
Small and Medium-sized Industry in Turkey

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Foreword

Small and medium-sized industry constitutes a major component of an economy because it is flexible in adapting to social and economic conditions, and it is a dynamic sector in which new technologies are first tried out. Moreover, it supplies parts and components to large establishments. These characteristics make it essential to collect data on small and medium-sized establishments. The “Small and Medium-Sized Industry Project”, funded by the World Bank, aimed to regularly collect and analyse reliable data on key variables (capital and labour productivity, capacity utilization, market structure, export potential, competitive strength, etc.) that determine the structure and characteristics of small and medium-sized industry in Turkey.

The project was carried out jointly by the Industrial Investment and Credit Bank, the People's Bank, the Vakıf Bank, the Housing Bank, the Export Promotion Centre, the Standards Institute of Turkey, and the State Institute of Statistics. As a partner in the project, the State Institute of Statistics was in charge of creating and developing a database on small and medium-sized industry. For this purpose, the Institute was supported through technical assistance, training and equipment to enable it to collect data on micro-establishments (establishments employing less than 10 people) from Annual Surveys of Manufacturing Industry.

Besides collecting and compiling reliable data, the Institute also aims to conduct scientific research and to disseminate research findings to the public. The present study presents a part of the ongoing research on the longitudinal database compiled in the context of the Small and Medium-Sized Industry Project. The Institute will continue to participate in similar projects that are vital to improve our statistics.

I would like to thank Prof. Orhan GÜVENEN and Prof. Mehmet KAYTAZ, former Presidents of the Institute, and Prof. Haluk KASNAKOĞLU, former Vice President and the Advisor to the President. They supported the studies to improve industrial statistics, and made this project possible and successful. I would extend my thanks to the author of this book, Assoc. Prof. Erol TAYMAZ, for guiding the staff team in a cooperative spirit, and organizing the seminar where the team members presented their research findings.

M. Sıddık Ensari
President, SIS

Abbreviations

APS	average plant size
AT	Appropriate Technology
DC	Developed Country
EU	European Union
GATT	General Agreement of Trade and Tariffs
ILO	International Labour Organization
LDC	Less Developed Country
NGO	Non-Governmental Organization
NIC	Newly-Industrializing Country
R&D	Research and Development
SIS	State Institute of Statistics (Turkey)
SME	small and medium-sized enterprise/establishment
SMI	small and medium-sized industry
SPO	State Planning Organization (Turkey)
TNC	Transnational Corporation
UN	United Nations
UNIDO	United Nations Industrial Development Organization
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
WTO	World Trade Organization

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Chapter 1

Introduction

Turkey joined the customs union of the European Union (EU) to strengthen its economic development potential through more extensive trade with the European Community. The customs union brings Turkish industry into more open and extensive competition with international organizations, both domestically and abroad. There is a pressing need for more factual information about the status of this sector of the economy, and, in particular, the small and medium-sized industries, in order to assess its ability to compete in the global economy and provide a basis for effective economic development policies by the Government and for developing appropriate business strategies by private sector organizations.

In July 1991, the State Institute of Statistics (SIS) initiated a project to enhance its capacity to collect and to analyze data on small and medium-sized establishments (SMEs). As a part of the project, two special surveys, one on the innovative potential of SMEs, and the other on the inventory of machinery and equipment in the textile and engineering industries, were conducted in 1992 and 1995 respectively. The findings of the first survey were published in 1994 (SIS, 1994). The Institute also organized a seminar on the Analyses of Technological Level and Efficiency of Small and Medium-Sized Industry in Spring 1996. This

book was prepared to summarize the research findings of the SIS staff.

In most of the twentieth century, SMEs were considered to be an archetypical and declining sector in which "informal" and "pre-modern" labour relations and technologies hindered the process of economic development. The SME sector was thought to be eliminated by more efficient and advanced large firms. The tendency towards gigantism was dominant among public policy makers both in the developed and the less developed countries (LDCs) who try to imitate the industrial development experience of the former group. The apparent failure of the industrialization attempt in most of the LDCs and the prolonged economic crisis in the developed countries in the 1970s and 1980s, as well as the striking resistance and vitality of SMEs in many sectors, forced policy makers to re-evaluate the role of SMEs in the economy.

The small firm has increasingly become the focus for public policy designed to decrease unemployment in the developed and less developed countries. In the 1970s, international organizations started to advocate the promotion of SMEs in LDCs to alleviate the problems of unemployment. It is argued that the capital-intensive "modern" sector in LDCs is unable to generate employment opportunities to a rapidly growing population.

Two influential organizations, the International Labour Organization (ILO) and the World Bank developed and suggested policies to promote the SME sector. For example, as Özcan (1995: 12) said, "[t]he International Labour Organisation (ILO, 1976, 1972) redefined the informal sector in underdeveloped countries as a potential engine for achieving self-sustained economic growth. The World Bank (1980, 1978) has also supported policies of small scale enterprise development in developing countries as part of an important role in creating income and employment opportunities for the poor in urban areas."

Subcontracting is assumed to play an important role in policies designed to promote SMEs. For example, Watanabe (1971: 51), in one of the leading articles on subcontracting, claims that "... subcontracting can smooth the path of small enterprises and make them a suitable instrument for mass employment creation in developing countries that are committed to industrialisation." United Nations Industrial development Organization (UNIDO, 1974) also called for the promotion of industrial subcontracting.

The Turkish governments seem to adopt SME-promotion policies under the auspices of international organizations. The Small Industry Development Center (KÜSGEM) was established in 1970 by the support of UNIDO. KÜSGEM was a local organization focused on assisting SMEs in Gaziantep province. In 1983, it

was replaced by a nation-wide organization, the Small Industry Development Organization (KÜSGET), by an agreement with UNIDO. KÜSGET was transformed into a autonomous organization, the Small and Medium-Sized Industry Development Administration (KOSGEB) in 1990 (Müftüoğlu, 1989: 135; SPO, 1985). These organizations proved to be quite successful in providing technical assistance and training services to SMEs.

