in Penang, Malaysia, a preferential production site for TNCs assembling consumer electronics and electronic components for export. Since the early 1980s, the first domestic SMEs started to develop linkages with these TNCs, especially in three areas: machine-tooling, plastic injection, and subcontracting of PCB assembly. Today, several local suppliers provide complex machinery (e.g., automatic die-bonders) and inputs such as plastic casings for consumer electronics. Some of them employ several hundred persons, some have started to export, and the most advanced ones have even opened branch plants abroad.²⁴

To develop local suppliers, one basic element is to refrain from discriminating against them. For instance, incentives offered to foreign suppliers should also be available to their domestic competitors. Aside from this, most Latin American countries have introduced subcontracting exchange schemes (SES), which usually consist of databases and sometimes subcontracting fairs aimed at matching supply and demand. Although UNIDO claims that in 1993, 36.5% of all firms registered in SES using the UNIDO methodology succeeded in signing contracts (UNIDO, 1994), interviews of the author with SES managers in Mexico and Central America showed a more pessimistic record. Furthermore, interviews with 80 firms in Mexico that regularly subcontract revealed that especially small subcontractors often did not even know that matchmaking services existed, and those who were registered in databases or had participated in subcontracting fairs claimed not to have received any substantial benefits. Large customer firms typically argued that they expected little from matchmaking, since the overwhelming number of SMEs registered in SES did not meet the requirements to be accepted as suppliers (Altenburg *et al.*, 1998, pp. 92–94).

In Mexico, some SES recognized this problem and adopted a more integrated approach, combining matchmaking with specific support for potential suppliers. After having identified potential candidates that firm data indicate are able to produce a requested item, SES managers visit and preselect a few firms to be

proposed to the interested customer. Then the customer visits these firms, assesses their capabilities and identifies their deficiencies. If the customer believes that the firm visited has a good development potential, an agreement is signed. The SES then helps to find all the necessary technical and financial support to eliminate the bottlenecks identified by the customer. A pilot project supported with Japanese development assistance involved 17 medium and large Japanese companies and was later extended to US, European, and Mexican customer companies. The project led to the conclusion of some contracts, although the results are modest compared with the resources deployed (Ynurigarro de la Vega and Cervantes Romero, 1996). According to the SES manager, the major problem was a lack of institutional coordination: Although specific needs of potential suppliers were identified, other support institutions (e.g., development banks) were unwilling to channel their resources to these firms.²⁵

What is especially interesting about the Mexican experience is the demand-driven approach. No one knows better than the customer what the relevant bottlenecks of a potential supplier are and what specific support is needed to achieve the required performance level. The pilot project showed that many large corporations (in the second stage of the project, not only Japanese firms) were willing to participate in the assessment of potential suppliers. This assessment appears to be a sound basis for a more targeted supplier development. At the international level, the most successful programs to foster suppliers to TNCs are based on a similar demand-driven approach.²⁶ But the example also shows that large customer firms are not willing to bear the costs of supplier development alone. SME policy thus matters, but it is likely to succeed only if policy instruments are coordinated and accessible to the suppliers targeted.

(iii) *Technology transfer to other local firms*

Most foreign affiliates in Latin America constantly exchange information on technologies and management and marketing techniques with their corporate headquarters. They are thus relatively close to international best practices of production. This makes them interesting showcases in a business environment in which most firms lack access to the latest developments in many aspects of business administration, such as quality management,

logistics, worker motivation, or international product standards. Most of these best practices build on generic techniques, and demonstration effects are therefore not confined to particular sectors. Conscious transfer and incidental spillovers help to raise the competitiveness of the cluster as a whole.

The *Comité de Empresas Trabajando en Calidad* in Toluca, Mexico, is an interesting case (Mertens, 1997). The Comité is a group of firms meeting every three to four weeks to exchange experiences concerning quality management. Each meeting is held at a different plant, and corporate officials inform managers of other local companies about their specific experiences in setting up quality management; they also conduct tours to demonstrate implementation on the shopfloor. While the original impetus for these meetings came from the local ILO office, meetings are now organized by a State Productivity Council in close cooperation with a group of entrepreneurs. Only few companies participated in the first events, but the number rose constantly and has now reached 50 companies. The Comité includes TNCs as well as local SMEs, but usually only TNCs are willing to invite visitors to see their production facilities.

The fact that foreign affiliates were far more willing to show their production processes than Mexican entrepreneurs highlights their positive role as transmitters of organizational know-how. There are two reasons for their different behavior: first, many foreign companies own licenses, brandnames, or serve specialized export markets and therefore do not see local firms as serious competitors; second, as part of their public relations, foreign affiliates are often interested in demonstrating their commitment to the local business community.

