

**Building Systemic Competitiveness**  
Concept and Case Studies from Mexico,  
Brazil, Paraguay, Korea and Thailand

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## Preface

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

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

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

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

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

An earlier version of this paper was prepared for the UNIDO Seminar "New Trends and Challenges in Industrial Policy," Vienna, 16 – 17 October 1997. The authors wish to thank Jorge Katz, Hirohisa Kohama, and John Martinussen, commentators at the seminar, for their valuable contributions. We also appreciate the many helpful comments of other participants in the seminar. Last but not least, thanks are due to UNIDO, and especially to Jang Won Suh, director of the Studies and Research Branch, to whom we owe the impetus to write this comparative study.

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

Berlin, March 1998

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1 Esser et al. (1996).

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## Abbreviations

ACI	Association of Commerce and Industry
ALADI	Asociación Latinoamericana de Integración
APyME	Asociación de la Pequeña y Mediana Industria
ASIC	Application specific integrated circuits
CEFE	Competency-based Formation of Entrepreneurs
CEPAL	Comisión Económica para América Latina y el Caribe
CIM	Computer-integrated manufacturing
CP	Clean production
DANCED	Danish Cooperation for Environment and Development
EEI	Eco-efficient industrialization
EM	Environmental management
EPB	Economic Planning Board
ESID	Ecologically sustainable industrial development
EST	Environmentally sound technologies
EU	European Union
FACISC	Federação de Apóio á Pesquisa e Extensão Universitária de Santa Catarina
FDI	Fondo de Desarrollo Industrial
FIESC	Federação das Industrias do Estado de Santa Catarina
FTI	Federation of Thai Industries
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GERI	Genetic Engineering Research Institute
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HAN Project	Highly Advanced National Project
HDTV	High definition television
ICT	Information and communication industry
IEM	Industrial Environmental Management Program
IMF	International Monetary Fund
IMS	Integrated manufacturing system
INEGI	Instituto Nacional de Estadística, Geografía e Informática
ISDN	Integrated service and digital network
ISO	International Standards Organization
KII	Korean Information Infrastructure
KIITF	Korean Information Infrastructure Task Force
MERCOSUR	Mercado Común del Sur
MIC	Ministry of Industry and Commerce
MOST	Ministry of Science and Technology

MSTQ	Measuring, standards, testing, and quality assurance
NAFTA	North American Free Trade Association
NIC	Newly industrializing country
OECD	Organization for Economic Cooperation and Development
R&D	Research and development
RD&E	Research, development and engineering
SEBRAE	Serviço Brasileiro de Apoio à Pequena e Média Empresa
SECOFI	Secretaría de Comercio y Fomento Industrial
SENAC	Serviço Nacional de Aprendizagem Comercial
SENAI	Serviço Nacional de Aprendizagem Industrial
SME	Small and medium-sized enterprise
SWOT	Analysis of strengths, weaknesses, opportunities and threats
TDRI	Thailand Development Research Institute
UIP	Unión Industrial del Paraguay
UNEP	United Nations Environmental Program
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
VAT	Value-added tax
WBCSD	World Business Council for Sustainable Development
WTO	World Trade Organization



## Summary

### The concept of systemic competitiveness

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

The key ingredients of successful industrial development are

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

We have developed the analytical concept of systemic competitiveness in order to be able to assess,

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

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

Dynamic industrial development requires deliberate action by both government and social actors in order to stimulate and support firms in their effort to create competitive advantages. In other words, it is the outcome not only of the invisible hand of the market but also of governance. Regarding the term *governance*, we follow here the World Bank's rather broad definition as "... *the manner in which*

*power is exercised in the management of a country's economic and social resources for development".\** Just like development in other sectors, governance of industrial development today has to be based on a participative model in which social actors interact with the state in defining strategies and policies. This kind of model has emerged spontaneously in the industrialized countries as a reaction to increasing social complexity and the limited success of state interventionism. It is emerging, though hesitantly, in the developing world, especially in those countries where democratization processes have opened some scope of action for civil society, and where the limited competence and inactivity of the state has created opportunities for nongovernmental organizations.

### Whose competitiveness?

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

The concept of systemic competitiveness refers to nations, regions, industrial sectors or subsectors rather than individual companies. It should be noted that the notion of competitiveness applied to such aggregates is not synonymous to the concept of competitiveness of companies, as defined above, although nations (as well as other aggregates) just as corporations have a more or less sustainable market position. Krugman rightly states that the competitiveness of companies has a clearly defined bottom line: *"if a corporation cannot afford to pay its workers, suppliers, and bondholders, it will go out of business. So when we say that a corporation*

*is uncompetitive, ... it will cease to exist. Countries, on the other hand, do not go out of business ... they have no well-defined bottom line".\*\** Hence the measure for the competitiveness of nations is not sustainability in the market. Empirical evidence indicates that not even the trade balance is a reasonable indicator of a nation's competitiveness, since trade surpluses can occur in phases of economic crisis and vice versa.

In the case of nations or regions, a loss of competitiveness does not lead to elimination, as in the case of firms, but to deteriorating welfare conditions. Normative parameters, including socio-economic and environmental issues, are therefore necessary to assess the competitiveness of such aggregates as nations. We define national competitiveness as *the degree to which a nation can, under free and fair market conditions, produce goods and services that meet the test of international markets, while simultaneously maintaining and expanding real incomes of its people over the long term. This long-term perspective implies the need to reduce ecological impacts and resource intensity to a level at least in line with the carrying capacity of the nation's ecosystems.*

### Why "systemic"?

By using the term *systemic* we want to point to several factors. First, a firm will generally not become competitive on its own, that is, without a supporting environment of suppliers and production-oriented services as well as the competitive pressure of local competitors. Microlevel competitiveness is based on interaction. Learning-by-interacting is a key element in firms' innovation processes, and feedback loops between firms and supporting institutions are crucial in order to establish dynamic competitive advantages.

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

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\* World Bank (1992), p. 1.

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\*\* Krugman (1994).

Third, we maintain that the state has an important role to play in industrial development and restructuring. However, we take for granted that autocratic, hierarchical modes of governance are becoming obsolete. New forms of governance are emerging that are based on a new kind of interaction between state and social actors, typically in horizontal networks. Here we find, again, interaction and feedback-loops.

### Scope of the concept

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

First, some mature production processes can be transferred to greenfields sites which lack most elements of a modern supporting business environment. This is obvious in the case of those light industries which are typical of Export Processing Zones (apparel, electronic assembly, toys, etc.). Basic infrastructure consisting of access to international airports and ports, electricity and minimal education of the workforce are sufficient conditions to attract such industries. Recently, even relatively complex state-of-the-art production processes including robots and modern management methods such as *kaizen* have been successfully transplanted to greenfields sites in developing countries. But it is important to note that all these examples refer to mature industries which can be built up by transplanting codified knowledge embodied in blueprints, machines and operation manuals. These industries may be called *blueprint industries* since they do not depend on more tacit forms of knowledge that are not codified in blueprint form, and thus cannot be

entirely disseminated. These blueprint industries do not conduct any substantial R&D and will as a rule not even produce much incremental technological change, either.

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

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

### Country case studies

The report presents case studies of five developing countries. All these case studies use the concept of systemic competitiveness as a heuristic framework to analyze the factors that stimulate or hinder dynamic industrial development. Nevertheless, all of them focus on the mesolevel, that is, on strengths and weaknesses of industrial policies and institutions. Each study highlights different aspects of industrial policy. Four case studies present findings from empirical research projects conducted in 1996 and 1997, while the Korean chapter is based on desk research.

### Mexico

The study on Mexico focuses on the creation of linkages between small and medium-sized enterprises (SMEs) and large export companies. The liberalization of the national economy caused a se-

vere crisis of inward-oriented industries, especially SMEs, while export industries experienced an extraordinary growth. This export growth, however, is almost exclusively generated by large, often transnational, firms. The development of supplier relations is therefore seen as a promising approach to involving domestic SMEs into export activities. The case study distinguishes between "high" and "low road" forms of supplier relations, the former are based on technological specialization and the latter on low wages and unstable labor relations. Mexican supplier development policies should selectively promote "high road"-relations. Up to now, target groups have not been clearly defined. In addition, there is a lack of governance capacity in the sense of involving key social actors into a collective strategy. As a result, policies are not coherent.

### **Brazil**

Brazil is facing the challenge to redefine the role played by central government and by state and local government in industry-related policies. In the last years, central government made some efforts in this field; macroeconomic stabilization was its key priority. This has opened a scope for state and local policy. The case study of Santa Catarina shows that using this scope may be complicated as both government and social actors have to redefine quite profoundly their roles and behavior as well as their interaction. However, the case study also shows that under the conditions of a severe crisis changes and learning processes may occur that lead to a decentralized policy aimed at shaping locational advantages. In the case of Santa Catarina business associations emerged as key actors in this field.

### **Paraguay**

We include a case study on Paraguay in this paper as it shows that the concept of systemic competitiveness is also useful in analyzing and defining policy interventions in industrially less advanced countries. Looking at Paraguay from a systemic competitiveness point of view helps to understand the obstacles the country faces in its industrialization efforts, and it helps to avoid grandiose but in-

appropriate policy proposals. Industrialization in this case should instead involve a cumulative process of upgrading at the microlevel, stronger interaction between the private sector and government, and a strengthening of the position of industry interests in overall economic policymaking.

### **Korea**

The Korean economy is facing a severe economic crisis. Many main-stream economists have seen this crisis as a result of an interventionist industrial and technology policy. The case study does not share this widespread point of view. The analysis of three strategic national R&D projects – the Highly Advanced National Project 1992-2001, the Biotech 2000 Program and the strategy to build a Learning and Information Society – shows that the government has an important role to play as regulator, initiator, coordinator, promoter and catalyst of technological development. At the same time, a new governance pattern is emerging in which private sector firms and organizations participate more actively in the formulation, implementation and financing of R&D projects. The study concludes that although major structural reforms are necessary, especially in the financial system and its poor regulatory framework, the state should continue to assume an active role in shaping the long-term strategies for industrial development. The emerging, more complex patterns of public-private partnerships are basically in line with best practice policies in other OECD countries and should be studied carefully by developing countries.

### **Thailand**

Over the past 25 years Thai industry has grown at impressive rates, but at the same time, due to three reasons there is an urgent need to improve the environmental performance. First, the environmental load resulting from manufacturing has reached unsustainable levels. Second, export-oriented companies are likely to face enormous difficulties if they do not move towards cleaner production concepts which are imperative in international markets. Third, Thailand needs to meet its obligations under

Agenda 21. These pressures have already led to the emergence of a fairly important group of environmentally proactive companies. A survey of these companies shows that substantial efforts have been made to introduce cleaner production concepts, but environmental management is not yet based on a comprehensive concept along the lines of schemes such as life-cycle-assessment or ISO 14000. The study proposes to complement these efforts at the firm level with a new regulatory framework at the macrolevel which encourages not only the economic but also the environmental performance of firms. This framework should support production-integrated instead of end-of-pipe solutions. At the mesolevel, it is not necessary to set up many new institutions. The focus should be on the reorientation of existing institutions and on treating the environment as a cross-cutting issue in economic decision-making.



# 1 The Concept of Systemic Competitiveness

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

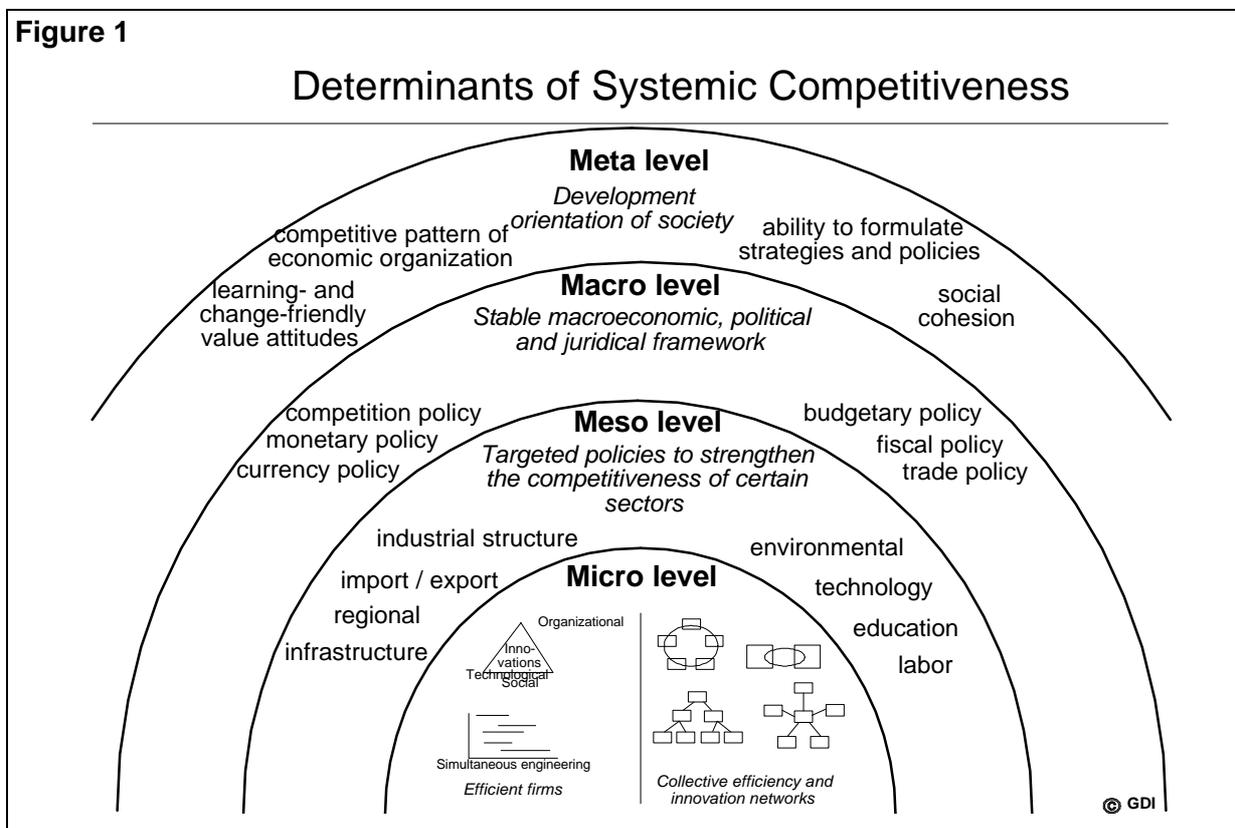
The key ingredients of successful industrial development are

- at the metalevel: first, development-oriented cultural values shared by a large part of society; second, a basic consensus on the necessity of industrial development and a competitive in-

tegration into the world market; third, the ability of social actors to jointly formulate visions and strategies and to implement policies;

- at the macrolevel: a stable and predictable macroeconomic framework. This should include a realistic exchange-rate policy and a general foreign-trade policy that stimulates local industry;
- at the mesolevel: specific policies and institutions to create competitive advantages. What is meant here are specific, targeted policies aimed at shaping industries and their environment (technology institutes, training centers, export finance, etc.). Moreover, it is the world of local and regional industrial competitiveness initiatives to strengthen the business environment. Many of the institutions that act at the meso-level are typically, or can in principle be, non-government entities, e.g. business associations, nonprofit entities, or firms;
- at the microlevel: capable firms and their continuous improvement, and networks of firms with pronounced externalities.

Figure 1



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

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

Dynamic industrial development requires deliberate action by both government and social actors in order to stimulate and support firms in their effort to create competitive advantages. In other words, it is the outcome not only of the invisible hand of the

market but also of governance. Regarding the term *governance*, we follow here the World Bank's rather broad definition as "... *the manner in which power is exercised in the management of a country's economic and social resources for development.*"<sup>2</sup> Like development in other sectors, governance of industrial development today has to be based on a participative model in which social actors interact with the state in defining strategies and policies. This kind of model has emerged spontaneously in the industrialized countries as a reaction to increasing social complexity and the limited success of state interventionism. It is emerging, though hesitantly, in the developing world, especially in those countries where democratization processes have opened some scope of action for civil society, and where the limited competence and inactivity of the state has created opportunities for nongovernmental organizations.

