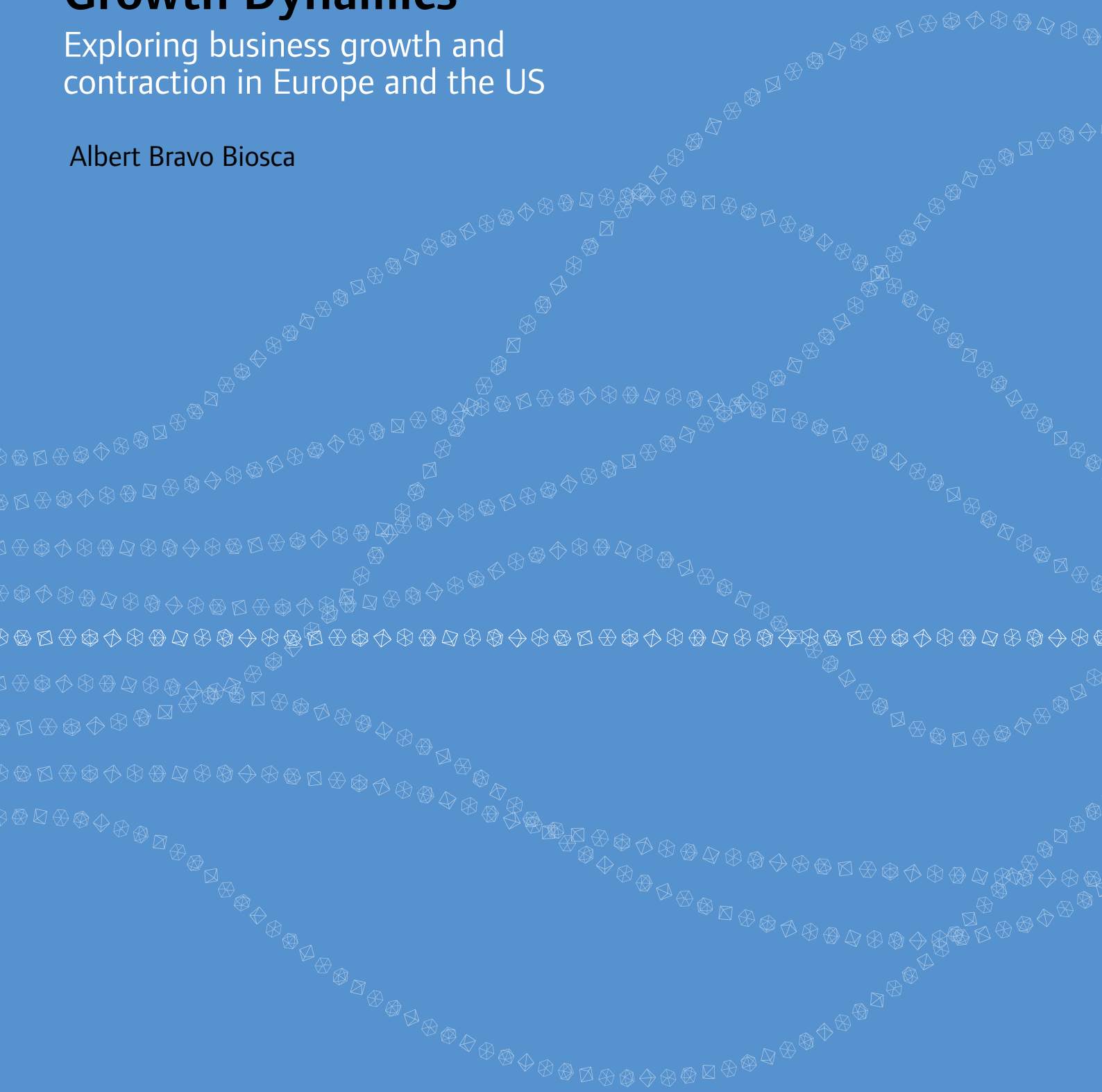


Research report: November 2010

# Growth Dynamics

Exploring business growth and contraction in Europe and the US

Albert Bravo Biosca



## Executive summary

In the aftermath of the recession, countries across Europe face a range of challenges. The immediate one is to consolidate the nascent recovery and create jobs. But if European economies are to thrive in the next decade they also need to meet the longstanding productivity challenge: European businesses are less productive on average than those in the United States, and this gap had been widening for over a decade before the recession took hold.

This report provides new evidence on an important contributor to this productivity gap: the dynamism of Europe's business landscape. It focuses on a new, purpose-built database of business growth in the period from 2002 to 2005, drawing on individual records for six million businesses, the result of an international collaboration involving eight European countries, the United States, Canada, and New Zealand.

The dearth of European equivalents to Google or Microsoft, innovative start-ups that grow quickly to dominate their markets, has long vexed European policymakers. But the analysis in this report highlights that this is only part of a wider picture:

- European countries have on average a lower share of high-growth firms than the US. But they also have fewer medium-growth firms and fewer shrinking firms. At the same time, Europe has a much larger share of 'static' firms, that is, firms that neither expand nor contract in a three-year period.
- The top half of firms grow faster in the US than in the average European country, while the bottom half shrink faster. Thus, the US has both faster-growing and faster-shrinking firms, and consequently at the end of the

period the gap between successful and unsuccessful firms is larger in the US.

- There is a strong negative correlation between the growth rate of firms at the top and the bottom of the growth distribution. In other words, the faster successful companies grow, the faster unsuccessful companies in the same industry shrink.