In the 1970s and early 1980s, the labour intensive technological structure was emphasized as the major factor behind the potential of SMEs to generate employment. In recent years, the emphasis has been gradually shifted towards the technological dynamism and entrepreneurial spirit of SMEs. The SME sector is now hailed for its flexibility and creativity. As Özcan (1995: 1) explains, "[t]he most popular panacea for economic rejuvenation is the harnessing of the entrepreneurial spirit of small firm owners. The theory behind this is that a complex of market sensitive, resource maximising, flexible companies can counter the supposed 'dead hand' of big business and generate jobs and income." (Özcan, 1995: 1). *The Seventh Five Year Development Plan* of Turkey echoes these well-known arguments. The Plan explains the "new" policy towards SMEs as follows:

Small and medium size enterprises are quick to adjust to economic change and innovations and they have a high capacity to create employment. These enterprises will be supported and developed through a special programme taking account of the problems of adjustment they may face in the customs union process. The necessary legislative arrangements will be made to allow for more financing opportunities to be available. The institution of risk capital, which is important for putting productive ideas into production and for contributing to technological progress, will be put into effect along with a credit guarantee fund, and R&D activities will be encouraged. (SPO, 1995: 75)

The Seventh Five Year Development Plan emphasizes the flexibility and employment-creating capacity of SMEs, and proposes financial support (through the "institution of risk capital" and "credit guarantee"), especially for R&D activities. The plan also envisages that the Small and Medium-Sized Industry Development Administration will provide financial, technical and management consultancy services, and urges the encouragement of "the transfer of present

establishments to organized industrial zones" (SPO, 1995: 76). Although the Plan does not provide a comprehensive framework to support SMEs, it can be reasonably claimed that the issue will be on the agenda of the Turkish governments in the next decade because the new GATT (now, WTO) regulations forbid all industrial support policies with the exception of those for the promotion of SMEs, local development, and R&D activities. Therefore, support for the SME sector will be one of the main policy tools available to the Turkish government to support its industries.

Although the importance of SMEs for economic development and employment generation is accepted in the rhetoric of policy makers (those establishment employing less than 100 people account for more than half of the manufacturing employment in Turkey), the real level of knowledge about such firms is surprisingly low. Because of the lack of data, most of the existing scholarly studies are based on small-sample survey data whose coverage is usually limited (see, for example, Bademli, 1977; Ayata, 1987 and 1991; Aktar, 1990; Evcimen, Kaytaz and Cinar, 1991; Kaytaz, 1994; and Özcan, 1995). These studies present a very detailed (usually sociological) description of the patterns of capitalist (under)development in specific sectors/regions. On the other hand, there are a number of studies that are published by the practitioners and policy makers (for example, see Koparal, 1977; Baykal, Pazarcık and Gülmez, 1985; MPM, 1987; SPO, 1989; and Müftüoğlu, 1989). These studies are usually based on "macro" data, and discuss the "problems" of the SME sector as perceived by practitioners and policy makers.

The difficulty of collecting data on SMEs could explain the scarcity of analytical studies on small and medium-sized industry (SMI) in Turkey. In most cases the smallest firms (self-employed and those employing less than 10 people) are not fully included in government statistics. The survey studies that collect data on even the smallest firms lack the longitudinal dimension, i.e., the data are not available over the time dimension. Moreover, the survey data could be misleading to concentrate upon survivors. As Storey and his colleagues correctly observe,

There is a somewhat cavalier tendency for researchers to conduct interviews with an easily identifiable group of small businesses and infer that the results are generally applicable to the small business sector. For example business schools or public agencies frequently report the results of interviews with their

own client group, planners tend to interview firms on industrial estates and small business pressure groups place great weight on the views of their members. (Storey *et al*, 1987: 11)

The SIS collects data for all SMEs and large establishments and a selected sample of micro-establishments (those employing less than 10 people). Since a unique identification code is assigned to each establishment, it is possible to follow establishments over time, including even those that are eventually closed. This is the first study that exploits the longitudinal dimension of the SIS data at the micro level.

This book is restricted to small and medium-sized establishments in manufacturing industry. This explains why we prefer to use the concept of "small and medium-sized industry" (SMI). Therefore, the concept of "SME" in this book refers only to the small and medium-sized *manufacturing* establishments. The study covers all manufacturing sectors, and, therefore, does not analyze each sector in detail. We hope to conduct sector-specific studies in near future.

This book describes the features that characterize SMEs in Turkish manufacturing industries. Beyond the mere description, the data are analyzed to shed light on the determinants of average plant size, the relationship between efficiency and plant size, etc., through some statistical techniques.

The book is organized as follows. Chapter 2 discusses how the SME sector has become a subject of increasing interest in the last couple of decades. Recent theories on the new role of SMEs are also discussed in this chapter. Chapter 3 explores inter-sectoral differences in the share of SMEs. An econometric model is estimated to understand sectoral determinants of the average plant size (APS). Chapter 4 describes the characteristics of SCI in Turkey. Chapter 5 presents the findings of a study on technical change, technical efficiency, and returns to scale in Turkish manufacturing industries. It focuses upon the degree of returns to scale and the effect of plant size on technical efficiency.

Chapter 6 studies the dynamics of new firms to shed light on SME births and deaths, failures and successes. After an analysis of the employment generation potential and growth patterns of new (and, usually, small) firms, the determinants of entry at the industry level, and the determinants of survival and growth at the plant level are investigated by using statistical tools. Chapter 7 summarizes the basic findings, and suggests future research.

The book is based on current statistics collected by the SIS. Unless otherwise stated, the source of all data and analyses presented in the book is the panel dataset prepared at the Industry and Agriculture Statistics Department of the Institute. There could be some minor discrepancies between the data presented in this study and the data published previously by the SIS, because we have corrected some errors found in the initial dataset.

Chapter 2

The re-emergence of small businesses and the "small business economics"

2.1 Industrialization, mass production and the dominance of large corporations

The Industrial Revolution in Britain marked the beginning of a period of economic growth on the basis of industrialization, and, consequently, the transformation from the agricultural to the industrial society. A cluster of product innovations such as new textile machinery, steam engines and machine tools and a series of related process innovations like new spinning and weaving, iron casting, and metalworking technologies in the late 18th and early 19th centuries laid down the foundation for technological progress in the next centuries. The technological basis of economic growth after the Industrial Revolution seemed to be grounded firmly on the steady drift towards mechanization, i.e., i) the "substitution of machines - rapid, regular, precise and tireless - for human skill and effort", ii) the substitution of inanimate for animate sources of power, and iii) the use of new and far abundant raw materials (Landes, 1969: 41). A number of subsequent organizational innovations settled the transformation of the labour process: the factory system of production gradually replaced the craft production in the early 19th century. In a sense, the principle of mechanization and the factory system of production constitute the Industrial Revolution, i.e., the industrialization of the currently developed countries.

The US economy took the lead in technological development from the mid-

19th century onwards. The American producers refined and developed further the principles of mechanization. The production of interchangeable parts that have earned the name of the "American system of manufacturing" was the critical achievement that forced the British producers to accept the superiority of the American counterparts. The new forms of work organization innovated in the US in the early 19th century, namely Taylorism and Fordism, seemed to augment the unavoidable drift towards mechanization/automation, mass production and ever-increasing economies of scale.

