Small Firms and Economic Growth in Europe

M. A. CARREE AND A. R. THURIK*

Economic activity in manufacturing industries moved away from large firms toward small firms in many Organization for Economic Cooperation and Development countries during the last two decades. However, the speed of this industrial transformation process has varied considerably across countries. This paper investigates the consequences of lagging behind in this restructuring process in manufacturing. A sample of 14 manufacturing industries in 13 European countries has been constructed for this purpose. It is found that, on average, the employment share of large firms in 1990 has a negative effect on output growth in the subsequent four-year period. This provides support for specific policies introduced during the 1980s in European countries stimulating small enterprises. (JEL L11)

Introduction

Economic activity in manufacturing industries moved away from large firms toward small firms in many countries of the Organization for Economic Cooperation and Development (OECD) during the last two decades. However, the speed of this industrial transformation process has varied considerably across countries. This paper investigates the consequences of lagging behind in this restructuring process in manufacturing. A sample of 14 manufacturing industries in 13 European countries has been constructed for this purpose. It is found that, on average, the employment share of large firms in 1990 has a negative effect on output growth in the subsequent four-year period. This provides support for specific policies introduced during the 1980s in European countries stimulating small enterprises.

There is substantial evidence that economic activity moved away from large firms to small firms in the 1970s and 1980s. Acs and Audretsch [1993] and Carlsson [1992] provide an overview of evidence concerning manufacturing industries in countries in varying stages of economic development. Carlsson mentions two explanations for this shift. The first deals with fundamental changes occurring in the world economy since the 1970s. These changes relate to the intensification of global competition, an increase in the degree of uncertainty, and growth in market fragmentation. The second deals with changes in the character of technological progress. Carlsson shows that flexible automation has various effects resulting in a shift from large to small firms. The pervasiveness of changes in the environment (for example, the world economy) and in technological progress results in a structural shift which affects the economies of all

*Erasmus University Rotterdam and EIM Small Business and Consultancy—The Netherlands. This study benefitted from a grant by the Research Centre for Economic Policy (OCFEB), Faculty of Economics, Erasmus University, Rotterdam.

industrialized countries. Piore and Sabel [1984] also argue that market instability resulted in the demise of mass production and promoted flexible specialization. This fundamental change in the path of technological development led to the occurrence of vast diseconomies of scale.

This shift away from large firms is not confined to manufacturing industries. Brock and Evans [1989] show that this trend has been economy-wide at least for the U.S. They provide four more reasons why this shift has occurred: the increase in labor supply, changes in consumer tastes, relaxation of (entry) regulations, and the fact that this is a period of creative destruction. Loveman and Sengenberger [1991] stress the influence of the two industrial restructuring trends of decentralization and vertical disintegration of large companies along with the formation of new business communities. Furthermore, they emphasize the role of public and private policies in promoting the small business sector. de Koning and Snijders [1992] provide an overview of the various public policies in countries of the European Union (EU) which have been introduced during the 1980s.

The consequences of the shift of economic activity from large to small businesses have been discussed by Acs [1992]. His claims are that small firms play an important role in the economy by serving as agents of change by their entrepreneurial activity, being the source of considerable innovative activity, stimulating industry evolution, and creating an important share of the newly generated jobs. Baumol [1990] amply deals with the role of entrepreneurial activities. The role of smallness in the process of innovative activities is investigated extensively in Acs and Audretsch [1990], Audretsch [1995], and Cohen and Klepper [1996]. The discussion of the relationship between the role of small firms and industry dynamics is spread out (see, for example, Audretsch [1993, 1995] and You [1995]). The role of small firms in the job creation process is a controversial topic. Davis et al. [1996] and Carree and Klomp [1996] provide a recent discussion.

This paper concentrates on whether or not the size class structure of industries has affected their economic performance or, more specifically, their economic growth. The list of consequences, as mentioned above, suggests such a relationship. Clearly, to a large extent, the question neglects the various roles of the intermediary variables between class structure size and economic growth. Some preliminary results for the relationship between changes in firm size distribution and economic growth are presented by Thurik [1995, 1996]. The analysis shows a positive effect of an increase in the economy-wide share of small firms on growth in gross domestic product. The interpretation of this result is somewhat difficult because it is not clear whether changes in the economy-wide share of small firms mainly result from changes in the sectoral composition or from downscaling in the specific industry. Schmitz [1989] presents an endogenous growth model which relates entrepreneurial activity and economic growth. He shows that an increase of the proportion of entrepreneurs in the working force leads to an increase in long-run economic growth. His model also implies that the equilibrium fraction of entrepreneurs is lower than the social optimal level, providing a rationale for policies stimulating entrepreneurial activity. The size class structure of an industry and the proportion of entrepreneurs in its working force are strongly related. Therefore, the

current study also provides a preliminary empirical test of the Schmitz model at the industry level.