## 1.1 Definition and Scope of the Concept

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

The concept systemic competitiveness refers to nations, regions, industrial sectors or subsectors rather than individual companies. It should be noted that the notion of competitiveness applied to such aggregates is not synonymous with the concept of company competitiveness, as defined above, although nations (as well as other aggregates), like corporations have a more or less sustainable market position. Krugman rightly states

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2 World Bank (1992), p. 1.

that the competitiveness of companies has a clearly defined bottom line: *"if a corporation cannot afford to pay its workers, suppliers, and bondholders, it will go out of business. So when we say that a corporation is uncompetitive, ... it will cease to exist. Countries, on the other hand, do not go out of business ... they have no well-defined bottom line"*.<sup>3</sup> Hence the measure for the competitiveness of nations is not sustainability in the market. Empirical evidence indicates that not even the trade balance is a reasonable indicator of a nation's competitiveness, since trade surpluses can occur in phases of economic crisis and vice versa.

In the case of nations or regions, a loss of competitiveness leads not to elimination, as in the case of firms, but to deteriorating welfare conditions. Normative parameters, including socioeconomic and environmental issues, are therefore necessary to assess the competitiveness of such aggregates as nations. We define national competitiveness as *the degree to which a nation can, under free and fair market conditions, produce goods and services that meet the test of international markets, while simultaneously maintaining and expanding real incomes of its people over the long term. This long-term perspective implies the need to reduce ecological impacts and resource intensity to a level at least in line with the carrying capacity of the nation's ecosystems*.<sup>4</sup>

**Why "systemic"?:** By using the term *systemic* we want to point to several factors. First, a firm will generally not become competitive on its own, that is, without a supporting environment of suppliers and production-oriented services as well as the competitive pressure of local competitors.<sup>5</sup> Microlevel competitiveness is based on interaction. Learning-by-interacting is a key element in firm-

level innovation processes, and feedback loops between firms and supporting institutions are crucial in order to establish dynamic competitive advantages.

Second, an environment that sustains competitiveness is rooted in a national system of norms, rules and institutions that defines the incentives which shape the behavior of firms.<sup>6</sup>

Third, we maintain that the state has an important role to play in industrial development and restructuring. However, we take it for granted that autocratic, hierarchical modes of governance are becoming obsolete. New forms of governance are emerging that are based on a new kind of interaction between state and social actors, typically in horizontal networks.<sup>7</sup> Here we find, again, interaction and feedback loops.

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

First, some mature production processes can be transferred to greenfields sites which lack most elements of a modern supporting business environment. This is obvious in the case of those light industries which are typical of Export Processing Zones (apparel, electronic assembly, toys, etc.). Basic infrastructure consisting of access to international airports and ports, electricity and minimal workforce education are sufficient conditions to

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3 Krugman (1994).

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

5 Cf. Porter (1990).

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6 Cf. Nelson (1992).

7 Cf. Mayntz (1991).

attract such industries. Recently, even relatively complex state-of-the-art production processes including robots and modern management methods such as *kaizen* have been successfully transplanted to greenfields sites in developing countries. But it is important to note that all these examples refer to mature industries which can be built up by transplanting codified knowledge embodied in blueprints, machines and operation manuals. These industries may be called *blueprint industries* since they do not depend on more tacit forms of knowledge that are not codified in blueprint form, and thus cannot be readily disseminated. These blueprint industries do not conduct any substantial R&D and will as a rule not produce much incremental technological change, either.

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

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

## 1.2 The Roots of the Concept of Systemic Competitiveness

The concept systemic competitiveness draws on different strands of the discussion in economics and social science. The contribution of the concept is primarily to address the complementarities of

largely unrelated discussions in different disciplines. We do not claim that systemic competitiveness is a theory; it is more a heuristic framework to that can be used to overcome the limitations of isolated discourses in different disciplines.

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

1. Innovation economists have done extensive research on the functional logic of innovation processes and innovation systems, to a certain degree continuing along lines established by Schumpeter.<sup>9</sup> In this view, innovation is not an event but a process that typically occurs along trajectories. Defining a path or trajectory implies a decision in favor of one and against other technological options. The decision typically reflects a specific historic constellation, including economic, political, technical, and other factors as well as coincidence. Once a trajectory has been established, the latitude for guiding technological development is limited (path dependence). The innovation process is based on continuous learning in the form of learning-by-doing, learning-by-using, and learning-by-interacting, between firms as well as between firms and research and technology institutes. Innovation patterns differ from country to country due to different institutional frameworks and different incentive structures; it is in this way that different national systems of innovation emerge. Technological knowledge can never be fully codified, i.e. it is crucial to keep in mind the importance of tacit knowledge, which is not easily transferable and is for the most part person- and firm-specific. If it is to use to use a given technology, a firm must therefore undertake learning efforts to create the necessary tacit knowledge. Due to path dependence and the tacitness of knowledge, neoclassical views that suppose complete freedom to choose, transfer, and switch between technolo-

<sup>8</sup> Altenburg (1995), pp. 70 - 76.

<sup>9</sup> Dosi et al. (1988); Freeman (1987); OECD (1992).

gies do not provide an adequate understanding. Accordingly, policy recommendations based on neoclassic thinking will often prove inadequate.

2. A key issue in the post-structuralist discourse is the redefinition of the role of the state in processes of late industrialization.<sup>10</sup> Traditional structuralism pointed to the central role of the well-informed, powerful development state in guiding the industrialization process. The experience of the East Asian NICs has shown that this concept was not altogether wrong. However, it depended on a number of specific factors which had to be combined in a sophisticated way. Only few societies have succeeded in doing so. In other parts of the world, particularly in Latin America, a statist, market- and competition-unfriendly model of industrial development temporarily generated high growth rates. In the end, however, it led to mutually reinforcing blockade constellations and a deep economic and social crisis. The post-structuralist discussion still maintains that the state has to play an important role. It at the same time emphasizes the importance of economic incentive structures, especially the role of competitive pressure, in stimulating technological learning and upgrading.
3. The new institutional economics seeks (essentially inside the framework of neoclassical economics) to identify those rules, conventions, norms, and structures which shape the behavior of economic agents, especially firms.<sup>11</sup> Two elements are particularly important in our context. First, institutionalist economics emphasizes the importance of systems of rules, particularly property rights. Without well-established and enforceable property rights the conditions for entrepreneurship are severely restricted. Second, institutionalist economics points to the importance of transaction costs, i.e. the costs involved in the arrangement, supervision, and enforcement of contracts. High

transaction costs, e.g. due to missing or badly organized information systems (for instance regarding the credit standing of firms), will often lead to suboptimal patterns of organization (e.g. extreme vertical integration as firms prefer not to deal with suppliers and subcontractors due to high transaction costs).

4. In the view of management science there is no question that company competitive advantages do not emerge randomly but are created by strategic management. The discipline emphasizes that firms should concentrate on their core competencies, outsourcing other activities, and should also strive to create competitive advantages along the whole value chain. Apart from intra-firm features, management science has over the last few years increasingly dealt with aggregates of firms.<sup>12</sup> Going beyond this perspective, Porter has argued that the distinguishing element between more and less successful economies is the difference in the quality of industrial clusters (and not just individual firms). According to Porter, successful industrial development has to be created through deliberate action. Sustained industrial competitiveness is based on four factors: competent firms with a strategic vision, a demanding domestic market, highly capable supporting industries, and a well-developed environment of specific supporting institutions.

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

1. Economic sociology seeks to analyze structures and processes, as well as in particular power relations that shape economic transactions in the real world.<sup>13</sup> The discipline aims at ex-

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

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

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

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

plaining, outside the world of economic models, why economic agents behave in the way they do. Important insights include the observation of the crucial role of trust and relational contracting. Economic transactions, e.g. between a firm and its most important suppliers, are not anonymous market transactions but embedded in a complex social relationship pattern. This insight arose from observations of such different phenomena as long-term supplier relationships in the Japanese industrial system and dense networks with highly differentiated forms of communication and sanction mechanisms in Italian industrial districts.

2. Industrial sociology has made important contributions to the understanding of the fundamental changes in firms that have occurred since the 1980s.<sup>14</sup> It identified "new production concepts" which differed profoundly from traditional Taylorist concepts. While management science prescribed new organizational concepts (lean production, flat hierarchies, teamwork, strongly reduced division of labor inside the firm), industrial sociology also analyzed the obstacles to their quick introduction, particularly the power structures inside firms.
3. Economic geography received increasing attention as other disciplines began to realize the importance of spatial concentration of firms and supporting institutions.<sup>15</sup> Spatial concentration stimulates formal and informal communication, thus facilitating rapid diffusion of information and collective learning – and these are the factors that decide on success and failure in ever tougher competition based on continuous innovation. Traditional concepts of regional policy that aimed at dispersing industries have increasingly come in for criticism in this context.
4. Political science has moved from optimism to pessimism and back again regarding the governability, i.e. actively and deliberately shaping

the fate, of industrial societies.<sup>16</sup> The 1970s were, in many industrial countries, marked by attempts to restructure societies in a top-down manner, using hierarchical governance modes. The success of these efforts was limited, not only due to various sources of resistance but also due to the objective problems of governing across different levels of government and across different sectors, which created extremely entangled structures with mutually reinforcing blockades. The result was deep pessimism regarding the governability of industrial societies, which shaped the discussion in the 1980s. Pessimism was theoretically well-founded, but it was at least partially rejected based on the observation of new, network-like governance patterns in fields like research, health, and telecommunication policy. The main finding was that such sectors were no longer governed through hierarchical structures under the guidance of the state. Instead, there were horizontal, heterarchical structures that involved state and nonstate actors alike. Policy networks in the shadow of hierarchy served to define problems and to find solutions. Involving social actors, it turned out, mobilized essential know-how and creativity and improved the perspectives for successful implementation. This pattern is supplanting the traditional pattern of political organization based on division of powers and is helping to overcome some of its deficits.

The common denominator of these different strands of theory is the concept of networks. The network feature is crucial for both the political and the economic dimension of systemic competitiveness. Firms that compete in globalized markets are not the atomized agents of textbook microeconomic theory. Rather, they are woven into dense networks that consist of other firms (suppliers, customers, and competitors) and of mesoinstitutions. Likewise, political actors that formulate industrial strategy are not the utility-maximizers of rational choice theory. Instead, they are also woven into networks, in this case policy networks that consist

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14 Pathbreaking contributions were made by Kern / Schumann (1984). For an overview, see Sauer / Wittke (1994).

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

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

of agents from different public institutions and representatives of different organizations of the civil society. These policy networks complement the established, hierarchical governance patterns and democratic institutions. They are the place where joint definitions of problems are sought and concrete measures to solve them are formulated.

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

### 1.3 The Four Levels of Systemic Competitiveness

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

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

An enabling macroeconomic environment, i.e. well-functioning factor, commodity and capital markets, are crucial to ensuring the efficient allocation of resources. In view of the experience made in the 1970s it is now widely accepted that an un-

stable and highly biased macroeconomic framework (high inflation, persistent high budget and trade deficits and a distinct anti-export bias in the economy resulting from an overvalued exchange rate as well as high protectionist barriers) considerably reduce the ability of these markets to function properly, with negative effects particularly on economic growth and exports.

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

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

When measures are taken to reduce state expenditures, the approach to curtailing state investment most simple in political terms – for example education, health and development of physical infrastructure – must be avoided. In order not to weaken the basis for future growth, consolidation measures must be used to cut expenditures for consumption, to remove privileges for interest groups, and to examine the extent of state activity. What becomes particularly necessary is to reduce military expenditure, to avoid overstaffing in the public sector, to cut subsidies by introducing fixed-term, degressive subsidies, to concentrate social

policies on the poorest groups of the population, and to eliminate deficits in state enterprises by making use of the scopes available to privatize and commercialize state activities. Also, investment expenditure must be subject to careful scrutiny and must be concentrated in those areas which are particularly important for the development of the private sector and for social development. In this context, the potential of innovative extra-budget financing mechanisms such as build-operate-transfer schemes for infrastructure development should also be exploited.

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

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

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

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

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

The first option, i.e. general import liberalization, aims at tariff rates which are low and uniform for all types of goods. It puts its trust in the validity of the principle of comparative advantage and accepts that only those industries will survive which derive their competitive strength from existing comparative advantages. This option usually involves high frictional costs, as it does not take into account the fact that different groups of industries need different periods of time for technological learning. It may therefore provoke deindustrialization in branches which have the potential to become competitive in the medium term, and it may inhibit technological upgrading. However, countries with little experience in actively shaping economic

structures may have no other choice than to pursue a policy of nondiscretionary import liberalization.

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

### **Microlevel: Technological and Organizational Requirements**

Firms are faced today with increasing challenges resulting from six different trends: First, globalization of competition in a rising number of product markets; second, an increase in the number of competitors on account of successful late industrialization processes and successful structural adjustment as well as export orientation; third, increasingly differentiated demand patterns; fourth, shortening product innovation cycles; fifth, establishment of radical technological and organizational innovations; and sixth, upheavals in technological systems in which the boundaries between sectors are newly demarcated, for example overlaps between computer technology and telecommunications (telematics) or between mechanics and electronics (mechatronics).

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

If they are to meet the new demands, firms must reorganize extensively both internally and in conjunction with their immediate environments. Incremental changes as envisaged in the 1980s with far-reaching automation and interlinking in the field of information technology (cf. the "auto-

mation of Taylorism") are simply not enough. In order to increase efficiency, quality, variety, and responsiveness at the same time, profound changes are needed in three areas:

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

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

A separate issue that has to be addressed at the microlevel is that of the structure of industry, and

the appropriate framework for analyzing it. A traditional view would be to distinguish consumer nondurables and durables, intermediate goods, and capital goods. Another view, addressing technological issues, is the distinction between supplier-driven, scale-intensive, specialized supplier, and science-based industries.<sup>17</sup> Yet another view, addressing the interaction between profound changes in the macroeconomic framework and adjustment at the microlevel, is the distinction between resource-intensive, qualified labor-intensive, and R&D-intensive industries.<sup>18</sup> These concepts are often helpful in analyzing specific circumstances. It is furthermore important to note that hardly any industry, or any firm, qualifies *a priori* for any of these classifications; the Finnish pulp and paper industry was probably much more R&D-intensive than the Brazilian computer industry. It is thus essential not to confuse empirical concepts (*How do I order a given reality?*) and normative concepts (*Which industry should I try to stimulate because it has a particularly positive impact on welfare?*)

### Mesolevel: Supporting the Efforts of Firms

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

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

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

*"Basic factors include natural resources, climate, location, unskilled and semi-skilled labor, and debt capital. Advanced factors include modern digital data communications infrastructure, highly educated personnel such as graduate engineers and computer scientists, and university research institutes in sophisticated disciplines. (...) Generalized factors include the highway system, a supply of debt capital, or a pool of well motivated employees with college educations. They can be employed in a wide range of industries. Specialized factors involve narrowly skilled personnel, infrastructure with specific properties, knowledge bases in particular fields, and other factors with relevance to a limited range or even to just a single industry."*<sup>19</sup>

In the early stages industrial development in a given location will be based mostly on basic and generalized factors. Only after a certain period of time will advanced and specialized factors be created, partially through private enterprise (e.g. provision of venture capital or specialized business consultancy), partially through the activities of business associations (e.g. technology informa-

17 Cf. Pavitt (1984).

18 Cf. Katz (1996).

19 Porter (1990), pp. 77 f.

Figure 2

### Selective Policies and Specialized Factors: Which Institutions and Orientations Constitute the Mesolevel?



tion), and partially through government activities (e.g. university research and education). As a matter of fact, a closer look at the elements mentioned in Figure 2 reveals that most factors at the mesolevel can be provided through the private sector, either by specialized individual firms or by business associations. It is thus important to note that shaping the mesolevel does not necessarily, indeed not even predominantly, involve government activities.