The drift towards mass production was accompanied by a tendency towards concentration and centralization of production. After the depression of the 1870s American industry underwent a significant transformation. Oligopolistic structures emerged and became dominant in the US and other western economies in the late 19th century. There are three factors put forward to explain the creation of oligopolistic markets:

1. The process of competition forced inefficient firms to exit whereas efficient and innovative firms increased their market shares either through rapid growth or by absorbing other firms.

2. The intensified rivalry forced some firms to fuse together by merger and consolidation to increase their market power and competitive strength.

3. Most importantly, technological change favoured mass production, i.e., increasing economies of scale in production, marketing, finance, and innovation. The minimum efficient scale has almost incessantly been raised by new product and process innovations. The dominant characteristic of new technologies was the bias towards large firms over small firms. Only a handful entrepreneurs "who made investments large enough to exploit fully the economic potential of these new process and products developed competitive capabilities" (Chandler, 1991: 342), and dominated their markets.

Chandler says that the exploitation of the economic potential offered by new technologies required the creation of the "modern industrial enterprise" that

was, in turn, the result of three sets of investments. Most essential was the investment in production large enough to utilize the economies of scale and scope inherent in the technological innovation. A second set was the investment in marketing and distribution large enough to sell the goods produced by the new processes of production in the volume in which they are made. Finally, the

success of the resulting enterprise called for the recruitment of a managerial hierarchy to manage and coordinate the day-to-day processes of production and distribution and to allocate resources for future production and distribution. (Chandler, 1991: 432)

The creation of large corporations was necessary to reap the benefits of economies of scale. However, mass production, i.e., high volume of production of standard products by using special purpose machinery, is very sensitive to economic fluctuations and disruptions because of its rigid structure. Therefore, mass producers were compelled to maintain minimum efficient scale and to carefully coordinate all of their activities: They strived for the "careful coordination not only of flow through the processes of production but also of the flow of inputs from the supplier and the flow of outputs to the retailers and final consumers." (Chandler, 1991: 439)

The construction of giant corporations from the 1870s to the 1920s was, therefore, a precondition to create a stable market environment desperately sought by mass producers. The typical giant corporation in the US was created through three merger movements: "horizontal mergers", i.e., the merger of corporations in the same sector, were the main type in the first wave in 1897-1903. The second merger wave in 1922-1929 led to vertically integrated corporations. The last one after the Second World War was characterized by conglomerate mergers.

The application of Fordist production techniques in the early 20th century gave another boost to productivity and economies of scale. However, the productivity boom was soon followed by the economic crisis in the late 1920s that showed that mass production was not sustainable without mass consumption. Micro-regulation of the market by giant corporations could accomplish stability for mass production, but macro-regulatory mechanisms were also necessary to realize the ever increasing consumption of mass produced commodities. The Keynesian system was created to match production and consumption in the national economy as a whole after the late 1920s and firmly established in the western economies after the Second World War. The combination of intensive Fordist accumulation with mass consumption was the leitmotif of the *Golden Era* of development in the post-war period which is characterized by stable and unusually high growth rates in output, productivity and real wages. As Boyer

(1988: 82) observes, in this era,

Not only does scientific management continue to advance (diffusion of the assembly line as the key configuration of industrial organization) and new products are launched (radio and TV sets, electrical appliances for the home), but a *new social compromise* between capital and labour ensures that workers will benefit from economic and technological progress. Workers are now both *producers and consumers* of capitalist new goods. Similarly, wages are a cost but also a key determinant of consumption and hence aggregate demand (via an investment accelerator effect.)

The large scale enterprises (LSEs) have grown steadily more important in the industrialized countries. In manufacturing the share of small firms in employment and total assets has fallen substantially and almost continuously since the late 19th century. There was also a dramatic fall in the number of small manufacturing firms up to 1948 and a slower but continual decline has going on since then. For example, the share of "small" enterprises in manufacturing employment in the UK dropped from 38% in 1935 to 24% in 1958, then to 20% in 1963 (Boswell, 1973: 20). Similarly, the LSEs in the US raised their share in employment and in total assets throughout the period. As a result, the average plant size (APS) jumped from 31 employee per plant in 1919 to 55 in 1939 (Bolino, 1966: 212). The percentage of total assets held by the 100 biggest firms increased from 34.5% in 1925 to 42.5% in 1933, then to 46% in 1958 and 48.4% in 1968 (Aglietta, 1987: 222).

The increasing dominance of mass production and large corporations in the process of economic growth since the Industrial Revolution led many researchers to conclude that it is an inevitable and even desirable outcome of technological change.* As Chandler (1991) summarizes the argument, "large firms have formed the basis of economic growth in the advanced capitalist countries."

* The creation of large corporations in the US is thoroughly analyzed by Chandler in his monumental studies, *The Visible Hand: The Managerial Revolution in American Business* and *Scale and Scope: The Dynamics of Industrial Enterprise* (Chandler, 1977 and 1990, respectively).

2.2 *The reemergence of small business economics*

The large corporation and the drift towards gigantism was identified with industrialization especially after World War II. The late developers, such as South Korea, and many other less successful LDCs, attempted to follow the experience of the industrialized countries. Gigantism seemed to be a technologically predetermined condition for and an inevitable consequence of economic development. For example, the Korean government "intentionally created large firms, *chaebols*, as an instrument to bring about the economies of scale in mature industries" (Kim and Dahlman, 1992: 442).^{*} The APS in Korean manufacturing steadily grown during the early industrialization process: from 25 employees per plant in 1966 to 60 in 1981.^{**}

The dominant paradigm that emphasizes the role of the LSEs in economic development, and the LSEs themselves have been increasingly questioned and came under attack after the late 1960s because of four related factors.

Firstly, there was the growing sensitivity to the dangers of big industry nurtured especially in the political climate of 1968. As Boswell (1973: 13) says, "[a]fter many years of neglect the subject of smaller firms is at last coming to the fore again. There are several reasons for this, perhaps the most important of which is that the giant corporation has grown increasingly suspect." *Small is beautiful* became a very influential slogan. Schumacher who published his popular book in 1973 explained why small is beautiful as follows:^{***}

* The combined sales of the five largest *chaebols* as percent of GNP increased from 12.8 in 1975 to 35.0 in 1980 and 52.4 in 1984 (Kim and Dahlman, 1992: 446).

