

FLEXIBLE SPECIALIZATION

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*The dynamics of small-scale industries
in the South*

Edited by
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and MEINE PIETER VAN DIJK

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Preface

Flexible specialization, new competition and industrial districts are some of the many terms used to refer to the dynamics of small enterprises. Usually the terms are put forward in the context of developed countries, but questions also arise in Eastern Europe and the South: what determines the dynamics of the industrial sector? Which role do small enterprises play in this sector? How can we achieve that kind of dynamic development?

Since its inception, the EADI Working Group on industrialization strategies has had the potential of small manufacturing enterprises in the South as one of its main concerns.¹ Since the general conference of EADI in Oslo in 1990, efforts have been under way to apply the concept of flexible specialization and use network theories to understand the problems of small industries in the South and study diffusion of innovations in small enterprise environments.

The authors contributing to this volume have worked within this context. Flexible specialization has been accepted as a concept generating relevant topics for research. The results are presented in the papers in this volume. Earlier versions were discussed during a workshop at the Research Policy Institute in Lund. Topics taken up are the importance of flexible production techniques for small industries in the South, of clusters, of interfirm linkages, of trading and other networks, of technological development and an advanced division of labour, and the collective efficiency resulting from this. A number of the subsequent chapters are critical about the flexible specialization concept and draw on a wider range of theoretical traditions to explain the dynamics of small enterprises.

P.O. PEDERSEN

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1 Introduction

Industrialization in the North created what has come to be called 'Fordism', referring to the assembly-line technology that played an important role in the success of the T-Ford automobile production at the beginning of this century. The Fordist type of production organization is usually coupled with 'Taylorism' in management. This implies a clear line of command, and a highly-developed division of labour and stratification within the factory, which places management and workers on different sides. This has been seen as a fundamental weakness of many Western economies by many critics, e.g. Best (1990). Furthermore, the Fordist paradigm has come under criticism in the wake of increasing difficulties in balancing an economic scale of assembly-line production with existing consumer demand.

Hence, elements of a post-Fordist industrial paradigm have emerged in the wake of economic troubles in the seventies and the eighties. The central feature of this discourse is the emphasis given to increasing flexibility. In developed countries this means automation, electronic information systems and robotization. In addition, neo-Fordism is based on semi-autonomous groups of producers, often small firms. Their co-ordination depends on a centralized information system, which is often located within an established corporation. Through this form of organization, producers are able to respond efficiently to fluctuations in the volume and quality of sophisticated and differentiated consumer demand.

These developments have also suggested that industrialization does not necessarily have to mean an increasing share of mass production in large-scale enterprises. Indeed, the flexible specialization concept puts small industries at the centre of the industrial strategy debate. Piore and Sabel (1984) suggested that the deterioration in industrial performance in a number of Western countries results from the limits of the mass production model and saw flexible specialization as a future alternative. They emphasized in particular the decentralization of big factory chains and redeployment of productive forces in small units, which take advantage of flexible technologies. Dissolution of rigid mass production systems and introduction of more innovative ways of producing, using multi-purpose equipment and employing skilled workers, would enable crisis-ridden economies to react to continuous changes.

Schmitz (1989) explicitly discussed the applicability of these ideas to the Third World. He distinguished a small enterprise variant and a large firm variant of flexible specialization. In the first case, flexible specialization results from the clustering of small firms and a strong interfirm division of labour. The large firm variant exists when large firms decentralize and specialize internally or use specialized suppliers. The latter in particular has

produced organizational innovations such as 'Just In Time' (JIT) inventory management techniques.

The small-firm variant of flexible specialization presumes that clusters of small producers can reach collective efficiency. Innovative behaviour is expected in such an environment and competition is tempered by co-operation. Suppliers of parts in the automobile industry can and do compete, for example, but co-operation between the 'assembling' firm and its suppliers, or between suppliers, in solving specific technological problems, also occurs.