The lower dynamism of European businesses – both in terms of growth and contraction – should be a concern. It points to less experimentation and a slower reallocation of resources from less to more productive businesses in Europe, both important drivers of productivity growth. The analysis of the database supports this link: a less dynamic business growth distribution is associated with lower productivity growth. Importantly, both a higher share of growing and shrinking firms are correlated with faster productivity growth.

This has a number of implications for policymakers in Europe. Policies targeted solely at high-growth businesses, such as improving the climate for venture capital, are not on their own sufficient to address the lack of dynamism that hampers Europe's productivity performance. They need to be combined with deeper structural reforms that remove not just barriers to entry, but also barriers to growth and contraction, such as improving product and labour market regulation, tackling access to finance, and reducing the European market fragmentation that stops businesses, especially in service industries, operating across borders.

Over the coming months, NESTA and its partners will use this newly developed database to examine the specific drivers of business growth, with a view to providing more detailed evidence to support policymakers in tackling Europe's growth challenge.

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The database analysed in this report builds on a joint effort between FORA and NESTA, with support from the International Consortium for Entrepreneurship (ICE), and has greatly benefited from the work led by Eurostat and the OECD to harmonise business registers across countries (in particular the Entrepreneurship Indicators Programme). Several people in addition to the author have participated in the long process leading to this new database, including Joseph Alberti, Henrik Lyngge Hansen, Rodrigo Lluberas and Glenda Napier. Ditte Petersen and Mark Hart deserve a special mention, for their respective contributions in putting together the manual and the code file that initiated this project.

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NESTA is a world leader in its field and carries out its work through a blend of experimental programmes, analytical research and investment in early-stage companies. [www.nesta.org.uk](http://www.nesta.org.uk)

## Part 1: Introduction

**As European economies recover from the recession, they face significant challenges. Not least of them is the perennial productivity problem: European businesses are not as productive as those in the United States, and this gap has been widening since the mid-1990s. This divergence deserves more analysis. In a unique project, 11 countries in Europe, North America and New Zealand worked together to produce a new database that measures how quickly businesses grow or shrink in each country, allowing a much better statistical overview of business dynamism to be developed.**

2. See for instance 'Project Europe 2030: Challenges and Opportunities. A report to the European Council by the Reflection Group on the Future of the EU 2030' or the recently approved Europe 2020 strategy, which aims to "turn the EU into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion."
3. See for instance Veugelers and Cincera (2010) or Bloom, Sadun and Van Reenen (2009).
4. Annual labour productivity growth between 1995 and 2006 averaged 1.5 per cent in the EU15, compared to 2.3 per cent in the US. As a result, the EU15-US gap in GDP per hour increased from 2pp to 10pp during this period (Van Ark, O'Mahony and Timmer, 2008).
5. Véron (2008).
6. Bartelsman, Haltiwanger and Scarpetta (2004).
7. 63 per cent in the US vs. 20 per cent on average in Finland, France, UK, West Germany, Italy and Portugal. Note however that US entrant firms were also smaller on average than in most other countries.
8. Bosma and Levie (2009).
9. See for instance Baily *et al.* (1992).
10. See for instance Bartelsman, Perotti and Scarpetta (2008).
11. Noteworthy exceptions include the recently developed indicators on high-growth firms produced yearly by the OECD and the pioneering program of work led by Eric Bartelsman, John Haltiwanger, Stefano Scarpetta and Fabiano Schivardi who, with support from the OECD and the World Bank, undertook the most comprehensive comparative analysis of firm demography, business dynamics and firm-level productivity performance across countries.
12. The potential influence of business cycles in the results presented in this report is discussed in Part 2.
13. Bravo Biosca (2010).
14. All European Union members and several other countries around the world were invited to participate in this project. Unfortunately, due to a variety of reasons (ranging from data unavailability to budget constraints) so far only some of them have been able to provide data.

Europe faces serious economic and social challenges. The recession has left the continent burdened with low employment and high fiscal deficits. More worryingly, with its high indebtedness, an ageing population and overly rigid institutional structures, Europe's long-term prospects are not encouraging either.

The fear is that, without decisive changes, Europe will fail to compete with fast-growing emerging markets and a traditionally more dynamic US economy. This could have dire consequences for Europe's ability to maintain its quality of life, economic prosperity and social cohesion.<sup>2</sup>

This challenge is not new. Even before the recession, many European countries lagged behind when it came to generating exciting new ventures, capitalising on new technologies or making the most of globalisation.<sup>3</sup> The result was weak economic growth and a widening productivity gap with the US.<sup>4</sup>

Lack of dynamism and insufficient innovation are often blamed for this poor performance. Both Europe and the US have highly successful companies, but the European ones tend to be much older. The demographics of the world's 500 largest companies by market capitalisation illustrate the point. The US and Europe both have a large number of companies in the top 500, but only 2 per cent of the European companies in the top 500 were founded after 1975, whereas 14 per cent of the US firms were.<sup>5</sup>

Barriers to growth appear to be one of the reasons behind this. Recent research suggests that post-entry growth rather than entry rates represent the main difference between the US and Europe business dynamics.<sup>6</sup> Firms that

entered the market in the late 1980s and 1990s grew three times faster in their first seven years in the US than comparable firms in the average western European country.<sup>7</sup> These results are backed by surveys of entrepreneurial attitudes showing that European entrepreneurs are less likely to expect to have at least 20 employees after five years than their US counterparts.<sup>8</sup>

A better understanding of the dynamics of business growth would provide further insight on Europe's economic performance and its recent history of slow productivity growth. Productivity grows faster in competitive environments where firms continuously expand or shrink, as this speeds up the reallocation of resources (both labour and capital) to their most productive use.<sup>9</sup> A dynamic distribution of firm growth is also intimately linked to innovation, it reflects an environment where firms experiment with new projects, scaling them up when successful while being able to backtrack and shrink when they are unsuccessful.<sup>10</sup>

But despite considerable progress over the last decade, data on business growth remain scarce.<sup>11</sup> This makes it difficult to examine differences in growth dynamics across countries, as well as to ask what factors drive it, how it impacts on economic performance and what policymakers can do about it.