** The data covers all establishments employing more than 5 workers.

*** Schumacher has been criticized for his over-emphasis on smallness. For example,

I have no doubt that it is possible to give a new direction to technological development, a direction that shall lead it back to the real needs of man, and that also means: *to the actual size of man*. Man is small, and, therefore, small is beautiful. To go for gigantism is to go for self-destruction. (Schumacher, 1973/1993: 131)

Secondly, the repeated failure of attempts to follow the experience of the industrialized countries and the growing disappointment with the large-scale development policies programs promoted an interest in less ambitious and more defensive strategies in the LDCs. Schumacher, who developed the "small is beautiful" concept, recommended LDCs to reject advanced large-scale capital-intensive technologies and to adopt the "intermediate technology". The intermediate technology, which is replaced later by an appropriate concept, "Appropriate Technology" (AT), will be labour-intensive and will lend itself to use in small-scale establishments. Schumacher claimed that

The poor of the world cannot be helped by mass production... [which is] based on sophisticated, highly capital-intensive, high energy-input dependent, and human labour-saving technology. The technology of mass production is inherently violent, ecologically damaging, self-defeating in terms of non-renewable resources, and stultifying for the human person. (Schumacher in Kaplinsky, 1990: 15).

As Kaplinsky (1990: 16) explains, AT organizations were in existence even before the Second World War, but "it was only in the second half of the 1960s

Goss (1991: 3) says that from within Schumacher's camp "... the picture of smallness which emerges often appears as a romanticized response to the perceived iniquities of 'bigness', a knee-jerk reaction frequently characterized by confusion and inconsistency, particularly in relation to issues such as ownership and control, technological development, and state regulation."

that the movement took off. The next significant step occurred towards the end of the 1970s when international institutions (such as the United Nations) began to show a more active interest." (Kaplinsky, 1990: 16) The US Agency for International Development (USAID) embraced the idea of AT and set out a program for it in 1976. Appropriate technologies were defined and defended as "small-scale but efficient, replicable in small units, readily operated, maintained and repaired, low cost and accessible to low income persons." (Kaplinsky, 1990: 30-31) As explained in the preceding chapter, international organizations such as the World Bank and UNIDO also began to advocate small-scale development since the early 1970s.

Thirdly, starting in the late 1960s, the industrial world entered a time of troubles. The first oil shock in 1973 was blamed for the recession in the mid-1970s. However, the persistent coexistence of high inflation and stagnation, which gave rise to the concept of "stagflation", ever-increasing unemployment and low rates of productivity growth, in spite of rapid technological progress, convinced many researchers that the industrialized countries were going through a major crisis that marked the end of the model of industrial development based on mass production. Although there are many theories put forward to explain the crisis (the theory of flexible specialization by Piore and Sabel (1984), the neo-Schumpeterian approach by Freeman and Perez (1988), and the "Regulation School" by Aglietta (1987) and Boyer (1998)), they all claim that industrialized countries are no longer able to grow on the basis of mass production systems. An old but forgotten topic, the entrepreneurial role of the SMEs was now praised as a panacea for economic growth. As Boswell (1973: 13) said just before the first oil shock

...the small-firm sector has long been expected to nurture that resource which can be argued as being useful, even indispensable, to our economy: a continued supply of entrepreneurs. It is expected to throw up new businesses -operating in the foothills of size or shooting upwards into big industry- which are willing and able to take risks, to innovate and to be agents of radical change.

The last, but not the least important, factor that explains the re-emergence of interest in small business is the re-emergence of small business itself. As explained before, the employment share of small manufacturing plants declined

(in other words, the APS increased) in most of the industrialized countries until the early 1970s. However, this trend seems to reverse around 1970: the share of small plants has tended to increase in many countries. This finding has been confirmed for many countries (see Carlsson (1989 and 1992) for nine industrialized countries, Storey and Johnson (1990) for the UK, Loveman and Sengenberger (1991) for the US, Japan, France, Germany, Italy and the UK, and Thurik (1990) for the Netherlands). Thus, economists have been forced to address the stubborn persistence, and even increasing share, of small businesses in industrialized countries.

Table 2.1 shows the APS in manufacturing in four major EU countries (Germany, Italy, the UK and Spain). The data on South Korea and Japan are also included for comparison. It is shown that APS declines substantially in all countries but Japan. There is a slight increase in Japan where the APS is quite low compared to other industrialized countries. Thus, the data in Table 2.1 proves that the trend towards small plants continues in major EU countries in the 1980s.

Table 2.1 Average plant size in manufacturing in a selected group of countries, 1981 and 1991

	1981	1991
Germany ^a	160.3	143.5 ^d
Italy ^a	126.2	88.3
United Kingdom ^a	54.0	33.6 ^c
Spain ^b	15.0	13.2
South Korea ^b	61.1	39.5
Japan ^c	24.3	26.9 ^f

Source: UNIDO, *Industrial Statistics Yearbook*, 1995 and 1985.

a covers establishments with 20 and more employees.

b covers establishments with 5 and more employees.

c covers establishments with 4 and more employees.

d 1993 e 1990 f 1992

2.3 The rise of small business: Dynamics of transition or transitory dynamics?

The rise of SMEs made economists reevaluate the history of industrial development. It is emphasized that while the share of SMEs declined throughout the late 19th and early 20th centuries, they were far from being extinct and, in several sectors they have remained the dominant and typical form of industrial organization. The "dual economy" argument has been developed to explain this phenomenon: the persistence of SMEs is attributed to a functional relationship with LSEs. This relationship rests upon three factors: differences in markets, costs, and demand structures (Piore and Berger, 1980).

Mass production is high volume production of standardized products by means of special purpose machinery. Special purpose machinery, by definition, cannot be a subject of mass production. Special purpose machinery should be produced by using general purpose, flexible machinery which is usually employed by small firms. In other words, the minimum efficient scale could be small in some sectors, at least in those that produce special purpose machinery. Similarly, SMEs exist in specialized and/or small markets.

LSEs may prefer to work with SMEs to take advantage of lower wages in

smaller firms. SMEs could pay lower wages because they usually employ unorganized labour. They also tend to have lower hiring and firing costs, and have weak incentives to have long-term employment contracts. Moreover, the owners of SMEs "may accept a low rate of return on their capital and the time and effort they put into their business in order to retain control of it" (Pratten, 1991: 34).

Finally, SMEs serve as a buffer against business fluctuations. LSEs supply the part of the demand which is stable and predictable, and the residual demand is supplied by SMEs.

The dualism theory considers SMEs as a vulnerable and transient form of industrial organization. Their conditions of existence are functionally dependent on the will and requirements of LSEs. They exist and survive to the extent that they serve LSEs. Although the dualism theory and various related concepts like "informal sector", "traditional sector", "pre-capitalist forms" etc., could illuminate various facets of the reality of SMEs, they are apparently incapable of explaining why the share of SMEs has tended to increase in the industrialized countries in the last couple of decades. The failure of traditional theories has led economists to develop new concepts and theories to explain the reversal in the historical trend towards gigantism. The Schumpeterian paradigm that emphasizes the role of technological innovations in economic development has decisively become dominant in recent studies in a rather paradoxical way because Schumpeter himself claimed in his late studies (Schumpeter, 1942/1976: 132, 134) that "[t]echnological progress is increasingly becoming the business of teams of trained specialists who turn out what is required and make it work in predictable ways" so that capitalist enterprise tends to automatize progress and "the perfectly bureaucratized giant industrial unit ... ousts small or medium-sized firm and 'expropriates' its owners", reinforcing the dominance of LSEs in the economy.

