Clusters and Development Strategies: Reflections for a developing country's SME policy

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Foreword

As a practitioner of Sme (small and medium-sized enterprises) and local development programmes I have often wondered why the issues of national competitiveness, and consequently, those of sme competitiveness, do not appear high on the political agenda of many of the emerging economies. The lack of importance of these issues in the political agenda has in turn caused a lack of programmes devoted to competitiveness improvement. Since cluster promotion is one of the key ingredients of a national competitiveness policy as practiced in most industrialized countries, either with that name or under the heading of "innovation policies", with very similar goals and methodologies, I strived to describe here some of the issues I consider most relevant for a policy maker wishing to look at clusters. In so doing the paper presents a review of subjects useful when he/she designs a programme, and specially when it comes to its presentation to the higher levels of country policy formulation. The issues are chosen also to help cluster implementers . Some of them are intrinsic to the subject, such as cluster definition and cluster origins. Based on these basic issues, the paper goes on to present some others which are not often cited in cluster literature, such as the differences between a classical macroeconomic view and that which promotes programmes at a "meso" level such as clusters, the mechanisms of firm-supplier cooperation, the new phenomenon of cluster internationalization, a comparison between American and European views on sme assistance, and national competitiveness rankings as a tool for the design of sme policy in general, and of clusters promotion in particular.

The work towards this paper was done by reviewing literature on the Clusters issue and on Regional Development, and by interviewing academics and practitioners in the Emilia Romagna Region, Italy. There I met with many of the people directly involved in the implementation of Sme programmes, and those interested in the SME development issues from the point of view of universities, the regional government and the business associations. While I could not within the length of this paper include all the views surveyed on Sme policies, they helped me significantly in choosing the subjects to be included. I am therefore indebted to many specialists and colleagues there, and specially to the University of Bologna, whose Masters in Ingegneria dell Innovazione provided a nourishing environment for these reflections, and to the ERVET, the regional development agency.

Introduction

In the last 15 years there has been a significant interest about how the Emilia Romagna region, and others in the Third Italy, have gained global competitiveness through its SME (small and medium enterprise) districts. A widespread opinion is that this feat is significantly due to a set of regional SME promotion policies aimed at strengthening institutions which articulate private and government efforts ("public-private partnerships") at a local level. Often these partnerships are aimed at the strengthening of "Clusters". On the other hand, the recent economical and social crises in several emerging countries, particularly in Latin America, has called into question the implementation of economic policies that tend towards a macroeconomic equilibrium **without** being accompanied by policies that promote sme competitiveness, specially managerial and technological innovation.

Cluster development may be an important goal of a developing country's SME policies, specially among those aimed at technological improvement. The new reality of the internationalization of developed-country clusters poses an opportunity for clusters in regions of developing countries to link with them, and through them with international supply chains. This document aims at helping the reflection on the importance of cluster development policies and on how those could be implemented.

To this end the paper is organized in its 5 Sections as follows:

The onset of the **first Section** provides a definition of clusters. The section then describes three key aspects related to clusters which throw light on issues relevant to a developing or transition-economy's policy maker:

-First, economic explanations of why they benefit the firms that are part of them, and how cluster mechanisms relate with mainstream economic theory. It is assumed that policy makers will often need to explain how the cluster concept relates to a vision from classical economy.

-Second, a closer look at the typical cluster issues of inter firm competition and cooperation, including a brief view from technology innovation management theory. This highlights the issues involved with firm-supplier relationships, typical of clusters. It is believed that an understanding of the nature of these relationships is important for a developing country policy maker since they affect the degree of value that may be added by a local cluster to an international supply chain.

-Third, a view on how and why clusters originate, taking Italy as an example, and regarding a) the instruments that could be utilized to further cluster development, even in a country like Italy where many clusters originated spontaneously, and b) the relationship between Italian cluster economic thinking and an "American view", as expressed by Michael Porter .

The **second Section** describes cluster dynamics, specially the new phenomenon of cluster internationalization, whereas whole clusters of firms in a developed country, here called "mother clusters", may transfer part of their activities to a new "daughter cluster" located in a developing country. This phenomenon has been highlighted recently by the OECD (Conference on East West clusters Udine, October 2002). A description, from the

point of view of technological innovation management, of the knowledge content of firm-supplier relationships, helps explain the manner in which a developing or transition-country cluster could join the global economy.

The third and fourth section present a global perspective on Clusters.
The **third Section** looks at the conditions, in a developing country, that could favour a more advanced development of "daughter clusters", as these conditions are described by "national competitiveness rankings" such as the ones developed by UNIDO.

The **fourth Section** offers a further explanation for the lack of attention paid by developing country governments (specially Latin American) to the issues of regional development and sme competitiveness as they could have been advanced by cluster-reinforcing programmes. It looks at how American economic policy, usually regarded as a model for liberalization during the 90´s, relates to the issues of regional and SME competitiveness.

The **fifth Section** presents the Conclusions. Based on the issues reviewed in the previous sections it includes final comments and a set of Prospective Measures for policy design, which offers 3 tools to facilitate policy making (Global rankings, the following of Regional models, and Cluster-to-cluster comparisons); and proposes a general diffusion instrument that would spread competitiveness issues, in order to prepare the ground for the debate on SME policies.

Annex I lists a series of sources that could be looked at in the search for national competitiveness benchmarking.

Annex II presents examples of how American economic policy regards SME and regional development.

SECTION 1) **Clusters Definition**, **theoretical approaches and origins**

Summarizing the many papers and conferences devoted to the issue, a cluster can be defined as a geographical grouping of firms that belong predominantly to one activity sector. As Schmitz (1998) puts it, Italian distretti, with their complex set of social history and institutions, would then be *specially advanced cases of clusters*, characterized by a high degree of voluntary collaborative actions within cluster firms. UNIDO, United Nations Industrial Development Organization, defines clusters as: a sectoral and geographical concentration of enterprises that produce and sell a range of related or complementary products and thus face common challenges and opportunities. A term often confused with "cluster" is that of "Networks". They are, instead, "groups of firms that cooperate on a joint development project complementing each other and specializing in order to overcome common problems, achieve collective efficiency and penetrate markets beyond their individual reach". Networks are termed horizontal when formed by Smes only, and vertical when large scale enterprises are involved. UNIDO describes also the relationship between the two terms : networks can develop within or out of clusters. Clusters lead sometimes to the development of networks within them. Also a network can eventually evolve into a cluster, as it develops business development services providers, enterprise associations and the involvement of public institutions.

1.1 Clusters and Economic Theory: What makes clusters successful

Clusters have become important for management and economic theory because of the volume of production they handle: Becattini (1998) points out to the importance of clusters for a given country: in the case of Italy he estimates that 20% of total manufacturing employment, and 30% of manufactured exports, are produced in industrial districts.