In response to this challenge, a collaboration was established between researchers and statistical agencies in 11 countries across three continents to collect new and comparable data on business growth. The resulting database describes the distribution of business growth for all established firms in the participating countries. It measures how firms expanded and shrank in different countries and industries

between 2002 and 2005, after the dotcom bubble but before the height of the boom that preceded the recent financial crisis.<sup>12</sup> See Box 1 for a brief description of the process used to assemble this new database.

This report briefly summarises initial findings from this new database. The accompanying working paper provides a more thorough examination of the database and its characteristics, presenting the data underlying this report.<sup>13</sup> And in on-going work NESTA and partners are exploiting this new database to examine the drivers behind the dynamics of business growth in different countries.

### A note on the scope of our analysis

The database contains information on business growth in Austria, Canada, Denmark, Finland, Italy, the Netherlands, New Zealand, Norway,

Spain, the UK and the US. This provides a good mix of small and large economies as well as Southern and Northern European countries. Data have, so far, not been available for France, Germany or the new EU member states.<sup>14</sup> While there are differences that should not be ignored, the regularity of the patterns identified across the European countries that have participated in this project suggests that the results may apply more widely in Western Europe.

When discussing the results, the terms 'Europe' and 'European countries' are used interchangeably to refer to the simple average across the participating European countries.<sup>15</sup> This is then compared to the US, a country also facing challenges of its own but historically a benchmark in terms of productivity growth and business dynamism. Work is underway to expand the database to capture business growth in more countries.

#### Box 1: Developing a new database on business growth across countries

Measuring the distribution of business growth consistently across several countries presents a challenge. Official business registers provide the most comprehensive coverage of business activity in a country, since they are assembled from tax, social security or other administrative records for the universe of companies. But due to their nature they are strictly confidential and access is highly restricted. Accordingly, the project required the active participation of each national statistical office or, alternatively, local researchers with authorised access to the microdata.

Collaborations were established across eleven countries: Austria,<sup>16</sup> Canada,<sup>17</sup> Denmark, Finland, Italy, the Netherlands, New Zealand, Norway, Spain, the UK and the US. Each has provided harmonised micro aggregated data on business growth following standard definitions provided at the outset of this project (which built on the Eurostat-OECD Manual on Business Demography Statistics developed by the Entrepreneurship Indicators Programme). The resulting database draws on individual records for six million firms, which employed over 125 million people in 2002.

Briefly, average annual employment growth over a three-year period (2002–2005) was measured for each surviving private sector firm<sup>18</sup> with at least one employee.<sup>19</sup> Based on their growth rate, firms were placed in one of the 11 growth intervals.<sup>20</sup> These data were used to compute the percentiles of the growth distribution and produce growth distribution curves for up to 51 sectors, ten firm size classes and five age groups.<sup>21</sup> The accompanying working paper<sup>22</sup> provides further details of the database construction process, the underlying definitions and the limitations of this approach.<sup>23</sup>

15. The report uses unweighted averages to create a proxy for the average European country in the sample. A weighted average might provide a more representative picture of the European continent as a whole (or the EU15 at least), although due to the omission of France and Germany, it would be problematic too. Weighting countries does not however alter the main conclusions of the analysis.
16. Note that data for Austria are not derived from the business register but from social security records.
17. Note that Canada only provided data for firms that have between ten and 250 employees.
18. Non-agriculture business sector (ISIC Rev.3 Sectors 10–74).
19. In addition, a few countries have been able to provide data for 2004–07 or 2005–08 as well as indicators based on turnover growth, and work is underway to expand the list. Both employment and turnover are commonly used to measure business growth. While they both have strengths and weaknesses, they offer an imperfect proxy for value-added growth, the metric of most interest for policymakers but unfortunately the least available in business registers.
20. Specifically, the 11 growth intervals considered are:  $]-\infty; -20\%]$ ,  $[-20\%; -15\%[$ ,  $[-15\%; -10\%[$ ,  $[-10\%; -5\%[$ ,  $[-5\%; -1\%[$ ,  $[-1\%; 1\%[$ ,  $[1\%; 5\%[$ ,  $[5\%; 10\%[$ ,  $[10\%; 15\%[$ ,  $[15\%; 20\%[$  and  $[20\%; \infty[$ .
21. The database thus includes both young and old firms, although this report does not however distinguish between them. Work is ongoing to be able to do so in the near future.
22. Bravo Biosca (2010).
23. A few points are worth highlighting regarding the analysis presented in this report. First, the growth data for the UK are derived from a database still under development, so they may change in future revisions. Excluding the UK does however not change the main conclusions of the report. Second, unless otherwise stated, the data and figures discussed in the report only include surviving firms, defined as those that have survived with positive employment throughout the three-year period. Third, data were collected for all firms with at least one employee, but unless otherwise stated the data discussed here consider only firms with ten or more employees (firms with more than 250 employees are not included for Canada).