Schumpeterian/evolutionary economists explain the increasing importance of small firms by the economic and technological transformations in the world capitalist economy following the economic crisis of the 1970s. The two most influential contemporary small business economists, Zoltan J. Acs and David B. Audretsch (1990a: 4-5) say that

There are at least six major factors underlying the shift in the size distribution [towards SMEs]... These are: (1) the implementation of new flexible

technologies; (2) the increased globalization of American markets; (3) a changing composition of the labour force; (4) the proliferation of consumer demand, away from standardized mass-produced goods and towards stylized and personalized products; (5) government deregulation in numerous markets; and (6) a period of "creative destruction", in the Schumpeterian [1911] sense, is currently ongoing, whereby a cluster of innovations, in the sense that Mensch (1979) introduced, are shaping industries, just as entrepreneurs developing new products and processes are displacing existing entrenched firms and institutions.

Carlsson and Taymaz (1994) also highlight recent changes in the world economy, and the reaction of manufacturing firms to these changes. They claim that

The most important motivating forces [that underline the shift in output and employment towards smaller plants] are rooted in three major changes taking place in the world economy in the past two decades. These changes in the economic environment are i) intensified *global competition* as a result of the developments in transportation, information, and communication technologies and the resulting increased integration of the world economy; ii) a high degree of *uncertainty* reflecting a significant growth slowdown in all industrial countries triggered by the oil price shocks in the 1970s, exacerbated by volatility of exchange rates and reflected in high rates of interest, inflation, and unemployment; and iii) intensified *fragmentation* due to growing consumer demand for differentiated products, inducing firms to increase their emphasis on product differentiation. (Carlsson and Taymaz, 1994: 202)

Increased global competition forces manufacturing firms to specialize in core business areas in which they are competitive (the so-called "back-to-basics" movement). Specialization is regarded as "i) a way to cut overheads and fixed costs, ii) a way to reduce uncertainty, iii) a means of accessing cheap labour sources, and iv) a way to obtain new sources of supply of high quality, specialized inputs" (Carlsson and Taymaz, 1994: 202). Specialization can take three forms: decentralization, subcontracting, and outsourcing. Moreover, under the pressure of uncertainty and fragmentation of markets, firms are intensifying the search for greater flexibility. New flexible manufacturing technologies using

microelectronics and organizational forms now enable firms to enhance their flexibility. Thus, smallness has become a competitive advantage thanks to the emphasis on flexibility and economies of scope.

These arguments attribute the increasing importance of SMEs to the strategic reaction of manufacturing firms to changes in their economic environment. In this sense, the increasing share of small businesses could be due to transitory dynamics or temporary disruptions in underlying trends due to the economic crisis in the world economy (for example, see Williams *et al.*, 1987). The Schumpeterian economists, however, conceptualize economic crisis as a painful transition from the mode of development/techno-economic paradigm based on mass production in which economies of scale were dominant to a new mode of development/techno-economic paradigm based on flexible production in which economies of scope have become dominant, i.e., economies of scope are replacing economies of scale as the main route to cost reduction. The new technological trajectory which is determined by the new techno-economic paradigm now increases the scope for developing new products and hence the advantages of flexibility and responsiveness. Thus, the growing importance of SMEs is attributed to their innovative potential.

2.4 Innovative potential of SMEs

Two distinct lines of Schumpeterian research can be identified as regards the innovative role of SMEs: a group of researchers emphasizes the role of the entrepreneur as the main agent of technological progress. This line of research frequently refers to the early writings of Schumpeter, especially to *The Theory of Economic Development*, in which he defines the entrepreneur as a unique historical figure who carries out new combinations of the means of production. The function of entrepreneurs is to reform or revolutionize the pattern of production. "The carrying out of new combinations we call 'enterprise'; the individuals whose function is to carry them out we call 'entrepreneurs'." (Schumpeter, 1911/1989: 74) Since the SME sector is considered to be a fertile environment that nurtures entrepreneurship, SMEs are more innovative than LSEs so that they will play an important role in future. Moreover, entrepreneurs usually launch their innovations by creating new (and, consequently, small) firms.

Acs and Audretsch (1990a) show that "[t]he mean small-firm innovation rate, or number of innovations per million employees, was 322 [in 1982]. By

contrast, the large-firm innovation rate in manufacturing was 225." In other words, SMEs are not passive agents adapting to a changing environment, but active agents who mould industrial structure by new products and processes (see Acs and Audretsch, 1987, 1988 and 1990c).

The argument that SMEs are intrinsically more innovative than LSEs are criticized by some researchers. For example, Goss (1991: 109) says that

A popular image of the high-tech small enterprise, run by a scientist-turned-entrepreneur, has captured the imagination of many and has been bolstered by the cases of the 'Cambridge Phenomenon' and Silicon Glen in the UK, and Silicon Valley and Route 128 in the USA. The image has developed to embrace workers in these small firms as white-coated 'boffins' engaged in original creative activity in clean and pleasant laboratory surroundings. ...the claim that high-technology small businesses are in some sense the vanguard of a revolutionary revitalization of the economy is one that must be treated with a good deal of caution.

Goss (1991) says that SMEs have less bureaucratic administrative structures and thus "dynamic, entrepreneurial managers react quickly to take advantage of new opportunities" but they usually lack necessary skills and financial resources. Thus, it is necessary to assess the innovative potential of SMEs under certain historical and economic conditions. Table 2.2 summarizes advantages and disadvantages of small and large firms in innovation.