Clustering of enterprises can enhance this co-operation and help the enterprises in surviving economic adversity by increasing their capacity to adapt to changes in the environment. In many cases small enterprise clusters are not only able to survive during hard times, but actually increase their share of total production, at the expense of mass producers (Piore and Sabel, 1984:12). This has *inter alia* been demonstrated by their ability to withstand and respond to the oil and debt crises.

The problem remains of how to measure flexibility, innovative mentality and collective efficiency. The last concept can easily be confused with localization, urbanization or other agglomeration economies.¹ Innovativeness and flexibility at the level of enterprise clusters are not as easy to identify in the field. Several papers in this volume, however, suggest different approaches to this problem.

Enterprise environments and collective efficiency

A key element in the theory of flexible specialization is the realization that the individual enterprise cannot be understood in isolation from the specific environment in which it is operated. Both the structure and the efficiency of the enterprise depend on the products and services available from other private or public enterprises in the area, on the structure and qualifications of the labour force, and on the size and structure of the market. Agglomerations of differentiated interacting activities may achieve what Schmitz (1990) has called collective efficiency. The areas where they are clustered are often called Marshallian (industrial) districts after the English economist Marshall who wrote about such districts in the beginning of the twentieth century (see Pyke, Becattini and Sengenberger, 1990; and Pyke and Sengenberger, 1992).

If needed services or production inputs are not available on the market the enterprise will either have to produce them itself, accept an often much-reduced efficiency, or choose a technology which reduces its needs for external inputs. The choice of technology also depends on the structure of the labour market, and the choice of product depends on the size and structure of the market.

Flexibility in a production system is a response to instability and uncertainty in the market (Salais and Storper, 1992). Large-scale production

requires a relatively large and stable market to be profitable. To secure the necessary market stability, large-scale producers are forced to opt out of the smallest and most unstable markets and leave them to niche producers, to subcontractors or un-serviced.

Enterprises venturing into these smaller and more unstable markets have, briefly, three options:

- They may invest in multipurpose machinery and employ skilled labour which make it possible for them to shift production between different markets and thus create stability for themselves, although their individual markets may fluctuate. This option corresponds to what has come to be known as flexible specialization, or what Pyke and Sengenberger (1992) call the 'high road' to industrial restructuring.
- They may minimize their investments in machinery (and preferably treat investments as sunk costs) and rely on unskilled labour which can be hired and fired at short notice. In this way the enterprise may be able to survive, although its market fluctuates wildly. This option leads to what could be called sweatshops often operated as simple subcontractors. It corresponds to what Pyke and Sengenberger (1992) call the 'low road' to industrial restructuring.
- Finally, in the smallest and most unstable markets, very small or household-based enterprises may survive on a semi-subsistence level. Capital investment is insignificant, and only part of the labour of the proprietor and family is devoted to the venture, which is supplemented by other sources of income from agriculture or formal or informal wage labour.

These options form a hierarchy with respect to size, capital intensity, productivity and market. The competitiveness of each option depends not only on output market structure, but also on labour markets, input markets and the general social context in which the enterprises operate. Examples of each will be given in the following chapters.

Flexibility of labour markets

For the large capital-intensive enterprise, stability of the labour force, especially but not only in the higher echelons, is important for stable production and high-capacity utilization. The needed qualifications will often be highly specialized and enterprise specific, and in order to reduce the costs of training and labour turnover the enterprise will often train people so narrowly that their qualifications cannot be utilized in other enterprises. On the other hand, it will also be willing to pay above average wages in order to keep its trained personnel. Thus the enterprise will attempt to create an internal labour market where the enterprise and at least its core personnel have a common interest in reducing labour turnover.

Enterprises choosing the flexible specialization strategy will require a core labour force with broader and more general qualifications. However, it will be relatively easy for the qualified workers to switch from one enterprise to another. Therefore, the enterprises will also be unwilling to finance training, which is rather paid by the trainees themselves or by the government. On the other hand the high mobility of labour is important for rapid innovation diffusion among the enterprises and it will often be relatively easy for workers to start their own enterprises.

