VII. PRODUCTIVITY AND FIRM DYNAMICS: EVIDENCE FROM MICRODATA

Introduction and summary

Chapters in the two previous issues of the *OECD Economic Outlook* (Nos. 67 and 68) discussed growth patterns in the OECD countries at the macroeconomic and sectoral levels. But growth of output and productivity takes place in individual firms, whose behaviour and decisions are influenced not only by market forces but also by policies and institutions. Understanding the underlying forces generating differences in performance at the firm level thus helps to formulate growth-oriented policies.

This chapter looks at the role of resource reallocation and firm dynamics in aggregate productivity growth

There is by now a sizeable body of evidence on firm performance, but international comparisons have been difficult to make. This chapter reports evidence on productivity growth and firm dynamics[1] for ten countries (United States, Germany, France, Italy, United Kingdom, Canada, Denmark, Finland, Netherlands and Portugal) on the basis of a common analytical framework and, to the extent possible, harmonised data.[2]

The main conclusions of this analysis are the following:

– A large fraction of aggregate *labour* productivity growth is driven by what happens in each individual firm, while shifts in market shares from incumbents in decline to those who are growing seem to play only a modest role.

Aggregate productivity growth largely depends on the performance of incumbents…

– Labour productivity growth is also boosted by the exit of low productivity units, especially in mature industries. In other industries – in particular those experiencing rapid technological changes (*e.g.* ICT-related industries) – the entry of new units is important in fostering overall productivity growth.

… but also on the entry and exit of firms…

– Within-firm growth makes a relatively smaller contribution to multifactor productivity growth – a proxy for overall efficiency in the production process – than it does to labour productivity. This suggests that incumbents often raise labour productivity by increasing capital intensity and/or shedding labour. By contrast, new firms provide a relatively larger contribution to multifactor productivity, possibly because they enter the market with a more "efficient" mix of capital and labour and likely new technologies.

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1. Firm dynamics includes firms starting up (entry) and firms going out of business, for whatever reason (exit).
2. The chapter draws from an ongoing project on firm-level data which is itself part of the OECD project on growth. The analysis has been conducted in close co-operation with country experts, who have contributed to the definition of a common analytical framework and the standardisation of key concepts. The institutions and research centres involved in the study are the following: Canada: Statistics Canada; Denmark: Ministry of Finance and Aarhus School of Business; Finland: Statistics Finland and Research Institute of the Finnish Economy; France: INSEE; Germany: consultants; Italy: Bank of Italy; Netherlands: Free University Amsterdam; Portugal: Banco de Portugal; United Kingdom: Queen Mary and Westfield College; United States: Center for Economic Studies, US Census Bureau. The full set of results from this project will be published in due course in the Economics Department Working Papers series.

– A large number of firms enter and exit most markets every year. The early years are the most difficult for entrants: 20 to 40 per cent of entering firms do not survive the first two years. Young firms that fail are often very small, while those surviving tend to be larger and experience further increases in the initial years.

The chapter is divided into four separate sections. The first section discusses the contribution of firm-level data to the analysis of productivity growth in OECD countries. The second section presents evidence on the importance for aggregate productivity dynamics of developments within individual firms as well as entry and exit of firms in markets. A decomposition of productivity growth is performed for manufacturing and for some service sectors and refers to estimates of both labour and multifactor productivity. The third section characterises entry and exit of firms across industries and countries and sheds some light on post-entry growth. Lastly, a short final section offers some preliminary policy considerations.

The role of firm-level data for the analysis of productivity dynamics

Aggregate patterns hide significant differences in performance of individual firms...

Analysis of micro data points to a marked heterogeneity in the distribution of output, employment, investment and productivity growth across firms and establishments.[3] Even in expanding industries, many firms experience substantial decline, and in contracting industries it is not uncommon to find rapidly expanding units. Likewise, business-cycle upturns and downturns do not necessarily involve a synchronised movement of all, or even most, firms or establishments.

There are a number of possible explanations for this. Heterogeneity may reflect certain conditions in the product market, *e.g.* product differentiation, which can, at least partially, be related to regulatory and institutional conditions. At the same time, uncertainty about market conditions and profitability may lead firms to make different choices concerning technologies, goods and production facilities.[4] This process of "experimentation", in turn, is associated with high entry rates but also high failure rates, especially amongst relatively young firms, and more generally widens differences in outcomes. Finally, it has been argued that new technologies are often embodied in new capital, which, however, requires a retooling or remodelling process in existing plants adopting these technologies, as well as changing work practices in some cases. Insofar as new firms do not have to go through this process, they may better harness new technologies and growth will then tend to be associated with new entrants who displace obsolescent establishments, and this process of "creative destruction" contributes to the observed heterogeneity in firms' performance.

... and this could affect the orientation of growth-enhancing policies

Policy orientations to enhance growth may depend crucially on how growth is generated at the level of individual firms. Importantly, the expansion or contraction of existing units or the creation and failure of firms impose costs on all those involved (*e.g.* entrepreneurs, workers, financing institutions). The magnitude of these costs is influenced by institutional and regulatory settings in the product and labour markets, such as administrative regulations on start-ups, bankruptcy laws and regulations affecting the

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3. For a survey of recent empirical studies see Caves (1998) and Bartelsman and Doms (2000).