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

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

it can make sense to target different industrial branches in a differentiated way.

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

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

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

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

**The interrelationship between the regional and the national level:** The *locus* of industry-related policymaking is changing. Traditionally, industrial policy, technology policy, and other specific policies that shaped industrial development were prerogatives of central governments. The situation has changed. As firms come under increasing pressure due to globalization, their demands on their local environment increase. Consequently, mesopolicies increasingly have to be formulated at the regional and local level. In some countries, regional or local governments are in any case responsible for key mesopolicies, e.g. for education.

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

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

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

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

## Metalevel: Governance for Industrial Competitiveness

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

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

The third basic element at the metalevel is the ability of social actors to jointly formulate visions and strategies and to implement policies. This implies a vision shared by a relevant group of social actors about which position should be targeted in the international division of labor, which comparative advantages should be developed in the long run, how profits and costs of market integration should be distributed among social groups, etc. Such a shared vision is important to concentrate resources. Moreover, long- and medium-term orientations are important for asserting future interests against current interests and for generating

stable expectations. The construction of such a basic consensus is a complex political process and places great demands on social actors: entrepreneurs, workers and other concerned members of civil society have to be prepared to become involved in institutions and commit themselves to achieving common goals.<sup>20</sup> In addition, they must be willing to compromise with other interest groups. This is the difference between democratic and corporatist cultures, in that the latter excludes relevant social groups from strategy formulation.

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

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

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

21 Kaufman (1990); Cavarozzi (1992).

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

As systemic competitiveness cannot emerge without social integration, its creation implies a social transformation venture that goes far beyond correcting macroeconomic framework conditions. For one thing, it requires fundamental restructuring of business associations and labor unions as well as other key organizations of civil society. The process of restructuring organizations and creating new intermediary institutions follow three complementary logics. First, these organizations and institutions need to be restructured internally; second, they must strengthen their ability to represent their interests vis-à-vis government or other social actors; third, they must shape their own environments through cooperation and networking with public or private institutions.

Major groups in society must learn that safeguarding government from influential, privileged groups may establish a positive-sum game. Only a relatively autonomous government is able to gear its activities toward overall social and economic interests. Transparency and accountability are crucial. Autonomous functional subsystems are based on a clear-cut division of responsibilities between government, industry, and social actors. They may then be further developed by intrinsic learning processes, flexibility and responsiveness, and by dia-

logue and efforts to search cooperatively for optimal solutions involving government and social actors. This may occur at the national as well as the regional and local levels.

**The need for heterarchical governance patterns:**

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

Still, the conclusion that the state has no role to play at all is not well founded, since this proposition ignores the indisputable fact that new forms of governance have emerged, initially in a number of OECD countries where government policy no longer follows the pattern of a traditional interventionist state. Instead, government acts as a coordinator, moderator and communicator in policy networks with firms and their associations, science,

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22 Cf. Cumings (1984).

23 Cf. Best (1990).

intermediary institutions, and labor unions. It aims at collecting and disseminating relevant information and working out joint medium- and long-term visions that can serve as points of reference for government mesopolicies as well as private initiatives. This makes it possible to relieve government's burden by shifting decision-making processes into intermediary arenas, to ensure a higher degree of information availability, to heighten the legitimacy of government decisions, and to mobilize the creativity available among social actors by involving them and their respective problem-solving capacities in a strategic fashion. Policy networks do, however, presuppose on the part of social actors a capacity to compromise, to perform and learn, and to accept transformation.<sup>24</sup>

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

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

Successful policy networks are based on six core elements:<sup>26</sup>

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

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

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

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

25 Cf. Powell (1990).

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

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

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

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

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

On the one hand, the opening of the economy imposed a heavy burden on inward-oriented industries, especially small and medium-sized enterprises (SME). The reduction of import tariffs exposed these firms to strong foreign competition, especially from industrialized and East Asian countries. At the same time, domestic demand heavily declined due to tight monetary control.

Real wages today are just at 61 % of their 1980 level.<sup>27</sup> In addition, the sharp rise in interest rates following the peso crisis of December 1994 aggravated the financial problems of many highly indebted firms. As a result, many firms disappeared and manufacturing output fell sharply in several industrial sectors, such as footwear, textiles, and most capital goods.

On the other hand, manufactured exports have been the driving force of economic activity, growing at an impressive rate of 20 % per year since 1985.<sup>28</sup> However, this growth is almost exclusively generated by a small number of large, often transnational, firms. Only a few Mexican SMEs are competitive in price as well as product quality and have sufficient marketing experience to access foreign markets. What is more, SMEs do not even play a major role as suppliers to the export industries. Much of Mexico's exports are in fact intra-firm trade by corporations that operate NAFTA-wide, relocating certain labor-intensive parts of the production chain to Mexico. Generally, large corporations either import almost all their required inputs or are vertically integrated. In some branches, for instance the automobile and television industries, transnational manufacturers urge their established international suppliers to follow them to Mexico, thus giving rise to the formation of clusters of transnational firms. These clusters employ world-class technologies, but to a large extent exclude Mexican companies from production. Technology transfer from large corporations to domestic small firms is therefore very limited. Linkages with Mexican SMEs are especially weak in the case of in-bond industries (*maquiladoras*), which source less than 2 % of their required inputs locally.

The lack of linkages between large and small firms contrasts sharply with industrial structures in most OECD and some newly industrializing countries (NICs). In those countries, large firms build upon highly diversified networks of SMEs, thus taking advantage of reduced overhead costs, lower wages,

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

28 INEGI database.

and greater flexibility to respond to changing markets and take advantage of gains from specialization. Instead of competing in the same product markets (as most Mexican SMEs do), industrialized country SMEs tend to specialize in areas complementary to large-scale production, offering a wide range of inputs and special services. According to Porter, the existence of a dense fabric of competing, cooperating and supporting firms is an important prerequisite for competitiveness, especially in high-end markets.<sup>29</sup> This is even true for transnational corporations.

## 2.2 Reorientation at the Macrolevel – Neglect of the Mesolevel

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

In 1996, the Ministry of Trade and Industrial Promotion published a new "Program of Industrial Policy and International Trade."<sup>30</sup> The underlying philosophy of this program marks a considerable shift in government attitude toward the manufacturing industry. The program recognizes the necessity for the government to play a more active role in building industrial competitiveness, and it targets specific sectors and groups of firms. Among other things, it identifies as priorities the integration of production chains, the strengthening of the

technological infrastructure, selective export promotion, SME promotion and the formation of clusters. Yet the program has several major shortcomings. First, it is full of good intentions but lacks concrete proposals and clear statements about the financial volume of programs. This is due to the fact that the program has not been sufficiently coordinated with other important agencies, especially the Ministry of Finance. Some analysts thus anticipate that major parts of the program will not be implemented.<sup>31</sup> Second, while the program rightly focuses on exports and integration of production chains, strategic options for the huge number of inward-oriented SMEs remain unclear.

## 2.3 Toward Dynamic Comparative Advantages and SME Integration

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

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

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29 Porter (1990), pp. 100 ff.

30 SECOFI (1996).

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

objective should therefore be to gradually upgrade domestic industries toward technologically more complex, higher value-added activities.

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

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

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

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

The most common linkage between small and large firms consists in supplier relations. However, not all of these relations contribute equally to the development of a competitive SME sector. Some are based exclusively on low wages and labor stan-

dards or the externalization of environmental costs. These linkages are not desirable from the social and ecological points of view, and furthermore rarely create a basis for sustained competitiveness, since they do not foster technological learning and productivity growth. Sengenberger and Pyke have termed this the "low road to competitiveness".<sup>32</sup> To embark on a "high road" strategy, it is therefore necessary to assess the long-term development effects of different supplier relationships. Promotion should then be selectively targeted to supplier relations which favor the transfer of technology and skills as well as mutual learning of suppliers and customers, thus enhancing productivity and innovation.

- If the underlying rationale of the customer is to make use of **technological specialization** and/or economies of scale, the supplier has a relatively high level of autonomy as regards product design and will be responsible for improvements. Since the supplier produces a specialized complementary input for the customer, the latter cannot easily play one supplier off against another. This gives the smaller partner a certain bargaining power. The most privileged suppliers are those who achieve technological leadership in their field and therefore may negotiate high prices (innovation rents) for their products. In addition, the specialized supplier gains access to a reliable market, assuming the customer remains viable. Intra-industry linkages based on mutual specialization usually go beyond arms-length transactions, including the coordination of delivery times, product standardization, joint research, and so on. These agreements guarantee a long-term commitment on the part of the customer. They sometimes include substantial transfers of product as well as process technologies, such as the implementation of total quality management, *kaizen* and eco-efficient production methods.
- If the customer establishes a relationship with a supplier only to cut **wage costs**, the terms are usually far less beneficial for the supplier. In this case, the supplier can only survive if he

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

achieves leadership on a cost basis. Given that the production process is standardized and the necessary technology is available to a great number of competitors, price competition is usually fierce, forcing firms to continuously cut costs. Except for some cases where firms achieve extraordinary increases in productivity, suppliers are obliged to reduce profits, wages, and labor standards.

- Equally, the occasional subcontracting due to demand peaks with the aim of **smoothing production** does not provide a sound basis for SME development. There is little stability and security for the supplier, who can easily lose his investments if the customer does not receive orders in excess of his own capacity. As a result, neither the customer nor the management of the supplier will show a long-term commitment to invest in machinery or the skills of the workforce. Jobs in these firms will be extremely insecure.
- Sometimes supplier relations are established to **externalize environmental costs**, because small subcontractors can more easily evade environmental regulations. This is another type of interfirm linkage which is not consistent with long-term growth, since it endangers ecological sustainability of the industry as a whole.

## 2.5 A Systemic Approach to the Promotion of Small and Large Firm Linkages<sup>33</sup>

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

In the past decades, the main instrument used to develop such linkages was local content requirements. In some industries, these induced substan-

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

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

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

- to define **targets**, for example whether or not it is feasible to develop endogenous capabilities as first-tier suppliers for the automotive and electronics industries. In Mexico, both industries are relevant and highly dynamic exporters, but almost exclusively dominated by transnational corporations. The supply of most complex components and systems is also increasingly concentrated on a few global players, and barriers to entry are high. On the other hand, there is much space to at least develop second- and third-tier suppliers in Mexico. Policymakers should try to identify in which areas it is possible for Mexican firms to *enter* supplier rela-

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

tionships and what specific support is necessary to *upgrade* these suppliers, aiming at the first level of system suppliers and R&D partners for transnational corporations. As yet no such strategic outlook has been formulated, and therefore criteria for the promotion of supplier relations remain unclear;

- to define **target groups**. Promotion should selectively foster firms with a realistic potential. Modern large corporations are very demanding as regards their suppliers. Trying to push very inefficient firms into partnerships with these enterprises is therefore a lost cause. This is the main reason why subcontracting fairs and databases have found little acceptance on the part of large firms. Public policy should rather provide specific support to help overcome certain bottlenecks in firms which are otherwise generally efficient. Identifying such "good candidates" and determining where their bottlenecks lie often quite easy for the potential private-sector customers, since they are the ones who establish the performance criteria for their suppliers. Policymakers should therefore involve these customers in the process of defining target groups and policy packages. This can greatly increase the efficiency of public-support programs. On the other hand, policymakers should obviously not just execute private-sector recommendations. A careful assessment is needed to avoid free-riding on the part of firms which have access to all relevant factors of production. In Mexico, some support mechanisms are targeted toward transnational suppliers of the automotive industry;
- to define **which types of interfirm linkages** are conducive to sustainable competitiveness and socially desirable. Until now, promotion schemes have not been selective with regard to the development impact of each specific type of supplier relationship. Outsourcing motivated by evasion of social security payments or environmental regulations receives the same benefits as interfirm cooperation that implies a high degree of technology transfer. It is therefore recommended to foster exclusively those interfirm arrangements which enable suppliers to upgrade their performance. This is not only important for social and ecological reasons. Stable

relationships based upon mutual specialization promote cooperative technological learning and are conducive to innovation.

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

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

Public-private partnerships can also be an effective means of facilitating technology transfer to SMEs. A key to the success of some Asian NICs has been to involve large corporations in supplier development programs, with the governments applying a

policy of "carrots and sticks".<sup>34</sup> In Mexico, as in most Latin American countries, supplier promotion was almost exclusively confined to local content requirements, thus neglecting the potential of large firms to transfer know-how to SMEs. The Singaporean *Local Industry Upgrading Program* shows how large corporations can be involved effectively in supplier development programs. Under this program, experienced engineers from transnational corporations are seconded to the government's Economic Development Board to identify potential SME suppliers as well as areas for focused assistance to these firms. The Board assumes the full remuneration of these engineers and coordinates the necessary SME support.<sup>35</sup> In a survey of Mexican subcontracting, a considerable number of large corporations expressed their interest in similar public-private partnerships.<sup>36</sup>

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

Labor unions should also participate in the formulation and implementation of strategies to promote small and large firm linkages. Unions are often opposed to outsourcing plans of large corporations, alleging that these are often aimed at cutting wages and restricting workers rights. While this is often true and union opposition is therefore absolutely legitimate, a more flexible interfirm division of labor may be necessary to maintain competitiveness of an industry as a whole. This is why it is imperative to find a balance between workers

rights and the requirements of a competitive industrial structure. Unions should help to define this balance rather than obstructing structural change. In fact, the argument of maintaining adequate labor standards is a good one, since the importance of price competition is constantly diminishing, while factors such as product quality, good services, quick market response and innovation are becoming crucial. Under these circumstances, the success of firms increasingly depends on skilled and motivated workers.