Large Firm Presence in European Manufacturing

Considerable data are available showing that the size class structure of firms is changing. The most impressive, and the most cited, is that of the 500 largest American firms, the so-called Fortune 500. Their employment share dropped from 20 percent in 1970 to somewhat more than 10 percent now. European data zooming in on size distribution of firms were not available in a systematic manner until recently. However, Eurostat [1994] has begun to publish yearly summaries of firm size distribution of (potential) EU members at the two-digit level for the entire business sector. This paper uses data from the third edition of this summary entitled *Enterprises in Europe*. The efforts of Eurostat are currently being supplemented by the European Network of Small and Medium-Sized Enterprises Research, a cooperation of 16 European institutes. This organization publishes a yearly report of the structure and developments of small business sectors in EU countries [EIM, 1995].

Table 1 shows the development of the share of large business (firms with more than 500 employees) in total employment in some European countries, Canada, Japan, and the U.S. in the late 1980s and early 1990s. On average, European countries have experienced a decreasing share of large firms but the most pronounced decreases are found for Canada and the U.S. The table does not show whether these decreases are due to sectoral shifts or downscaling within industries. They are probably due to a combination of downscaling in the manufacturing sector and a decreasing share of this sector in the total economy.

This paper investigates the effect of differences in the size class structure of firms on the growth of industrial output. This will be done for a sample of 14 manufacturing industries in 13 European countries for 1990-94. The share of large firms is calculated from Eurostat [1994]. Not all data of industries and countries in the Eurostat report are used. Some countries are not incorporated because they provide establishment data instead of enterprise data. Industries are not considered where the total number of employees is below 10,000. Finally, Eurostat sometimes does not provide employment data due to reasons of confidentiality. Two measures of the share of large firms are calculated. The first is the employment share of enterprises with 100 or more employees or medium and large firm presence (MFP). For this variable, there is a total of 144 observations. The second is the employment share of enterprises with 500 or more employees or large firm presence (LFP). For this variable, there are 130 observations. The correlation between the two measures of MFP and LFP for the 130 observations is 0.929. Growth in total production from 1990 to 1993 and from 1990 to 1994 is measured by the production indices of the industry in 1993 and 1994 with base year 1990. The primary sources for the indices are Eurostat [1996] and OECD [1996].

Data are available for the 13 countries (number of industries incorporated) of Belgium (11), Denmark (10), Finland (7), France (14), Germany (13), Italy (14), the Netherlands (13), Norway (6), Portugal (12), Spain (14), Sweden (8), Switzerland (8), and the United

TABLE 1
Employment Share of Large Firms in 1988 and 1991

Country	1988	1991
Belgium	35.7	34.9
Denmark	22.9	21.0
Finland*	38.6	37.2
France**	35.3	33.7
West Germany**	36.1	37.2
Portugal	23.5	21.0
United Kingdom	35.2	33.8
Canada	38.8	34.6
Japan***	26.7	27.6
U.S.	50.2	43.1

Note: * denotes beginning period is 1989; ** denotes end of period is 1990; *** denotes end of period is 1992.
Source: *Economic Outlook* [OECD, 1994].

Kingdom (14). All data refer to the year 1990 except for Italy (1989) and Switzerland (1991). Five countries with total employment in incorporated industries of more than one million persons are Germany (7.6 million), the United Kingdom (4.9 million), Italy (4.2 million), France (4.0 million), and Spain (2.4 million). Total employment in the 144 industries equals 27.3 million persons.

Table 2 shows how these are distributed over the 14 two-digit level manufacturing industries. The next three columns of the table show the average MFP and the average production indices. The last three columns show the average correlation between MFP and the production indices for 1993 and 1994. The unweighted average of these correlations is -0.074. On average, MFP and production growth appear to be negatively related but the differences across industries are large. The correlations range from -0.55 to +0.66.