4. Individual firms experiment to some extent with different production processes and technologies as they learn more about their markets, but a more important process of "experimentation" (in the sense of a natural experiment) occurs because different firms try different approaches to production and technologies. See, amongst others, Aghion and Howitt (1992); Caballero and Hammour (1994, 1996); Erickson and Pakes (1995) and Jovanovic (1982).

reallocation of labour and capital across firms and sectors. Identifying policy barriers that increase adjustment costs at the level of the individual firm is thus an important role for firm-level analysis. More generally, knowledge of the determinants of heterogeneity across firms, and how they are affected by policy interventions, may contribute to the understanding of how the aggregate economy evolves and reacts to exogenous shocks.

The growing number of empirical studies based on firm-level data have often focussed on the United States. Results for other countries have typically not been immediately comparable, because of differences in the underlying data and/or in the methodology used by researchers. The analysis presented in this chapter refers to ten OECD countries and, to the extent possible, is based on comparable data. Notwithstanding the efforts made to harmonise the data, there remain some differences that have to be taken into account in assessing cross-country differences (see Box VII.1).

New data permit international comparisons

Box VII.1. The firm-level data

Sources of the data and definitions

Available data at the firm level are usually compiled for fiscal and other purposes and, unlike macroeconomic data, there are few internationally agreed definitions and sources, though harmonisation has improved over the years. The data used for this project come from different sources.

The *analysis of firm entry and exit* has been based on *business registers* (Canada, Denmark, France, Finland, Netherlands, United Kingdom and United States) or social security databases (Germany and Italy). Data for Portugal are drawn from an employment-based register containing information on both establishments and firms. These databases allow firms to be tracked through time because addition or removal of firms from the registers (at least in principle) reflects the actual entry and exit of firms.

In this chapter, the entry rate is defined as the number of new firms divided by the total number of incumbent and entrant firms in a given year; the exit rate is defined as the number of firms exiting the market in a given year divided by the population of origin, *i.e.* the incumbents in the previous year.

The *decomposition of aggregate productivity growth* required a wider set of variables and was based on *production survey data* in combination with business registers. Production surveys are based on representative samples and often exclude firms below a given size threshold. The decomposition follows the approach proposed by Griliches and Regev (1995) that identifies three components: *i)* within-firm productivity growth; *ii)* gains in productivity that come from high-productivity firms' expanding market shares; and *iii)* productivity growth due to the entry of high productive firms or the exit of low-productive firms. Each term of the decomposition is weighted by the average market shares (over the time interval considered). An alternative approach proposed by Foster *et al.* (1998) weights each term by the base-year market shares and include an additional term (the so-called "covariance" or "cross" term) that combines changes in market shares and changes in productivity (it is positive if enterprises with growing productivity also experience an increase in market share).

In this chapter, *labour productivity growth* is defined as the difference between the rate of growth of output and the rate of growth of employment and, whenever possible, controls for material inputs. *Multifactor productivity* (MFP) *growth* is the residual from a growth accounting in which labour is measured by the number of employed persons, the capital stock is based on the perpetual inventory method and material inputs are also considered. Real values for output are calculated by applying 2-4 digit industry deflators.

Comparability issues

Two prominent aspects of the data have to be borne in mind while comparing firm-level data across countries:[1]

Unit of observation: The unit of reference in this study is the firm, with the exception of Germany where data are available only with reference to establishments. Firm-based data are likely to more closely represent entities that are responsible for key aspects of decision making compared with plant-level data. However, business registers may define firms at different points in ownership structures; for example some registers consider firms that are effectively controlled by a "parent" firm as separate units, whilst other registers record the parent company only.

Size threshold: While some registers include even single-person businesses, others omit firms smaller than a certain size, usually in terms of the number of employees but sometimes in terms of other measures such as sales (as is the case in the data for France and Italy). Data used in this chapter exclude single-person businesses. However, because smaller firms tend to have more volatile firm dynamics, remaining differences in the threshold across different country datasets should be taken into account in the international comparison.[2]

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1. For more detail on the comparability of the firm-level data, see Scarpetta *et al.* (2001).
2. However, a sensitivity analysis on Finnish data, where cut-off points were set at 5 and 20 employees, reveals broadly similar results for the productivity decomposition and aggregate entry and exit rates.

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Productivity developments: the role of reallocation and within-firm growth

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Productivity growth stems from growth within firms and from reallocation of resources between firms

At the industry level, productivity growth is the result of different combinations of growth within existing firms; increases in market shares of high-productivity firms; and the entry of new firms that displace less productive firms. Productivity growth within firms depends on changes in the efficiency and intensity with which inputs are used in production. Thus, this source of aggregate productivity growth is associated with the process of technological progress. Shifts in market shares between high and low productive units also affect aggregate productivity trends, as does the reallocation of resources across entering and exiting firms. The overall contribution of reallocation to productivity growth is generally identified with a competitive process taking place in the market, although it may also reflect changes in demand conditions and, as argued above, may also be an aspect of technological progress. It should be stressed that this simple taxonomy hides important interactions. The entry of highly productive firms in a given market may stimulate productivity-enhancing investment by incumbents trying to preserve their market shares. Moreover, firms experiencing higher than average productivity growth are likely to gain market shares if their improvement is the result of a successful upsizing, while they will lose market shares if their improvement was driven by a process of restructuring associated with downsizing.

