Entrepreneurship as an engine for growth: evidence and policy challenges

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A growing interest in entrepreneurship in the OECD countries

It is a great pleasure for me to be here today and to have an opportunity to address this distinguished audience. Entrepreneurship is a hot topic these days. It features frequently in discussions among policy makers, academic researchers, and even in more mundane talk shows. There is a large consensus that entrepreneurship is good and should be encouraged. There is also growing scientific evidence that entrepreneurial activities matter for employment, productivity and, ultimately economic growth.

The OECD has focused increasingly on entrepreneurship in the context of its broader reflection on the sources of economic growth. Let me start by briefly summarizing the key findings that have emerged from our research. It will make clear why we increasingly focus on entrepreneurship.

• First, there is a significant gap in GDP per capita between the US and most other OECD countries (Fig.1). And it reflects to a very large extent a productivity gap. Some countries, like France and Belgium, may seem to have higher productivity than the US. But this is a statistical artefact, stemming from the large proportion of unskilled workers being out of employment and thus not registered in productivity statistics.

• Second, outside some English-speaking and Nordic countries, there has been little productivity catch-up with the US over the past 15 years. Countries like Spain, Italy, the Netherlands, Austria continued to lose ground (Fig.2).

• Third, after decades of weakening technical progress, the U.S. and other smaller countries have seen a major revival. Unfortunately this is not the case in much of the EU.

• Fourth, if we then go one step forward and look at the sectoral productivity performance, we note that productivity developments in the OECD countries take place to a large extent in ICT-intensive sectors (Fig.3). Many of the countries with low GDP growth have lagged behind in both ICT production and ICT adoption.
• **Fifth**, innovation is key for productivity gains and not only in ICT-related activities (Fig. 4). Unfortunately, innovation has lagged behind in the EU on average. This is evident when you look at how countries rank in terms of R&D intensity, patents or the share of R&D employees in total employment.

There is a clear causal chain running from entrepreneurship to innovation, productivity and finally growth. And here a potentially important mechanism that drives innovation and productivity gains is “creative destruction”.

Innovation is a bumpy process, where entrepreneurs start new firms and by doing so introduce and disseminate innovative products and processes throughout the economy. Existing firms not driven out are forced to innovate. This process of “creative destruction” involves frequent reallocation of outputs and inputs across firms, sectors and locations.

Despite a long history, efforts to develop empirical definitions and practical measures of entrepreneurship are relatively recent. This is largely because entrepreneurship is inherently a micro-economic phenomenon and micro data – whether on individuals or enterprises – have only recently been made available to researchers and policy analysts.

These data enable us, the GEM or the OECD, to better understand what drives entrepreneurship and how to better design policies to help entrepreneurs.

Today, given time constraints, I would like to first present some evidence on how firms’ entry and exit are influencing productivity growth. Second, discuss some of the key policy challenges for promoting innovation.

I. **The importance of firm demographics for productivity growth**

Let me focus on a few stylized facts that emerge from analysis undertaken at the OECD and elsewhere.¹ I would like to start by saying that, indeed, there is a lot of creative destruction”.² Many firms are forced to close down each year, while a similar number of firms enter the fray.

In most countries one-fifth to one-fourth of all firms enter or exit the market each year (Fig. 5).³ This high turnover rate involves a proportionally lower number of workers because both entrants and exiting firms are generally smaller than incumbents. For most countries, new firms are only 20 to 60 per cent the average size of existing firms.

Interestingly, there are no major differences in firm turnover across countries. As a result, we may be tempted to conclude that, after all, creative destruction is not a strong candidate to explain growth disparities.

However, we do observe that turnover rates vary significantly across industries. They are notably larger in high-tech manufacturing and some business-service industries, in particular those related to ICT. So what matters is creative destruction in those strategic sectors that badly need new firms to bring new technologies and new ways of production.
Market selection is harsh in all countries. Only about 60-70 per cent of entering firms survive the initial years of life (Fig. 6). And only about 40 to 50 per cent of firms entering in a given year survive on average beyond the seventh year. There is a lot of infant mortality. Many failing firms are small businesses that do not pass the market test, while surviving firms are not only larger, but also tend to grow rapidly.