1.1.1 **Clusters and models of economic growth**

Rullani (2002) presents two dimensions to the analysis of clusters, that are interesting for both describing the cluster phenomenon and for looking at the ways in which it may spill-over to other countries: He explains that, to a "Fordist" economic model characterized by "accumulative" capital, followed, since the 70s, a "propagative" model characterized by the presence of small business and clusters. While Fordist economic reality seemed to need big companies to produce economic growth, thus leading governments to assist the creation of big industrial conglomerates, clusters provide the example of a "**propagative**" economy, characterized by low barriers to the entry of new businesses. While the Fordist model required big amounts of capital which acted as barriers to entry and favored the development of oligopolies in several sectors, the "propagation" model seems apt to create clusters with firms that need small amounts of capital. In order to generate economic activity based on the accumulative development, countries needed to fund the growth of big "national champions" or to attract huge multinational investments. Furthermore, "fordist" companies follow a slow, step by step evolution, where no stages can be saved. This was called "path dependence": each development follows a new big investment. Instead, the propagative model can be described as a "wood" of small companies. For a cluster, "a wood of Smes", to prosper, 3 conditions must appear:

1) The "land", must be fertile, meaning that there must be a capacity of absorption of know-how "seeds", and the availability of labour and space. These conditions were present in Italy after WWII, when some of the workers that had migrated to the advanced economies

of Germany, Switzerland, etc., returned to their home cities bringing new "seeds" of industrial know-how.

2) The links that allow know- how transfer are the second condition for the success of this "ecology", such as technical centers, secondary or tertiary learning institutions, etc. In the case of Italy, labor and space were available, but also a climate of "cooperation" that allowed the know how to be shared by many new small firms,

3) The third condition is that the "ecology" must grow in variety, producing *differentiation* among its components, as labour division grows when the many suppliers of specific inputs develop, usually as spin offs from existing small companies. Small companies concentrate in a core of well known competencies, while they outsource components from other small companies. Within a true cluster there is a "capacity for exploration", for experimenting new processes, new products, or new markets.

On the issue of how prepared is the "land" to develop a propagative model, Gian Carlo Omoboni, from ERVET, adds two interesting aspects: as SME support systems evolve, there is a crescent role not only for business centers, such as it was the case of the Emilia Romagna region during the 70´s to the 90´s, but also for institutions that assist an area's overall competitiveness (Rullani's "land"), by making sure that aspects such as regulatory environment, logistics, financing, and telecommunications are of a world -class quality. Omoboni also adds that there is an important opportunity for policies aimed at local growth, to focus on those aspects that would encourage not only Sme development but also social development. For example, a policy aimed at encouraging the development of "niche" SMEs which provide services for the elder, benefits at the same time economic growth and this segment of the population.

1.1.2 Clusters and mainstream economic thinking

Mainstream economics has ignored, until very recently, the phenomenon of industrial groupings (Hubert Schmitz 1999). Exception to this is Krugman´s contribution (1991), which, following Alfred Marshall thinking of 1920, identifies 3 reasons for a firm's choice of a given geographical setting:

1) the existence of a pool of adequate labor

2) the existence of specialized suppliers, and

3) the possibility of external spill-overs, this is, the rapid transfer of know how and ideas.

These three conditions tend to be present primarily in clusters.

Schmitz explains that these three factors are examples of local external economies and adds a fourth important element: While external economies occur in clusters spontaneously, this is, without a voluntary decision by the firms to engage in cooperation with others, it is the *voluntary, planned cooperation* which gives force to the firms located in a given cluster. Example of voluntary cooperation is the joint organization of a presence on a trade fair, aimed to enter a foreign market. From a policy-making point of view, the empirical evidence supports, according to Schmitz, the importance of voluntary cooperation, which implies the need, for clusters containing larger numbers of firms, of institutions that promote, organize and manage that cooperation. This is certainly the case of the Italian distretti, where often several

institutions handle many of the inter-firm cooperation activities. Locke (1995, cited by Schmitz) reaches also this conclusion, when comparing the different strength of different clusters.

Although most of cluster literature describes cluster´s success in aiding the individual firm's *production* process, successful clusters also provide *commercial and distribution* advantages. For example, distant buyers would go to a cluster since they can find in that place a variety of offer, thus facilitating cluster's firms to access distant clients. Another example is that of product quality certification processes, in themselves a tool of marketing, which need a collectively-certifying institution. He points out to the commercial (as much to the often- cited production cooperation) aspect of clusters as essential for long- term cluster success.

The relationship between mainstream economics and clusters literature has gone through the difficulties in constructing econometric models of the increasing returns to scale which characterize the success of clusters, and which effects go beyond Adam Smith's idea of the progressive subdivision of production activities as the market growths.

A further difference with mainstream economics is that, according to it (Samuelson), external economies are a type of inefficiency that does not allow a firm to appropriate, via the price of its goods, all the advantages derived from its economic process: some of it goes to other firms, since the walls of a cluster firm are "porous". Thus, a certain innovative technology or a given piece of information gathered by a firm can go "free of charge" to another firms in the district. This transfer of technology or commercial information is favored, within clusters, by the numerous informal contacts that exist between firms, and due to the fact that workers may easily change from one firm to another, carrying specific knowledge with them.

The possibility of these external economies would lead, in "mainstream thinking" (which Schmitz relates with "neoliberalism"), to under-investment by the firms, (as sub-optimal allocation of resources) which would be afraid of investing in processes that could then be appropriated by rivals in the cluster. The fact that firms rarely move away from clusters seems to indicate that businessmen, however, identify more advantages than disadvantages in the external economies that exist within a cluster.

Clusters are not formed only by small businesses, since many successful clusters generate or attract big companies. Schmitz introduces the concept of collective efficiency, defined as the collective advantage that derives from the local external economies, and from cooperative actions. The mix of these two factors depends of each cluster and each period of its evolution.

Di Tomasso (1999) distinguishes the different phenomena within a cluster: external economies can be differentiated in *pecuniary or market-based* (as for example, the money a business saves when searching for labour within a labour-rich cluster) and *technologist* (the advantage a firm gains from all the know how transfer that occurs within a cluster, i.e. within the vertical information exchange between a firm and its suppliers or clients). A further classification looks at the effects of external economies, which are a) those *static*, this is, the **effect** on a firm's lowering of unit costs, or improvement of input quality that comes with the acquisition of a given technology facilitated by an external economy; and b) those *dynamic*, when the external economy causes a growth in the stock of *skills* of a firm, be them technical or commercial.

1.2 Cluster's typical issues: Cooperation and Competition

A further approach at how clusters function is provided by the analysis of the cooperation and competition tendencies inside them. Rabellotti has studied the mechanism that firms use when planning cooperative actions, as those of Compensation (rewarding mutually beneficial behavior), and Exclusion, used to punish opportunistic behavior. Mutually beneficial cooperation is favored by the existence of trust and "social embededdness".

Cluster cooperation can be further classified as vertical (with suppliers or clients), horizontal, with "colleague" firms, or multilateral, involving not only firms but institutions, which provide business services: consulting, lobbying, training, funding, quality certification, etc.

Di Tommasso, as Schmitz, concludes with a caveat about the natural evolution of clusters: it is far from "natural" that clusters evolve always towards more and more positive (non collusive) cooperation. Also, there are several examples in Italy (Prato, studied by Nomisma,1994) where firms move away from a cluster location, to be able to exclude cluster competitors from the production specific advantages they have acquired.

Of special interest for policy makers are studies that look at a sectoral cluster in both a developed and developing country setting: Rabellotti´s studies of shoe clusters in Guadalajara, Mexico, and Rivera del Brenta, Italy, throw more light on cluster inter-firm cooperation. She finds a positive relationship between the participation in cooperating activities and the development of firms in Mexico, with less growth for those cluster firms that developed lesser cooperation levels. Her study of Rivera del Brenta shows that the further globalization of Brenta shoe firms (with the possibility of supplying global top brands such as Gucci or Vuiton in addition to the traditional Brenta clients, the German groups of buyers), has produced 3 simultaneous phenomena: 1) a higher profitability for the shoe firms supplying these global top brands vis a vis those that continue to sell exclusively to the German market, 2) a functional impoverishment that occurs within the global brand suppliers, which relinquish design (a traditional Brenta "forte") to the dictates of the brands, 3) a new prioritization of out- of- the cluster relationships, as global fashion firms become important buyers. This third phenomenon would contradict the "natural" evolution of clusters towards ever closer inter-firm cluster cooperation.