The decomposition of labour productivity

Within-firm growth explains much of labour productivity growth, as does the exit of low productive units

Figure VII.1 presents a decomposition of labour productivity growth rates in manufacturing into a within-firm component and the different components due to the reallocation of resources across firms (see Box VII.1 above). Such a decomposition will give different results depending on the time horizon considered (see below). Concretely, the decomposition in Figure VII.1 concerns productivity growth over five-year periods. In the eight countries for which data are available, labour productivity growth was largely accounted for by gains within individual firms. In the second half of the 1980s, the within component accounted for three-quarters or more of total productivity growth in all but one country (Italy), with a somewhat smaller, though still predominant, role in the first half of the 1990s. The impact on productivity *via* the reallocation of output across existing enterprises (the "between" effect) varies significantly across countries and over time, but is generally small and in a few instances even negative. The net contribution to overall labour productivity growth of the entry and exit of firms (net entry) is positive in most countries (with the exception of western Germany over the 1990s), accounting for between 10 per cent and 40 per cent of total productivity growth. Evidence also suggests that in most of the cases in which the net entry effect is positive and sizeable, exits made most of this contribution to overall productivity growth, *i.e.* exits involve low-productivity units.

Within-firm patterns also largely drive aggregate fluctuations in productivity

In countries where a sufficiently long time series is available, evidence suggests that year-to-year changes in the within-firm component are the main drivers of fluctuations in aggregate growth; the *between* and *net entry* components show only modest fluctuations. Moreover, in years of expansion (the second half of the 1980s in most countries), within-firm growth makes a stronger contribution to overall

Figure VII.1. **Decomposition of labour productivity growth in manufacturing**[1]

Percentage share of total annual productivity growth of each component[2]
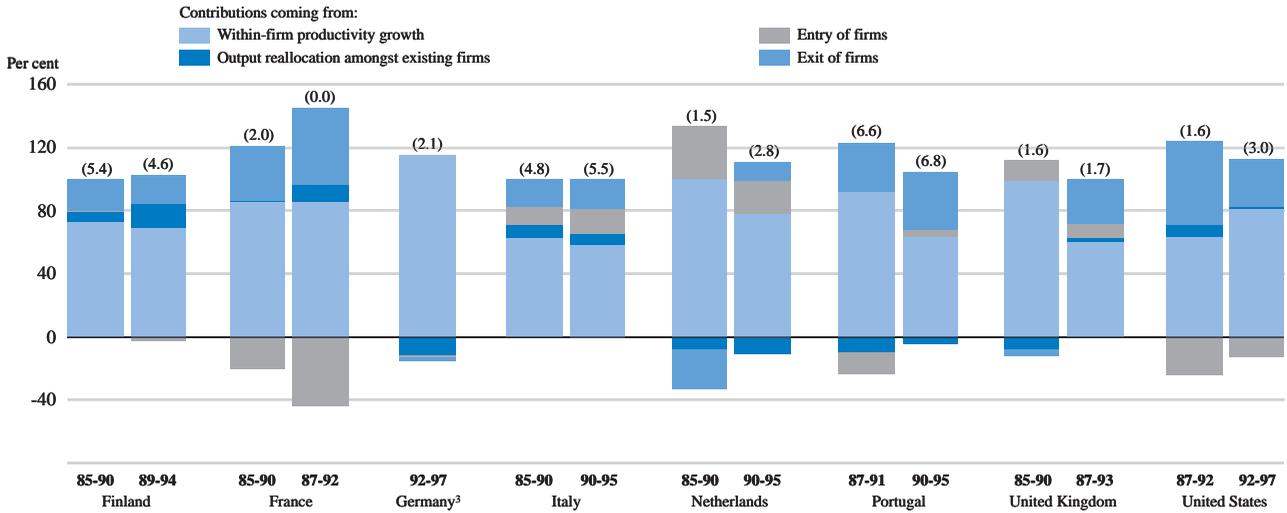
Note: Figures in brackets are overall productivity growth rates (annual percentage change).
1. Decomposition based on the Griliches and Regev (1995) approach.
2. Components may not add up to 100 because of rounding.
3. Data refer to western Germany.
Source: OECD.

productivity growth, whilst in slowdowns (the early 1990s) the contribution from the exit of low-productive units increases in relative importance.[5]

The entry of new firms has variable effects on overall productivity growth: positive in Italy, the Netherlands and the United Kingdom; negative in France and the United States; and, on balance, small in Finland, western Germany and Portugal. The contribution of entry to productivity is, however, significantly influenced by the horizon over which productivity growth is measured: by construction, the contribution of entering firms is greater the longer the horizon considered.[6] Moreover, if new entrants undergo a significant process of learning and selection, the time horizon is likely to affect the comparison between entering and other firms. For example, US studies focussing on long time horizons generally found a significantly higher contribution of entry to aggregate productivity growth than those using short time periods as in this chapter.[7]

Although the driving forces of aggregate labour productivity growth differ significantly across countries, a few common patterns can be identified. In particular, in the industries more closely related to information and communication technologies (ICT), the entry component makes a stronger contribution to labour productivity

In some countries, new firms also boost overall productivity…

… especially in some sectors, e.g. ICT-related industries

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5. The results are also broadly consistent with findings in Baily *et al.* (1992) and Haltiwanger (1997) for the decomposition of MFP growth in the US manufacturing sector: during a period of robust productivity growth (1982-87), the within-firm contribution is large and positive, while in a low growth period (1977-82) the contribution is negative.
6. The share of activity (the weighting factor in the decomposition, see Box VII.1) of entrants in the end year increases with the horizon over which the end year are measured (see Foster *et al.*, 1998).
7. See Baily *et al.* (1996, 1997) and Haltiwanger (1997).

growth than on average,[8] suggesting an important role for new (high-tech) firms in an area characterised by a strong wave of technological changes. The opposite seems to be the case in more mature industries, where a more significant contribution comes from either within-firm growth or the exit of obsolete firms.