Enterprises choosing a sweatshop strategy will typically offer relatively poor working conditions, low wages and unstable employment. However, even in the sweatshop, on the job training is often important, and although the enterprises hire and fire workers according to seasonal and cyclical demand, the same workers may often be attached to the enterprise for long periods. Especially in rural areas there may be a mutual interest in such permanent seasonal employment if it complements the agricultural work seasons.

Finally, the very small semi-subsistence enterprise will typically offer employment only to the owner and possibly to some family members. It will often be a part-time activity supplementing agricultural work or some type of wage work. The incomes earned in such activities vary widely depending on the activity, the qualifications of the owners, their investments and the priority they are able and willing to give to the enterprise.

In principle, all four enterprise strategies are likely to be pursued in any society. However, the importance of each strategy will vary, depending on the character of local and global markets and their accessibility. The larger the accessible market, the more important will the mass production sector be.

The growing importance of flexible specialization

In the industrialized societies, flexible specialization is often said to have become more important partly because the market for more specialized high-income consumer goods has expanded and partly because subcontracting and what has been called 'labour market informalization' has become increasingly important. However, the increased demand for small and medium-scale flexible production is also a more direct result of the development of large-scale production itself; firstly, because large-scale production requires more standardization which increases the demand for niche products to cover markets which cannot be satisfied by the standardized product. Secondly, with increasing levels of mechanization and automation the large-scale producer needs a growing supply of dedicated, non-standard machinery and equipment to maintain and renew the production system.

In the developing countries the situation is very different. Markets are significantly smaller and less stable. Consequently, the room for large-scale

production is much smaller than in the industrialized countries. In spite of this, the goal of industrialization policies in many developing countries has been to develop large-scale industries. Supported by government and donor funds, production capacity has in many cases been expanded well beyond the feasible level. This has resulted in low capacity utilization, which the government has attempted to increase by granting monopoly status to these companies. Instances of preferential treatment in allocation of scarce resources and foreign currency also abound, and outright state ownership is common in many countries. This strategy has effectively blocked the development of other alternatives. Semi-subsistence producers and small workshops have remained at that level, and frequently suffer from harassment by the authorities.

The absence of small-scale service establishments and input suppliers in the local environment has often led large enterprises to develop such auxiliary activities within the enterprise. Such activities are usually not operated at an optimal level and this therefore further reduces the efficiency of the large enterprise at the same time as they undercut the chances for developing such activities on a market basis.

As a result, the intermediate enterprises which do develop tend to grow out of the demands of the semi-subsistence producers and consumers, rather than as a response to the large-scale sector. However, their development is limited by the low purchasing power of their main customers, and they are unable to break out of this vicious circle because of the closed, monolithic and monopolistic nature of the mass-production sector, and the attractiveness of its products for the local elites, middle classes and labour aristocracy. Expansion therefore tends to create sweatshop groups, rather than flexibly specialized enterprise networks.

Because of this, it can be difficult to distinguish between nascent flexible specialization and proliferation of sweatshops. They coexist side by side, and only a closer look at their operations will reveal which trend is dominant. Where flexible production and Marshallian districts could be said to exist it is often at the same level as or at an even lower level in terms of wages, skills and employment security than the sweatshops. This problem is discussed in several contributions below, but particularly by Knorringa and Wilson. Furthermore, Cho shows that even South Korea, which started its industrialization on the basis of very large-scale production, has developed a production system during the 1980s based on a mix of large-scale production, flexible specialization, and sweatshops, particularly in the garment sector.

Lastly, low-income levels and instability in the economy often force people to rely for their survival not on one activity, but on a mix of wage labour and entrepreneurial activities in small or large enterprises. Their association to labour market organizations and unions, therefore, tends to become rather unclear, while on the other hand social and family networks

become more important. For small entrepreneurs the result is often that they are only able to focus part of their energy and resources on their enterprise and, therefore, are also less likely to succeed.