1.2.1 Clusters and the management of innovation technology

Cooperation and competition could be analyzed also with an approach derived from technology innovation management concepts. While these concepts seem to have developed mainly from a view at the relationships established between larger American firms and their suppliers in technologically advanced environments, many of the issues could be relevant also to the analysis of the relationship of cooperation and competition existing within a cluster. The issues of how technology is innovated by a single firm, how "appropriable" are the advantages gained by first movers, how technological advantages are transferred to other aspects of a firm's overall performance, the costs associated with technological pioneerism, and how easy is the access to resources that the firm does not have, either through contracts or integration, could all be applied to a cluster reality. Specially so when the recent history of many clusters show phenomena of concentration that resulted in the existence of several large companies within the clusters. The "porous" walls of a cluster firm, which allows externalities to benefit other firms in its vicinity, would also prompt companies to find ways to appropriate technology during a longer term. Leaders in a cluster would look at innovating products or processes faster than competitive neighbors.

Also, they would look at profiting as much as possible, in other areas of the firm, from any technological development achieved: their reputation, their commercial positioning vis a vis groups of buyers visiting the cluster, their selection of channels of distribution for the new products deriving from the new technology, their privileged access to resources that are needed to use the new technology, the removal of institutional barriers (as for example municipal concerns on the environmental effects of a new technology) are all subjects that a small cluster firm would share with large innovating peers. So are the risks associated with the first movers: the costs of having a new product approved (for example a new "bio" food product that must be certified as biological), the training of employees and the development of the infrastructure needed to implement the new technology, the development of suppliers of the new input, which is probably costly as it is first produced in small quantities for the innovating firm.

While imitation seems to be a big part of clusters reality, from the perspective of a single company leading in a certain technology the issue of appropriability is as important as for a single large firm outside a cluster: If it is weak the firm would try to make it "tacit" as much as possible, and would use non legal mechanisms to protect its advantage, this is, secrecy and lead time rather than legal tools such as patents or contractual agreements. While technological standards are probably not defined by the smallish companies typical of clusters, certain product standards related with final consumers´ tastes do have strong impact on clusters. Examples would be "standards" related to product design, according to seasonal fashion, or the characteristics of certain new "more healthy" food products. Innovative firms in a "chair cluster" would have to adapt quickly to combine metal and plastic if such combination becomes fashionable. A new fashion standard would mean that new resources outside the firm would be necessary, and then it would appear the issue of how to access complementary resources. Would they be developed internally? If not, are customary informal (not written) agreements with suppliers in the district strong enough to prevent the diffusion of the new product's advantages? While complex contractual relations may not be usual in a SME cluster, the issue is still relevant and could lead a cluster firm to decide to permanently acquire a supplier now considered strategic, in order to better keep the long term benefits of a new technological improvement.

1.3 Clusters origins: socio-economic roots of clusters development in Italy

Once described the issues of what clusters are and how they work, we can turn our attention to their evolution. We will first see how they originated in Italy and then how they internationalize today. Becattini´s book "Distretti industriali e made in Italy" remarks several issues relevant to the nature of the industrial district phenomenon, (here considered as an advanced case of clusters). For one, clusters are important to Italy but are not most of Italy’s industrial structure. Although important, they only account, with his ample definition of clusters, for 20% of manufacturing employment and 30% of exports. Second, the "American" vision of clusters, as expressed by Michael Porter, is in line with his own thinking: he acknowledges Porter's merit in:

a) Analyzing international trade looking at specific sub-sectors,

b) Analyzing Italy's weight in the international trade of certain sub-sectors

c) Keeping always an eye on global total (all products) trade.

While he agrees with Porter that the result of a firms strategic decision depends of where, with whom and in which context it is taken, thus giving importance to geographical proximity factors, he also points out that Porter's view is "very American" in the sense of resting importance to the attitude towards intra-cluster cooperation emphasized by most Italian authors. Porter, in his view, is very much enthusiastic about the extreme form of competition that exists within a cluster.

Why this competition exists? Becattini says it in simple words:

1) Contiguity accelerates the perception, by cluster firms, of the production or commercial movements made by their competitors, prompting them to respond quickly.

2) Contiguity allows a personal interaction that adds, to commercial rivalry, the ingredient of personal envy and emulation!

Becattini also looks at Porter's description of Italian clusters' competitive advantage as related to three broad groupings of consuming goods, which conform the so called "Made in Italy": products for the home (furniture, ceramics, washing machines, refrigerators), textiles, and goods for the personal wear (sunglasses, jewelry, leather goods), *plus* all the machinery to produce them. Looking at Italian weight in the international trade of these sectors identifies these three sectors of Italian competitive advantage. As to why these sectors, Becattini points out that, although they are not necessarily "prestigious" such as electronics, fine chemistry and other " high tech ", they are profoundly rooted in Italian history and culture. Therefore further movements towards district internationalization must be based on the evolution of these consuming goods and of the intermediate (machinery) sectors that support them.

He also looks at this geographical base of Italy's competitiveness: He sees, as in the example of Veneto, a hybrid social reality that keeps the agricultural ties of the "pre-capitalistic era" living next to the new industrial districts that have appeared. This, he says has allowed Veneto and in general the Third Italy, to mix competitive and cooperative trends and has allowed the country to quickly respond to changes in the demand for "fashionable goods": a demand that is both highly variable and highly differentiated. The fortunate fact, he implies, is that a richer world has increasingly demanded, in the recent decades, more and more of this type of goods.

If a successful district is a productive phenomenon and at the same time it has a social dimension derived from the geographical proximity of its firms, is then easy that a "*cluster awareness"* type of mentality appears in the district. Becattini refers to the institutions that promote clusters, and the new type of company, the "district firm". He describes successful clusters as a socio-territorial organism aware of the interdependence of its members. If in a cluster it is important that most members firms keep up the pace with the technological and commercial evolution of the global markets, is then necessary that exist institutions that make sure such update takes place. He describes the "*districtual sme*" as a new socioeconomic agent, that has evolved towards a high degree of awareness of its mutual dependence with others in the district, and of the need for institutions that help the cluster.

A final point made by Becattini is that Italian clusters need a logistic environment, both outside and inside the district, both in physical and telecommunication terms, which he sees as a lacking in certain district areas, as a consequence of a centralized highway policy that has prioritized the logistics of the big business rather than those of the small-company districts.