The decomposition of labour productivity growth in service sectors is more varied

The decomposition of labour productivity growth in service sectors gives far more varied results than that for manufacturing, no doubt because of the difficulties in properly measuring output in this area of the economy.[9] But in two broad sectors, transport storage and communication and trade, the results are qualitatively in line with those for manufacturing (Figure VII.2). The within-firm component is generally

Figure VII.2. **Decomposition of labour productivity growth in selected service sectors**[1]

Percentage share of total annual productivity growth of each component[2]
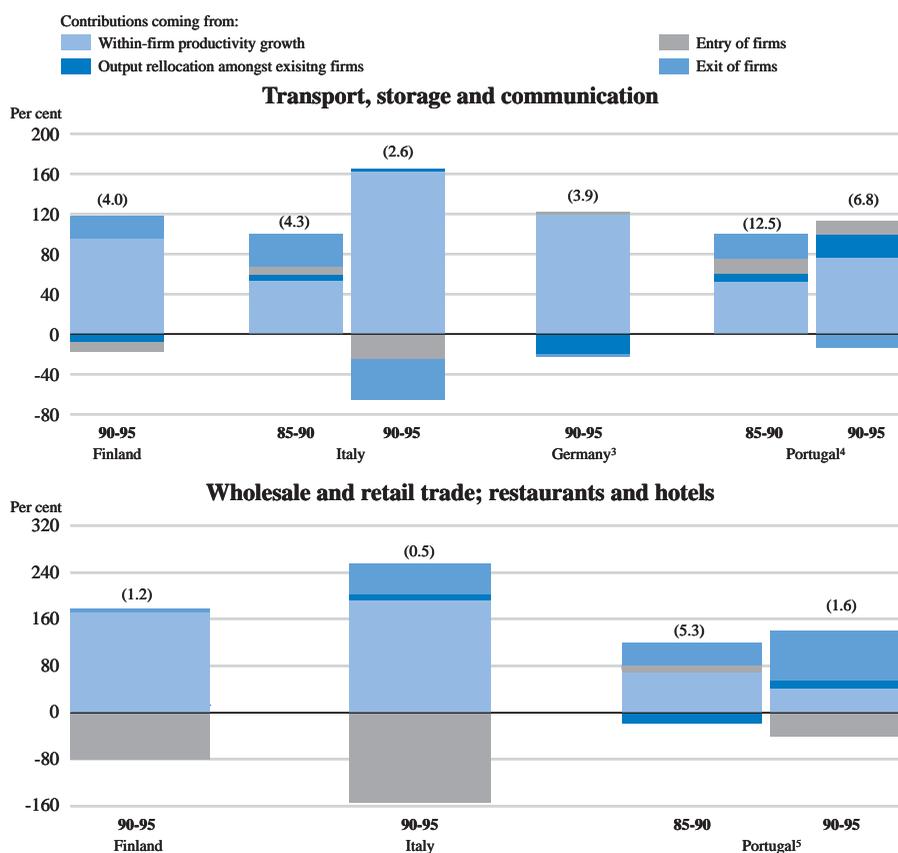
Note: Figures in brackets are overall productivity growth rates (annual percentage change).
1. Decomposition based on the Griliches and Regev (1995) approach.
2. Components may not add up to 100 because of rounding.
3. Data refer to western Germany.
4. Transport and storage.
5. Wholesale and retail trade; repairs.
Source: OECD.

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8. The industry group is "*electrical and optical equipment*". In the United States, most 3-4 digit industries within this group had a positive contribution to productivity stemming from entry, contrary to the result for total manufacturing (see Figure VII.1). In the other countries, there are cases where, within this group, the contribution from entry is very high, including the "*office, accounting and computing machinery*" industry in the United Kingdom and "*precision instruments*" in France, Italy and the Netherlands.
9. See *e.g.* Scarpetta *et al.* (2000) for more details on measurement issues in service sectors.

larger than the component related to net-entry and reallocation across existing firms, although in the trade sector entering firms seem to have a lower than average productivity growth in general, driving down aggregate growth.
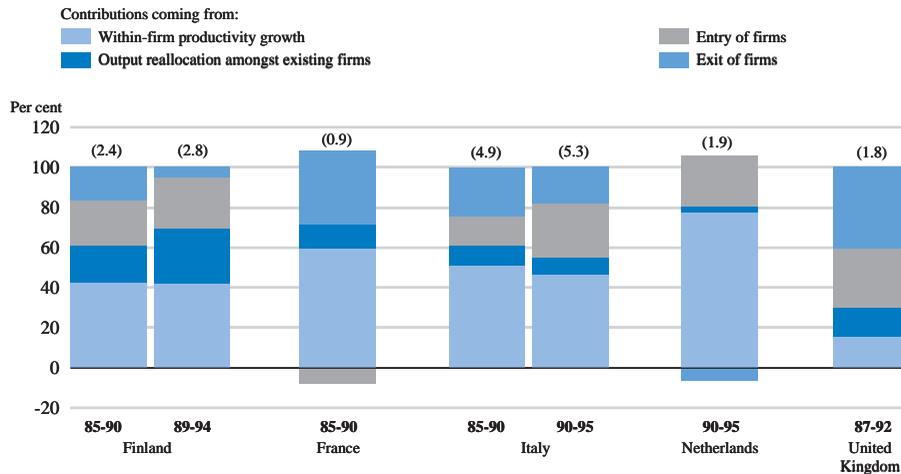
The decomposition of multifactor productivity