It is in the performance of surviving new firms that we start observing significant differences across countries. In the United States, surviving firms on average increase their employment by 60% by their seventh year, while employment gains amongst surviving firms in Europe are in the order of 10 to 20 per cent (Fig. 7). Firms in ICT-related industries seem to experience rapid post entry growth in all countries.

However, even in these highly dynamic industries, surviving US firms show a stronger employment expansion, compared with those in most of the other countries. This leads me to my following remark: we should focus policy attention on creating the conditions that allow profitable firms to survive and grow. This also involves allowing the market exit of unprofitable firms.

The marked dynamism in post-entry behavior in the United States partially reflects that size at entry is small relative to average firm size, i.e. there is a greater scope for expansion amongst young ventures in the U.S. markets than in Europe.

So the evidence does not suggest a major difference in the magnitude of the creative destruction process across OECD countries. What differs is size at entry, failure rates and post-entry growth of successful new firms. Hence, the natural question is: do these differences matter for productivity growth?

One way to address this question is by comparing the efficiency of market selection processes. Are they good at replacing low productivity incumbents by high productivity start-ups? OECD-wide, the entry of new firms and failure of obsolete ones jointly account for a significant share of total productivity growth. From 15 to 30 percent of total labour productivity gains in manufacturing is explained by firm turnover. Firm exits always involve low productivity units and thus contribute to promote aggregate productivity by freeing resources for other activities.

However, in several countries new firms also tend to be less productive than existing firms (especially in the U.S.). It is only after a period of learning by doing and adaptation that they climb the productivity ladder, often above most of their older competitors.

Interestingly, the contribution of new firms to productivity growth is generally modest in low-technology industries. But new firms make a strong positive contribution in technologically more advanced industries, most notably in ICT-related manufacturing industries. 4

This suggests an important role for new firms in promoting the adoption of new technologies. While existing firms often find it difficult to adjust the work organization and infrastructure to the requirements of new technologies, entering firms do not have to face the legacies of old modes of production and are often better at harnessing new technologies.
The creative destruction process not only allows redeploying resources but also pushes incumbent firms toward efficiency-enhancing investment. There is indeed a strong relationship between firm turnover and the productivity growth of incumbent firms across countries and industries (Fig.8). This leads me to an important remark: promoting the entry of firms makes the market more contestable. It forces incumbents to upgrade technology, or change work organization to promote efficiency.

We have seen that new firms tend to be different from the firms they replace, but how heterogeneous are they among themselves? After all, entrepreneurship should be associated with a lot of experimentation and heterogeneity among new firms. Indeed, there is a greater variance of productivity performance among new businesses than among already established ones.

Here again, the heterogeneity among new firms is larger in the U.S. than in Europe.\(^5\)

Entrepreneurial efforts are not confined to new ventures, but also involve the continuous process of adaptation and retooling of existing businesses. We should then ask ourselves, are those firms successful at expanding and gaining market shares or not? (Fig.9).

In practice, in the US more productive businesses tend to expand on average, while many of them improve their performance by downsizing in Europe. In this context it is noticeable that eight out of the largest 25 firms in America in 1998 did not exist, or were very small, in 1960 while the largest 25 European firms in 1998 were already large in 1960. And this turnover at the top continues at a brisk pace in the American economy. It took 20 years to replace 1/3 of the Fortune 500 companies listed in 1960 yet only 4 years to replace 1/3 of those listed in 1998.\(^6\)

Putting the pieces together, the evidence is consistent with the view that there is greater market experimentation in the U.S. In the U.S. new entrants are small, more heterogeneous and often less productive relative to well established businesses. Many of the new entrants fail but the more productive survive and grow rapidly. This US “experimentation premium” appears more pronounced in high-tech and emerging sectors.

II. Promoting effective entrepreneurship requires sound framework conditions

The main message I would like to convey to you here is that improving framework conditions is essential for entrepreneurship. In a nutshell, “what is good for the whole economy is good for entrepreneurship”. Of course, this does not mean that attention should not also be paid to some specific factors that matter to innovation and entrepreneurship.

Framework conditions operate through a variety of channels. For example, our empirical research tells us that innovative activities benefit a lot from \textit{stable macroeconomic conditions} (Table 1). Likewise, open, \textit{competitive product markets} are essential for innovation and firm dynamics. It leads to a better allocation of resources and greater efforts on the part of managers to reduce slack at the firm level. More competition should also foster dissemination of best practice and sharpen incentives to innovate at the technological frontier. OECD empirical work provides strong support to these claims.
OECD research shows, for example, that regulatory barriers slow the catch-up process towards the productivity frontier. Anti-competitive product market regulations slow the speed of catch-up even more so in those industries that are heavy users of ICT.