The new competition and flexible specialization

Best sets himself the task of integrating 'a theoretical analysis of the business enterprise with extra-firm concepts of markets, competition, regulation, and planning that have been the preserve of economists' (1990: viii). He uses the term the 'new competition' to refer to the prevalence of firms that are organized to 'pursue strategies of continuous improvement in product and process within a regulatory framework that encourages industrial restructuring' (Best, 1990: 252). The emergence of this phenomenon has increased pressures on firms everywhere to reorganize or restructure their operations.²

Best's book addresses the failure of the United Kingdom and the United States to compete with Japan, the newly industrializing countries (NICs) and some European countries. His main point is that big business in the United States suffers from rigid command structures and control routines in production organizations, and he calls for restructuring according to the organizational principles of his theory.

At the centre of this paradigm is the entrepreneurial firm; 'an enterprise that is organized from top to bottom to pursue continuous improvement in methods, products and processes' (ibid: 2).³ Such firms seek a competitive edge by superior product design (which may or may not lead to lower costs) and organizational flexibility, which manifests itself in a variety of interfirm complexes, ranging from groups of small Italian firms linked by co-operative associations for joint marketing, technological advance and financial underwriting, to giant Japanese organizational structures co-ordinating trading companies, banks and manufacturing enterprises.⁴ Such firms will also try to capture export markets where possible and Best argues that the emergence of the 'new competition' has taken the United Kingdom and the United States by surprise.

The new competition concept contrasts with the old competition concept, which was predicated on mass production at the lowest cost possible. The old competition was 'market-coordinated by vertically specialized industrial enterprises' (ibid: 7), whereas the new competition turns on strategic action, which aims at the shaping of markets, in contrast to responses in reaction to markets. The new competition is distinguished from the old in four dimensions:

1. *The organization of the firm.* It has a strategic orientation to choose the terrain on which to compete, while the traditional, hierarchical firm takes the terrain as given. The entrepreneurial firm actively seeks a strategic advantage.

2. *The co-ordination of phases of production in the production chain.* The choice is not restricted to plan, market or hierarchy. Consultative-co-operative interfirm relations may exist among mutually interdependent firms.⁵
3. *The organization of a branch of activity.*⁶ This refers to a variety of inter-firm practices and extra-firm agencies such as trade associations, apprenticeship programmes, labour education facilities, joint marketing arrangements and regulatory commissions, each facilitating interfirm co-operation.⁷
4. *Patterns of industrial policy.* According to Best, the health of an industrial system depends on combining competition with co-operation. This can only be achieved by policy intervention. Industrial policies should help to shape markets and address production rather than distribution and be strategically focused.

However, the new competition does not necessarily affect all sectors of the economy. Traditional non-exporting sectors may be less affected in particular by the developments discussed above. Another criticism is that Best does not explain why all of a sudden the new competition emerged.⁸

The 'new competition' concept is more general than the flexible specialization concept, which explains the success of industries in Italy, Japan and Germany that are based on craftsmanship, multi-purpose equipment, industrial districts and networks of innovating entrepreneurs. These are also the essential elements of any strategy based on that theory. The flexible specialization theory focuses primarily on firms interacting with other firms and the way they use their technologies. In contrast, the new competition theory looks at worldwide markets and emphasizes primarily the different modes of organization that are possible in branches where vertical disintegration is the trend at the moment (for example the automobile and electronics industry).⁹ The key variables in the flexible specialization theory are technology and division of labour, while the new competition theory stresses improvements in methods, products and processes, including organizational forms, financial arrangements and marketing strategies. Increased research on the organizational and institutional aspects of flexible production is therefore necessary, and can be initiated by drawing on the new competition theory.

Both theories include a spectrum of strategic factors. Among these are the importance of continuous alertness, the combination of some competition with some collaboration and the advantages of subcontracting relations. Policies in the case of flexible specialization concentrate on creating clusters and networks and an environment prone to innovation, while the new competition theory stresses the importance of shaping markets and of targeting strategic sectors. Government policies should have a production focus and encourage firms to seek strategic alliances.

Technological change and technological networks

To assess the dynamic role of small and medium enterprises in the future and to delineate growth paths open to them, it is necessary to examine specifically their technological characteristics and those of enterprise networks, although it is not only technology which contributes to flexibility. Employment of casual labour, piecework contracts and product diversification are also among the strategies used.