The decomposition of multifactor productivity (MFP) growth in the manufacturing sector of five countries suggests a somewhat different picture than that shown with respect to labour productivity (Figure VII.3). Thus, within-firm MFP growth provides a comparatively smaller contribution to overall MFP growth (although it still drives overall fluctuations), while the reallocation of resources across incumbents (*i.e.* the between effect) plays a somewhat stronger role. More important, a strong contribution to MFP growth generally comes from net entry. Indeed, the (limited) information available suggests that the entry of new high-productive firms has made a marked impact on aggregate trends in the more recent period. Combining the information on labour and MF productivity decompositions it could be tentatively hypothesised that in a number of European countries, incumbent firms were able to increase labour productivity mainly by substituting capital for labour (or by exiting the market altogether), but not necessarily by markedly improving overall efficiency in production processes.[10] By contrast, new firms entered the market with the "appropriate" combination of factor inputs, and possibly new technologies, thus leading to faster growth of MFP.

The decomposition of MFP growth yields a stronger role of entry in total productivity growth

Figure VII.3. **Decomposition of multifactor productivity growth in manufacturing**[1]

Percentage share of total annual productivity growth of each component[2]

Contributions coming from:
- Within-firm productivity growth
- Output reallocation amongst existing firms
- Entry of firms
- Exit of firms

Note: Figures in brackets are overall productivity growth rates (annual percentage change).
1. Decomposition based on the Griliches and Regev (1995) approach.
2. Components may not add up to 100 because of rounding.
Source: OECD.

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10. This finding is consistent with aggregate data for a number of European countries (see Scarpetta *et al.*, 2000). In particular, in many Continental European countries, high labour productivity growth in the 1990s was accompanied by significant falls in employment, especially in manufacturing, leading to low (as compared to the 1980s) GDP per capita growth rates. Moreover, the relatively high labour productivity growth was accompanied by significant falls in MFP growth with respect to the previous decade.

Firm dynamics and survival

Many firms enter and exit every year

Since entry and exit of firms makes a significant contribution to aggregate productivity growth, it is of interest to see how frequently new firms are created and others close down across countries and sectors. In fact, a large number of firms enter and exit most markets every year (Figure VII.4). Data covering the first part of the 1990s show firm turnover rates (entry plus exit rates) to be around 20 per cent in the business sector of most countries: *i.e.* a fifth of firms are either recent entrants, or will close down within the year. Turnover rates vary significantly across detailed industries in each OECD country, and differences in the industry composition across them influence the international comparison of average turnover. Controlling for the sectoral composition suggests that Germany (western) and Italy have somewhat smaller turnover rates than the United States, while turnover is consistently higher in the United Kingdom (manufacturing sector) and especially in Finland.

*Entry and exit are highly correlated across industries…*

The industry dimension also makes it possible to compare entry and exit rates and characterise turnover. If entries were driven by relatively high profits in a given industry and exits occurred primarily in sectors with relatively low profits, there

Figure VII.4. **Turnover rates in broad sectors of OECD countries, 1989-94**

Entry plus exit rates, annual average
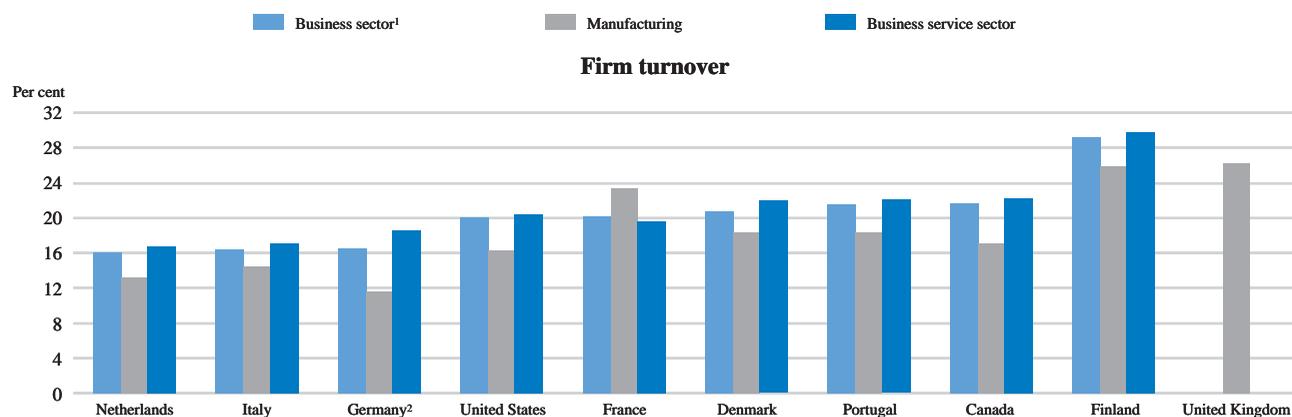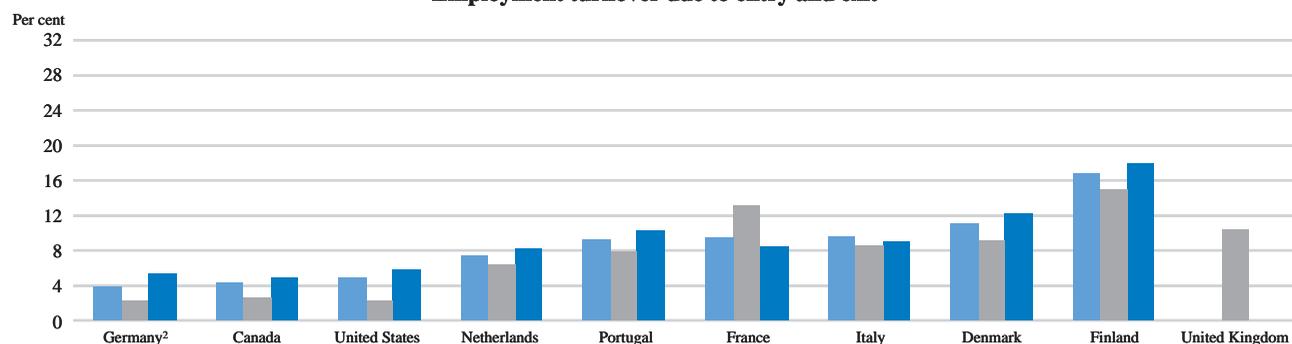
1. Total economy minus agriculture and community services.
2. Data refer to western Germany.
Source: OECD.