## Part 2: Exploring the distribution of business growth across countries

This section uses this newly developed database to examine the dynamics of business growth across countries. This analysis reveals that differences in business growth dynamics between the US and Europe go beyond just high-growth firms, with fewer firms in Europe growing moderately or shrinking and more of them remaining stable. In many European countries smaller firms struggle to grow relative to their US peers, while this is not necessarily true for larger firms.

24. See Figure A1 in the appendix for the growth distribution country by country.
25. The percentile  $x$  is the value of a variable below which  $x$  per cent of observations lie. For example, the percentile 95<sup>th</sup> is the growth rate that is higher than the growth rate experienced by 95 per cent of the firms in the economy but lower than the growth rate of the top 5 per cent of firms. In an economy with a hundred firms ranked by growth rate, it would correspond to the growth rate of the 95<sup>th</sup> ranked company (i.e. the growth rate of the top 5 per cent firm). See the accompanying working paper for a description of the methodology used to estimate the percentiles of the growth distribution, as well as more detailed data on other percentiles.
26. The share of high-growth firms corresponds to the column at the top of the growth distribution in Figure 1. High-growth firms are defined by Eurostat

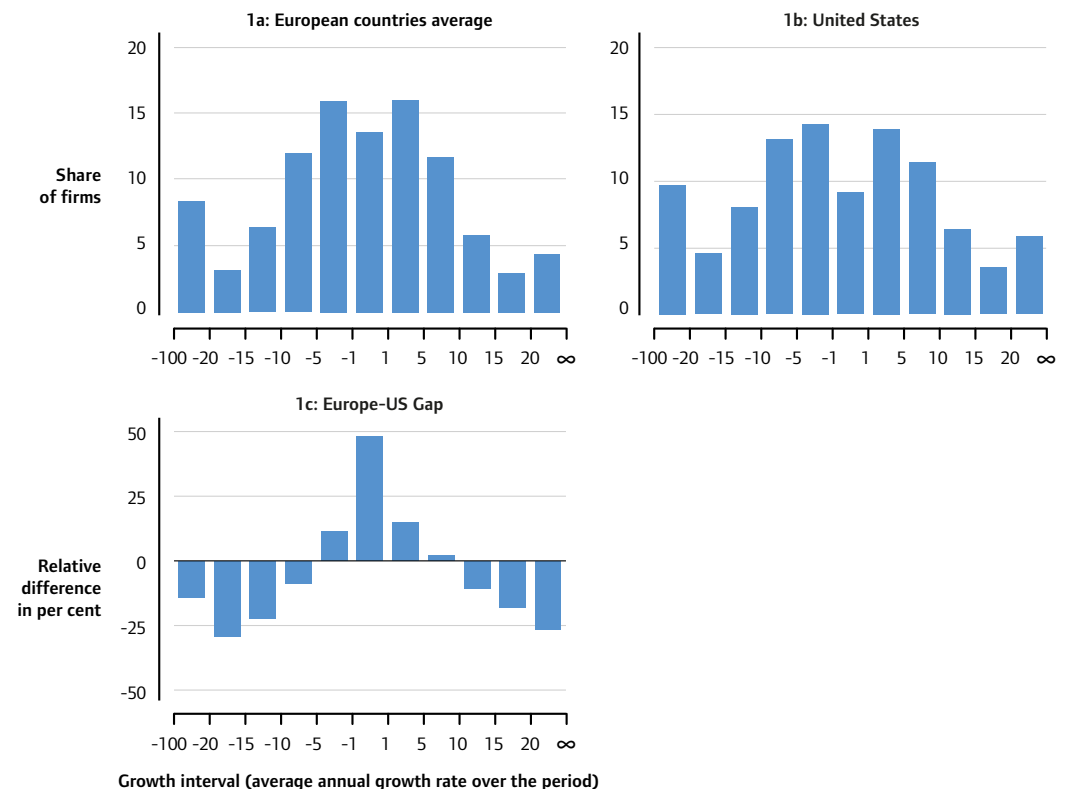
The distribution of business growth for private sector firms is summarised in Figure 1. Each column indicates the share of firms with ten or more employees with average annual employment growth rates over a three-year period falling within that growth interval (with the range covering 11 intervals from less than -20 per cent to more than +20 per cent employment growth per annum).

At first glance, the distribution of business growth for the average European country and

the US looks broadly similar.<sup>24</sup> It is symmetric with extreme bursts of growth or decline occurring quite regularly. Significantly, existing firms are more likely to shrink than grow, and the median firm experiences slightly negative growth.

However, closer examination highlights significant differences between Europe and the US. Figure 1c reports the relative difference between the US and the European average in the share of firms that fall within each growth

Figure 1: Growth distribution in Europe and the US



interval. This reveals that US firms are more likely to expand or contract, while European firms are more likely to remain stable. These differences are examined in more detail below.

### European firms are less likely to grow fast

Firms at the 95<sup>th</sup> percentile<sup>25</sup> of the growth distribution grew 21 per cent faster in the US than in the average European country (86 per cent and 71 per cent respectively over a three-year period, a 15 percentage point gap – Figure 2a). This pattern holds across most European countries when considered individually. While the UK and Spain had higher growth rates at the 95<sup>th</sup> percentile than the US, the gap with other European countries was significant, with the Netherlands, Norway and Austria faring particularly poorly in terms of fast-growing companies.