It is important to consider technologies as integral parts of social networks, and transcend the dichotomy common in the popular literature between technology and society. After all, technology refers not only to the 'hardware' used in production, but also the organization of production processes, the knowledge applied, etc. (Callon, 1987; Sverrisson, 1993).

Any production process can be analysed as a series of more or less well-defined steps. Every step can be carried out within the confines of a single enterprise, or they can be developed as specialties of separate but interdependent enterprises. The former is typical of 'mass-production' enterprises of the old variety, as well as the large-scale variant of flexible specialization. The small and medium-scale variant, however, implies the subdivision of the process, involving several enterprises. Further, if each step is carried out by autonomous enterprises, and moreover, several enterprises are capable of the operations necessary for each step, an enterprise network is needed to ensure the co-ordination of the entire process.

Let us consider the consequences of this for technological change, and first address the options within each enterprise. In ordinary furniture production, for example, the main production sequences is as follows: sawing, planing, cutting of joints, sanding, joining and varnishing. Each step in this and most other production processes can be carried out by the means of handtools, and these are moreover often the property of the workers, and do not belong to the enterprise or its proprietor. However, each step can also be mechanized, or a mechanized function such as turning can be introduced, without the simultaneous mechanization of other operations. In this way it is possible for a handtool-based enterprise to develop along a path of incremental mechanization towards a fully mechanized workshop. The changes implied by increasing mechanization in the organization of the work are minimal. An example of this is provided in Sverrisson's paper below. This possibility is also in line with the limits on available capital in most small and medium-scale enterprises, making it all the more tempting for the proprietors.

However, any process of the type described above needs raw material and inputs, and distribution and transport are commonly separate functions carried out by specialized enterprises. Hence, the production of furniture can also be considered as an interactive process involving several enterprises. They may be involved in forestry, lumbering, saw-milling,

furniture manufacture, transport or sales. One production unit could conceivably do all this. However, usually several enterprises perform each of the functions mentioned and if one does not deliver, the manufacturers simply go to another. This contingency of relations within interactive enterprise networks are the key to other aspects, such as adaptability and innovativeness.

From the analysis above, it can for example be seen that flexibility in a network or enterprise collective is increased as the production process is separated into ever smaller parts, each organized in an independent unit. This is particularly relevant in the case of gradual mechanization. In order to mechanize, say planing, in a carpentry network, each enterprise does not need a planer. It is sufficient that one enterprise possesses a planer, if (and only if) this enterprise in turn provides planing services to other enterprises. This happens often enough, and similar relationships can be based on any other power tool, machine, or technically-defined segment of the production process. A mechanized spinning factory may for example provide thread to weavers using hand-operated looms, which in turn can sell the cloth to all kinds of enterprises, including household-based, rural dressmakers. The possibility of combining technology sophistication levels in other words also exists on the level of branches of industry.

Usually then, each enterprise involved in a production process has a specialized function of some kind. Exactly how the lines are drawn depends on the context: in Africa, the possession of a woodlathe is enough to set up a specialized turning shop because this tool, common though it is, is not found in the majority of carpentry enterprises. Simultaneously, cylindrical legs are very popular in many countries. If tastes were different or capital more plentiful, the lathe could not have this significance.

Arrangements of this kind maximize the benefits of partial mechanization of the network. However, to be effective the different parts of any production network must be closely attuned to each other, and this can *inter alia* be accomplished through the design of the hardware, by building an integrated production plant. The Achilles' heel of this type of integration is, however, that bottlenecks somewhere in the production sequence hold up the entire plant. If the process is prone to such bottlenecks, this can easily lead to a situation where any benefits which might accrue from scale economies are erased.

Technological and social networks

An alternative mode of integration is social rather than technical. The different phases in the production sequence can be matched by subsuming them under one management, or alternatively, through the activities of brokers or traders of various descriptions, or to use Williamson's terms, through hierarchies or markets. In actual fact, of course, existing networks combine these types of co-ordination mechanisms.