would be a negative cross-sectoral correlation between entry and exit rates. How-ever, confirming previous evidence,[11] entry and exit rates are generally highly corre-lated across industries in OECD countries (this is particularly so when the rates are weighted by employment). This suggests that in every period, a large number of new firms displace a large number of obsolete firms, without affecting significantly the total number of firms or employment in the market at each point in time.

The high correlation between entry and exit across industries may be the result of new firms displacing old obsolete units, as well as high failure rates amongst new-comers in the first years of their life. This can be assessed by looking at survival rates, *i.e.* the probability that new firms will live beyond a given age (Figure VII.5). The survival probability for cohorts of firms that entered their respective market in the late 1980s declines steeply in the initial phases of their life: about 20 to 40 per cent of entering firms fail within the first two years. Conditional on overcoming the

… because of the high failure rates in the early phases of a firm's life

Figure VII.5. **Firm survival rates at different lifetimes,**[1] **1990s**
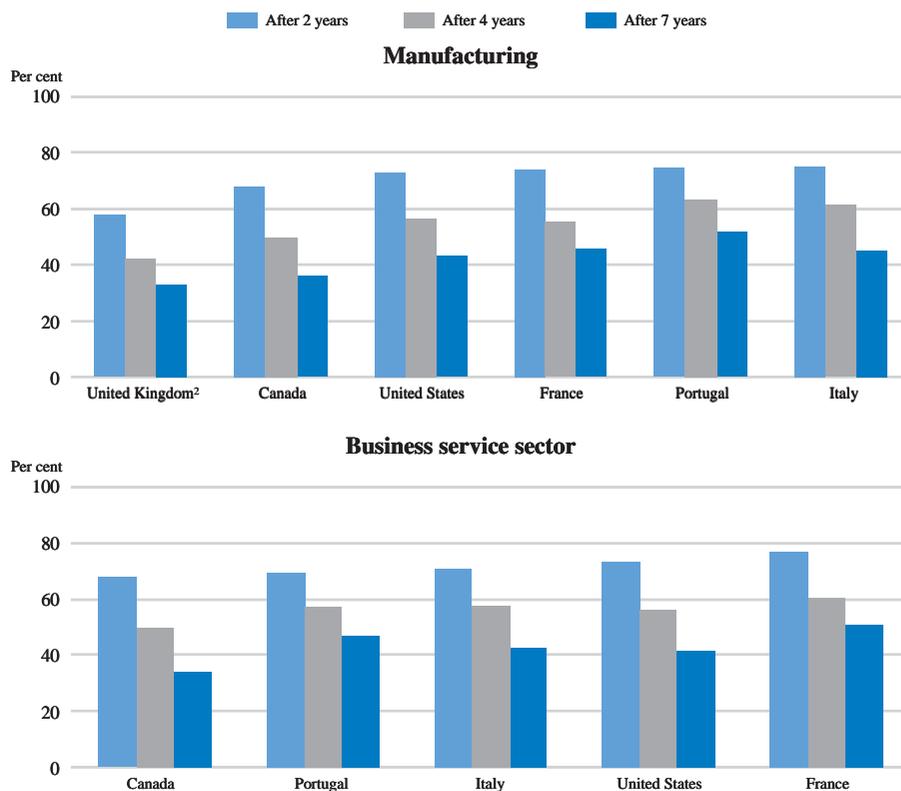
1. The survival rate at duration (j) is calculated as the probability that a firm from a population of entrants has a lifetime in excess of (j) years. Figures refer to average survival rates estimated for different cohorts of firms that entered the market from the late 1980s to the 1990s.
2. Data for the United Kingdom refer to cohorts of firms that entered the market in the 1985-90 period.
Sources: OECD, and Baldwin *et al.* (2000) for Canada.

11. See, amongst others Geroski (1991) and Baldwin and Gorecki (1991).

initial years, the prospects of firms improve in the subsequent period: firms that remain in the business after the first two years have a 60 to 70 per cent chance of surviving for five more years. Nevertheless, only about 30-50 per cent of total entering firms in a given year survive beyond the seventh year. The survival rates of new firms vary substantially across countries: the three English-speaking countries for which data are available show lower survival rates in manufacturing than the three continental European countries. It is important to note that a low survival rate is not necessarily a cause of concern. As argued above, entry by new firms can be seen as a process of experimentation and it is in the nature of this process that the failure rate will be high. This is particularly so if new entry leads incumbent firms to increase their efficiency and profitability.