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

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

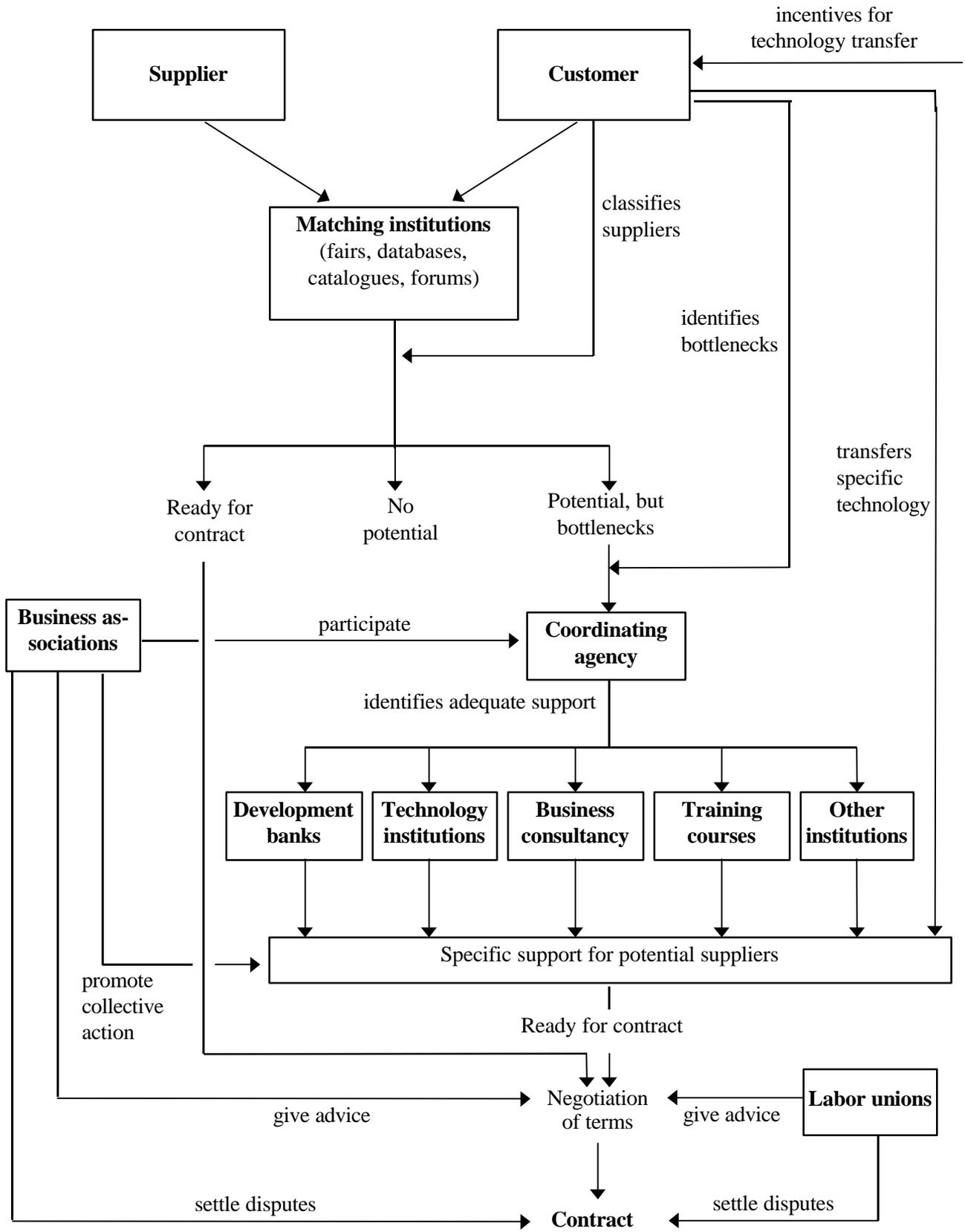
- Matching events and institutions are used to classify potential SME suppliers and identify the main deficiencies that prevent potential

34 See for example Meyanathan (1994).

35 Soon (1994), p. 82.

36 Altenburg et al. (1998).

Figure 3: A Systemic Approach to the Promotion of Small and Large Firm Linkages



Source: Altenburg et al. (1998)

customers from signing contracts with them. Potential (large-scale) customers are actively involved in this evaluation task;

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

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

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

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

neurial activity suffice to create a favorable environment for dynamic industrial development.

What probably has added to the skepticism is the experience of the late 1980s and early 1990s, when various attempts to formulate industrial policy mainly added more turbulence to an already extremely unstable environment.<sup>37</sup> The Sarney government tried in 1988/89 to formulate an industrial policy to prepare domestic firms for a more competitive environment. However, this policy was never really implemented. The Collor government (1990 - 1992) did something that had a much stronger impact than any specific industrial policy measures had had in years: In 1990 it engineered a fundamental turnaround in the overall economic framework by opening the economy up gradually (within 3 years) to the world market and removing all types of regulatory obstacles. Trying to add a carrot to the stick, it formulated a number of ambitious industrial policy programs which, however, had a limited impact. This was mainly due to one reason, i.e. the fact that the government did not succeed in stabilizing the economy by reducing the high level of inflation. Industrial policy had little credibility with firms that had to deal with an extremely unstable macroeconomic framework, frequent changes in the rules of the game due to government stabilization plans, and increasing competitive pressure. It was only in 1994 that the Franco government (1992 - 1994) succeeded in bringing down inflation and thus stabilizing the economy. The economic team which took office with the move of Fernando Henrique Cardoso into the ministry of finance in 1993 largely remained in place when Cardoso was elected president in late 1994. It was largely hostile toward the notion of sectoral industrial policy, with just one exception: It has tried to stimulate foreign direct investment in the passenger car industry. The industrial policy concept that was launched in late 1995<sup>38</sup> was not really worth its name, as it remained vague except for two areas, namely the reform of the basic tech-

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37 Cf. Meyer-Stamer (1997).

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

nology infrastructure (especially in the field of measurement, standards, testing, and quality) and export promotion. The attempt to operationalize this concept still remained vague;<sup>39</sup> the respective document, which was published in July 1997, contains proposals for a set of 18 different branches of industry and addresses immediate bottlenecks rather than outline a medium-term strategy for sustained competitiveness.

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

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

### 3.1 Locational Policies for Increased Competitiveness: Cases from Santa Catarina<sup>40</sup>

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

#### Adjustment in the Textile Industry

In the textile industry competitive pressure started to increase substantially between 1993 and 1995. Initially, the gradual opening-up of the market did not have much impact on consumer non-durables like garments. Things changed in 1993 at the end of the gradual reduction of tariff protection, and again after the government launched the Plano Real stabilization program in July 1994, which successfully fought inflation. One of the results was a boom in consumption, fueled in part by increased confidence, partly by the reintroduction of consumer credit. The local industry did not have the capacities to meet the increased demand, and moreover Brazil all of a sudden looked like a very interesting market for foreign suppliers. One of the results was a substantial increase in textiles imports. The situation changed again at the end of 1994 and in 1995 when the government decided that the economy was overheated and the Mexico

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

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

crisis made itself felt. Curbs on consumer credit and higher interest rates had a markedly cooling effect. However, foreign suppliers had their sales channels established by then and were determined not to give them up. The result was sharply heightened competition, basically over prices, in the local market.

On the whole, firms in the textiles/clothing industry initially stuck closely to the established development path in their adjustment strategies – a high degree of vertical integration, little inter-firm interaction (particularly low in terms of information exchange), and little demand for the services offered by mesoinstitutions. Increased subcontracting by some Blumenau garment firms is, thus far, the only discernible adjustment strategy that has broken away from the established development path. Apart from that, changes in the firms were largely incremental. This meant that rather than asking themselves fundamental questions about the way they do business, firms took it for granted that they could simply go on on the basis of incremental adaptations to the new conditions. For them, adaptation mostly meant cutting costs. The first thing firms noted was that foreign competitors sold their own products at lower prices. By cutting their own costs, which they tried to achieve first and foremost by investing in new, more productive equipment and through cuts in personnel, firms hoped to catch up with their competitors and thus win back a strong market position. They mostly failed to notice that competitors were often much more agile, flexible, and customer-oriented. To match them on these factors would imply a radical change in the way local firms do business. Based on reengineering, they would have to introduce new patterns of internal organization (flat hierarchies, employee empowerment, customer-driven organization) and external relations (deverticalization, concentration on core competencies, introduction of just-in-time delivery and cooperation with suppliers in engineering). Moreover, they would have to intensify inter-firm collaboration and cooperation with supporting institutions in order to stimulate rapid collective learning processes. These are some of the preconditions needed to move up-market, which is inevitable, as local production

costs are simply too high to compete with low-price imports from East Asia.<sup>41</sup> Other conditions include a greater effort in fashion design and changes in sales channels.

It was only recently that adjustment efforts started to go beyond intra-firm activities. This was mainly due to the commitment of the president of the largest and oldest firm in Blumenau, a firm that in several respects has always played a pivotal role, e.g. when it came to introducing new types of equipment or new management techniques. The president took the initiative of organizing a visit of local owners and managers of textile firms to Italy in order to learn about best practice, particularly in terms of inter-firm relationship and a highly developed supporting meso-environment. This visit gave rise to an ongoing dialogue among a number of large and medium-sized firms on measures to create collective efficiency, especially by improving information flows among firms (e.g. on credit standing of customers and prices of key supplies), by stimulating the emergence of new training courses at vocational schools, by creating a quality brand for products from the region, and by studying the feasibility of setting up a technology center. These activities were to a certain extent formalized in that this person was elected president of the Chamber of Commerce and Industry in Blumenau.

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

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

## Adjustment in the Ceramic Tile Industry

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

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

It seems that in the ceramic tile cluster there is at least some 'information in the air'. Substantial amounts of informal information is exchanged between professionals from tile producers; unlike in other branches, it is perfectly normal for them to visit competitors' factories. What is behind this is, first, the notion that local firms should stick together to maintain their positions vis-à-vis domestic competitors, especially from one region in the state of São Paulo. Second, firms' engineers claim that production technology is on the whole standardized, so that there is little risk of losing crucial se-

crets; competitive advantages instead lie in specific design and in logistics, i.e. the ability to deliver quickly without having to keep huge stocks. Suppliers of inputs and vendors of equipment are other agents who stimulate exchange among firms. For instance, if a vendor has set up a given piece of equipment in one of the firms, he will use this as a showcase for other firms, and unlike in other industries, it seems that tile producers actually permit executives from competitors to enter their factories.

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

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

Two factors appear to be most important to explaining this divergent. First, fierce rivalry and noncooperation has led some firms to the brink of

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

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

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

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

For the firms, membership in the industry association (*sindicato patronal*) is mandatory. They are organized by branch at the municipal level. The main role of the industry associations consists in

collective bargaining. Yet some of them have recently begun to broaden their profile. For instance, the textiles industry *sindicato* in Blumenau has explored sourcing alternatives abroad, e.g. in Argentina. It also has adopted an active role as a political lobbyist for the industry. The ceramics industry *sindicato* in Criciúma has played an important role in lobbying for the construction of a pipeline to provide the local industry with natural gas.

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

Apart from the *sindicatos*, there also exist at the municipal level Associations of Commerce and Industry (ACI) with voluntary membership ; there is also an umbrella organization (Federation of ACIs, FACISC) which is, however, only influential if its president is an important person with well-established links to politicians. Traditionally, they have resembled clubs of local businesspeople.<sup>42</sup> Their basic tasks were to administer the register of firms and to provide their members with legal advice. Many of them had no professional

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42 Cf. Müller-Glodde (1993).

staff at all, and even the larger ones employed no more than a handful of people. In the northeastern part of the state the impetus for change came through a German technical cooperation project, which established a partnership between around ten ACIs and the Munich Chamber of Craft and Trade. Essentially, it was the result of a German initiative to get German private business more actively involved in development cooperation, and as the northeastern part of the state had been an area colonized by Germans, local actors liked the idea of this partnership, although they failed to see the profoundness of the change it would induce. In fact, the visits to their German partner provoked a serious shock among representatives of the ACIs as they noted the impressive size, the large number of employees, and the broad spectrum of services provided by the Chamber in Munich. After these experiences, the directors of ACIs were much more open-minded about the changes proposed by the project staff. These changes, which took about five years to materialize, resulted essentially in three things. First, and most importantly, the role definition of the ACIs changed as they increasingly developed services geared to the demands of their members, and tried to attract new members. Second, there was an increase in the number of employees as ACIs began employing consultants to look after the needs of their members. Third, sectoral working groups were formed in the ACIs which brought together representatives from firms of one sector or were organized around a given problem, e.g. environmental protection. In many cases, the sectoral working groups established for the first time a forum for the exchange of business-related information between local firms.

### **The Persistent Failure of the State**

Thus far there has been little change when it comes to the role of the state and business-government relationships. Officials in the state apparatus think that it would be appropriate if the state could pursue a traditional hierarchical developmentalist policy model. At the same time, they concede that today the state is not really in the position to do this because, first, it is financially straitened and, second, it has no real planning and implementation

capacity in the field of industrial development. The notion that in such a situation new, heterarchic types of governance might offer a way out is only slowly emerging.

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

The prevailing political pattern used to be one of clear separation between business and government. This is due to traditional structures of the polity, i.e. within the political parties (personalism), within the executive (preference for hierarchic governance), between legislative and executive branches (clientelism), and between the political-administrative system and business associations (no clear articulation of business interests). Some firms may be heading for world-class manufactur-

ing, inter-firm relations may develop, but the state-business relationship is archaic, and when industrial promotion measures are discussed, the discussions follow a traditional pattern. In other words, path dependence is more deeply entrenched in the political arena than anywhere else. This has a lot to do with the 'mental model' of most of the key actors, who can hardly imagine a different *modus operandi* of politics. Two possible factors come to mind to explain this. First, the traditional model of clientelist politics has a long tradition in Brazil, and has never been challenged seriously. On the contrary, it was cast in the form of a rigid corporatist system in the 1930s, and this system still exists and serves many interests; for instance, it is of course convenient for the *sindicatos* that membership is mandatory. Second, this opens promising career opportunities, especially for business leaders who succeed in being coopted into the political class. Alienating political actors by pursuing an explicit, outspoken strategy of interest articulation may therefore appear as a personally unattractive option to business leaders.

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

What are the lessons to be learned from this experience against the background of the concept of systemic competitiveness? First, local firms displayed good performance in the import-substitution

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

### 3.2 The Role of the Central State in an Open Economy

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

approach. Rather, it will have to give in to political pressure and to formulate ad hoc measures. This is precisely what happened in Brazil over the last years, particularly with respect to sectors like textiles, clothing, footwear, and toys.

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

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

Second, central government should stimulate and supervise local and regional industrial policy. Key instruments would be to seek to establish a joint learning process between states and municipalities, to allocate funds on the basis of a competitive sys-

tem (i.e. to allocate them to those regions which come up with reasonable, widely shared strategy proposals), and to inhibit the incentive competition that is currently underway between states, e.g. by establishing ceilings for subsidies to private firms and by setting up a supervision mechanism similar to the one which works quite well in the EU.

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

#### **4 Obstacles to Systemic Competitiveness in Paraguay**

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

The increasing interest of Paraguayan policymakers in industrial development reflects the fact that both pillars have begun to crumble or may begin to crumble in the coming years. In the agricultural sector the times of easy growth are over, as most of the arable land in the fertile eastern part of the country is now under cultivation, and is suffering from declining productivity. Maintaining current agricultural output levels, to say nothing of

growth, will require changes in production practices.

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

#### 4.1 Structure and Importance of Industry

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

- In a speech given in late 1996,<sup>44</sup> the secretary of industry and commerce claims that industry contributed about 16 % to GDP in each of the last ten years, and that 30,000 firms employ 187,000 persons, a bit more than 11 % of the economically active population. He states that the most important branches are food process-

ing (33.5 %), wood processing (15.2 %), beverages (10.3 %), and textiles (probably including garments, 6.3 %).

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

Another report, prepared for ALADI, shows that the revealed comparative advantage of Paraguayan exports lies in agriculture-based products,<sup>47</sup> which is not surprising in a basically agricultural country that has never experienced much of a policy aimed at creating competitive advantages in industry.

#### 4.2 Obstacles to Industrial Development in Paraguay: An Overview

Existing studies show that firms see a number of problems at the macro- and mesolevels that inhibit their growth. A survey conducted by the World Bank identified lack of skilled labor as the most important problem, followed by access to credit. Further important problems are political instability, functioning of the judicial system, lack of technical/managerial staff, and high taxes.<sup>48</sup> A seminar

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

44 Cf. Scavone (1996).

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

46 Ibid, p. 4.

47 Cf. Macadar (1996).

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

organized by the Ministry of Industry and Commerce (MIC) resulted in a long list of problems in the fields of financing, taxation, inputs, labor, technology, customs and ports, environmental protection, unfair competition, and technical norms. A series of workshops organized as part of a MIC/GTZ-project indicated a similar set of problems.