Empirical Results

To test for the effect of the share of (medium and) large firms on production growth, the authors use the following equations:

TABLE 2
Some Descriptive Measures

NACE	Description	OBS	EMPL	MFP	P93	P94	COR
21/22	Basic Metals	8	907	0.87	91.6	99.4	-0.48
24	Non-Metallic Mineral Products	10	1,081	0.55	88.0	94.0	-0.18
25/26	Chemicals	12	2,047	0.82	100.5	107.7	0.41
31	Metal Articles	9	2,972	0.39	89.0	93.8	-0.07
32	Mechanical Engineering	11	3,146	0.58	87.5	93.1	0.02
34	Electrical Engineering	10	2,949	0.74	99.1	107.4	0.09
35	Motor Vehicles	8	1,885	0.89	85.9	96.5	0.10
37	Instrument Engineering	7	492	0.54	92.0	95.7	0.66
41/42	Food, Drink, and Tobacco	13	3,177	0.58	102.5	104.1	-0.11
43	Textiles	10	1,410	0.61	87.0	91.5	-0.48
45	Footwear and Clothing	11	1,872	0.38	87.2	87.7	-0.49
46	Wood and Wood Products	13	1,759	0.27	95.8	102.0	-0.09
47	Paper, Publishing, and Printing	11	2,381	0.57	100.4	105.9	-0.55
48	Rubber and Plastics	11	1,269	0.56	95.7	101.8	0.15
All		144	27,348	0.59	93.5	99.0	

Note: NACE is an industry classification system. OBS denotes the number of countries for which data are available on MFP and production indices for 1993 and 1994. EMPL denotes the total employment in the industries for the countries for which data are available (in thousands). P93 and P94 denote the average production indices for 1993 and 1994, respectively. For base year 1990, the production index = 100. COR denotes the average correlation between MFP and P93 and between MFP and P94.

$$P_{ij} = a_i + b_j + c\mathrm{MFP}_{ij} + e_{1ij} \quad , \tag{1}$$

and

$$P_{ij} = a_i + b_j + c\mathrm{LFP}_{ij} + e_{2ij} \quad , \tag{2}$$

where i refers to industry and j to country. The variable P_{ij} is the production index of industry i in country j in 1993 or 1994. The variables a_i and b_j are industry and country

dummies, respectively. The variables e_{1ij} and e_{2ij} are residuals assumed to be identically and independently distributed. It is necessary to incorporate industry dummies because a certain level of LFP that is considered relatively high in one industry may be considered relatively low in another. Choosing a specific period over which to evaluate economic growth is crucial. If the period is too long then the size class structure of the industry may change considerably during the period of observation. If the period is too short, then the effect of size class structure may be overshadowed by the business cycle influence on industry output. Considered here are two periods, 1990-93 and 1990-94. In 1993, most European manufacturing industries experienced a period of recession. The average production index in this sample for that year was 93.5. For 1994, a strong recovery was disclosed for most industries and the average production index rose again to almost the same level as in 1990.

Table 3 presents least squares estimation results of (1) and (2) where only industry dummies are incorporated, i.e., $b_j = 0$ for all j. Also presented are the results weighted by employment. This implies that countries or industries with a large number of employees have a stronger impact on the regression results. The first four rows of the

TABLE 3
Estimation Results with Industry Dummies

Measure	Year	Countries	Obs.	Unweighted	R^2	Weighted	R^2
MFP	1993	All	144	-6.66	0.35	-12.34	0.30
				(1.2)		(3.5)	
MFP	1994	All	144	-7.81	0.29	-21.23	0.19
				(1.1)		(4.5)	
LFP	1993	All	130	-0.18	0.34	-11.77	0.27
				(0.0)		(3.1)	
LFP	1994	All	130	-1.01	0.27	-19.08	0.16
				(0.1)		(3.8)	
MFP	1993	All*	118	-17.51	0.42	-17.93	0.35
				(2.7)		(4.6)	
MFP	1994	All*	118	-19.83	0.33	-26.01	0.23
				(2.3)		(4.9)	
LFP	1993	All*	104	-7.53	0.40	-16.19	0.30
				(1.2)		(3.8)	
LFP	1994	All*	104	-10.87	0.31	-22.40	0.20
				(1.3)		(3.8)	

Note: * denotes exclusion of Spain and Portugal. t-values are in parentheses. Industry dummies are incorporated in each regression.

table show that the effect of MFP or LFP on production growth is only significant where weighted least squares are used. There is little difference between (1) and (2) in the percentage of variance explained. The interpretation of the coefficients in the table is straightforward. For example, the weighted least squares results in the first two rows of Table 3 imply that an increase in MFP by 0.1 leads to a decrease in output growth by 1 percent for 1990-93 and 2 percent for 1990-94. That is, industries not only appear to be more affected by the recession where medium and large firms had a larger employment share, but they also tend to recover slower from this recession.