The analysis of the business environment, which characterizes Italian clusters, should also be enriched by the lessons from Italy's south, the Mezzogiorno. Even in the country most famous by the development of its industrial districts and five decades after the economic "miracle" started after WWII, the 36.2 percent of Italians who live in the Mezzogiorno enjoy a per capita GNP of only 67% of that of Italy as a whole (similar to the post-war differential) and the unemployment level is as high as 21% compared with Italy's 11%. Four decades of top-down policies such as the building of huge public infrastructure, fiscal incentives and subsidies did not solve the gap. Recent studies have shown that agglomeration of firms in the Mezzogiorno show, although in limited numbers, an export-propensity and labour quality no different from the rest of Italy. However, their propensity to build a network of formal and informal relations and the presence of an institutional environment that favours business development is very different. The firms in Southern Italy tend to buy less from their neigbhours, specialize less than in Northern Italy; their subcontratctors have less diversification of clients and are less often in contact with the final consumer. Also, they do not cooperate in setting up common high-quality service providers, nor they join together for lobbying for local agreements that result in an improvement of their business environments. (Barca, 2001). The root of this differing behaviour can be found in the lack of trust relations within the agglomerations, resulting from a lack of formal or informal relations: economic proximity, "knowledge pooling", does not accompany (as does in the case of true clusters) the geographic proximity. While Barca acknowledges, as other cluster authors, that regional promotion policy should start by enhancing existing agglomerations rather than attempting to create new ones, agglomeration enhancing should start by making the firms aware that they are already part of a potential cluster and could benefit from becoming, in Becattini's terms "districtual firms". As a matter of policy he proposes 4 interventions in order to enhance potential clusters: a) institution building of public-private partnerships, b) modernization of the judiciary systems so that contractual relations within the cluster are properly enforced, c) incentives for networking, using information technologies both for production and for marketing activities, e) modernization of the local administrations, enhancing their ability to select public projects on technical rather than "political" grounds, thus avoiding controversies between local firms.

Two additional aspects are relevant from Rabellotti's studies of Italian clusters: 1) her findings on the Mexican shoe cluster and that of Italy leads to the conclusion that an important difference among the two is the fact that most Italian firms have a wide variety of buyers clients, to which they can give different priorities as the market evolves. The Mexican ones are much more restricted. How many developing country clusters face this problem? The second, from a policy making perspective, is that the existence of sector comparisons of clusters between developed and developing countries should become, when available, an essential tool to consider for the implementation of SME programmes in developing economies. This "know how catch-up", with a developed-country cluster study giving useful insights on the possible path of growth for a cluster in a developing environment, should be utilized whenever possible.

Once reviewed the origins of industrial districts in Italy , a reflection on their future comes to mind, related to the sectors involved. They could be a weak point of Italy´s economy if either a global recession diminishes the demand for "fashion goods" and/ or other countries succeed in emulating Italy's advantage in the design, production and marketing of these items. While the growth of middle- class markets that should occur gradually as Eastern Europe and Asia continue their pattern of development should favor Italian districts, the entrance of many new players, could eventually harm its exports as percentage of global trade in fashion goods, and eventually in absolute terms. Global trade in fine wine, an industry traditionally dominated mainly by France and based on its "history", is now populated also by "new world" high

quality producers such as California, Australia and New Zealand. The barriers to entry in terms of the sophistication of the technology and the strength of French wines' marketing image were not enough to prevent the entrance of new players. A contrary example, however, would be the Italian global brands predominance in fashionable goods, like Prada, Armani, Gucci which help Italian cluster firms to maintain their share of the high price market.

SECTION 2: Cluster dynamics: internationalization and technology management

It is now time to turn to look at one of the ways clusters in developed countries are taking to preserve their success, internationalization, and how it could impact on developing countries.

Rullani´s description of a cluster as a "wood" is also useful to analyze why the cluster concept could be used by less developed economies and those in transition:

1) It promotes self employment,
2) it does not need huge amounts of capital. The banks come *after* the clusters have started their development since the first stages of growth are primarily financed from the entrepreneurs re-investing his profits.
3) It allows the country to produce in sectors of high rapidity of change in terms of products, processes or markets, as SME clusters can quickly adapt to changes in fashion, etc.

In industrialized countries, two phenomena seem to promote the emergence of a completely new species, the "**SME multinational** belonging to a cluster":1- Globalization pushes the SMEs to seek advantages of scale, thus seeking the benefits of inputs where it is most convenient to find them. 2- The present scarcity of space and labour , with the local populations opposing both the installation of new industrial "polluting" facilities, and the arrival of immigrant labor.

While these two factors push the SMEs to move part of its processes to other locations, such as those in Eastern Europe, it is difficult for a company grown on a local cluster to transfer part of its activities to places where such cluster interrelationship does not exist. It is therefore convenient to think of SME internationalization in the context of "cluster internationalization". An example of this would be the re-localization of production processes from North East Italy's chair cluster to the Timisoara area in Romania. For the new "daughter" cluster installed in a new place to prosper in the long run, all three conditions of the original "wood" must be generated: absorption, propagation and exploration would guarantee that the new cluster remains innovative without a complete dependence on the "mother- cluster". For the relationship between "mother" cluster and the new "daughter" cluster to favor also the development of the latest, it is important that local government highlights the specific local cultural traits that would allow the local companies to develop their own products. If the mother and daughter clusters are seen as a system, 3 activities can ensure its prosperity in the long run: a) the new cluster has the condition for propagation b) quality and strategic thinking remain in the original cluster, allowing its own continuous qualitative development c) a continuous institutional relationship is established between both clusters, aimed at correcting distortions and aid critical stages.

Timisoara-type of phenomena will lead companies to participate in two flows of information: from the companies in the mother cluster in Italy to its all-controlled subsidiaries in Timisoara and from those subsidiaries to some new local suppliers. How much of the knowledge would be transferred to the subsidiaries and to the local suppliers? As Rullani explains, without some knowledge transfer the new Timisoara cluster would be weak in the long run. In fact, there is a risk that some Italian companies may now return, as the rise of Romanian salaries and the total logistical costs involved with a subsidiary (both of cargo and of commercial, supervision and technical personnel) may in time overtake the initial cost advantage.

2.1 Cluster internationalization and technological innovation transfer within the supply chain

The interaction between firms and their suppliers can be looked upon from the point of view of technological innovation. Sobrero and Roberts (2002) identified 4 types of interactions, each carrying advantages and costs:

1) Traditional subcontracting, when the firm gives its supplier detailed drawings and technical specifications to make a component that does not critically affect other parts of a project.

2) Integrated subcontracting, when the firm gives its supplier freedom to design components which might critically impact other parts of the project. In this case suppliers are recognized as a source of knowledge.

3) Advanced subcontracting, when an area of the project is completely delegated to the supplier, without limiting the outcome by a predetermined set of solutions. The area subcontracted, however has low interdependency with the rest of the project.

4) "Black box" subcontracting, when suppliers are given responsibility for the whole problem solving of an area, from the overall design to the definition of functional parameters.

In turn, each of these types of activities can be characterized on the basis of a panel of 4 indicators:
a) how early the supplier was involved in the project,
b) the extent to which the firm and its supplier worked sequentially or with an overlap during the project,
c) how often they exchanged information, and
d) which media they used to exchange information (meetings, email, faxes of drawings, etc.,).

The issues at play for a manufacturer to choose different types of relationship with its suppliers are those of "efficiency" versus "mutual learning". While it is true that, theoretically, most knowledge resides with the "mother" cluster and that the role of the supplier company in the less developed economy is limited, in general, to "traditional subcontracting" it could be thought that, as the local demand develops with its own requirements and tastes, the firm from the mother cluster would be more tempted to delegate a wider range of activities (including design, choice of costly effective materials, etc.) to the local supplier, and / or even to learn from him. For instance, Romanian textile designing could be closer to the tastes of middle income consumers in Bulgaria than Italian designers themselves. If, then, inter-partner learning is convenient for both sides (in the example, Italian and Romanian) the theoretical requirements for facilitating the exchange of these invisible assets (knowledge and competencies) should occur: earlier involvement of the supplier in the project, elaborated communication structures, and an overlap in the problem- solving activities. As in the case of sophisticated supply chains, i.e., automobile or packaging, the long-term effects of knowledge transfer towards suppliers, enlarging their competence base, may in turn enable them to add more value (at less cost, in the long term) to the overall product made by the more sophisticated "mother cluster" company.