This would suggest that the opportunity cost of regulatory barriers may have increased with the emergence of such a pervasive technology as ICT. This view receives additional support at the aggregate level: there seems to be a negative cross-country correlation between product market regulation and the change in average labour productivity growth between over the past decade (Fig.10).

Anti-competitive product market regulations are also found to hamper business R&D and weaken incentives to innovate. Moreover, they dampen the level of patenting. And there is emerging evidence that cumbersome and costly start-up regulations have detrimental effects on firm turnover.

Significant progress has been made towards more open product markets in most OECD countries, but in some areas such as start-up regulations and network industries, the scope for strengthening competition remains large, including in many EU countries.

Needless to say, efficient, well developed and liquid financial markets are also essential for promoting entrepreneurship and innovation. Financial market regulations should allow the development of new market segments and new financial instruments. These financial innovations may indeed be important for channelling funds to innovative, but potentially risky projects.

Despite financial liberalisation, there are OECD countries where regulations remain too stringent. In the area, for instance, of banking or financial instruments. Our work suggests that these differences in regulatory settings have a strong bearing on output and productivity growth, especially in those industries that rely more heavily on external financing.

Digging deeper, we find that financial development promotes the entry of new firms and, most importantly it promotes growth for successful entrant firms.

A recent survey conducted by the OECD suggests that there is no strong evidence of a “financing gap” for SMEs in industrialized countries. But lack of appropriate financing is a hindrance to the expansion of the innovative SMEs, i.e. firms in technology sectors, with new business models and high growth prospects. Traditional bank finance may be of little relevance for these firms, as they have untried business models and high risk.

Innovative SMEs require a range of financing vehicles as they progress through their life cycle, and there are large differences in the availability of these different means of financing across the OECD countries. In particular, “business angels” are increasingly recognized as a vital link in the financing chain, especially in the initial stages of the firm life. And “venture capitalists”, which often enter at a later stage, provide the link between the SMEs and institutional sources of capital.

As we know, despite recent measures designed to encourage the development of these financial markets, there are very large differences across OECD countries. For example, venture
capital investment accounts for 0.5 percent of GDP in the U.S. but far less than 0.15 percent in Germany, France, Spain or Italy.

Time is pressing, so let me briefly mention two additional key factors that belong to the broad policy framework. First, labour market regulation and in particular employment protection legislation (EPL), matters for entrepreneurial activities, innovation and productivity.

Excessive EPL raises the cost of adjusting the workforce. This reduces the pace of reallocation of labour and may discourage major innovations, which typically require work-place reorganisation and substantial changes in the composition of the workforce.

At the firm level, there is clear evidence that strict EPL is reducing job turnover, especially in those industries that require more frequent adjustment of the workforce.\textsuperscript{14} Medium and large firms are more severely affected by stringent EPL, while small firms are less affected, probably because they are partially exempt from such regulations or can more easily circumvent them.

This is another important factor that helps explain why in some OECD countries, including those in Continental Europe, small firms may be reluctant to expand even if they are successful in the market.

Moreover, we find that product innovation is negatively related to the stringency of EPL.\textsuperscript{15} EPL also has a clear negative impact on patenting.\textsuperscript{16} So excessive EPL may create problems on labour markets. This is well known. But less well known, is that they can also have negative collateral effects on innovation.

Let me close this discussion of framework conditions with a few words on human capital. According to OECD research, a one-year increase in the average number of years of education, across the working-age population, appears to raise GDP per capita by 4 to 7 percentage points in the long run.

OECD research also suggests that large numbers of available scientists and engineers help raise the national capacity to innovate and absorb foreign knowledge. More specifically, our research finds that the stock of foreign R&D has positive spillovers on domestic R&D, all the more so as the share of scientists in employment is high.\textsuperscript{17}

Let me close my intervention by going back to where I started: we have growing evidence that, in our knowledge-based economies, entrepreneurship matters more than ever. But if we want to provide sound advice to policy makers on how to foster the entrepreneurial environment we need better data. This requires the efforts and support of national statistical offices, international organizations and researchers. We have made some progress, also thanks to some pioneering work (like GEM), but we need to push this agenda forward with determination.
1. Based on year 2000 purchasing power parities (PPPs).
2. Labour resource utilisation is measured as total number of hours worked divided by population.
3. Labour productivity is measured as GDP per hour worked.