In the last four rows of Table 3 the results are presented where Spain and Portugal are omitted from the sample. These two countries are in a stage of economic development different from the other countries. The gross domestic product per capita in the two countries is about two-thirds of that in the other countries and the LFP in industries is usually much lower than in the same industries of the other countries. It is not unlikely that many manufacturing firms in Spain and Portugal have a suboptimal scale. Small firm presence may only have a positive effect on output growth in a certain stage of organizational and technological development in which scale economies have become less important. Spain and Portugal, which joined the EU only recently, probably have not reached this stage yet. The estimation results in Table 3 seem to confirm this. The effect of MFP and LFP on output growth is stronger when Spain and Portugal are left out. The effect is now also significant for unweighted least squares estimation results for (1).

Table 4 presents least squares estimation results when country dummies are incorporated. The results for MFP are only presented because they do not differ much from those for LFP. The reason for incorporating country dummies is to correct for country-specific events in 1990-93 and 1990-94. One such event was the collapse of the

TABLE 4
Estimation Results with Country and Industry Dummies

Measure	Year	Countries	Obs.	Unweighted	R^2	Weighted	R^2
MFP	1993	All	144	-5.85	0.43	-14.74	0.35
				(0.7)		(2.6)	
MFP	1994	All	144	-3.50	0.42	-18.58	0.30
				(0.3)		(2.4)	
MFP	1993	All*	118	-16.10	0.49	-16.88	0.40
				(1.7)		(2.7)	
MFP	1994	All*	118	-14.71	0.45	-21.23	0.34
				(1.2)		(2.4)	

Notes: * denotes exclusion of Spain and Portugal. t-values are in parentheses. Country and industry dummies are incorporated in each regression.

Finnish-Russian trade relationship leading to a strong recession in the Finnish economy. The general conclusion remains that industries with a higher medium and large firm share in 1990 have shown less output growth in the subsequent years. Results are again somewhat stronger where Spain and Portugal are omitted from the sample.

Smallness and Economic Growth

The causes and consequences of the shift in economic activity from large to small firms have been on top of the research agenda since the early 1980s. This paper supplements the work of pioneers in this field by investigating whether or not a higher share of small business at the start of the 1990s has led to higher output growth in the subsequent three or four years in European manufacturing. This would give some support for the intuition of small business economists that changes in industrial structure have had some real effects on economic performance. The results indeed indicate that an industry with a low large and medium-sized firm presence, relative to the same industries in other countries, has performed better in terms of output growth. This suggests that lagging behind in the industrial restructuring process has come at a cost of lower economic growth. Countries most active in stimulating the small business sector in the 1980s may very well have reaped the fruits of this policy. The findings are in line with the endogenous growth model of Schmitz [1989]. They are also in line with empirical results for United Kingdom enterprises as provided by Nickell [1996]. Nickell studies the effect of competition on the development of firm productivity. He finds that an increased number of competitors is associated with higher rates of total factor productivity growth.

"Small business has to save us" is a slogan often heard from European politicians and representatives of social and institutional groups. They fear for a further rise in the already unacceptably high level of unemployment caused by the sheer endless series of efficiency and cost-cutting operations of the public and large business sectors. They hope that employment can be fought by stimulating smallness. There is probably more truth in their hopes and slogans than they think. First, stimulating smallness, whatever it may be, lifts the dependency on possibly sluggish and transient resources like scale, scope, and experience and intensifies the dependency on resources like adjustment and effectiveness. The latter resources are likely to be more robust against uncertainty and change than the former. Second, stimulation of smallness means stimulation of labor intensity and, hence, employment by definition [Loveman and Sengenberger, 1991]. Finally, stimulation of smallness implies an increase in the variety of the range of products and services offered. This not only paves the way for a competitive selection process and a process with different innovative approaches [Cohen and Klepper, 1992] but may also satisfy a fragmented and differentiated demand.

In the U.S., small firms replaced large firms not just in terms of generating almost all of the 18 million new jobs created in the 1980s but also in terms of much of the innovative activity that has driven the growth of new industries and renewed international competitiveness. Meanwhile, throughout Europe, job layoffs and downsizing of large firms (often in traditional moderate-technology industries) have been common

phenomena. The empirical results in this paper suggest that a policy of stimulating small firms, or more generally entrepreneurship, may be one of the most effective ways of combating the current decrease in competitiveness of European industry.

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