While a survey by the project Formez TeDIS (Italy, Nov. 2002) shows that Italian Smes´ investment in the emerging regions of Eastern Europe, South America and the Far East are mostly driven by the lesser costs of labour (66,7% of respondents cited this as one of the causes

of their FDI investment) and then by the market opportunities in those areas (33,3%) it also shows that most companies *see as highly relevant to be able to count, in those locations*, on services such as: finance, training, information, consulting and institutional representation. In fact the Formez report proposes, as a policy for Italy, that it assists the nations where its clusters are prone to establish new clusters in order that these new locations have these services available for Italian and local smes.

SECTION 3 Innovation technology and cluster internationalization: national environments as described by country rankings

We have seen that the management of technological innovation is relevant for the functioning of a cluster. This section explores how it also influences the potential of an emerging economy to attract cluster investment. Analysts of innovation technology issues look not only at sectorial international data but also at national "horizontal" indicators such as the percentage of GDP invested in R&D, how it varies in different countries, and how it is spread among the four sources of technology research: Universities, Business laboratories, Government research institutions and new entrepreneurs.

The type of firm-supplier relationship that evolves in a cluster that internationalizes depends not only on costs structures (i.e. labor, freight costs), the availability of resources (i.e. minerals, forestry products), or the access to markets facilitated by the new location (i.e. the convenience of manufacturing in Mexico as a point of entry to the US market). The relationship between a firm and its supplier in an emerging economy may also be influenced by the higher or lesser presence of factors that allow a higher or lower degree of sophistication. As such the UNIDO and other organizations have developed different sets of rankings that compare different countries. Although the comparisons are based on complex sets of data, a simplified outcome is given in the form of a ranking of countries that show, in the case of the UNIDO (2002) report:

a) how advanced is the manufacturing economy of a given country, compared with the others, in a given year. This is called CIP, competitive industry index. This index is constructed, for each country, based on 4 indicators: 1) manufacturing value added per capita; 2) manufactured exports per capita; 3) the share of medium and high tech products in manufacturing value added and 4) the share of medium and high tech products in manufactured exports.

b) how advanced are the factors that influence the evolution of manufacturing sophistication overtime, the so called "drivers of growth". This index is named the "Scoreboard". The drivers of manufacturing sophistication are 5: 1- Skills (secondary and tertiary enrolment); 2- Technological effort (R&D financed by productive enterprises); 3- Inward foreign investment (3-year average of FDI flows); 4- Royalty and technical payments made to foreign countries, and 5- Infrastructure (referred only to Information Technologies).

The most important issue relating the 5 drivers of growth and the CIP index is that statistical analysis made by UNIDO ***show a causal relationship*** *between the Scoreboard and the CIP*: the 5 drivers can be seen as factors that provoked the present degree of manufacturing prowess.

Indeed, for those countries looking at engaging their companies in global supply chains by attracting the attention of developed -country clusters which could set up subsidiaries in their own territories, the issue of which role would be given to local suppliers of the new cluster comes *After* the issue of whether their emerging economy is in fact chosen when compared to others. Ideally the recipient country would provide advantages that go beyond the cost of labor, if the local value added is to be higher and if the interest of "mother clusters" is to be maintained even after a certain rise in labor and other costs eventually occurs. One could think that emerging areas compete with each other for "mother cluster" attention as a possible location for investment. As such it would be interesting to see how the next incorporation of

Eastern European "accession" countries to the EU could affect the chances of Latin American countries to attract European investment.

In any case, 4 out of the 5 "drivers of growth" are "intelligence inputs" which must either be available locally, such as Skills or IT infrastructure, or there must be in place the capacity for its development: capacity for attracting FDI; and capacity for private R&D (in the form of Universities, Tech Centers and so on). These factors would suggest that there is considerable room for governmental development policy at the local level, i.e. in the way of public-private partnerships that foster cluster development as a broad approach that encompasses all the actors involved (schools, tech Centers, IT infrastructure, etc). A country wishing to attract investment would need to consider to which extent these factors, probably important for potential investors, exist already in the areas where investment would take place.

If we would look at attracting potential "mother clusters", from Italy as an example, one would also have to keep in mind that considerations such as freight costs from Italy, natural resource endowment and customs tariffs vary considerably between the potential investee regions. A useful comparison would be that between two broad competing regions, taken from those termed by the World Bank as "middle income economies", which probably share similarities in their industrial structures. The comparison could be done between regions that also share traditional ties with Italy. For instance "the new world" of Eastern Europe and the southern part of Latin America (Chile, Uruguay, Argentina, Southern Brazil).

While many objections could be made to ranking comparisons, they must be seen as providing "first clues" at benchmarking and at policy making, to be followed by more detailed, specific analysis.

For a view of different country rankings the ANNEX I provides a list of several of them.

SECTION 4: US and European competitiveness policies: relevance for cluster promotion

If clusters are important economic realities, if the relationships that may develop between clusters of different countries would depend on how prepared are those countries for adding value locally (both at the "mother" and "daughter" clusters) and if this preparedness depends on how the country or region is endowed with the "drivers of growth", then, why the importance given to promoting a competitive environment is so unevenly spread among emerging economies?
In the recent past there have been many reflections, prompted by the crisis in several Latin American economies, on how the "Washington Consensus", consisting in a set of macroeconomic recommendations for transition and developing economies may have caused policy makers in developing countries to neglect regional and competitiveness issues (Ocampo 2002). The roots of these crises may be related with this neglect: Ocampo summarizes it as "The idea that the combination of open economies and stable macroeconomics-- in the limited sense in which this term has come to be used, i.e., fiscal balances and low inflation-- would be sufficient to spur rapid economic growth has not been borne out so far".

This neglect may be rooted in a significant misinterpretation of US policymaking, which was taking as a model. Mikel Landabaso, from the EU Commission, exhaustively analyzed EU and American policies. He expresses (Landabaso 2000), that a) during the 90´s developing country officials, and many European ones, took the American economy as a model, specially its deregulation aspects. b) this model emphasized issues other than those of fostering regional development or "industrial policy" and that it was understood that "the best industrial policy was No policy". c) that this notwithstanding, American policy makers, under the headings of "sme competitiveness" and specially "technological competitiveness" have continued to use federal, state and local monies to foster economic development. The use of these monies has been more intensive in the US than in the EU. d) that the goals and many of the methodologies of these programs are very similar to the EU's "regional development programs". Among the many similarities is the fact that they are almost always executed by public-private partnerships and are often *designed* by them as, part of "knowledge strategy". e) that several US programs come very close to "picking winners" at a local (state) level.