An alternative approach to examining the top percentiles of the growth distribution is to measure the share of firms with a growth rate above a certain threshold. This is the approach followed by the OECD-Eurostat Entrepreneurship Indicators Programme, and leads to similar conclusions. The share of high-growth firms<sup>26</sup> was 37 per cent higher in the US than in the average European country (5.9 per cent and 4.3 per cent respectively).<sup>27</sup> Within Europe, the proportion ranged from 6.4 per cent in the UK to 3.2 per cent in Norway. The average high-growth firm multiplied its employment by more than 2.5 times over a three-year period. As a result, high-growth firms made a disproportionate contribution to employment growth. Despite their small share (ca. 3–6 per cent), in most countries high-growth firms accounted for between 35 per cent and 50 per cent of all jobs created by surviving firms with ten or more employees over the period.<sup>28, 29</sup>

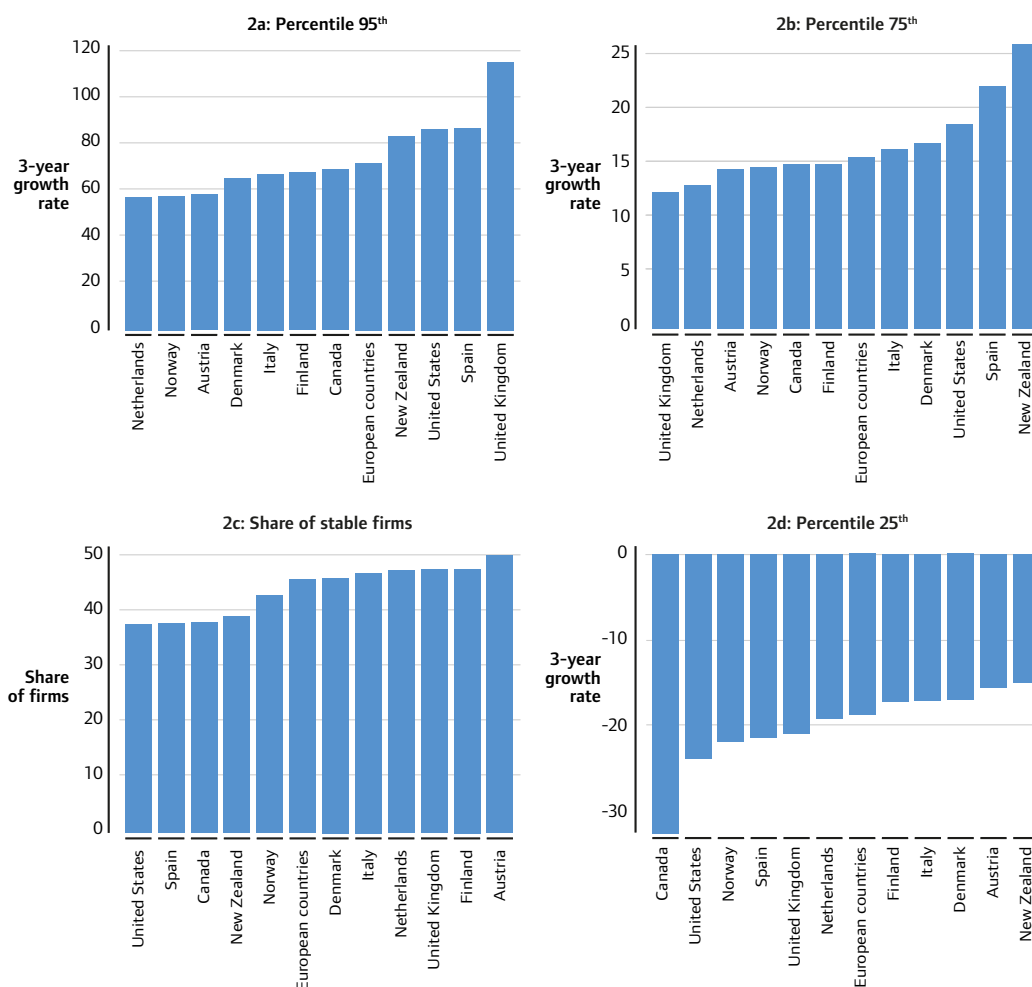
and the OECD as all enterprises with ten or more employees in the beginning of the observation period with average annualised employment (or turnover) growth greater than 20 per cent over a three-year period (Eurostat-OECD, 2007). Note however that the figures report the share of high-growth firms relative to all surviving firms with ten or more employees, so these figures are not directly comparable to those published by the OECD, which reports the share relative to the total population of active enterprises in the reporting year with at least ten employees (OECD, 2009).

27. See Figure A2 in the appendix for the share of high-growth firms and their contribution to job creation by country.

28. Note that the measures of job creation discussed in this report capture in principle all jobs gained by surviving firms, regardless of whether they are the result of organic growth or instead are gained through acquisitions of existing firms (Austria and New Zealand are exceptions). Similarly, job destruction counts both jobs lost by firms that dismiss employees but also spinouts that reduce the headcount of the firm. These measures thus capture the restructuring process that firms undertake, regardless of whether this is achieved through acquisitions, spinouts or organic growth. This approach is however far from ideal to measure job creation, but it is a consequence of the challenges that M&As and spinouts present for many business registers. See accompanying working paper for a more thorough discussion of this issue.