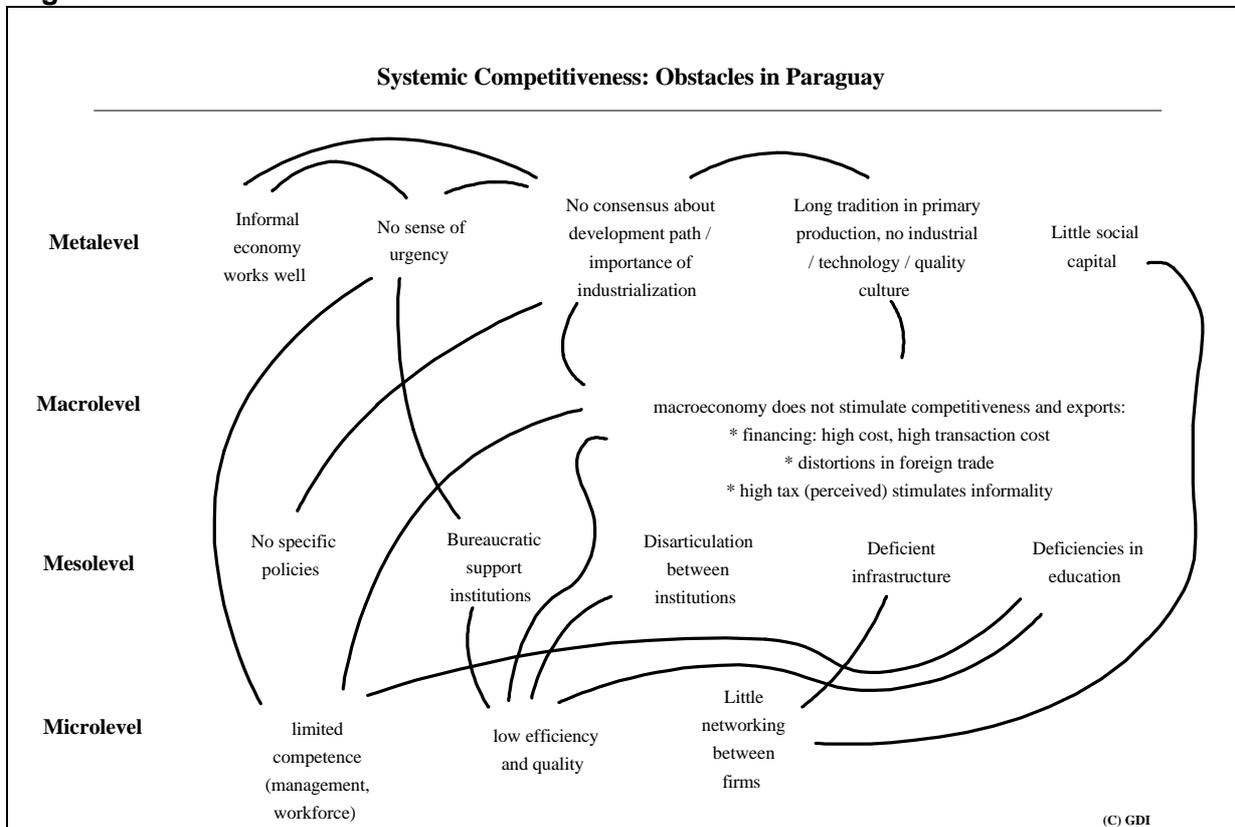
Based on the available reports plus a limited number of interviews with government officials and private sector representatives, it is possible to outline tentatively the obstacles to industrial development in Paraguay. Addressing this question using the framework of systemic competitiveness, we can identify factors on each of the four levels that reinforce each other (Figure 4). As the tourist trade business still functions reasonably well and there is no immediate crisis, there is no sense of urgency among key political actors. This, as well as the lack of an industrial tradition, accounts for the lack of an industrial strategy. The latter two factors may also explain the fact that the macroeconomic framework is not as industrialization-

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

### 4.2.1 Meta- and Macrolevel Factors

A closer look at the factors will best start out with the metalevel. The fact that the informal economy, especially the informal export sector ("tourist trade"), continues to thrive is an observation as surprising as it is important. Attempts to stimulate industrial development in Paraguay have been based on the assumption that this sector will suffer as the liberalization of trade within Mercosur continues; and should this fail to occur, no sense of

Figure 4



urgency (the lack of which has been pointed out particularly by Schwartz / Codas [1996]) emerges. One can only speculate about the perspectives of the informal export sector; its future may in fact not be so bleak, as shopping tours to Ciudad del Este, the main location of the tourist trade, are often part of a larger package that includes visits to the Iguazú waterfalls and the Itaipú dam. Moreover, as sales taxes are lower in Paraguay than in Brazil, it is possible that merchandise will remain so much cheaper in relative terms as to compensate for cost of transportation to Brazilian metropolitan areas. Prices may even decline further if investment projects by East Asian firms (who are the main suppliers of electronics, toys, and other products) for assembly plants close to Ciudad del Este actually materialize.

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

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

- Industry has problems in finding external sources of financing. Private banks offer credit at high interest rates (i.e. above 20 % per year in real terms), which is apparently acceptable for trading firms but not for industrial corporations. Foreign donors have tried to remedy this problem by setting up special credit lines for industry, which are administrated by the Fondo de Desarrollo Industrial (FDI). However, FDI deals not directly with firms but via banks, and the banks are free to add a service charge to the interest demanded by FDI. Moreover, firms complain that access to FDI funds involves

preparing voluminous applications and that the time FDI takes in deciding on applications is too long. FDI counters by pointing at the educational effect of forcing firms to elaborate a business plan or a project proposal that includes serious amortization calculations if they apply for funding, something they would otherwise not do.

- There are certain distortions in foreign trade. For instance, local garments manufacturers complain that they suffer unfair competition from imports of used garments that are charged lower taxes than the local product. Exporters complain that they are charged VAT.
- The across-the-board 30 % tax rate on corporate income appears to make informality an attractive option, especially for micro and small firms.

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

#### 4.2.2 Mesolevel Factors

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

It is as yet difficult to assess the effectiveness of these organizations. According to its own evaluation, Proparaguay seems to work reasonably well,

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

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

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

### 4.2.3 Microlevel Factors

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

Schwartz and Codas<sup>50</sup> found that Paraguayan entrepreneurs have insufficient access to reliable in-

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

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

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

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

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

51 Ibid (1996).

52 Cf. Altenburg (1995).

### 4.3 Systemic Competitiveness in Paraguay: Elements of an Industrial Strategy

Looking at Paraguay through the lens of systemic competitiveness leads to the conclusion that conditions are particularly favorable neither for dynamic industrial development nor for industrial strategy formulation. It would be unrealistic to propose formulating a grand design; observers like those<sup>53</sup> who tend to propose this are neglecting the incentives and restrictions faced by policymakers in the

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

Looking at this brief and undoubtedly superficial SWOT analysis, one can rule out certain options. First, Paraguay will find it difficult to attract medium- or high-technology industries which demand a higher-qualified workforce and a well-developed supporting environment of firms and mesoinstitu-

<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• stable macroeconomic framework</li> <li>• investment incentives</li> <li>• low wages</li> <li>• agricultural base</li> </ul>	<p><b>Opportunities:</b></p> <ul style="list-style-type: none"> <li>• Strategic location in Mercosur</li> <li>• Easy access to Mercosur markets</li> </ul>
<p><b>Weaknesses:</b></p> <ul style="list-style-type: none"> <li>• few internationally competitive firms</li> <li>• low qualification of labor force</li> <li>• no national innovation system</li> <li>• limited credit for industrial firms</li> <li>• limited government funds</li> </ul> <p>=&gt; comprehensive absence of systemic competitiveness</p>	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• Competition from Mercosur countries and elsewhere</li> <li>• Lack of vision in industry-related policymaking</li> <li>• Mutually neutralizing support from donor agencies</li> </ul>

country. In particular, it would be inappropriate to formulate a strategy that aims mainly at meta- and macrofactors. In other words, trying to create a widely shared sense of urgency and a consensus among key political actors on the necessity of an increased industrialization effort as a first step would not be a promising approach.

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

tions, let alone create them on its own. Second, Paraguay will find it difficult to attract large investments from abroad in capital-intensive sectors like the passenger car industry, since it is not in a position to take part in the multimillion-dollar subsidy and fiscal incentive race underway in Brazil and Argentina.

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

- there are static advantages, especially locally available inputs;

53 Cf. Moon (1996).

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

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

The three elements in Figure 5 – strengthening existing firms, stimulating the emergence of new

firms, and attracting foreign direct investment – should reinforce each other. Both the creation of new firms and foreign direct investment should particularly be encouraged in those branches where it seems possible to create a competitive advantage, and where it is possible to stimulate the emergence of clusters or networks of firms. Possible instruments include

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

In planning concrete activities, policymakers should pursue two paths: first, stimulate, initiate, and continue to support measures aimed at increasing company competitiveness (micro-/meso-level), and second, starting to create a culture of

**Figure 5**



ongoing dialogue between government and the private sector in order to stimulate the emergence of new governance patterns more conducive to mobilizing joint definitions of problems and formulations of strategy (meso-/macro-/metalevel).

### 4.3.1 Stimulating Firm-Level Competitiveness

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

This kind of exercise should take place, at least initially, in a triangular structure involving firms, a business association, and just one mesoinstitution (to limit complexity), with the government coordinating and moderating the exercise (Figure 7). It should involve a group of firms, preferably from the same branch of industry, because collective

learning among firms, i.e. learning from each other's experience, is a crucial element in creating competitiveness; in advanced countries this is by far the most important element in technological learning processes that go beyond the boundaries of the firm. A group-oriented approach is preferable, since support should not target just one individual firm in that assistance should encourage rather than distort domestic competition; firms must learn to compete and cooperate at the same time. The exercise should involve a business association because business associations generally play a crucial role in a competitiveness-oriented environment, both by assisting member firms and by articulating their member firms' demands on the government and other actors. It should involve a mesoinstitution in order to create a culture of cooperation between firms and supporting institutions, and to initiate as early as possible joint learning processes, since not only firms but also mesoinstitutions have to upgrade and learn to cooperate. The next step will then be implementing concrete measures in three different areas, namely within firms, between firms, and between firms and mesoinstitutions.

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

54 Schwartz / Codas (1996), pp. 3 - 4.

**Figure 6**

**Figure 7**

It is important to devise this strategy as an open process, i.e. not to define a priori the main fields of activity, or to define them based on academic analyses, without participation of the firms. Nevertheless, it is predictable what kind of projects to increase competitiveness will emerge; likely candidates are training courses for managers and workers, quality programs, and projects that combine increased efficiency with reduced environmental damage (eco-efficiency).

Regarding support for the creation of new firms, it is important to point out two aspects. First, support of the creation of new firms should not be limited to a too small number of sectors. The central aim is to create an environment that is favorable to the setup of new firms. The choice of the sectors and markets should be left to entrepreneurs; it is likely that they have a good sense of market opportunities. Only if it becomes apparent that sectors in which Paraguay has obvious potential are not thriving should the state try to encourage the creation of new firms in specific sectors.

Second, there are a number of methodologies available that have proved helpful in this context; CEFE (GTZ) and EMPRETEC (UN) are examples. In other words, there are alternatives to betting on macroeconomic conditions and just throwing money at might-be entrepreneurs.

As far as foreign direct investment is concerned, it is important to note that there are three sets of factors that make a given place interesting for foreign investors, provided that the more important factor, namely a market, exists and the question is where exactly, in a country or a region, to locate a factory (Figure 8). First, there are hard factors like the availability and cost of infrastructure, the availability and price of labor and real estate, and fiscal incentives. Second, there are soft factors which are directly relevant to the investment. These include the supporting environment at the micro- and mesolevel as well as the licensing process. Third, there are soft factors which are indirectly relevant. These include the macro- and meta-framework conditions as well as the "feeling at home" factor. Moreover, it should be noted that in several industries, for instance the car industry, the subsidies needed to attract foreign direct invest-

ment can be extremely costly ;these may amount to more than 100,000 US \$ per direct job created. Thorough cost-benefit-analysis is therefore crucial before attracting this kind of investment is contemplated.

### 4.3.2 Stimulating New Governance Patterns

Regarding the second point, i.e. creating a culture of ongoing dialogue between government and the private sector, it is first of all necessary to cut the traditional links between the state, a few business groups, and corporatist employers' associations and labor unions.<sup>55</sup> Only afterwards will it be possible to build a new kind of relationship between autonomous actors. It may then be useful to set up working groups which are organized on a topical or sectoral basis and which consist of government officials, perhaps not just from the ministry of industry but also from other agencies, which define certain rules of the game for industry or create obstacles to their dynamic development, and representatives of business associations. These working groups should not just identify meso- and macrolevel obstacles that hinder firms; this has been done repeatedly, and thus far with limited effect in terms of change. The working groups should try to identify the deeper reasons for existing obstacles, their resilience, and possible means of overcoming them. In order to sustain this process and to develop a larger credibility of government, it is essential that the government actually act on the proposals developed in working groups.

Obstacles are more apt to be due to specific partial interests than other factors like neglect or incompetence. These interests may be those of certain sectors of industry. In such cases it may be useful to initiate a negotiation process that includes the interested parties from industry rather than leaving it to the government to come up with a compromise.

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55 Cf. Esser (1997), p. 26.

**Figure 8**

Both processes – strengthening firms and establishing new governance patterns – are intertwined in several ways. The first process addresses the micro- and mesolevels, the second the meso- and macrolevels. Both will lead to changes at the meta-level over the course of time. Moreover, the establishment of new governance patterns to resolve concrete problems at the meso- and macrolevels gives legitimacy to government support measures that aim directly at firms. Firmowners typically believe that things at the firm level are their business, and the macroeconomy is the government's business. It would not be credible if the government tried to influence the firm-level without addressing meso- and macroeconomic obstacles, which are a constant source of frustration for firmowners.

#### 4.4 Conclusion

In developing an industrial competitiveness strategy for Paraguay, it is important to acknowledge a number of don'ts:

- Not to believe that the state can direct and order an industrialization process. Nor that the market alone will stimulate a strong industrialization drive.
- Not to have unrealistic aims regarding the kind of industrial branch that might be the backbone of industrial development and job creation in Paraguay.
- Not to put all your bets on foreign direct investment.
- Not to give in to firms' demands for protection, subsidies, or other specific support. Competitive firms will only emerge as the result of competition. Protected firms engage in rent-seeking rather than trying to improve their competitiveness.

- Not to believe that firms will demand the services of mesoinstitutions just because they are there, and for free.
- Not to forget that successful industrial development is based on networks, that working together in networks is apt to generate conflicts, and that it is crucial to commit one's self to conflict resolution. It is crucial to make sure that networks are sufficiently open, and in particular make sure that they are not captured by corporatist interests.

If these mistakes are avoided, it is possible that Paraguay can develop a much stronger industrial profile over the course of several years. A first step in this direction should be to set up a small number of pilot projects with modest goals and immediate benefits that involve a limited number of firms, and to publicize widely the positive experiences which emerge. The effort of the key actors (MIC and its affiliated bodies, business associations, and firms) should be guided by a vision that encompasses the long-term goal of systemic competitiveness and a clear understanding of the specialization profile that Paraguay should strive for.

## 5 Retreat of the Development State? New Directions in Korean Industrial and Technology Policymaking

In 1996 the Korean economy entered a downturn in its business cycle. The 1996 economic slowdown has been viewed by many observers as an indication of a deep-rooted structural crisis calling for a fundamental adjustment of corporate management and overall economic management. In particular, the weakening of the economy is seen to have been caused by the inability of the Korean economy to keep up with the worldwide trend toward liberalization and globalization. Even quite a few statements of Korean policymakers over the last few years create the impression that the country's approach to industrial and technology policymaking was a wrong one, and that it is high time for a major reform of existing governance patterns focusing on deregulation and liberalization. This

view is largely supported by main-stream economists and the business community. At the same time, however, another school of thought persists in maintaining that future challenges can only be met if the state continues to assume an active role in shaping socioeconomic structures. A closer look reveals, indeed, that Korea – while redefining the roles of government, the business community and other stakeholders – still relies on a multidimensional governance pattern with the State acting as regulator, initiator, coordinator, promoter and catalyst, and taking the lead in formulating long-term visions for the society as a whole and for techno-industrial development in particular. At the same time, however, in view of the growing complexity and internationalization of the economy, the general approach to managing the implementation of long- and medium-term strategies for techno-industrial development has changed over the last years, with more emphasis being placed on strengthening market forces, decentralized economic decision-making and participatory planning procedures. In this paper it is argued that this approach to coping with industrial and technological change in a turbulent international environment and a globalizing world economy is still a sound concept. In particular, it should not be made responsible for the country's debt and currency crisis, which came rather as a result of a fundamental weakness of the financial system and its poor regulatory framework. Countries seeking a new best practice in the making of industrial and technology policy should therefore continue to carefully study the Korean approach in these areas.