Says Landabaso: "If we are to compare U.S federal spending to the EU commission´s spending in these types of programs it is clear that the US public support is considerably higher than the European one. The EU commission spends in innovation promotion programs directly related to economic development mainly through European Regional Policy of the Regional Policy Directorate General and the Innovation Program of the Enterprise Directorate General." He summarizes the comparison as "when all federal public programs for the promotion of innovation are summed up, they amount to nearly 2 billion dollars per year, while the 2 European budgets amount to approximately half a billion Euros per year. The 2 billion figure does *not* include tax relief and credit, one of the most widely used policy tools to promote innovation in the US, and does not include the rising amount of states budgets earmarked for Science and Technology programs".
Annex II extracts from Landabaso's work 2 tables showing the extent and coverage of US SME and regional development programmes. Table 1 lists all major US federal innovation programmes. Table 2 shows tax incentives for Research and Development.

SECTION 5: Conclusions

While the purpose of the paper has not been to produce an in depth analysis of cluster economics but to present issues useful for the policy maker and those responsible for policy implementation, several points can be advanced as preliminary conclusions and as subjects meriting further study:

-There is a consensus on that, beyond the socio-economic roots and conditions from which clusters originate, it is convenient the presence of institutional intervention (in the form o public-private partnerships) in order to give them strength.

-Clusters can be analyzed by classical economic theory as well as by Development economics.

- Macroeconomic policies by themselves do not guarantee growth: four decades of sharing Italy's macroeconomic policies have not reduced Mezzogiorno's distance from the rest of the country in terms of economic development. Southern Italy is an example of top-down policies that failed in the absence of local public-private development partnerships.

-There is no important contradiction between Italian economists' views on clusters and that of Harvard's Michael Porter.

-There seems to be no important conceptual differences between US and European policies towards SME competitiveness and regional competitiveness, although the terminology differs markedly. In fact, far from the "Washington Consensus" recommendations, US funding of SME development and of regional development seems to be even higher than that in the EU.

-Clusters are characterized by a set of competition-collaboration activities. Both within clusters, and between clusters, (such as those generated by the new internationalization of clusters, this is, among industrialized clusters and the clusters they generate in developing countries), the relationships that firms develop with their suppliers are influenced by the milieu in which the potential supplier is located.

-The degree of sophistication of the industrial capacity of a given country or region can be described by a ranking and is related with 5 "growth factors". These growth factors can be influenced by macroeconomic policy but also by local development policy of which cluster promotion is one example.

5.1 Final Comments:

In the view of many, the present economy crises in several emerging economies in Latin America is due in part to a long- term lack of understanding of how a " macroeconomic equilibrium" needs, in the long run, a productive "real" economy characterized by a certain level of international competitiveness both in technological and managerial terms. The crisis that affects Latin American countries such as Peru, Uruguay, Bolivia and Argentina calls for a whole new set of policies and theoretical and practical approaches to economic development. There is thus an opportunity to introduce concepts which have

not been part of the mainstream of political and economic debate, such as those of clusters, as a tool for SME competitiveness improvement.

It is then relevant to remember Giacomo Becattini´s corollary (1998)of one of his chapters: "if the continuation of the growth of Italy in the last years is to be guaranteed in the future, skillful fiscal and monetary manoeuvres will not suffice. It is necessary the incisive intervention on our capacity for economic expansion: a well thought policy for the industrial districts is then the first thing to do."

If strengthening of local clusters is important, as it seems from the efforts that all developed nations are doing towards that goal, it is also important to see that national clusters will never be able to isolate themselves from *global trends* in their respective supply chains. More importantly, local clusters will, sooner or latter, be *integrated* into those chains. Cluster internationalization, such as the Timisoara phenomenon, may be a way in which such integration takes place. In any case, as described in the paper, the nature of the insertion of local developing-country clusters into global supply chains (i.e. the degree in which advanced activities such as R&D and design take place in the cluster) will be dependent of several factors. Important among them is the existence, or absence, of the "land" conditions, and of “drivers of growth”.

From a policy- making point of view, studies such as Rabelloti´s comparison of same sector clusters in different countries would be of extraordinary usefulness, providing a view at the issues critical for cluster development in the long term. It is also interesting to reflect on that the issues faced by an emerging country attracting a "mother cluster" are also relevant to developed country regions "receiving" a cluster. Ireland, for instance, had to think at how software investment would encounter a fertile "land" and produce ramifications that would enhance the whole of its economy.

The paper has also tried to show briefly two interesting aspects: how Italian thinkers see American management theory as related to clusters (Harvard) and how mainstream economic thinking could relate to the cluster phenomenon. In both issues it was found a positive approach: Beccattini agrees with Michael Porter theory and Schmitz points to ways in which classical economic theory can look at clusters.

If so, a large question appears: why, in Latin America, where management theories and macroeconomic policies are considered important, the issues of cluster formation and technological improvement are not been given the same priority. If emerging economies compete among each other to a certain extent, the issue is relevant since cluster promotion and technological improvement in general are important aspects of the policy agendas of other emerging (and probably competing) areas in Southern Europe, SE Asia, and more recently in Eastern Europe. Taking Italy as an example investor in emerging areas, already 46% Italian SMEs declare to have invested in Eastern Europe as compared to only 23% in South America (Mexico, Brasil and Argentina) where traditional cultural ties facilitated in the past this investment (Formez-TeDIs 2002). The other two preferred locations are Western Europe (30,8%) and the United States (11,5%).

Part of the response may be in the prevalence, in some of the Latin American countries of overly simplistic interpretations of US’s economic policy, often taken as a model. We have seen that what looks, from anecdotal evidence, huge US interest in SME and local development promotion, is in fact confirmed by rigorous study. With Landabaso´s thorough analysis we can affirm that the issue is more of "headings" that of substance, and that

American federal and state policies definitively use public funds to implement programmes that would be called, in Europe or elsewhere, "regional" or "sme" policies.

As the range and depth of the debate on SME policies found in industrialized areas such as Emilia Romagna, seem to show, there is not a single simple tool for competitiveness promotion. Rather, what characterizes Emilia- Romagna, a model region in terms of its sme development, is **that the issues of this debate are ever present**, both in the statements of public officers and businesspeople, and often in the declarations of the leaders of business associations. There is a widespread awareness, in most elements of the different supply chains ("from the farm to the grocery store"), of the need of improving quality in order to face increasing competition from developed, transition and developing countries and regions, and of the need of public-private partnerships to implement programs to this end. Perhaps the single most important conclusion from this debate is that the Emilia Romagna region benefits from a level of awareness that at the same time enriches the SME and regional policy debate and aids the consensus necessary for the implementation of its competitiveness programmes. Often it seems that, along with SME clusters, there are "Institution clusters", where whole groups of institutions work towards the overall goal of regional economic competitiveness.

5.2 Prospective views for Policy Making:

In view of the findings in the paper the policy recommendations for emerging countries would be:

1) To be aware of the fact that regional development, often with a clusters approach, is an important tool of a country overall economic strategy. Examples abound both in the US and Europe, many being implemented in their less developed states or regions, from which ideas and methodologies could be drawn.

2) In order to implement regional development policies 3 views, going from the "global" to the sector-specific, could be taken:

    a) Global benchmarking, as presented by the national competitiveness rankings already in existence. These are already available benchmarking tools which could be used to discuss national/regional development policies.

    b) Selection and following the policy debate processes and policy implementation of chosen regions in more advanced economies. Regional development in general, and sme cluster development in particular, are processes that involve many business and institutional actors and call for a general "cultural" attitude towards improvement and cooperation. For a region in a developing country willing to implement these policies, rather than a purely theoretical learning of these concepts may be better to focus in a set of one or two "example regions" in economically more advanced economies, -- ideally ones that are culturally related--, and to follow how the many different cluster actors debate, plan and implement their competitiveness policies.