7. CONCLUSIONS

In Latin America, clustering of manufacturing industries is widespread, and there are distinctive types of clusters in terms of firm size, markets served, cluster trajectories, growth potential etc. All types differ to varying degrees from the complex and innovative clusters of developed countries as have been described by Pyke, Beccattini and Sengenberger (1990). The Latin American clusters portrayed above have three main deficiencies in common, but the ways to overcome these deficiencies have to be very different in each type of cluster.

(a) *Heterogeneity of development levels and lack of competitive SMEs*

In most clusters in the industrialized world SMEs play an important role as providers of specialized inputs and services. In Latin American clusters, in contrast, the vast majority of SMEs are not competitive. Modern large firms may co-exist with SMEs, but due to a large technological gap the cooperation between both parts is much less pronounced.

To address the critical lack of competitive SMEs, some Latin American clusters offer promising opportunities to enhance the transfer of know-how from modern firms to less advanced ones, particularly in fields such as quality management, modern logistics, cost management, and human resources management. This is especially true for the differentiated mass production clusters which host a wide range of enterprises in technologically relatively simple industries. Even though some leading firms in these clusters perform much better than the majority of SMEs, they do not belong to an entirely different universe, and it is therefore possible for the latter to close the gap through learning and incremental upgrading. Policymakers should thus assume the role of catalyst for learning-by-interacting among cluster firms.

In clusters of transnational corporations it is much more difficult to foster business transactions between the lead firms and local SMEs, because barriers to entry for suppliers are very high. Here support programs should pick a selected number of potential suppliers that are already quite efficient and help them attain the high standards demanded by their transnational customers. In order to make managerial know-how of TNCs available to other local firms it may be helpful to involve the former into the daily work of business associations and meetings of local entrepreneurs.

In clusters of micro and small-scale enterprises no modern companies are involved which might be used as showcases. Public policy therefore has an important part to play in linking SMEs to efficient firms elsewhere or supporting their visits to trade fairs. Such support is justified because clusters of micro and small-scale enterprises generate a huge number of (albeit low-paid) jobs. Although empirical evidence shows that it takes time to induce microentrepreneurs to a systematic organization of the production process and that only some firms will accomplish the

transition to modern management, improvements will spread more rapidly and widely in a cluster than among scattered producers.

(b) *Lack of innovative capabilities*

In industrialized countries clustering often occurs in high-tech or design-intensive branches and involves substantial product and process innovations. In Latin America, clusters are almost completely confined to standardized production of simple consumer-goods or export-oriented assembly operations without any substantial innovations.

Policymakers should thus pursue the goal of upgrading Latin American clusters in the direction of innovativeness and knowledge-driven development (Meyer-Stamer, 1997a). The lack of innovativeness is largely an outcome of the protectionist policy environment of past decades, and liberalization has already created framework conditions that force firms to become more efficient. Competitive pressure is now spurring innovations in some leading firms, especially those which export or have other links with competitive international markets (e.g., foreign equity shares or licensing agreements). Yet liberalization is not sufficient to upgrade a wide base of SMEs from imitative, standardized operations to innovative strategies in specialized areas. To achieve this, policy interventions are crucial. The best opportunities to promote innovation may be found in differentiated mass production clusters with a strong presence of locally based firms. Here policy should support linkages with lead enterprises, promote specialization, and help to develop specialized supporting institutions. In order to ensure that resources are not wasted in unnecessary or overly sophisticated public science and technology institutions, a demand-driven approach should be adopted, i.e. firms should be persuaded to articulate their specific demands for support. In TNC-dominated clusters the opportunities to trigger SME-driven local innovations are limited to the improvement of certain supplier functions, because these clusters are highly dependent on R&D in corporate headquarters. It is in clusters of micro and small firms that the potential for technological upgrading is most restricted. Here the focus should be on disseminating state-of-the-art production methods tailored to the sector in which firms (aim to) operate.

(c) *Low degree of specialization and interfirm cooperation*

Compared to innovative clusters in industrialized countries, Latin American agglomerations usually comprise only few stages of the value chain, host few complementary services, and lack the social capital necessary to reach cooperative agreements.

While in many cases, especially in TNC clusters, the low degree of integration along the value chain is mainly due to a large technological gap between lead firms and local SMEs, the importance of social capital should not be underestimated. Therefore, network brokers and incentives for cooperation may help to overcome opportunistic behavior, lack of trust, and a path-dependent preference for vertical integration. This implies a step-by-step-process in which the first steps should focus on joint efforts to solve pressing problems, thus providing a strong incentive to participate and quick rewards that stimulate further efforts. But such pressing problems should not concern the firm's core competencies in that many businessowners will try to keep such area secret by all means. Only after a protracted process of trust-building will it be possible to introduce such issues as information exchange on process and product technologies or best-practice in sales and marketing.