29. See Figure A2 in the appendix. There are however differences across countries in the contribution of high-growth firms to employment creation, even if the US and the European average are quite close. For instance, in the UK high-growth firms were responsible for more than half of all jobs created by existing firms with ten or more employees, while in the US it was only 45 per cent. Similarly, Finland and Denmark had a similar share of high-growth firms, but they respectively accounted for 48 per cent vs. 37 per cent of job creation of firms with ten or more employees. Unfortunately, the database does not yet include data on job creation by entrepreneurs that entered the market during the period considered in this study, which would provide a fuller picture of job creation dynamics.

Figure 2: Business growth by country





## Europe also has fewer moderately growing firms

The US–Europe gap in high-growth firms is relatively well documented, but focusing exclusively on the top of the growth distribution can give an incomplete picture of business growth dynamics. The analysis reveals that Europe also has fewer medium-growth firms. The share of firms growing between 10 per cent and 20 per cent per annum was 15 per cent higher in the US than in the average European country (9.9 per cent and 8.6 per cent respectively).

Consistently with that, the growth rate at the 75<sup>th</sup> percentile of the distribution was higher in the US than in any other European country (bar Spain). US firms in this percentile grew by 18 per cent over the period, 19 per cent faster or 3 percentage points more than the average for European countries (Figure 2b).

The cross-country rankings for the 95<sup>th</sup> and 75<sup>th</sup> percentile have some similarities, but there are noteworthy differences. The UK tops the country rankings when looking at the fastest-growing firms, but appears at the bottom when moderate-growing firms are considered instead (US firms' growth rate at the 75<sup>th</sup> percentile was 6 percentage points higher than for UK firms – or 50 per cent greater).

## European firms are more likely to stay the same size than their US counterparts

Europe has fewer medium and high-growth firms. Instead, a greater proportion of European firms experience very modest or zero growth. The share of firms that did not expand or contract<sup>30</sup> over the period in the US was almost a third lower than in the average European country (9.2 per cent vs. 13.6 per cent). This is the largest gap between Europe and the US in all the 11 growth intervals considered, both in absolute and relative terms.

Broadening the definition of stability to include firms that grow or shrink by less than 5 per cent per annum leads to a similar conclusion:<sup>31</sup> 45.6 per cent of European firms were stable on this metric compared to 37.4 per cent in the US (Figure 2c). This eight percentage point gap is explained by both a larger share of expanding and contracting firms in the US.

Europe is a diverse continent, but this pattern holds for seven of the eight European countries in the study, with their share of stable firms ranging from 43 per cent to 50 per cent, significantly higher than in the US (Spain is the exception, discussed in more detail below).

## US firms also shrink faster than in Europe

There are also differences in the bottom half of the growth distribution. Fifty per cent of US firms with ten or more employees shrank, compared with just 46 per cent for the average European country. US firms at the 25<sup>th</sup> percentile of the distribution shrank by 24 per cent, 27 per cent or 5 percentage points faster than in Europe, where the average decline was 19 per cent (Figure 2d). While US firms shrank faster than in any European country, the differences within the continent were still substantial. At the 25<sup>th</sup> percentile the contraction rate ranged from 22 per cent in Norway to only 16 per cent in Austria.

Hence, the US has both faster-growing and faster-shrinking firms than the average European country. This is no coincidence, since the two are correlated. Each data point in Figure 3 represents a specific industry in a particular country, and shows the growth rate at the 90<sup>th</sup> and 10<sup>th</sup> percentile, normalised by the growth rate of the median firm.<sup>32</sup> A strong negative correlation emerges between the growth rate at the top and the bottom of the distribution. In other words, the faster successful companies grow, the faster unsuccessful companies in the same industry shrink.<sup>33</sup> This would be expected since, after all, firms frequently grow at the expense of other firms, by attracting their workers or taking over their markets.

## Surviving firms make a different contribution to employment growth in Europe and the US

US and European surviving firms also differ in their aggregate contribution to employment growth. On aggregate, surviving firms (including micro firms)<sup>34</sup> created employment in the average European country but destroyed it in the US.<sup>35</sup> The higher share of large firms combined with their faster contraction resulted in US surviving firms reducing their employment by 2.8 per cent over the period

30. Growth rate between -1 per cent and 1 per cent per annum on average over the period, which corresponds to the central interval in the growth distribution (Figure 1).

31. This corresponds to the three central columns in the growth distribution in Figure 1.

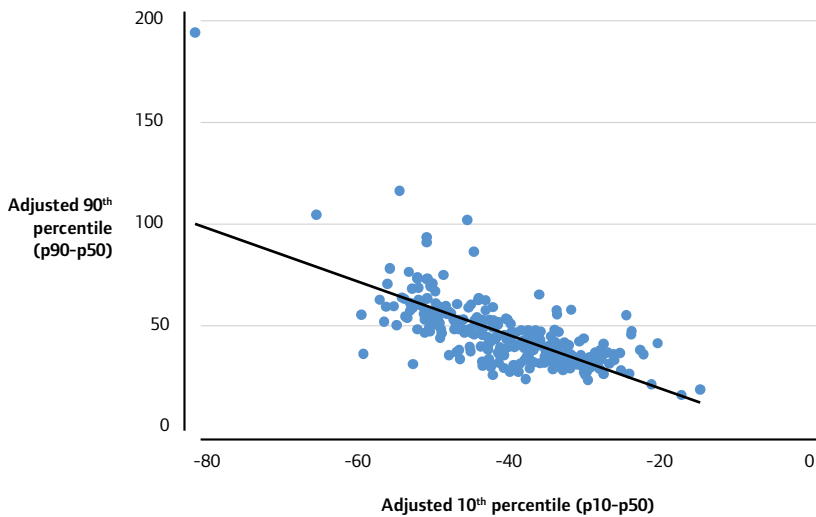
32. Looking at deviations relative to the growth rate for the median firm has the advantage of controlling for shocks that shift the full growth distribution upwards or downwards. But raw correlations without this normalisation are also negative, even if not as strong (-0.30 vs. -0.70).