    For middle-income developing countries the experience of Eastern Europe's local development of public-private partnerships as inspired by the EU may be an important source of lessons.

c) Review the analyses that are being done for certain industrial sectors, which compare cluster-to cluster. Cluster-Cluster analysis, as they are being performed for certain economic sectors comparing the evolution of a cluster in a developed country and one from the same sector in a developing or transition one, could be an excellent tool for a "look at the future" regarding sectorial policy making.

3) Since the key of a SME or cluster debate, as seen from the Emilia Romagna case is not rigid model but a general awareness of the need of SME competitiveness, cluster policy debate and implementation could be greatly aided by the **Diffusion (**sme policy benchmarking; the following of regional examples of SME development, and cluster-to-cluster comparison). Local policy involves many actors. An instrument for a broadly-spread diffusion of news from these 3 sources of ideas and initiatives would stimulate the debate, prepare the "land" for the development of a common strategic view and focus the policy debate.

Literature reviewed:

- UNIDO, Development of Clusters and Networks of SMES, UNIDO Brochure Vienna 2001 and UNIDO Doc 331101 by Fabio Russo.

-Eficienza Collettiva e Sistemi D Imprese, oltre la esperienza italiana edited by Marco di Tommasso and Roberta Rabellotti. 1999 Societa Editrice il Mulino
Patrizio Bianchi, Introduzione
Hubert Schmitz, Efficienza Collettiva e Rendimenti di Scala
Marco Di Tommaso: Efficienza Collettiva e Politica Industriale

-Enzo Rulliani: "Dallo sviluppo per accumulazione allo sviluppo per propagazione: piccole imprese, clusters e capitale sociale nella nuova Europa in Formazione" Paper presented at the East West Cluster Conference OECD LEED 28/10/02 Udine

-Conoscenze, Relazioni e Tecnologie di rete nelle filiere distrettuali, il caso del distretto della sedia, a cura di Alberto De Toni e Roberto Grandinetti, 2001 by Franco Angeli srl

-Roberta Rabellotti, The Effect of Globalization on industrial districts: The case of Rivera del Brenta in Italy, Nov 2001

-Giacomo Becattini: Distretti Indstriali e Made in Italy, le basi socioculturale del nostro sviluppo economico, Bollati Boringhieri 1998

- Fabrizio Barca: Cooperation and Knowledge Pooling in Clusters: Designing Territorial Competitiveness Policies, presented at the Max Planck Institute for Research into Economic Systems, October 2001.

-Maurizio Sobrero , Edward Roberts: Strategic Management of Supplier-manufacturer relations in new product development, Elsevier Policy Research 31, (2002)

- UNIDO Industrial Development Report 2002/2003, Vienna 2003, Specially Chapters 1 to 4.

-Patrizio Bianchi, Davide Parrili Obstaculos e Oportunidades de Inversion para el desarrollo de las pequenas y medianas empresas en Chile. Universita degli Studi Di Ferrara, Dipartimento di Economia Istituzioni Territorio 8, 2002

-Stefano Zamagni: El caso dramatico de la Argentina, Revista Empresa n°152, marzo 2002 pags. 20-32

-Mikel Landabaso , EU Commission, DG REGIO B3 Reflections on U.S economic development policies: meeting the "new economy" challenge. Chapel Hill, December 2000.

-Jose Antonio Ocampo, Executive Secretary, Economic Commission for Latin america and the Caribbean (CEPAL)Commentary: Rethinking the development agenda, Cambridge Journal of Economics 2002.

-TeDIS Project: Sistemi locali di sviluppo e piccole-medie imprese alla prova dell´integrazione europea: dall´analis alle politiche. Novembre 2002.

ANNEX I : Sources that could be tapped in order to construct a Competitiveness Monitor Index

World Competitive Yearbook, by the IMD International Institute for Management Development, a University based institute located in Switzerland
It lists countries ranked on a set of **5 main factors. (**In brackets the number of indicators for the Economic Performance, as an illustration of the total number of quantitative or qualitative indicators).

Economic Performance	5 Subfactors: Domestic Economy(33) Intl Trade (20), Intl Investment (10), Employment (7), Prices (4)
Government Efficiency	5 Subfactors: Public Finance, Fiscal Policy, Institutional Framework, Business Legislation, Education
Business Efficiency	5 Subfactors: Productivity, Labor Market, Finance, Mgmt Practices, Impact of Globalization
Infrastructure	5 Subfactors: Basic Infrastructure, Techological Infrs. Scientific Infrs., Health and Environment, Value System

Site: www.imd.ch/wcy

Global Competitive Report, by the World Economic Forum, WEF.
Based conceptually on M Porter´s competitiveness diamond, it lists countries in a Global Competitive Index, ranked on a set of 8 main factors, each formed by a Quantitative and a Qualitative component. In turn, the GCI weights differently each factor :

Factor	Weight on Index
Openness of the Economy	3/18
Government	3/18
Finance	3/18
Infrastructure	2/18
Technology	2/18
Management	1/18
Labor Market	3/18
Institutional Development	1/18

Site: www.weforum.org

UNIDO´s Scoreboard is comprised of two rankings:

a)Competitive Industrial performance Index, CIP, by UNIDO ranks 87 countries on the basis of only **4** Factors:

- Manufacturing Value Added (MVA)
- Manufactured exports per capita
- Share of Medium and High tech activities in MVA

Share of Medium and high-tech products in Manufactured exports

b)Ranking of economies by the 5 "Drivers of industrial performance", on the same 87 countries:

- Skills index
- R&D Spending per capita by productive enterprises
- Foreign Direct Investment per capita
- Royalties per capita
- Infrastructure Index

The Industrial Development Report accompanies the Scoreboards´s 2 rankings with an interesting section on how to use them to design policy.

Site www.unido.org/doc/511836.htmls

Development Report Card, by the Corporation for Enterprise Development generates **3 Indexes:**

-Performance Index, based on **5** factors: Employment, Earnings & Job Quality, Equity, Quality of Life, and Resource Efficiency

-Business Vitality Index, based on **3** factors: Competitiveness of Existing Business, Structural Diversity, Entrepreneurial Energy

-Development Capacity Index, based on **5** factors: Human Resources, Financial Resources, Infrastructure Resources, Amenity Resources, and Innovation Assets

The Report is accompanied by a very simple definition of each factor. Site: www.drc.cfed.org

-**State Competitive Report**, by Beacon Hill Institute ranks the 50 US states based on **6** factors:

a) Government and Fiscal Policy

b) Security & Legal Institutions

c) Infrastructure

d) Human Resources

e) Technology

f) Finances

Its director of Communications accompanies the release of the Report with a catchy summary of findings.

Site: www.beaconhill.org

EURADA´s benchmarking of regional competitiveness. The EU´s Regional Association of Development Agencies uses a set of 63 indicators for its ranking of 20 European regions located in 10 countries. Each indicator is simply defined.