We wish to close with a recommendation for future research. Thus far empirical research on clusters in developing countries has focused on a few traditional craft-based industries, such as shoes, garments, furniture, and ceramic tiles. It is likely that future industrial dynamism in Latin America will stem from export-oriented clusters driven by large enterprises rather than from traditional SME clusters in import-substituting industries. It is therefore important to redirect the attention of the ongoing cluster debate toward the dynamics of the former. Emphasis should be placed on the role of large enterprises, either as agents of change in traditional clusters or as lead firms in TNC-dominated production systems. Although there is a considerable body of literature on TNCs in Latin America, especially on the auto industry and its suppliers, most of this literature is delinked from the cluster debate and therefore does not address issues such as the role of information networks, transaction costs, trust, joint action, and supporting institutions. Moreover, Latin America has recently been enhancing its competitive advantages in

resource-based industries. Given the increasing diversification of business structures in these industries, it may be worthwhile to study these

industries from the perspective of cluster development.

NOTES

1. The World Bank is conducting cluster projects in Brazil, Turkey, Morocco, Egypt, and India (Business Environment Group, undated). UNIDO's Small and Medium Enterprises Programme is increasingly building on "cluster thinking" (e.g., Humphrey and Schmitz, 1995). UNCTAD organized a first workshop on cluster-related issues in 1992 and is currently redirecting its work on Enterprise, Business Facilitation and Development in this direction (UNCTAD, 1997). ILO's International Institute for Labour Studies was among the pioneers in popularizing the industrial district experience (e.g. Pyke, Beccattini and Sengenberger, 1990).
2. E.g., Beccattini (1990), Sengenberger and Pyke (1992), Storper (1993), and Porter (1990).
3. Geographical proximity is crucial to the emergence of customary information exchange among entrepreneurs. Such exchange can easily be maintained in a city, a region, or sometimes even a state. We do not agree with Porter's definition (1998, p. 10), which includes country-wide business networks (Porter, 1998, p. 10).
4. Quantitative indicators may be designed using the ratio of input-output linkages to gross production.
5. Our distinction of clusters and industrial districts coincides with the one put forward by Humphrey and Schmitz (1995, p. 8).
6. E.g., the Corporación Venezolana de Guayana (CVG, 1992) and Argentina's Techint Group (Bisang, 1996, pp. 408).
7. For clusters in Mexico see Hanson (1991), pp. 41–63 and Altenburg *et al.* (1998), pp. 62, 79; for Peruvian examples: Villarán (1993) and Visser, 1999. A case study of Sarchí has been presented by Pérez Sainz and Cordero (1994).
8. Altenburg interviewed 45 microenterprises of both branches in Honduras (1993), 40 in Costa Rica (1994) and 13 in Mexico (1997).
9. See Altenburg and Gómez (1995), p. 207, for Honduras and Costa Rica; Barrón and Hernández (1996), p. 898, for Mexico.
10. Based on one authors visit to the project in October 1995. For an additional assessment of UNIDO's program to promote SME clusters see Rabellotti (1998).
11. According to SECOFIs Registro Nacional de Empresas Integradoras.
12. The Sinos Valley case analyzed by Schmitz (1995b) is the only documented exception. To a large extent strong specialization and interfirm cooperation can be traced back to the fact that it is not an import-substitution cluster. Partly by chance partly by deliberate action it entered into supply relationships with North American and European trading firms 30 years ago. Ever since it has been driven by the logic that prevails on the export market rather than the distorted incentive structures faced by import-substitution industries.
13. This process has thus far not been documented systematically in a cluster-related perspective. For more general overviews, see, for instance, Borges and Almeida Cunha (1996).
14. In the case of Brazil there is one further strategy: to relocate operations to cheaper locations, e.g., from the Southeast/Southeast to the low-wage/high-subsidy locations in Northeast and Central West.
15. On the huge gap between the performance of Brazilian exporters of manufactures and global best practice at the end of the import-substitution era, see Sequeira (1990).
16. Personal communication, Silene Seibel, Federação das Indústrias do Estado de Santa Catarina, March 1998.
17. Personal communication, Moacir Márcio Lawin, Associação Comercial e Industrial de Jaraguá do Sul, August 1997.
18. During 1990–95, Volkswagen invested 896 million US\$ in the Puebla plant. Ruiz Durán, Dussel Peters and Taniura (1997, p. 53).
19. Interview with management at the Puebla plant, April 14, 1997.

20. For example Humphrey (1998), pp. 20 for Brazil and Altenburg *et al.* (1998), p. 37 for Nissan Mexicana in Aguascalientes.
21. Personal communication from Tobias Hartmann who in 1997 conducted interviews with 14 electronics transnationals in the cluster.
22. Informe Latinoamericano, January 20, 1998.
23. First half of 1997, *Comercio Exterior*, October 1997, p. 850.
24. Cf. Rasiah (1994), and own field research conducted in April/May 1998.
25. D. Cervantes Romero, manager of the SES at Mexico City, personal communication.
26. See Battat, Frank and Shen (1996, pp. 28–35, for successful Linkage Programs in Singapore, Ireland and Taiwan.

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