33. Employment growth is used here as a shorthand for success. Obviously, a firm's contraction in employment does not necessarily equate to lack of success. For instance, process innovation often involves substituting new equipment for labour, generating efficiency gains as a result. Similarly, firms may decide to re-focus on its core competences in response to changing market conditions, as IBM did when it sold its PC division.

34. Note that in contrast to the rest of the report these employment figures refer to all surviving firms with one or more employees, and not only to firms with ten or more employees.

35. See footnote 28 for a discussion of the limitations of the job creation measures discussed here.

**Figure 3:** Percentile 90<sup>th</sup> vs. percentile 10<sup>th</sup> by country-industry pair



(Figure 4a). By contrast, those established European firms that survived over the period increased their employment by 3.3 per cent on average (although there are quite significant differences across countries).<sup>36</sup>

But surviving firms are only one of the contributors to employment growth. Figure 4b displays private sector employment growth over the period, which also captures job creation and destruction through entry and exit of firms.<sup>37</sup> It shows that overall employment growth in the US was both positive and higher than in the average European country. Given that the contribution of established business to net job creation was negative in the US, the question that arises is who filled the gap? The

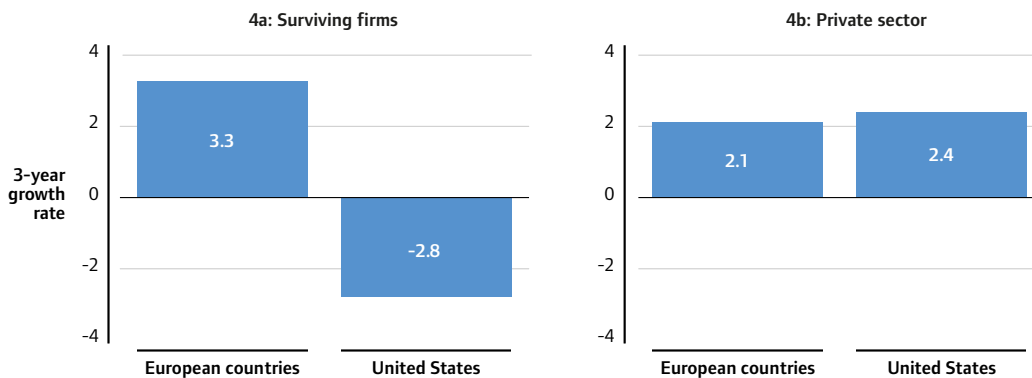
answer is entrepreneurs. These appear to play a much more significant role in job creation in the US than in Europe, although definitive conclusions would require further data.<sup>38</sup>

**Differences in growth dynamics cannot be explained by the smaller size of European firms, sectoral mix or business cycles**

European firms are significantly smaller than their US counterparts, with the average surviving European firm employing 14 people compared to an average of 30 people in the US.<sup>39</sup> While the vast majority of firms in both