* In the case of Luxembourg, the population is augmented by the number of cross-border workers in order to take into account their contribution to GDP.

Source: OECD, National Accounts of OECD Countries, 2005; OECD, Economic Outlook, No. 79; and OECD, Employment Outlook, 2005.
Figure 2. Growth of labour productivity reflects capital deepening but also multifactor productivity (MFP) growth

Yearly growth in labor productivity split into capital deepening and MFP growth (1990-2004)

Notes: Labour productivity is defined as growth of GDP per Hour Worked, in per cent
* For Germany data from 1992 onwards
** For New Zealand data from 1992 onwards
Source: OECD productivity database.
Figure 3. ICT-intensive sectors largely drove productivity developments

Labour productivity growth

Source: OECD.
Figure 4. In the EU, indicators of innovation activity fall short of the U.S.

Source: OECD.
Figure 5. High firm turnover rates in OECD countries, 1990s

Overall firm turnover in broad sectors

Employment turnover due to entry and exit in broad sectors

1. The entry rate is the ratio of entering firms to the total population. The exit rate is the ratio of exiting firms to the population of origin. Turnover rates are the sum of entry and exit rates.
2. Total economy minus agriculture and community services.
Source: OECD
Figure 6. Strong market selection among new firms

![Bar chart showing market selection among new firms across different countries.]

Figure 7. Successful new firms growth rapidly in the U.S. but much less in the EU

![Bar chart showing successful new firms growth across different countries.]

Figure 8. Net entry promotes productivity growth among incumbents

Each dot represents a industry in a given country.

Figure 9. Most productive firms grow in the US but not in the EU

Figure 10. Labour productivity accelerated mainly in countries where competition thrived

![Graph showing labour productivity acceleration, 96-03 vs 85-95.](image)

without Greece:
correlation coefficient = -0.58
t-statistic = -3.1

Source: OECD.

Figure 11. Labour productivity accelerated mainly in countries where competition thrived

- State control
- Barriers to entrepreneurship
- Barriers to trade and investment

![Bar chart showing productivity acceleration across different regions.](image)

Source: OECD.
Figure 12. Venture capital investment by stage as a share of GDP, 1999-2002

Note: 1999-2001 for Australia, Japan, Korea and New Zealand. The definition of private equity/venture capital tends to vary by country.
Table 1. Ranking of OECD countries according to different dimensions of innovative activity

<table>
<thead>
<tr>
<th>Country</th>
<th>Total R&amp;D intensity</th>
<th>Business R&amp;D intensity</th>
<th>Non-business R&amp;D intensity</th>
<th>Scientists share</th>
<th>R&amp;D employees share</th>
<th>Triadic patents (1999)</th>
<th>Average indicator</th>
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<tr>
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<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
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<td>United States</td>
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Correlation with Total R&D intensity: 0.99

1. The comparison is based on rank orders according to the various criteria. Rankings are a rough measure of cross-country differences. A more refined measure would use deviations from the country mean expressed in multiple of the standard deviation of countries' observations around the mean. Countries in the table are ordered by decreasing level of total R&D intensity.

2. The employment of scientists and R&D personnel is expressed as a share of total dependent employment. There are no data on the R&D employee share for the United States and the ranking according to this criterion is not perfectly comparable because only 19 countries are included instead of 20.

3. The average is the simple arithmetic average of the rankings for total R&D intensity, scientist share and triadic patents.

Source: OECD Main Science and Technology Indicators database, R&D database and Patent database.

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The industry group is “electrical and optical equipment”. In the United States, most 3-digit industries within this group had a positive contribution to productivity stemming from entry. 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 Finland, the United Kingdom and Portugal and “precision instruments” in France, Italy and the Netherlands.

We assess the degree of heterogeneity in firm characteristics by looking at the coefficient of variation (standard deviation divided by the mean) of the distribution of productivity levels of entrants.


See de Serres et al. op cit and Aghion et al. op cit.


See Jaumotte and Pain (2005a), op.cit.

See Jaumotte and Pain (2005a), op.cit.