The second line of research that also emphasizes the increasing importance of economies of scope conceptualizes the process of innovation as an interactive process. It is suggested that interaction and non-market mediated information flows among firms are essential to launch new products and processes. New technologies develop in such a direction that a broad and rapidly evolving technological base is necessary for innovativeness. Even the largest firm cannot have such a broad base and needs to interact with others. This line of research focuses on the systemic nature of the innovation process and considers "systems" as the unit of analysis ("user-producer interactions" by Lundvall (1988), "networks" by Imai (1989),

Table 2.2 Advantages and disadvantages of small and large firms in innovation

	Small firms	Large firms
Marketing	Ability to react quickly to keep abreast of fast-changing market requirements.	Comprehensive distribution and servicing facilities. High degree of market power with existing products.
Management	Lack of bureaucracy. Dynamic, entrepreneurial managers react quickly to take advantage of new opportunities and rare willing to accept risk.	Professional managers are able to control complex organizations and establish corporate strategies. (Can suffer an excess of bureaucracy. Often controlled by accountants who can be risk-averse. Managers can become mere administrators who lack dynamism with respect to new long-term opportunities.)
Internal communication	Efficient and informal communication networks. Affords a fast response to internal problem-solving; provides ability to recognize rapidly to adapt to change in the external environment.	Internal communication often cumbersome; this can lead to slow reaction to external threats and opportunities.
Qualified technical manpower	(Often lack suitably qualified technical specialists. Often unable to support a formal R&D effort on an appropriate scale.)	Ability to attract highly skilled technical specialists. Can support the establishment of a large R&D laboratory.

Table 2.2 Continued

	Small firms	Large firms
Finance	(Can experience great difficulty in attracting capital, especially risk capital. Innovation can represent a disproportionately large financial risk. Inability to spread risk over a portfolio of projects.)	Ability to borrow on capital market. Ability to spread risk over a portfolio of projects. Better able to fund diversification into new technologies and new markets.
Patents	(Can experience problems in coping with patent system. Cannot afford time or costs involved in patent litigation.)	Ability to employ patent specialists. Can afford to litigate to defend patents against infringement.

Source: Goss, 1991: 110.

(): potential disadvantages.

"technological systems" by Carlsson and Stankiewicz (1990), "national systems of innovations" by Lundvall (1988), etc.). These researchers pay attention to the *diversity* of firms and forms of interaction which is the topic we discuss in the following section.

2.5 SMEs: A homogeneous identity?

The discussion on the "innovative role of SMEs" needs to be based on the definition of "SME". What is a "small firm"? It is, of course, almost impossible to give a precise definition. Although the concept of SMEs obviously refers to the *relative* size of enterprises, researchers tend to extend the concept to embrace perceived characteristics of SMEs. For example, Bannock suggests that

A small firm is one that has only a small share of its market, is managed in a personalised way by its owners or part-owners and not through the medium of an elaborate management structure and which is not sufficiently large to have access to the capital market. (Bannock, 1982: 24-25, by Özcan, 1995: 3).

This definition obviously embraces various characteristics that are not necessarily related to the firm size. For example, a small firm may have a dominant position in a niche market. Similarly, access to the capital market depends on many other factors including the development of the capital market itself, the type of industrial organization, the institutional framework including laws and regulations, etc. Any definition that describes an SME by a number of characteristics other than the size of the firm is based on the assumption of small business homogeneity and, tautologically, will portray the SME sector as an homogeneous entity. As Goss (1991: 149) says,

the assumption of small business homogeneity can lead to profound inadequacies of understanding. These inadequacies will be referred to as 'homogenization effects'. The first of these is the encouragement of a tendency towards essentialism: that is to say, the attribution to small businesses in general of some fundamental and ontologically privileged quality, e.g., 'entrepreneurship', 'industrial harmony', 'innovation', etc.

Second, the assumption of homogeneity implies the existence of common small business interests and a shared outlook amongst their owners and workers.

Third, it creates problems of definition and conceptualization, particularly in terms of the nature of small business organizational structure.

Finally, the assumption of a unitary small business sector discourages the examination of small firms in their wider economic and social context - i.e., it implies that small business exhibits its own distinct dynamic relatively independently of extraneous relations.

Any explanation of the behaviour and performance by some intrinsic, ahistorical "characteristics" will obscure the understanding and apprehension of the diversity of SMEs. It is misleading to claim that "innovation" or "flexibility" are essential characteristics of SMEs. On the contrary, it is necessary to study the conditions under which SMEs could be innovative or flexible.

A taxonomy of SMEs should be developed to avoid essentialism and to

understand various forms of the existence of small businesses. In this context, the taxonomy proposed by Rainne (1989) is a valuable contribution to the literature. He offers a four-fold classification of small firms:

- 1 *Dependent small firms* These complement and service the activities of larger firms (e.g. through subcontracting). Their viability depends on the level of activity and the 'make or buy' decisions of these large 'patrons'. Such a situation places effective control in the hands of the large enterprise, a control which extends not only over financial matters but also over the organization of the labour process, e.g., by forcing the minimization of wage costs and the implementation of flexible working.
- 2 *Competitive independent small firms* These compete with large firms by intense exploitation of labour and of (often antiquated) equipment. Even here, however, the rules of existence are laid down, if possibly unwittingly and unintentionally, by the large firm. In terms of industrial relations the result is, more often than not, hyper-exploitation of labour.
- 3 *Old independent small firms* These operate in niches of demand unlikely ever to be touched by large capital. This will often entail a hand-to-mouth existence, scraping around for a living. It is amongst this and the latter type of small business that sweat-shops are more likely to be found.
- 4 *New independent small firms* Small firms operating in (often founding and developing) specialized markets, but remaining open to the potentially fatal attentions of large firms. In other words, small firms which, within a very wide reading of the term, conduct the product and market research which large firms then step in and develop. (Rainne, 1989: 85ff)

Rainne's taxonomy, although simple, is useful in attracting attention to the diversity of SMEs that exist in very different market environments. SMEs are usually studied in the context of SME-LSE relations. Table 2.3 summarizes various forms of SME-LSE interaction that should be taken into consideration in any analysis of SMEs.

Table 2.3 Some modes of large/small firm interaction

Manufacturing subcontracting relationship

SMEs supply components and sub-assembly to large companies. As part of this process large companies frequently transfer technological, manufacturing and quality control know-how to their small suppliers. Stable, trust-based relationships can develop which are mutually advantageous.

Producer/customer relationships

SMEs supply finished products to large companies. Large companies can transfer technological know-how and supply suggestions for improvements to small suppliers based on user experience.

Licensing agreements

Large companies provide licences to small firms for innovative new developments. This frequently involves technology that the large company does not wish to exploit in-house but from which it wishes to gain a financial return. In some cases it can involve technology that the large company will subsequently purchase in the form of equipment for in-house use, for example large companies transferring new process control technology to small instrument companies.

Contract-out R&D

Large companies fund targeted R&D in small specialist consultancy companies, e.g., automobile companies funding R&D in specialist engine developers; pharmaceutical companies funding R&D in small biotechnology companies.

Collaborative development

Large and small companies collaborate in the development of a new product for the large company, e.g. small software or design houses collaborating respectively with large computer and automobile manufacturers.