There is substantial variation in survival rates at different life spans across manufacturing industries and the entire business sector. Overall, the variance of "infant mortality" (or failure within the first years) across industries is typically much higher than the variance of entry rates across industries. Furthermore, these industry differences in initial failure are also reflected in the variability of long-term survival rates (*i.e.* five-seven years of age) which remains substantial. This evidence points to the fact that industry characteristics such as those that are generally considered to create barriers for firms to enter the market, are likely to condition initial survival even more.[12] However, the impact of these barriers on survival is not permanent, but rather declines rapidly as entrants gain experience in the market.

Entrant firms are generally smaller than incumbents…

The process of entry and exit of firms involves a disproportionally low number of workers: in all but two countries (Finland and Denmark), less than 10 per cent of employment is involved in firm turnover, and in the United States, Germany and Canada, employment-based turnover rates are less than 5 per cent (bottom Panel of Figure VII.4). The difference between firm turnover rates and employment-based turnover rates arises from the fact that entrants (and exiting firms) are generally smaller than incumbents. New firms are only 20 to 50 per cent the average size of existing firms, and their relative size is less than a fifth of that of incumbents in the United States and Canada (Figure VII.6).

The relatively small size of entrants in Canada and especially the United States reflects both the large size of incumbents (in the United States, twice that of most other countries, see Box VII.2) and the small average size of entrants compared to that in most other countries (in the United States, about three employees in the total economy and about six in manufacturing). In other words, entrant firms are further away from the average (or "optimal") size in the United States than in most other countries for which data are available. There are a number of different possible explanations for this. First, the larger market of the United States may partly explain the larger average size of incumbents.[13] Second, the wider gap between entry size and "optimal" size in the United States may reflect economic and institutional factors, *e.g.* the relatively low entry and exit costs may increase incentives to start up relatively small businesses.[14]

… as are exiting firms

The likelihood of failure in the early years of activity is highly skewed towards small units, while surviving firms are not only larger but also tend to grow rapidly. Thus, the size of exiting firms is similar to the size of entering firms in most
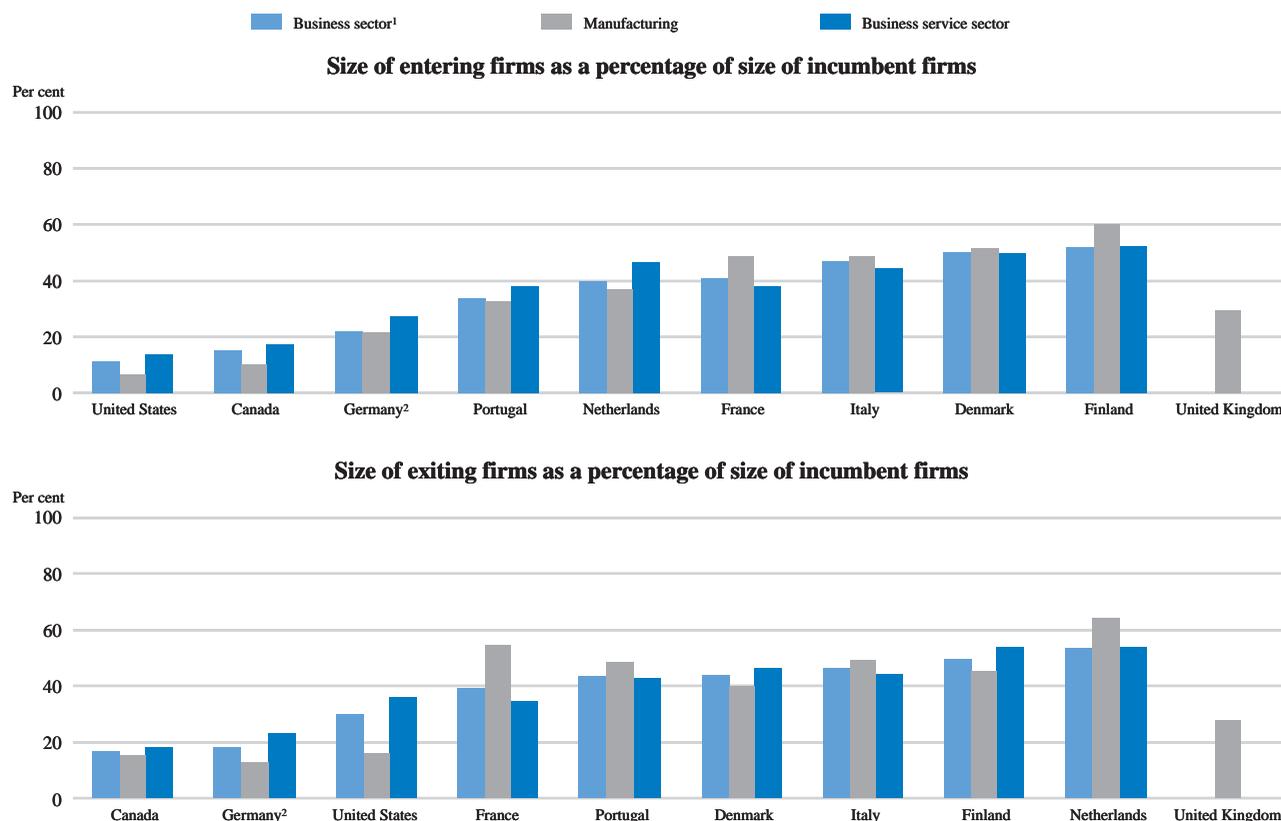
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12. See also Geroski (1995) and Audretsch and Mahmood (1994).