### 5.1 The Challenges to Korean Industry and Policymakers Ahead

With a current account deficit of about 24 billion US \$ in 1996 – the second largest deficit worldwide after the US –, an external debt of around 140 billion US \$, the 1997 GDP growth rate down to 6 % from 9 % in 1995, drastically reduced profit margins in Korean industry, spectacular bankruptcies (Hanbo, Sammi Steel), and Kia – the eighth largest *chaebol* – placed under a government-orchestrated protection scheme, Korea was generally seen to have lost its international com-

petitiveness and to be in a major structural crisis well before the turmoil in currency and equity markets in Southeast Asia – that had started in Thailand in early July 1997 – reached the country in November 1997. The way out of this crisis will be not be easy and will require far-reaching reforms on a broad front at the micro-, meso- and macrolevels.

### Challenges at the Macrolevel

Until recently, Korea had generally received high scores for its good macroeconomic management. Prudent fiscal and monetary policies have kept inflationary pressures low and created a macroeconomic environment that encouraged high savings and investment rates. Also, gradual adjustments of the exchange rate enabled the country to avoid any persistent overvaluation of its currency and emergence of an anti-export bias in the overall system of incentives, although it is generally accepted that better fine-tuning of exchange rate management would have been needed to improve the overall trade balance. For example, since early 1995, exchange rate management allowed the Korean currency to appreciate against the yen by around 17 % until April 1997. As a 10 % rise in the won's value against the yen translates into an estimated loss of some 4 billion US \$ in Korean exports over a two-year period, the country's potential to raise exports was negatively affected.

However, the foreign exchange crisis in late 1997 when the won depreciated against the US currency by nearly 100 % was basically not triggered by Korea's too rigid currency regime and insufficient fine-tuning of exchange rate management, but rather a result of the long-criticized fundamental defects of the financial system. In particular, poor financial supervision of state-owned and commercial banks, lax lending policies of the financial institutions, widespread cross-financing and cross guarantees among companies, and easy access for the larger companies to international markets for short-term credits resulted in a highly unsound debt structure with drastic increases in short-term debt over the last three years, amounting to some 70 billion US \$ in 1997. So, when it became clear that

Korean banks and companies would not be able to repay some 30 billion US \$ in foreign-currency loans before the end of the year, and another 30 billion US \$ in mid-1998, the country had to turn to the IMF and became the third Asian nation after Thailand and Indonesia since July 1997 to seek a rescue package from the Fund. As a result of the negotiations with the IMF over a 55 billion US \$ aid package, the country now will have to implement macroeconomic and structural reforms that are long overdue. In particular, the government agreed to strengthen the role of the central bank, to set up a powerful supervisory institution to oversee the financial markets, to restructure the banking sector, to open up capital markets, and to pressure the *chaebols* to improve their debt ratio and to phase out cross subsidies and cross guarantees among their subsidiaries. Moreover, the government will have to tighten monetary and fiscal policies, to liberalize labor laws and the trade regime. In the new macroeconomic environment financial and economic restructuring will not be smooth, and companies will have to improve their productivity and strengthen their competitiveness under the condition of a low-growth or even no-growth economy over the next few years.

### Challenges at the Microlevel

With a monthly wage rate of around 1,500 US \$ for a skilled worker, Korea now has the second highest wage level in Asia after Japan. More importantly, the country is seen as having become a "high-cost, low-efficiency location." Between 1990 and 1995 unit labor costs increased by around 14 % p.a. as opposed Taiwan's only 10 % and Japan's only 2.4 %. At the same time productivity increased by only 9 % p.a. Accordingly, in order to compete successfully on increasingly competitive domestic and international markets, companies need to negotiate more modest wage increases and improve productivity by moving to comprehensive strategies for technological modernization, i.e. a combination of best practice technology and best practice of organization. However, despite serious efforts since the early 1980s, in particular on the part of the largest *chaebols* such as Samsung, Hyundai, Daewoo and Lucky Goldstar to expand

their technological capabilities and to introduce modern management concepts,<sup>56</sup> large parts of Korean manufacturing industries are lagging behind in acquiring technological competence and adopting state-of-the-art management concepts. While this holds particularly true for perhaps 85 to 90 % of the some 70,000 small and medium-sized enterprises,<sup>57</sup> the technologically most advanced *chaebol* must also strive hard to achieve and maintain international efficiency standards. For example, while Hyundai needs 26 worker hours to assemble a car, it takes only 16 hours for the best Japanese companies. In ship building, where Korea has established itself as the world's second largest producer, Korean shipyards are also seen as lagging behind their Japanese competitors in terms of level of automation and productivity, having placed too much emphasis in the past on capacity expansion while neglecting technological and organizational innovations.

Overall, it is clear that Korean industries are at an important juncture in their development which indeed resembles a "sandwich situation." On the one hand, Korean industries are facing considerable "pressure from below," as they have more or less lost their traditional competitive edge derived from low labor costs to the second generation of newly industrializing countries, China included, and other emerging economies in Asia such as Indonesia and Vietnam. On the other hand, Korean industries are under heavy "pressure from above," as industries in OECD countries are striving hard to sharpen their competitive edge through a combined strategy of restoring their cost-competitiveness and strengthening their technological competitiveness, thus making it difficult for Korean industries to gain ground on higher-end markets in both OECD and overseas countries. In this context it is interesting to note that in 1996 the trade balance with developing countries showed a surplus in the order of 20 billion US \$ while the trade deficit with OECD countries reached a record high of around 40 billion US \$. This dual structure might be taken as an indication that Korean industries have suc-

cessfully established themselves in the middle of the market, i.e. in product groups of medium technology intensity, while they are still fairly weak in higher- to high-technology product markets. Accordingly, the real challenge Korean industry is facing today seems to be caused more by "pressures from above" rather than by "pressures from below," a constellation which underlines the need for Korean industry to move to broadly based and offensive technology strategies.

### Challenges at the Mesolevel

The current economic crisis is often taken as proof of the ineffectiveness of the country's selective industrial and technology policies, which have targeted specific industries and technologies, favored the growth of large enterprises at the expense of small and medium-sized companies (SMEs), and protected the industry via a host of tariff and non-tariff barriers. These policies, together with a misdirected credit policy, are seen as having led to an inefficient allocation of resources on a large scale, hampered the emergence of a competitive industrial sector and slowed down the country's move to a concept of productivity- and technology-based growth. Here it is interesting to note that the Korea Examiners' Report produced in the context of the 1996 OECD review of Korea's national science and technology policy<sup>58</sup> concluded that the Korean R&D system still presents features typical of developing countries in terms both of structure and level of effort.<sup>59</sup> In particular, the Korean examiners maintain that Korea's indigenous technological base is too narrow, with the other weak points being

- the overly reliance on technology imports and a negligible contribution to world science;
- a science and technology policy that has tended and continues to emphasize a technology-push approach rather than a demand-driven approach and that is at the same time

56 Cf. Hillebrand (1996), Part II, Chapter 4.

57 Cf. Hillebrand (1992).

58 Cf. OECD (1996).

59 Cf. MOST (1996a) p. 4.

too mission-oriented and not sufficiently diffusion-oriented;

- a set of poorly linked policy measures, i.e. the different strategic national R&D projects, which appear to lack a certain coherence, not least as a result of the lack of coordination and related ministerial rivalries;
- insufficient S&T-based actions in favor of local and regional development, and often not well developed interaction between industry and the scientific infrastructure, which is also true for Daeduck Science Town, established since the mid-1970s, with its some 10,000 scientists (in about 40 R&D centers);
- too low a research intensity of Korean industry in general, which translates into an insufficient techno-industrial base in such sectors as measurement instruments, machinery, mechanical and electrical equipment and semi-conductors; and
- an insufficient number of innovative small and medium-sized enterprises.

Whether these weaknesses – alleged or real – can really be used as an argument against active and selective industrial and technology policies, has to be doubted, however. Establishing internationally competitive industries has become an ever more demanding task and a moving target, as this process has to be managed in an era of radical technological and organizational change and increased globalization of the world economy, resulting in ever tighter competition in world markets. Against this background, a more positive interpretation of what has been achieved in Korea over the last decades seems justified:

First, it should not be overlooked that Korea has succeeded in establishing the world's fourth largest electronics industry, the second largest shipbuilding industry, and the fifth largest automotive industry. It is hard to see that these developments would have been achieved without selective policy interventions. For example, a recent study on the performance of Asian NICs, including Korea, in information and communications industries con-

cludes<sup>60</sup> that the success of Asian NICs in this sector is, in part, due to strategic and selective support to information technology.

Second, Korea has also clearly made impressive strides in deepening its industrial base: for example, expenditures on R&D increased from a mere 300 million US \$ in 1980 to around 4.5 billion in 1990 or from only 0.7 % of GDP to 2.1 %. Today, R&D expenditures are approaching the 10 billion US \$ mark (2.4 % of GDP in 1995), of which some 70 % are spent on the advancement of industrial technologies. For the end of this decade the overall target is to increase the relative R&D intensity of the economy (expenditure on R&D as a proportion of GDP) to 4 %.

Third, as regards the R&D intensity of the manufacturing sector, Korean industries are actually devoting some 2.4 % of total turnover to R&D, which is no longer far from the average OECD figure of around 3.5 %. And the number of R&D departments or centers in the manufacturing sector, the first of which was first established by Lucky Goldstar in 1975, increased to around 1,500 in the year 1993.

Fourth, due to well targeted manpower policies, considerable success has also been achieved in the field of human resource development. Public spending on education (all levels), which averaged already about 4 % of GDP in the early 1980s, has increased to 6.5 % of GDP since the mid-1980s. When private spending is added, education is likely to account for more than 10 % of GDP, placing the country among the top performers worldwide. And, more specifically, since the early 1990s, the number of graduates from the engineering and natural sciences with a technician's, bachelor's or master's degree entering the labor market each year has increased to around 60,000 some 1,200 of whom hold a Ph.D. Also, it should not be overlooked that with its roughly 46 scientists and engineers per 10,000 working population in 1993, Korea is no longer far from the OECD average of 50, although it should be kept in mind that the share of re-

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60 Cf. Hanna et al. (1996).

searchers with a master's or Ph.D. degree is still much lower compared to the share of the OECD countries.

Finally, while Korea has invested heavily in developing an indigenous R&D capability and human resource base, it has complemented these efforts over the last 15 years by importing best practice technologies on a large scale (in the order of about 10 % of GDP p.a.), namely via imports of capital goods, licensing agreements, consultancy services, and from around the second half of the 1980s, increasingly also via foreign direct investment.

Taking all the indicators together, it seems to be justified to conclude that Korea, from the early 1980s, has achieved remarkable success in deepening its industrial base, matched by a few other emerging economies only, i.e. Taiwan and Singapore. The contention that Korea's R&D system has still the typical feature of a developing country, thus does not seem to do justice to what has been achieved over the last two decades.

## 5.2 Toward Effective Forms of Selective Industrial and Technology Policies

While Korea needs to accelerate the pace of liberalization and deregulation, the question whether Korea should abandon its approach of selectively intervening in and guiding the market remains a controversial issue. In fact, a closer look reveals that Korea continues to actively shape the development of its industrial and technological base with a view to building an advanced industrial society by around 2015. The overall long-term visions are

- to prepare for the era of globalization by opening up the economy and internationalizing society by adopting new ways of thinking (*se-gyehwa*),
- to establish Korea – now the world's 11th largest economy, with a per capita income of around 10,000 US \$ – as the seventh world economic and technological power by 2005,
- to create a science-based and learning and information society by around 2015, and

- to move to a concept of sustainable development by around 2005.

To these ends, Korea continues to rely on a governance pattern for industrial and technological development that shows that a stronger reliance on market forces is not necessarily at variance with the practice of industrial and technological targeting as long as selective interventions are based on participatory planning procedures and the creation of policy networks involving all relevant actors, i.e. central and local government, academia, business groupings, and companies. In what follows, three examples illustrating this basic approach to industrial and technology policymaking – the HAN Project, the strategic national R&D project "Bio-tech 2000," and the strategy to build an information society – will be briefly presented and analyzed. It is important to note, however, that the brief description is based on desk research only. A fuller and more balanced account of the ongoing initiatives would have required intensive discussions with the different stakeholders concerned. Most likely, such a broader approach – beyond the scope of the present paper – would reveal that the way from participatory design of strategic blueprints to their actual implementation is a long and conflict-ridden one.

### Targeting the Development of Core Industrial Technologies – The Highly Advanced National Project 1992 – 2001 (HAN-Project)

The first national R&D program, initiated by the Ministry of Science and Technology (MOST) in 1982, was entirely government-initiated and -funded. The second national R&D program, implemented by the Ministry of Trade and Industry since 1987, deviated from the MOST approach in that it emphasized a co-funding mechanism to involve both government and participating industries.

As compared to these earlier initiatives, the process from project identification to implementation adopted by the HAN-Project, launched in 1992, has undergone substantial changes. The main features of the overall management approach to implementing the HAN Project, which aims at turning Korea into one of the top seven technologically

advanced countries by the year 2001, can be summarized as follows:

- **technological targeting based on participatory planning and informed decision-making:** in line with and part of the general approach adopted for the preparation of the seventh five-year plan, 1992 - 1997, which emphasized

<b>Category</b>	<b>R&amp;D Projects</b>	<b>Period</b>	<b>Target Technologies</b>	<b>Investment<sup>a</sup></b>
Product Technology	1. New drugs and new agro-chemicals	1992 - 1997	To develop 2 - 3 new antibiotics & germicidal agents	246
	2. B-Integrated Service and Digital Network (ISDN)	1992 - 2001	To produce prototype products of 10 giga-ATM	856
	3. Next-generation vehicle technology	1992 - 1996	To develop an electric car of 120 km/h speed	563
	4. Development of ASIC Technology	1995 - 1998	To develop ASIC design technology for digital HDTV	128
	5. Development of advanced technologies for flat panel displays	1995 - 2001	To develop large-size (40" - 55"), full color, plasma display panels	228
	6. Development for 1995 - 2001 Biomedical Engineering	1995 - 2001	develop biomedical technologies for the diagnosis, rehabilitation, and prevention of diseases	217
	7. Development of micro-machining technologies and micro-machines	1995 - 2001	To develop micro-machining technologies to make micro-parts or micromachines	103
Fundamental Technology	8. Next-generation semiconductors	1993 - 1997	To develop basic & core technologies for making a superintegrated semiconductor	244
	9. Advanced material for information, electronic and energy	1992 - 2001	To develop 30 kinds of new advanced materials	240
	10. Advanced manufacturing systems	1992 - 2001	To develop FIM, CIM & IMS	549
	11. New functional biomaterials	1992 - 2001	To develop process technology of bioactive, new material for commercialization	483
	12. Environmental technology	1992 - 2001	To develop core technologies	289
	13. New energy technology	1992 - 2001	To develop fuel cell systems	357
	14. Next-generation nuclear reactor	1992 - 2001	To develop concept and basic design	297
	15. Development of Advanced Superconduction Tokamak	1995 - 2001	To develop compact, steady-state-capable, advanced superconduction tokamak	188
	16. Development of human sensibility ergonomics technology	1995 - 2001	To develop quantitative measurement and evaluation techniques for understanding human responses to comfort and subject feeling	81
	17. Development of Satellite image Date Processing Technology	1996 - 2001	in the planning stage	-
Total	17 Projects			5,069
a (US \$ mill.)				
Source: Ministry of Science and Technology (1996b)				

openness, transparency and consensus-building efforts by integrating the views from different social strata, the process of identification of a select number of core technologies involved experts from government, public and private research institutes and the business community. It was based on a systematic survey of key technology areas at world level with a view to identifying those fields of generic technologies where Korea was seen to have a potential capacity to compete with the advanced countries based on Korea's existing industrial foundation. As a result, 11 core technologies were initially selected, the number of which was increased to 17 (Table 2) after a review at the beginning of the second phase of the HAN Project starting in 1995. Within these 17 fields several hundred subprojects are set to be promoted.