Large/small firm joint ventures

Large and small firms collaborate in the development of an innovative new product containing technology new to the large partner. The large firm provides financial, manufacturing and marketing resources; the small firm provides specialist technological know-how and entrepreneurial dynamism. Generally the new products are complementary to the large firms' product range. They may be manufactured by the small partners.

Table 2.3 Continued

Learning opportunities

Large companies acquire new technology based firms to provide them with a window on new technology and an entrée to new business areas. Examples of this are fairly common in the biotechnology field. SMEs can learn about production and manufacturing.

Sponsored spin-offs

The large company offers financial backing for entrepreneurial employees to spin off to form a new small firm to exploit technology developed within the parent company which is deemed unsuitable for in-house exploitation.

Venture nurturing

The large company offers not only financial support to the sponsored spin-off, but also access to managerial, marketing and manufacturing expertise and, if appropriate, to channels of distribution.

Independent spin-off assistance

The large company offers technical assistance to an independent spin-off and sometimes acts as first customer for its products. Advance payments can provide a crucial source of income to the new company.

Personnel secondment

A number of large European companies have developed schemes to 'loan' experienced managers to assist new and existing SMEs in their locality.

Source: Rothwell and Dodgson, 1994: 322-323.

2.6 The implications of new technologies for the LDC SMEs

"New technologies" have emerged as the main factor in explaining the increasing importance of SMEs in industrialized countries. New computerized manufacturing technologies revolutionized small-scale, batch production by weakening the link between automation and scale. These technologies have considerably reduced costs of batch production by combining "flexibility" and "automation" (Taymaz, 1991). Thus, small scale production have again become profitable because of the decline in the minimum efficient scale of production.

A number of researchers expect that these technologies have created many

new opportunities for SMEs in LDCs. First, the descaling effects of new technologies have been decreasing or even eliminating the cost disadvantages of developing country SMEs that produce in low volume because of the limited size of domestic markets. Second, the flexibility of new technologies allows for increased product diversity so that developed and developing country firms are now able to produce products that suit the peculiar needs and resource endowments of LDCs. Finally, as explained in Section 2.2, some Schumpeterian economists argue that "the world is experiencing a structural crisis, during which, in spite of the obvious difficulties, there would be greater - rather than lesser - scope for a major positive change in development prospects" for developing countries because the new technologies allow "leapfrogging" for some of the developing countries that do not carry the inertia of the previous industrial structure (Perez, 1985: 441, 457). The LDCs can take advantage of the transitional phase to leap forward, to the new "information and communication paradigm".

All economists are not so optimistic about the implications of new technologies. It is argued that "descaling" by new technologies is not observed in some aspects of production and/or in some sectors. For example, Kaplinsky (1990: 168) argues that

... as there are tendencies towards descaling in some dimensions and in some sectors, ensclating factors are being injected into others. This has particularly deleterious implications for Developing Countries, especially those who rely on low wages for their comparative advantage. In addition, whilst both product and plant economies of scale may in general be reducing, two of the major factors underlying firm-scale economies (that is, R&D and marketing) not only shows no sign of diminishing but, if anything, are likely to increase further. These growing indirect costs may either be met by a further growth in firm-concentration or by more co-operation and networking between small- and medium-sized firms. There are no inherent technological reasons why large-scale firms should win.

Kaplinsky says that the minimum efficient scale is falling in traditional large-batch (mass production) industries whereas it is more likely to increase in small-batch industries. This finding is also supported by the fact that the new

"flexible" technologies are not more flexible than conventional manual production which is the dominant form of production in small-batch industries in the LDCs. The effects of changes in scale in large-batch and small-batch are summarized in Table 2.4.

The further increase in economies of scale in R&D and marketing activities may lead to a growth in firm-concentration and/or networking between SMEs. This trend has important implications for LDCs, because it suggests that we can observe opposite trends at the firm and plant level. A recent OECD study (OECD, 1992) shows that the transnational merger movement of the 1980s has led to world oligopoly in "high-technology" industries in which R&D plays a crucial role for competitiveness.

World oligopoly is not, of course, an entirely new form of supply structure. In petroleum and in several non-ferrous metal mining and processing industries (e.g. aluminium), world oligopoly has long been a key feature of supply. What is new is *the current rapid extension of global oligopoly* and the fact that *it is now constitutes the dominant form of supply structure in most R&D intensive of "high-technology" industries*, in many scale-intensive manufacturing industries, and in an increasing number of service industries. (OECD, 1992: 221, our emphasis)

Table 2.5 presents the data on the degree of *world* concentration in a selected group of high-technology and service industries. The high levels of concentration show that the opportunities for LDC SMEs in these sectors could be rather bleak. Moreover, as explained in the OECD study, "The current dynamics of globalisation may drastically increase inequalities of access to sources of foreign investment, the acquisition of foreign technology and access to foreign markets. ...On account of the particular resource and skills requirements of the new technologies, the gap separating rich and poor nations is likely to increase" (OECD, 1992: 257). The increasing importance of scientific knowledge in product and process development also contributes to the gap between the industrialized and developing countries because the LDCs that lack necessary technological capabilities do not benefit at all from technological spillovers.

The combined impact of increasing economies of scale at the firm level and the growing technological gap between the industrialized and developing countries needs to be carefully assessed by the policy makers in the LDCs. When

the appropriate policies are not implemented, these countries will be rapidly marginalized within the global economy.

Table 2.4 Likely changes in the dimensions of scale and their implications for appropriate technology in the Third World

	Changes in scale in the dimensions of			
	Plant size		Product	Firm size
	falling in large-batch industries	growing in small-batch industries	falling	growing
Industrial development in modern sector	positive impact on economic growth	negative as local production hindered	positive as more possibilities	negative if large firms/TNCs choose inappropriately or repatriate profits
Wage goods for the low-paid	positive as local production	positive as goods cheaper	positive if for low income goods	negative if large firms/TNCs choose inappropriately
Intersectoral linkages (incl. for agriculture)	positive as local production easier	negative as local production hindered	positive as more possibilities	
negative if large firms/-TNCs have				

fewer linkages

Table 2.4 Continued

	Changes in scale in the dimensions of			
	Plant size		Product	Firm size
	falling in large-batch industries	growing in small-batch industries	falling	growing
Wholly new possibilities (i.e. technological blending)	positive as local production easier	negative as capital goods industry is less viable	positive as new products are developed	negative if large firms/TNCs do not relate to local needs
Balance of payments	positive as local production easier	negative as local production hindered	positive if more local production or exports	negative if large firms/TNCs import more or export less
Encouragement of small-scale or co-operative ownership	positive as entry barriers lower	negative as entry barriers higher	neutral	negative by definition

Source: Kaplinsky, 1990: 167.