GDP	Population	Imports
Exports	People in Employment	Working Population
Inflation rate	Number of firms registered	Roads (km)
Railways (km)	Power Supply (Gw/h)	Fixed telecom subscriptions
Ports(tonsembarked+disem)	Flights(#arrival+departures)	Cost (rate) of borrowing
Cost of labour	Cost of Premises ($/m2)	Number of Inmigrants
Number of Emigrants	# of business start ups	Number of winding ups
Company taxation rate	Time lapse f or incorporation of a Ltd. firm	# of Public administration employees
#of resident graduates	Public R&D expenditure	Total R&D expenditure
# of collaborative agreements for tech transfer	Total number of research bodies	Number of patents registered for the year at EU
# of employees in R&D	Participation in innov.programmes	Companies involved within Recognized clusters
#of employees in med/high tech manufact/services	Annual turnover of all companies in recog clusters	Total turnover of companies registered in the region
# of spin offs, jv, between research bodies and firms	Number of students graduating with a magmt degree	#of licensing agreements between universities and firms
#firms buying/sell over the internet	#regular users of Internet	# of computers /100 pupils
# of IT students graduating	Costs of incorporate a firm	

Univ. of Ferrara Benchmarking study on Chile SMES competitiveness environment

As an additional source on benchmarking studies on PMI competitiveness environment, this study, conducted by prof. Patrizio Bianchi and Nomisma considers the following aspects:

Legislation Obstacles, which include:

- Existence of Cooperatives y SME groupings
- Financial regulation & factoring
- Regulations on subcontracting
- Incentives for new enterprises
- Incentives on competition
- SME access to Public bids
- Legislation on labour, environment and taxation aspects

Market failures, which includes:
- Human Resources
- Technology, Innovation and Quality
- Firm´s cooperation and business services
- Financial aspects

ANNEX II: US SME and Regional development policies

Tables extracted from M. Landabaso (2000)

Table N 1 -Key Innovation Programs by the U.S. Federal Government

Name of Program	Agency Responsible	Type of Aid and Beneficiary	Objective
SBIR- Small Business Innovation Research Program	Small Business Administration as coordinator and ten Federal Departments	Project Grants to Small Firms[1] up to $100.000 for Phase I and up to $750.000 for Phase II per winning company	To stimulate technological innovation in the private sector, strengthen the role of small business in meeting federal R&D needs and increase the private sector commercialization of innovations derived from federally-supported R&D efforts (and foster women-owned and socially disadvantaged small business firms in technological innovation)
SBTT- Small Business Technology Transfer Program	Small Business Administration as coordinator and ten Federal Departments	Project Grants funding cooperative R&D projects between a small firm and a research institution	Expansion of the public/private sector partnership to include the joint venture opportunities for small business and the nation's premier nonprofit research institutions – a mechanism for small businesses to tap research institutions for the enormous reservoir of ideas that have not yet been deployed effectively for the nation's economic benefit
ATP- Advanced Technology Program	National Institute of Standards and technology – Department of Commerce	Project grants to U.S. businesses and U.S. joint research and development ventures.	To work in partnership with industry to foster the development and broad dissemination of challenging, high risk technologies that offer the potential for significant, broad based economic benefits for the nation
MEP – Manufacturing Extension Partnership	National Institute of Standards and technology – Department of Commerce	Co-financing at 50% for the creation and support of manufacturing extension services. Beneficiary shall be U.S. manufacturing firms, specially smaller companies.	Funds may be used for the purpose of demonstrations, technology deployment, active transfer and dissemination of research findings and extension service expertise to a wide range of companies, especially those with fewer than 500 employees
EPSCoR- Experimental program to Stimulate Competitive Research	National Sciences Foundation	Grants directed at those jurisdictions that have historically received lesser amounts of federal R&D funding (19 States and Puerto Rico)	To identify, develop and utilize a state's academic science and technology resources in a way that will support wealth creation and a more productive and fulfilling way of life to its citizens through public-private partnerships
EPSCoT – Experimental Program to Stimulate Competitive Technology	Department of Commerce	Co-financing project grants to regional institutions, including private firms, in 26 States and Puerto Rico	To build state-wide institutional capacity to support technology commercializa conducive to technology development, deployment and diffusion

Source: Catalog of Federal Domestic Assistance (2000) – www.cfda.gov/, Small Business Administration – www.sba.gov/ , National Sciences Foundation – ww.nsf.gov/, and National Institute of Standards and Tech innovation.

Table N 2 - Examples of R&D Tax Incentives in the U.S.[2] The first 9 states (alphabetical order)

Arizona	Arizona offers a tax credit for increasing research activities in the state. The credit is modeled after the federal guidelines, and allows an 8% to 12% credit. The credit may not exceed $500,000 in any year and may be carried forward for 15 years
Arkansas	The Biotechnology Development and Training Act, provides additional incentives: 20% tax credit on qualified R&D expenses; 30% tax credit on the cost of cooperative research with state universities; 30% tax credit on the cost of training necessary to prepare employees to work in biotech (in facility or at an accredited Arkansas higher education institution); 30% state income tax credit on the costs of building, equipment, higher education partnerships and intellectual property associated with the production of advanced biofuels; and 5% income tax credit on the costs of construction, expansion, renovation or purchase, of biotechnology facilities and equipment, exclusive of undeveloped land. Tax credits are to offset first $50,000 of tax liability, and no more than 50% of the remaining tax liability. Any unused credit may be carry forward 9 years.
California	California has a sales tax credit for R&D expenditures and exempts new businesses with less than $50 million in assets or less than $1 million in annual credit. California has a 6% investment tax credit on equipment purchases ($1 million cap) with no carryback provisions and up to a 9 year carryforward. The state has a 9% corporate tax. California offers a 12% credit on research (increased research) and earnings (R&E) with no carryback and unlimited carryforward (24% for university research). Manufacturing and Research Equipment Credit: This credit reduces California corporate franchise tax, and in some

[1] Small firms are considered to be those with less than 500 employees. Other requirements for participating in SBIR are that business applicants must be American owned and independently operated for profit.

[2] Extracted from Survey of State Incentives – Biotechnology Industry Organization, 12th April 2000 (http://www.bio.org/govt/survey.html) and State Science & Technology Institute (2000), "New Developments in State S&T Policy: highlights from the SSTI Weekly digest", March 2000.

	instances can be used to reduce the sales tax on the acquisition of qualified property. Taxpayers are entitled to 6% of the amount paid for equipment placed in service in California.
Connecticut	Allowance for businesses with $70 million or less in gross sales to exchange unused R&D tax credits with the State for a cash payment equal to 65% of the value of the credit (effective for income years beginning January 2000).
Delaware	Delaware Research and Development Tax Credit permits companies to claim credits against either a business' corporate income tax or, where applicable, against personal income tax for qualified research expenses done within the state. State's exposure in a year for credits is limited to $5 million.
Georgia	Georgia offers a 10% tax credit of qualifying research expenditures. Any unused credit may be carried forward 10 years. The credit taken in any one taxable year shall not exceed 50% of the business enterprise's remaining Georgia net income tax liability after all other credits have been applied.
Hawaii	10% tax credit of up to $500.000 for private investment in high-tech businesses that do research within the state. Enacting a personal or business income tax credit for increased research activities. Exempting from capital gains or income taxation stock options from qualified high-tech businesses. Exempting individuals and Hawaii technology businesses from paying taxes on any royalties received from copyrights and patents.
Illinois	Illinois offers an R&D tax credit of 6.5% of qualifying expenditures made for the purpose of increasing research activities in Illinois. The credit is authorized through 2000 and allows a five-year carry-forward.
Indiana	Indiana allows a 5% credit to Indiana taxpayers for qualified research expenses over the taxpayer's base amount. Indiana follows federal guidelines and definitions.