- **joint implementation and financing:** Building on earlier efforts, as manifested by a number of laws, i.e. the Industrial Technology Research Consortium Act of 1986 and the Cooperative R&D Promotion Law of 1993, enacted to encourage tight cooperation among government-supported research institutes, academia and private industries, the HAN Project research particularly emphasized cooperation throughout the project cycle from planning, managing and evaluation. At the same time, industry is expected to make serious efforts to match government funds with its own resources, on the order of 30 to 50 % of project costs, in particular if the stages of commercialization and diffusion are reached. If projects succeed, industry will have to refund government subsidies and firms will receive licensing fees prorated according to their contributions.
- **international cooperation:** Rather than relying on its indigenous R&D potentials only, joint research activities among domestic and foreign researchers will also be encouraged, though on a selected basis.
- **monitoring and evaluation:** In order to decide whether the different projects merit further efforts, all projects will constantly be monitored and reviewed.

Although it is still too early to say whether the HAN initiative will meet its highly ambitious overall objectives, the general approach adopted to technological and industrial targeting, with its emphasis on participatory planning rather than a top-down approach to technological decision-making, seems to be well in line with the practices followed in OECD countries and close to the emerging best practice in formulating and implementing active and anticipatory technology and industrial policies.

### **Managing Technological Capacity-Building in Strategic Industries – Example: "Biotech 2000 Program"**

Recognizing that the 21st century will be an era of information and biotechnology, the Kim Young Sam government identified biotechnology as one of the strategic national R&D projects, the other ones being computer software, aerospace technology, nuclear energy, and marine technology. Building on earlier efforts, namely the 1983 - 1991 biotechnology development plan, the "Biotech 2000 Program" aims to bring Korean scientific and technological capabilities to the levels of the world's leading countries. Under the 14-year development plan (1994 - 2007) a total of 10 strategic projects – including relevant projects of the HAN initiative – in six core areas (bio-materials, health care, agriculture and foods, biosafety, alternative energy and basic life sciences) involving an investment of 20 billion US % are to be promoted.<sup>61</sup>

As is clearly reflected in the government's activity calendar (Box 1), the overall approach to program identification and formulation, has – as in the case of the HAN initiative – sought from the very beginning to intensively involve all relevant actors in the process of program identification and formulation and seems to have contributed to the emergence of a highly interactive biotechnology policy network. In order to ensure its efficient functioning and to secure the efficient implementation of the "Biotech 2000 Program," a total of 10 implementation action plans specifying, among others things,

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61 Hanna et al. (1996).

**Box 1: Government Activity Calendar for Formulation of "Biotech 2000" Program****Dec. 1983 - Nov. 1991**

- The "Genetic Engineering Promotion Law" was legislated (83.12).
- A meeting of the "National Steering Committee for Genetic Engineering Research" was held (85.11) and discussed the "Basic Plan for Genetic Engineering Promotion".
- No follow-up has been made.

**Dec. 1992**

- A Feasibility Study was made for establishing a national strategic plan for biotechnology development by the Genetic Engineering Research Institute (GERI).

**Jan. - Aug. 1993**

- A draft of the National Biotechnology Development Program ("Biotech 2000") was proposed based on the GERI's feasibility study.
- "The First MOST Plan" outlined after the review by an evaluation of panel members representing academia, industries and government research institutes.

**Aug. 18, 1993**

- "The National Policy Council for Genetic Engineering Research" and the "National Steering Committee for Genetic Engineering Research" were organized based on Chapters 6 - 8 of the "Genetic Engineering Promotion Law".
- "The Advisory Council for Biotechnology Policy" was formed as an advisory body for the Minister of the Ministry of Science and Technology.

**Sept. - Nov. 1993**

- An overall evaluation of the draft of "Biotech 2000".
- "The Second MOST Plan" proposed.

**Nov. 21, 1993**

- Reviews on "The Second MOST Plan" of "Biotech 2000" were made by related government ministries including the Economic Planning Board (EPB), Ministry of Trade, Industry and Energy, Ministry of Agriculture, Forestry and Fisheries, Ministry of Health and Social Affairs, Ministry of Education, Ministry of Finance, and Ministry of Environment.

**Dec. 3, 1993**

- A meeting of "The National Steering Committee for Genetic Engineering Research" was held, and it was decided to submit the "Biotech 2000 Program" for a review by the "National Policy Council for Genetic Engineering Research".

**Dec. 13, 1993**

- A meeting of the "National Policy Council for Genetic Engineering Research" was held and finally approved the "Biotech 2000 Program" as a national program.

Source: Ministry of Science and Technology (1996c)

the roles and responsibilities of the different actors have been formulated. Among the organizing principles – which come very close to those of the HAN Project – the following stand out:

**Government:** The government will assume a role as a regulator, initiator, coordinator, promoter and catalyst. To prepare for its role as a **regulator**, for

example, a Committee for Reformation of Institutional Systems for the Promotion of Biotechnology was formed in 1994, with specialists from universities, research institutes and government officials. The suggestions put forward by the committee will be reviewed by the Advisory Council for Biotechnology Policy. If approved by the National Policy Council for Biotechnology Research, a government

agency, the proposals will be used as a basis to amend existing legislation or introduce new legislation. As regards the government's role as an **initiator, coordinator, promoter and catalyst**, each of the participating eight ministries will prepare its own action plan and, in this process, involve relevant government agencies, research institutes and bioindustries, and appropriate counterparts throughout the world, namely from the US, Japan, the EU and developing countries such as China, Malaysia, Thailand and Brazil.

**Business:** The bioindustries participating in the program, most of them grouped in voluntary sectoral associations, i.e. the Korean Genetic Engineering Research Association, created in 1984 (19 members), and the Bioindustry Association of Korea, established in 1992 (56 members), are not only expected to actively engage in the joint formulation and implementation of the different R&D projects but also to engage in financing the different projects, in particular those focusing on applied research. For the first phase of the program from 1994 to 1997 the expected volume of matching public investment with funds from the industrial sector was in the order of 1.3 billion US \$, although this target is not likely to have been met in reality.

### Strategic Management to Prepare for the Learning and Information Society

In Korea the electronics industry has been considered as a strategic industry since the mid-1960s, with the Electronics Industry Promotion Act of 1969 being the first major step to a systematic approach to building technological capabilities in electronic, information and communications industries. While the government initially concentrated on fostering a select number of *chaebols* to spearhead the country's entry into information and communication industries (ICTs), in particular in consumer electronics and semiconductors, it soon started to design a strategy to create a diversified and technologically advanced ICT sector, and to view ICTs as a generic technology offering a broad spectrum of externalities for downstream industries and the development of a national information in-

frastructure. As a result of around 30 years of highly focused efforts, Korea has become one of the most informatized societies in the industrializing world,<sup>62</sup> and is in the process of implementing one of the world's most ambitious strategies to build an advanced information society.<sup>63</sup>

Discussions in Korea on the concept of an information society as a relevant long-term vision for the country started already in the early 1980s. After a series of preparatory steps since the mid-1980s, the Korean government, in April 1994, announced a major initiative aimed at advancing the Korean Information Infrastructure (KII) as a cornerstone to build an information society. In March 1995, an action plan for the KII prepared by the Korea Information Infrastructure Task Force was presented. The main goal of the KII Plan is to connect every home, school, library, hospital, governmental agencies by the year 2015 through an information superhighway exchanging a variety of information in various forms (voice, data, picture, etc.) at high speed. In another major initiative toward the information society, the National Assembly passed in August 1995 "The Basic Law for Promotion of Informatization" and enacted it in January 1996. The purpose of the Law is to promote informatization of society, to nurture the multimedia industry, and to develop an advanced information infrastructure. The implementation of the KII Plan spans 20 years, from 1995 to 2015, with expected total expenditures of 60 billion US \$, of which more than 95 % will be provided by the private sector.

In this context, it is important to note that – as in the case of the "Biotech 2000 Program" – another task-specific though broadly-based policy network has been created with a view to pooling the country's resources. To orchestrate its move toward an information society, the Korean government first organized the Policy Committee for the KII to systematically and effectively implement the building of KII. It is headed by the Prime Minister

62 Cf. Hanna et al. (1996), p. 112.

63 Cf. Oh (1996), the major source of the following sections.

and consists of the all ministers concerned. The Executive Committee, chaired by the Minister of Finance and Economy, is organized under the Policy Committee. Second, the implementation of the KII Plan will be coordinated by the Korea Information Infrastructure Task Force (KIITF), which is a part of the Ministry of Information and Communication (MIC) and has established close links with all relevant stakeholders in the public and private sectors and the science community. As an initial step, the KIITF has established four basic principles for the KII structure. First, the private sector should assume a leading role in KII. Second, the government should actively reform rules, regulations and policies in order to promote innovations and fair competition in the ICT sector. Third, information on the importance of ICTs and the concept of an information society should be made available to every citizen. Fourth, the harmonious relationship between the private sector and government should be promoted. In addition to that, in March 1995 the KIITF released a detailed phased strategy for implementing the KII comprising five major action plans, i.e. construction of the New Korea Net-Government and New Korea Net-Public, development of key technologies, establishment of testbeds and promotion of pilot projects.

Overall, taking all the ICT and information-society-related initiatives together, it becomes clear that Korea's strategy for moving to a learning and information society here too goes well beyond the orthodox philosophy of economic management according to which government should focus on its role as a regulator and arbitrator and restrict public action to creating a market-friendly business environment. As in the case of the HAN initiative and the "Biotech 2000 Program," the Korean government has clearly opted for a broader role to support technological capacity-building in ICTs and to advance the concept of an information-society by acting as a regulator, initiator, coordinator, promoter and catalyst. Looking at the ongoing and far-reaching information society-related initiatives in OECD countries such as the US, Japan, and also Germany, it becomes clear that the Korean approach to actively shaping the country's transition to an information society is by no means a unique one but has rather been modeled along the

lines of the emerging new best practice in OECD countries. It is also well in line with the strategy of building a national information infrastructure as proposed by international agencies and bodies.<sup>64</sup>

## **6 Balancing Economic and Environmental Performance – Prospects for Eco-efficient Industrialization in Thailand**

Over the past 25 years Thai industry has grown at impressive rates. It has increasingly become more diversified and export-oriented. Future industrial growth will critically depend on the industry's ability to move to a concept of technology- and productivity-based growth.

At the same time, due to three reasons there is an urgent need for Thai industry to improve its environmental performance.<sup>65</sup> First, the environmental load resulting from manufacturing has reached unsustainable levels. Second, export-oriented companies which are not moving to cleaner production concepts are likely to face enormous difficulties in surviving in export markets. Third, Thailand needs to meet its obligations under Agenda 21.

Whether the process of introducing cleaner production methods in Thai industry has started already, is a controversial issue. To be sure, the number of companies moving to cleaner production is still very small. Even so, there is an emerging group of environmentally proactive larger and medium-sized companies. In the medium-term, market pressures, in particular in export markets, and growing public awareness are likely to put pressure on more companies to green their business. However, the real problem seems to rest with the some 70,000 smaller and medium industries which are not exposed to these pressures and which do not have the potentials and management skills necessary to introducing cleaner production concepts. Also, in view of the many constraints, namely a

64 Cf. UN Commission (1997); Mansell / Wehn (1998).

65 Cf. TDRI (1990).

weakening economy, an exaggerated focus of most Thai entrepreneurs on improving their cost competitiveness, weak public and private mesolevel support structures, and a persistent command- and control-oriented regulatory framework, the process of introducing cleaner production concepts on a broader scale will be a fairly slow one. In order to speed up this process, an integrated approach to environmental capacity building will become necessary.<sup>66</sup> A closer look at the ongoing initiatives at the meta-, macro-, meso- and microlevels reveals both strengths and weaknesses of the country's approach to moving to a concept of eco-efficient industrialization.

### **6.1 Moves to Cleaner Production in Thai Industry – Optimist and Pessimist Views**

The question whether there is a trend in the Thai manufacturing industry to introducing cleaner production concepts is subject to a substantial controversy among managers and industry experts. Two schools of thought might be distinguished, a pessimist and an optimist one:

The main arguments of the "pessimists" seem to be the following: a) Thai industry is under heavy competitive pressure. Accordingly, companies cannot mobilize sufficient funds to green their business. b) The awareness of Thai industry of the need to move to cleaner production concepts is not sufficiently developed. Environmental management is totally new to Thai Industry. c) The regulatory framework, i.e. government policy, does not send sufficiently clear signals to the local and international business community to green their business. Government largely relies on command and control instruments. At the same time, the capacity to enforce existing rules and regulations is very weak.

The "optimists" seem to largely share the arguments of the "pessimists" but come to different conclusions. According to the views of the "optimists" Thai industry has already come under heavy

pressure to move to cleaner production concepts. The main pressures are on the important group of export-oriented companies. They stem from the ever stricter legislation of overseas clients in OECD countries, international codes of conduct, and an increase in importance of sector-specific voluntary guidelines. Moreover, at least the large export-oriented companies as well as quite a few larger companies oriented to the domestic market are seen as anticipating already both an increase of awareness of the general public in Thailand as well as a changing regulatory regime over the next few years, with more emphasis being placed on market-based instruments.

On balance, it seems that the various pressures have already led to the emergence of a fairly important group of proactive companies, a group which is likely to become larger in the medium term. The real problem with regard to the greening of Thai industry seems to rest with the some 70,000 smaller and medium-sized companies which so far are not exposed to the same pressures as the export-oriented and larger companies and which do not have the resources and potentials to introduce cleaner technologies.

### **6.2 Challenges for and Responses of Proactive Companies**

In order to shed some light on the ongoing controversy, to better understand the processes in the Thai manufacturing sector with regard to the introduction of cleaner production concepts, a company survey was carried out by a joint GDI/TDRI research team in March 1996. The survey aimed in particular at the group of proactive companies, i.e. companies which – according to the views of industry specialists – were seen to have undertaken a number of steps toward greening their business.<sup>67</sup>

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66 Hillebrand et al. (1998).

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67 The survey included 12 larger and medium-sized export-oriented American, Japanese, German and Thai companies in the fields of textile/clothing/dyeing, agro-industry, electrical/electronics industries and chemicals/pharmaceuticals, and one large US-American trading company specializing in tuna trade. See Hillebrand et al. (1998), Chapter II.

On balance, it seems that within the group of proactive companies the introduction of cleaner production methods is well under way. Also, the barriers to initiating the move to cleaner production are astonishingly low for these companies. The picture is, however, likely to change substantially when smaller companies with little or no experience in the field of international enterprise cooperation are considered. This group, which is the largest group in terms of numbers, faces different starting conditions. They cannot draw on the resources of parent or overseas' companies, have more difficulties in general to obtain credit, and are not used to accept pack-back periods for "green investments" longer than, say, a year.

### Overall Approach to Environmental Management of Surveyed Companies

Environmental management (EM) should basically be viewed as part of the overall management approach of a company, and it includes the organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the company's environmental policy.<sup>68</sup> On balance, the company survey revealed the following trends:

**1. Lack of comprehensive approach:** The surveyed companies – except one company, i.e. a producer of electrical components – have in fact started introducing cleaner production concepts. Around half of the companies are moving to an EM concept which emphasizes the precautionary principle, i.e. a policy that invests in pollution prevention rather than clean-up. However, EM is not yet based on a comprehensive concept along the lines of schemes such as "life-cycle-assessment" or ISO 14000. Written statements on EM for internal use exist in four companies and two companies only publish an environmental report (on an irregular basis) and conduct an internal environmental audit.