Table 2.5 World concentration in a selected group of industries

Market	Year	The degree of concentration
Computers	1987	90% of world output is produced by 10 firms
Telecommunications	1987	85% of world output is produced by 10 firms
Semiconductors	1987	61% of world output is produced by 10 firms
Automobile	1984	78% of world output is produced by 12 firms
Data processing/DRAM	1987	100% of world output is produced by 10 firms
Data processing/ASIC	1988	100% of world output is produced by 12 firms
Medical equipment	1989	90% of world output is produced by 7 firms
Reinsurance markets	1986	41% of world services is supplied by 8 firms
Computer services	1988	54% of world services is supplied by 8 firms
Advertising	1989	44% of world services is supplied by 8 firms
SBNC Services	1989	62% of world services is supplied by 6 firms

Source: OECD, 1992: 222-223.

Notes: DRAM: Dynamic random access memory, ASIC: Application specific integrated circuit, SBMC: Strategic business management consulting

Chapter 3

Determinants of average plant size in Turkish manufacturing industries

3.1 *What is an SME?*

Any empirical investigation of small business should start with the main question: what is a small establishment? The question of definition is central to an empirical study. There is no universally accepted definition of an SME among different organisations and different countries. The definitions of small firms used by different authors and organisations are often confusing and inconsistent. The definition poses such a difficulty because of three factors. First, as discussed in the previous chapter, the SME sector is not a homogeneous identity. Any definition based upon a one-dimensional measure tends to blur the diversity of SMEs. Second, SMEs are supported in almost all countries by various means, and the definition will determine who will benefit from such SME support schemes. Institutions construct and recommend their own definitions to suit their own purposes. Finally, the deficiency of data on SMEs makes it difficult to use some definitions that are otherwise relevant on theoretical grounds.

There is almost total lack of consistency between definitions proposed by various public agencies and institutions in Turkey. It seems that all agencies and institutions have their own definitions (for various definitions, see Müftüoğlu, 1989). In this study, it was decided to use the SIS definition which was first proposed by the State Planning Organization. In this study, we apply the

following categories:

- *Micro-enterprise: 0-9 employees*
- *Small enterprise: 10-49 employees (may be divided into 10-24 and 25-49)*
- *Medium-sized enterprise: 50-99 employees*
- *Large enterprise: more than 100 employees (may be divided into 100-199, 200-499, and more than 500 employees)*

The SIS definition uses employment as the measure of size. Small and medium-sized establishments are defined as establishments with less than 100 employees. This is, of course, an arbitrary definition and as with any arbitrary definition, open to endless criticisms. The Institute uses "employment" to measure the size of an establishment because information about employment is readily available and it is considered by managers to be less confidential than other measures of size, such as sales revenue or capital stock. Moreover, employment generation is a social objective in Turkey such that the growth of establishments in terms of employment has important policy implications.

In the EU, SMEs are frequently defined as enterprises with fewer than 500 employees. We believe that the employment ceiling used in the EU definition is too high for Turkey for all practical purposes, because, according to the SIS data, there were only 339 establishments employing more than 500 persons in 1992. Thus, we use the SIS definition in this study but tend to present the data for sub-groups as far as possible to have internationally comparable figures.

3.2 The share of SMEs in Turkish manufacturing industries

Turkey is often characterized as a newly industrializing country. The share of manufacturing employment in the labour force is relatively low compared to the developed countries. In such a developing economy, the share of SMEs in manufacturing employment is expected to be high. Table 3.1 presents the data on the distribution of manufacturing employment by establishment size in a selected group of developed countries. Although there are some differences in the definition of "establishment" among countries, the data allow us to compare Turkey with those countries.

Table 3.1 Distribution of manufacturing employment by establishment size, selected countries, 1990s

Country	Year	Number of emp. (000)	Distribution by size categories (%)			
			0-9	10-49	50-99	100+
Australia	1990	962	11	22	12	55
Austria	1992	580	2	16	14	68
Canada	1992	1,540	4	19	13	64
Germany	1993	6,929	13	23	9	55
Holland	1992	949	11	20	11	58
Japan	1992	11,156	12	29	13	46
Portugal	1992	989	15	26	14	45
Sweden	1989	749	1	16	12	71
Switzerland	1991	868	12	22	28	38
European Union, 12	1988	28,944	13	27		60
Turkey	1992	1,508	35	12	6	47

Source: Palas, 1996.

The share of micro establishments in the EU was around 13% in 1988. Portugal, the least developed region in the EU, has the highest share among the EU countries: 15%. The employment share of micro establishments is substantially higher in Turkey than in the developed countries. 35% of all manufacturing employment is generated by micro establishments, i.e., those establishments in which at most 9 persons are employed.

The employment share of LSEs in Turkey is lower than the EU average but it is comparable to Japan which has the lowest average plant size (APS) among the developed countries because of its unique inter-firm networking. The share of SMEs seems to be lower in Turkey than the EU, but this is a result of the outstanding share of micro establishments.

We argued in the second chapter that the APS in manufacturing tends to decline in developed countries as well as in the newly industrializing countries like South Korea. The changes in APS in the Turkish manufacturing industry since 1950 are summarized in Table 3.2. The level of manufacturing employment and the share of employees in total employment, i.e., "the number of persons engaged", are also presented to observe any structural change in the manufacturing sector. The APS is measured for two categories of establishments.

The first one is calculated for SMEs and LSEs, i.e., those establishments employing at least 10 employees. The second one is calculated for all establishments including the micro ones.

Table 3.2 Average plant size and employment in Turkish manufacturing industries, 1950-1992

Year	Average plant size		Employment ^a (000)	Share of wage earners ^b
	SMEs+LSEs	All estab.		
1950	c	4.1	336	68.8
1963	101.1	4.1	655	65.8
1970	105.9	4.8	837	72.1
1980	91.3	6.9	1289	77.9
1985	88.0	7.6	1463	81.0
1992	87.9	7.8	1528	83.4

Source: SIS, *Statistical Yearbook of Turkey*, related years.

a Number of persons engaged

b The proportion of employees (wage earners) in employment

c The data is not available because a different size criterion was used in 1950.

The two measures of APS display opposite trends after 1970. The APS of SMEs and LSEs declined from 105.9 employees in 1970 to 87.9 in 1992. However, the APS measured for all establishments increases gradually but steadily after 1963: on average, 4.1 persons were employed per establishment in 1963, but the average reached to 7.8 in 1992. These two trends show that the share of establishments at both extremes of the size distribution (micro establishments and LSEs) has been declining in the manufacturing industry. That is to say, manufacturing employment is concentrating in SMI.

Table 3.3 Average plant size in 1985 and 1992, and net change in employment in the period 1985 to 1992 (2-digit industries)

Sector	Average plant size		Net change in employment
	1985	1992	