Which particular combination prevails, however, has direct implications for technology choice, and the other way around: available technologies may preclude certain social arrangements and preselect others. The former has been the case in small enterprise networks all over the Third World, where divisible techniques and multi-purpose machinery is the rule simply because it fits the bill. The converse has occurred in numerous technology transfer projects, in which large-scale plant has been installed, in which the different steps in the process are not only organizationally, but also technically integrated. Attempts must also be made to line up suppliers and distributors in order to cater for the demands imposed the aim of running this particular plant effectively (Bagachwa, 1992). This in turn has called for a replication of the crisis-ridden corporate bureaucracies of the North, but this time in the South, where the immanent weaknesses of this type of organization are amplified, in particular by the absence of the infrastructure which they presuppose.

We saw above that the technical characteristics of the production sequence in many small and medium-sized enterprises in the South facilitate gradual mechanization. In addition, social aspects such as poverty increase the attractiveness of gradual and flexible mechanization, rather than the promotion of integrated mass production systems (see Kaplinski, 1990; Smillie, 1991). However, flexible specialization implies more than this, namely the co-operation of enterprises in some form.

The network approach makes it possible to elaborate this, otherwise underdeveloped, aspect of the flexible specialization theory. This approach has *inter alia* been refined in a series of Swedish innovation studies (Hakansson, 1987; Laage-Hellman, 1989). A network is then seen as a series of units which are interconnected through varied types of social relations. There is commodity exchange, information exchange, exchange of services, subcontracting, mutual reliance on technical specifications or standards, a common labour force, a common language, a common location, a common social background and so on. Such social production units are not fixed entities and their relations, technological and others, are not completely determined by the network. Hence, such technological networks are conceived to be in a state of constant evolution. Their borders are indeterminate and changing and the roles of different units in the networks are likewise malleable.

This in turn explains the innovative potential of certain participants in such networks, as well as the evolutionary potential of the enterprise networks themselves. If they are compared to a technically-integrated production system, a central characteristic emerges. It is possible for a unit in a loosely-integrated technological network to change its role, by launching a new product, introducing a new machine, or whatever, without the whole network having to follow suit immediately. Hence, experimentation is possible without jeopardizing the network itself. After all, most of the units

will carry on with business as usual. If the experiment turns out well, it is likely, of course, that the innovator will be imitated by his peers, and a diffusion process results. If, however, the experiment fails, no great harm is done, and the resources of the network, never committed in their entirety to the experiment, are largely intact. Under these circumstances, the risk for the production collective as a whole is significantly less than when this collective is closely integrated by hardware design, detailed technical specifications, and other sources of scale economies.¹⁰

These processes are particularly relevant to the problems of enterprise collectives in the South. There, experimentation usually means being the first to introduce a technique, which is mature in and of itself, and make it work in the local social context.¹¹ However, this type of development potential can only be realized in the case of innovations, which possess either or both of the following risk-minimizing characteristics:

- They are divisible. This is typical of the introduction of new input into an existing production process: the introduction of veneered blockboard or other similar material instead of massive wood can proceed gradually in a furniture workshop.
- They are of a multi-purpose character or, which amounts to the same, are single-function techniques. A drill can be used to make holes in just about any material, more or less effectively, but then, it is limited to this particular function.

The network argument reveals the close correspondence called for between technique and organization, if both are to function well.

Spatial elements: locations, clusters and industrial districts

Under certain circumstances some local regions and towns, especially in the industrialized countries, have become dominated by enterprises following one of the strategies discussed above and developed into a:

- Fordist industrial centre, or a 'one-company' town;
- Marshallian district;
- sweatshop economy; or
- semi-subsistence economy.

In these cases, enterprise structures, private and public services, labour markets and social networks may over time have adapted to each other and their environment and merged into mutual symbiotic patterns of social reproduction. Even enterprises which elsewhere would follow a strategy other than the dominant one, tend to take colour after the dominant strategy in order to exploit the collective efficiency of the local environment. Such arrangements persist as long as they offer viable solutions to the problems of survival even for the poor in an otherwise hostile economic environment. Therefore they