**2. Positive impact on competitiveness:** Seven of the companies felt that the impact of environment-related expenditures on their competitiveness is a rather positive one as the higher costs had largely been compensated by cost savings, namely through reduced costs for energy, water and waste disposal. Higher productivity resulting from improved work ethics and corporate identity, and a positive impact on sales were also mentioned but were clearly of lesser importance. Two companies took a neutral stance, stating a negligible impact on their competitiveness while three companies stated that the impact of environment-related expenditures on competitiveness was negative or very negative.

**a) costs/expenditures:** When asked for an educated guess, three companies stated that they had spent less than 1 % of their annual turnover on environment-related expenditures. Five companies estimated that the ratio would be in the order of 2 % or more.

**b) payback periods:** The length of payback periods for environment-related major investments depends very much on the fields and nature of investments. Energy- and water-saving-related investments are generally those with the shortest payback periods. In case of high front-end investments for installing cleaner production lines the payback periods are certainly much longer, easily exceeding five years. According to the survey, the minimum payback period was two years, which is already very long under Thai conditions. In five companies the estimated back-back period was five years or more.

**3. Process innovations:** The introduction of cleaner **process** technologies does not focus any longer on end-of-pipe solutions. Companies rather adopt a balanced strategy combining the precautionary principle with pollution-control measures at the final production stages. In addition, energy-saving measures also receive high priority. Five companies stated that process-related RD&E takes or will take into account environmental aspects.

The focus of introducing cleaner production concepts is clearly on cleaner production processes **within** the companies; only a few companies are already giving preference to "green" suppliers. Therefore, the spill-over effects on other industries

68 Cf. Tibor / Feldman (1996), p. 47.

via backward linkages are still very weak or negligible, although some companies stated that this aspect of EM is likely to become more important in the medium term. Overall, it is clear, however, that the companies have hardly started to formulate business and purchasing policies that favor green suppliers or to support suppliers who are environmentally conscious.

**4. Product innovations:** As compared to the companies' efforts at improving the environmental friendliness of their production process the measures aimed at moving to the production of cleaner products are less pronounced. This is largely due to the fact that although products are partly adjusted to local conditions, the products produced are standard OECD products in terms of environmental norms, and product development is still done by the parent companies. Accordingly, environment-related product standards are the same for both the domestic and export markets. Even so, the move to environmentally more friendly products seems to be under way in nearly half of the surveyed companies. Some five companies have started to increasingly use recycled or biodegradable materials. Design for disassembly, which will become very important in sectors such as electronics/electrical industries might be considered by the parent company of one of the two companies producing electrical goods. Four companies stated that product-related RD&E carried out in Thailand explicitly takes into account environmental aspects. However, none of the surveyed companies intends to introduce an eco-label for its products within the next three years.

**5. Sources of technology:** The move to cleaner production is largely based on proven technologies close to the OECD best practice. However, technology transfer and cooperation has so far mainly strengthened the **operational** capabilities of the companies. Environment-related RD&E is still in its infancy, hence adaptive abilities and innovative capabilities hardly exist. Even so, most of the larger companies, including two of the larger wholly Thai-owned companies, seem to have started to develop an in-house engineering capability aimed at reducing energy and water consumption and industrial wastes.

Other companies in Thailand (Thai, foreign) do not play a significant role as suppliers of cleaner technology, although in some cases local companies supplied air treatment technology, filters and measuring and control equipment. Companies from Asian NICs such as Korea, Singapore and Taiwan also played a marginal role as sources for cleaner technologies. However, there were some indications that Asian NICs might emerge as suppliers of water-consumption-related and waste treatment technologies.

### Motives for Moving to Cleaner Production Concepts

The most important motives for moving to cleaner production turned out to be in order of importance a) to secure the company's long-term competitive position in both export and domestic markets, b) a general commitment to cleaner production, c) to anticipate increasing costs for energy, water supply and waste treatment, d) to respond to the demand of customers for cleaner products and processes and e) to anticipate the increasing pressures from the environmental movement in both the export and domestic markets. As compared to these motives and driving forces, other motives, including a) to increase the profitability of the companies in the long term, b) to prepare to meet voluntary guidelines, and c) to respond to the tightening of the environmental legislation in the export and domestic markets, received lower scores.

### Constraints to Cleaner Production

At first sight, the main conclusion that followed from the company survey was somewhat surprising: In general it can be said that regarding the group of proactive companies the barriers to **initiating** the move to cleaner production concepts under Thai conditions are astonishingly low. At present, there do not seem to be major constraints that hamper the companies' move to cleaner production. Neither costs nor inadequate availability of finance or access to information and technology were viewed as major constraints by most companies. However, this picture is likely to change even for

the proactive group of companies if more systematic and ambitious approaches to cleaner production are to be implemented.

**1. Costs:** Of the 12 companies only three (two of the three textile producers; one of the three companies in agroindustry) considered the costs associated with investments for the "greening" of products, and/or cleaner production technologies to be an important or very important problem/ constraint. The main reason why the proactive companies do not view the costs for investing in green technologies as a major constraint seems to lie in the fact that the export-oriented companies have no choice but to green their business in order to stay in the market. As most of the competitors have more or less to shoulder the same financial burden, higher costs are not a major competitive disadvantage. Moreover, in a dynamic context new investments embodying new environmental efficiency standards have to be financed in any case. For example, as part of its regular investment program one textile company plans to purchase a new 20 million US \$ dyeing shop to replace the outdated and highly polluting facility. Last but not least, to a certain extent, new investments in green technologies can also lead to cost savings. Accordingly, the net costs for a company are lower. Furthermore, expenditures on high front-end investments for greening business are not just costs but have to be viewed rather as regular investments which often pay themselves back within a period of two to five years.

**2. Financing:** Inadequate availability of finance was mentioned as an important or very important constraint by two companies only. Overall, the responses of the companies suggest that lack of own funds, inadequate supply or high costs of credit and lack of subsidies are not important obstacles to invest in cleaner technologies.

**3. Information:** Access to information on domestic or foreign sources of cleaner technology was also not seen as a problem. Of the many potential sources of information on cleaner technologies it is the information provided by the parent companies, companies in other OECD countries, companies in Thailand, and trade fairs both in Thailand and abroad which are the most important information

sources. Overseas suppliers of plant equipment and machinery are very active in Thailand, hence the market for environmental technologies is a very competitive one. Compared to these sources the business associations in Thailand are less relevant, although in some cases the Federation of Thai Industries and the bilateral chambers of commerce were also mentioned as important sources of information. R&D institutes in Thailand and abroad as well as professional journals were seen as being of lesser importance. So far, there are two companies only which are using in-house facilities to tap electronic data-bases.

**4. Technology:** According to the survey, the range of existing cleaner technologies, including pollution control and waste treatment technologies, seems to be well in line with the companies' needs. Looking at the two groups of companies, i.e. companies which are wholly owned by Thai entrepreneurs and companies with a foreign involvement, it seems that ownership has so far not been a decisive factor influencing the technological behavior of the companies concerned. As expected, both groups rely on product and process technology mainly from OECD-countries. Concerning the companies with a prominent foreign involvement, nearly all of the product and process technology is supplied by the parent company. In one case used plant equipment was imported. While representing only "90 %" of the OECD environmental standard the plant is still a very modern one in the Thai context.

**5. Human Resources:** Of the six problem areas, the human resource constraint seems to be the most important bottleneck to implementing more ambitious approaches to cleaner production. In this context four companies stated a shortage of skilled trainers for environment-related in-house training, and five companies pointed to weak support structures for environment-related training activities, namely for technical personnel such as technicians and engineers.

**6. RD&E:** So far, most environment-related RD&E activities are confined to marginal adaptations of processes and products, and are mostly part of the regular engineering activities. Weak local R&D structures were mentioned as a con-

straint by four companies, but more in the sense that more support would be useful in the future.

### 6.3 Toward a Systemic Approach to Eco-efficient Industrialization in Thailand

The World Business Council for Sustainable Development (WBCSD) coined the term eco-efficient industrialization (EEI), which is defined as being "reached by the delivery of **competitively** priced goods and services that satisfy human needs and bring quality of life while progressively reducing ecological impacts and resource intensity, through the life cycle, to a level at least in line with the earth's estimated carrying capacity".<sup>69</sup> With its reference to "competitiveness" it goes beyond both UNEP's concept of clean production (CP) of 1989 which is defined as the "continuous application of an integrated preventive environmental strategy to processes and products to reduce risks to humans and the environment", and UNIDO's concept of ecologically sustainable industrial development (ESID) as a pattern of industrialization "that enhance(s) the contribution of industry to economic and social benefits for present and future generations without impairing basic ecological processes".<sup>70</sup>

It seems, however, that in recent discussions the differences among the various concepts have narrowed down.<sup>71</sup> In particular, all concepts are now closely linked to UNDP's Capacity 21 approach with its emphasis on strengthening endogenous environmental technological capacities at the level of individual countries. Moreover, the concept of eco-efficient industrialization can also be linked to the concept of "systemic competitiveness" which, however, needs to be extended to include a broader definition of competitiveness along the lines of the WBCSD's concept. What follows is an assessment of the action taken in Thailand at the meta-

macro- and mesolevels to balance economic and eco-efficiency on the country's way to moving on a broad front to an industrialization strategy which could be termed eco-efficient industrialization.

#### Metalevel

Despite high political instability, socio-economic development in Thailand has always been based on some kind of strategic orientation, notably in the form of five-year social and economic development plans starting in 1962. Within these plans, protection of the environment has become an important issue since the early 1990s, i.e. under the seventh and eighth plan. So far, however, the five-year development plans have tended to be "stand-alone plans" not sufficiently backed by more specific action at the level of individual sectors.

Even so, as compared to the early 1990s, environmental concerns definitely rank higher on today's political agenda. First, a discussion has started stating that improved overall environmental management must involve all relevant social groups. Not only NGOs, the media and the science community call for a participatory approach, but also the government itself has recognized this need, as is clearly reflected in the revised Enhancement and Conservation of National Environmental Quality Act of 1992. Second, for key economic sectors such as agriculture and industry long-term visions and master plans that include environmental concerns have recently been formulated. Third, higher environmental awareness has begun to translate into action at the macro-and mesolevels.

#### Macrolevel – Adjustments of the Regulatory Framework

Thailand's past macro policies, especially its budgetary, monetary and trade policies are widely seen to have created a conducive and fairly stable general business environment and, in particular, encouraged the export orientation of Thai industry. The recent baht crisis of July 1997 which came as a surprise to most observers has revealed, however, a fundamental weakness of the financial sec-

69 Fussler (1994), p. 71.

70 UNIDO (1991).

71 Cf. UNEP / WBCSD (1996).

tor and the financial management as well as the country's currency regime. This led not only to a substantial overvaluation of the baht over the last few years but also encouraged the inflow of short-term capital on a large scale.

Given the enormous amount of nonperforming or bad short-term debt in the order of some 30 billion US \$, restoring the macroeconomic fundamentals will be no easy task. Macroeconomic reforms under an IMF-initiated 17 billion US \$ rescue package include in particular the strengthening of the financial system, tighter supervision of state-owned and private banks, the introduction of a more flexible exchange-rate system, and tighter fiscal and monetary policies.

Macroeconomic reforms cannot, however, be directed only at supporting the stabilization of the economy and improving economic efficiency. What is needed is a new regulatory framework that also encourages the restructuring of Thai industry toward eco-efficiency. Thus far the existing regulatory framework is clearly command- and control-oriented and tends to promote end-of-pipe solutions rather than to support production-integrated approaches, and therefore needs drastic overhaul. Indeed, in keeping with the general trends in OECD countries, Thailand has recently embarked upon a process of a far-reaching adjustment of the regulatory framework, focusing on the application of economic instruments. In this process the country will introduce both the polluter-pays-principle and the even more forward-looking pollution-prevention-pays principle. While the first concept basically seeks to internalize environmental costs, the second concept aims at a system of incentives that makes investments in environmentally friendly products and processes economically attractive to enterprises. In the latter context, fiscal incentives that include tax breaks for eco-efficient enterprises, subsidies to R&D, and reduction of import duties for green technologies are under discussion. Technically, the adjustment of the regulatory framework is a highly complex task. While the introduction of the polluter-pays principle requires the definition of sector-specific environmental standards that are in line with the carrying capacity of the Thai ecosystem and that can realistically be met by Thai enterprises, the prevention-pays principle needs to

be brought in line with the overall fiscal and budgetary policies. On balance, it will take at least some five years or so from now before the emerging new regulatory framework will really have a broader impact on environmental restructuring processes at the company level.

## Mesolevel

At the mesolevel, most of the efforts aimed at creating a specific business environment in support of eco-efficient industrialization have been initiated from the early 1990s. Rather than setting-up many new public and private mesolevel institutions it is first and foremost necessary to reorient existing institutions and to treat environment as a cross-cutting issue in economic decision-making. This process is, however, still in its infancy, although both private business groupings and the government have stepped up their efforts to respond to environmental concerns.

**Environment in the 1996 Industrial Master Plan:** The Master Plan for Industrial Development released in 1996 aims at generating a clear framework of strategies and measures for industrial development until the year 2012. Its overall objective is to assure that Thai industry will follow an efficient and sustainable development path. In particular, the plan calls for a productivity- and technology-based growth concept and a deepening and widening of the industrial base. In this context, measures to support more sustainable forms of industrial development practices, namely measures to implement the polluter-pays principle by means of legal, economic and social mechanisms, to introduce the prevention-pays principle and increase the participation of the private sector and the community in monitoring environmental quality will receive high priority.

**Initiatives of business groupings:** One of the earliest initiatives to promote awareness among industrialists of industrial environmental problems and appropriate environmental management concepts dates back to 1990, when the Federation of Thai Industries (FTI) launched its Environmental Management Program (IEM). Supported by

USAID and, from 1995, by DANCED, activities under the program have focused on projects demonstrating the application of cleaner technology under Thai conditions in a broad range of sectors such as textiles, electroplating, pulp and paper, food and leather tanning industries. In addition, workshops and training courses on environmental auditing and ISO 14000 addressing both large and smaller companies are being organized.

Given its limited resources, the IEM program certainly cannot already claim to have a larger impact on the greening of Thai industries. Even so, with its more than 3,000 members representing around 80 % of the industrial value added, its 26 industrial and 19 provincial clubs, the FTI is about to emerge as an important business organization to promote the introduction of cleaner production concepts on a broader scale. In this process, other business groupings such as the Thai Business Council for Sustainable Development, founded in 1993 and comprising some 70 large enterprises in different sectors (industry, services) or proactive sectoral associations such as the Thai Food Producers' Association and the Thai Tanning Association, are also likely to play an important role.

**Reorienting public and private institutions for human resource development and R&D:** Lack of skilled labor and weak technological capabilities are notorious bottlenecks that hamper the transition of Thai industry toward a concept of productivity- and technology-based growth. Therefore, under the current eighth five-year economic and social development plan, human resource development has received highest priority. It is, however, not sufficient to only develop the technical and managerial skills which are necessary to master more complex technologies. Relevant curricula must also seek to boost the capabilities of the work force in such fields as environmental engineering and management. So far, however, very few initiatives along these lines have been implemented. Even the members of professional organizations such as the Thailand Association of Environmental Engineers are not seen as having a sufficiently advanced know-how in cleaner production technology.

**Conclusion:** While environmental awareness has markedly increased in Thailand since the early

1990s, the transition to an eco-efficient industrialization pattern is still in its infancy. Even so, the emerging group of environmentally proactive companies, the ongoing reforms of the regulatory framework aimed at encouraging the adoption of integrated cleaner production concepts, and a select number of initiatives to "greening" private and public mesolevel institutions can be viewed as encouraging signs that political will is building up to adjust the country's growth pattern along the lines of eco-efficient development.

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