13. Geographical considerations may also affect the average size of firms: firms with plants spreading into different US states are recorded as single units, while establishments belonging to the same firm but located in different EU states are recorded as separate units.

14. As discussed in Nicoletti *et al.* (1999), regulations affecting the start up of firms are generally much less stringent in the United States than in most of Europe, with the notable exception of the United Kingdom.

Figure VII.6. **Average firm size of entering and exiting firms relative to incumbent firms**

Firm size based on the number of employees per firm

| ■ Business sector[1] | ■ Manufacturing | ■ Business service sector |

Size of entering firms as a percentage of size of incumbent firms

Size of exiting firms as a percentage of size of incumbent firms

1. Total economy minus agriculture and community services.
2. Data refer to western Germany.
Source: OECD.

countries (Figure VII.6, bottom Panel), and the average size of surviving firms increases rapidly to approach the average size of incumbents in the market in which they operate. The combined effect of exits being concentrated among the smallest members of a cohort and the growth of survivors makes the average size of the cohort almost double in the first seven years. Post-entry growth in average size is stronger in services than in manufacturing, given the smaller initial size and the higher failure of small businesses there. Moreover, both failure of small units and growth of survivors are stronger in the United States than in the other OECD countries, leading the average size of a given cohort to increase three-fold in the first three years. This could reflect the greater opportunities offered to small firms to enter the market in the United States, even though their failure rate is high. This greater experimentation of small firms in the US market may also contribute to explain the evidence discussed above of a lower than average productivity of US firms at entry.

As stressed above, turnover rates also show large variation across individual sectors of each economy and previous studies have related this to differences in product cycles. They indicate that, after commercial introduction of a specific new product, there is an initial phase of rapid firm entry, which is followed by a levelling

Different turnover rates partly reflect different degrees of maturity across industries

Box VII.2.   **The size of firms across sectors and countries**

Firm-level data indicate marked differences in the average size of firms in the different countries considered in this chapter. In all countries, the distribution of firms is highly skewed towards small units (fewer than 20 employees), although the average size of firms ranges from about 9-10 employees in Finland and Italy to about 30 in the United States (see table below). Differences across countries are only marginally affected by different size threshold in the datasets. Average firm size differs markedly across sectors of the economy. The incidence of small firms is higher in services than in manufacturing. Notably, the *"trade and restaurants"* sector has a particularly low average firm size.

There is also a positive association between average sectoral size and within-industry size dispersion: in both the US and UK manufacturing industries, average size is well above that of the other countries, but also the within-sector variability is much larger.

— **Average size of firms** —

Number of employees per firm, 1989-94

	Total economy	Non-agricultural business sector[a]	Manufacturing	Business services
Canada	13	15	41	14
Denmark	13	15	30	13
Finland	9	9	17	7
France	24	24	24	25
Germany[b]	17	18	45	12
Italy	10	10	15	7
Netherlands	12	10	24	9
Portugal	17	18	31	12
United Kingdom	. .	. .	51	. .
United States	29	29	86	24

a) Total economy excluding agriculture and community services.
b) Wertern Germany.
Source: OECD.

off and then a contraction in the number of firms.[15] Thus, for example the observation of 'waves' of entry at different points in time across industries may reflect initial phases in the product cycle. Available data for this study do not permit specific products to be followed over time. Rather they cover industries at a relatively disaggregated level, but one which still includes a variety of products and markets within each sector. Nevertheless, the correlation between ranks of industries (according to their turnover rate) at different points in time is generally low and declines as yearly observations are further apart. Moreover, the correlation of employment-based turnover rates is even lower and declines more rapidly over longer time spans. Hence, high turnover industries at a point in time are not necessarily at the top of the turnover ranking ten or even five years later. Albeit indirect, this observation is interesting because it throws additional light on cross-sectoral differences in market conditions. It suggests, in particular, that competitive forces in each market may vary over time, quite independently of changes in institutional factors, but rather because of the maturing of the market in which firms operate.

15. For example, a study of 46 products in the United States by Gort and Klepper (1982) found a typical initial phase of entry of about 10 years and a phase of contraction of about 5 years.

Some policy considerations

There are a number of policy implications that can be derived from the evidence presented in this chapter. In particular, the significant role that entry and exit play in productivity growth suggests that technology-driven strategies to enhance growth within firms need to be accompanied by moves to remove restrictions that unduly reduce the process of experimentation and "creative destruction". The cost of experimentation varies depending on market characteristics (concentration, product diversification, advertising costs etc.) but also because of regulations and institutions affecting start-up costs and the financing of new ventures. Allowing low-productive units to exit is an important part of this process, insofar as it frees resources which can be better used by other firms. The evidence shows that the brisk turnover of firms in OECD countries implies that resources will not remain unemployed for long. Policies that foster market contestability and entrepreneurship as well as appropriate bankruptcy rules play a role in this context, as do social programmes that cushion the transition period, without preventing the reallocation occurring in the first place.

Policy and institutions should not harm the process of "experimentation" and "creative destruction"…

The wide heterogeneity in firm performances also suggests the need for better understanding of why some firms do so well and why other fail. There is evidence in the micro-literature pointing to the importance of investing in human and physical capital as well as in R&D activities, and there is an important role for policy here through education and training, financial market reforms and innovation policy. However, much remains to be examined. Work by the OECD is continuing in these areas.

… though an appropriate framework for within-firm growth is also important

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