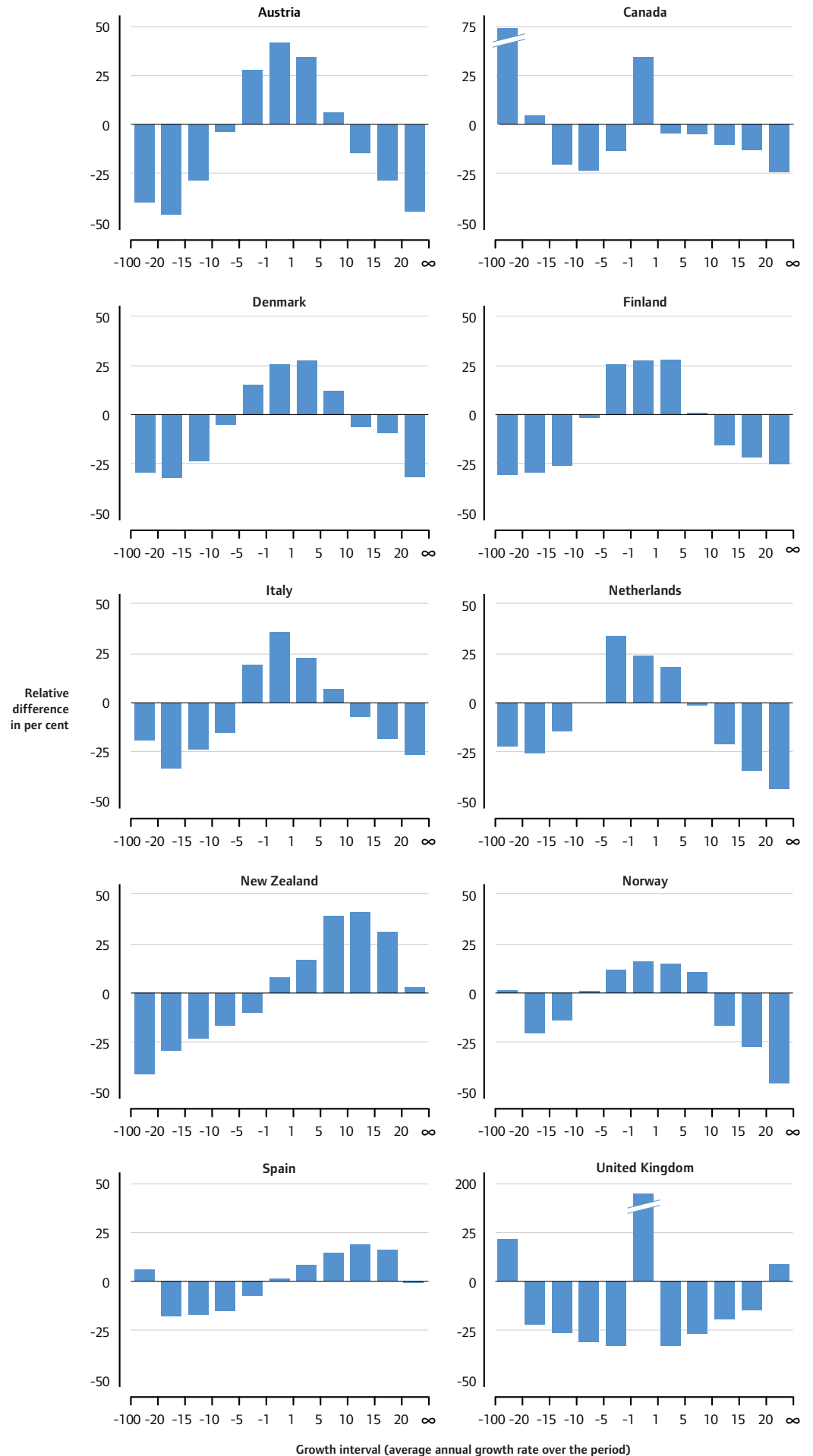
36. See Figure A3 in the appendix for data country by country.  
 37. Private sector employment growth is based on non-agriculture business sector employment as reported by the OECD Structural Analysis Database. Both sources measure employment growth between 2002 and 2005, but the precise time of the year to which the data refer may differ for some countries. UK data do not include self-employment, and so the UK is excluded from the European average for consistency (including it does not change the conclusion). New Zealand data are not available there.  
 38. Further data on jobs created by entrepreneurs or jobs destroyed through exit would be required to reach more definitive conclusions.  
 39. Note that all the firm size measures discussed here are based on surviving firms (with one or more employees), so they differ from the average size computed using the full stock of firms (which also includes new entrants and firms that do not survive three years).

**Figure 4:** 3-year employment growth rate – surviving firms vs. private sector



**Note:** OECD Structural Analysis Database used for private sector employment growth.

**Figure 5: Relative gap with the US by country**



40. Throughout this report the conventional statistical definitions for firm size are used. Micro firms have between one and nine employees, small firms between ten and 49 employees, medium firms between 50 and 249, and large firms 250 or more employees.

41. See Figure A4 in the appendix for data country by country.

42. Differences are even more striking if the variation within Europe is considered. Spain had the smallest firms, on average, with those with fewer than ten employees constituting 25 per cent of employment (vs. 8 per cent in the US), while large firms (250+ employees), traditionally expected to have higher productivity, represented only 30 per cent of employment by surviving firms in Spain (vs. 62 per cent in the US). The average firm size ranged from ten employees in Spain to 30 in the US, with the US far ahead of all the other countries. The picture does not change if micro firms are excluded and only firms with ten or more employees are considered, in which case average size ranged from 47 employees for Italy to almost a 100 for the US. Interestingly, Denmark and Finland had fewer micro firms and more large firms than larger countries like Italy and Spain, so it is not just country size that lies behind these differences.

continents have fewer than 50 employees (95 per cent or higher), the distribution of employment across different sizes of firms varies widely.<sup>40</sup> Firms with more than 250 employees accounted for over 60 per cent of employment in the US, but less than 40 per cent in Europe.<sup>41</sup> At the other extreme, firms with fewer than ten employees represented only 8 per cent of employment by surviving firms in the US, less than half their share in the average European country (18 per cent).<sup>42</sup>

However, differences in growth dynamics are not the result of differences in the firm size or sectoral mix in different countries. When firms of similar size or in the same sector are compared, European firms still grow and shrink more slowly than those in the US. If anything, the US-Europe gap becomes somewhat larger when firms of the same size are compared. There are, however, differences in the magnitude of the gap between smaller and larger firms and also across different sectors,<sup>43</sup> with manufacturing having a significantly larger gap (see Box 2 for a discussion of the differences by size class).

Business cycles could potentially explain the lower dynamism that European firms display. Without time series information it is difficult to accurately examine this hypothesis. However, it does not appear that the cycle fully accounts for Europe's lower dynamism. Although most countries experienced an expansionary phase

in the study period, the US economy was growing by 3.1 per cent per annum whereas the European countries considered here grew by only 2.2 per cent on average (although with significant variation within Europe). Thus even when the performance of the US economy was superior, US firms contracted more rapidly than European ones. Therefore, the US-Europe differences in growth dynamics are unlikely to be just the result of the business cycle. There is also a structural component to them.<sup>44</sup>

The business cycle may however have had a notable impact in some of the countries included in the study, particularly New Zealand and Spain.<sup>45</sup> Figure 5 displays the share of firms that fall within each growth interval in each country relative to the US.<sup>46</sup> It suggests that the full growth distribution for Spain and New Zealand shifted upwards, coinciding with the large economic boom that both countries experienced. Business cycles thus appear to be at least partially responsible for the high business growth that these two countries exhibited, and therefore they played a role in some of the country rankings.

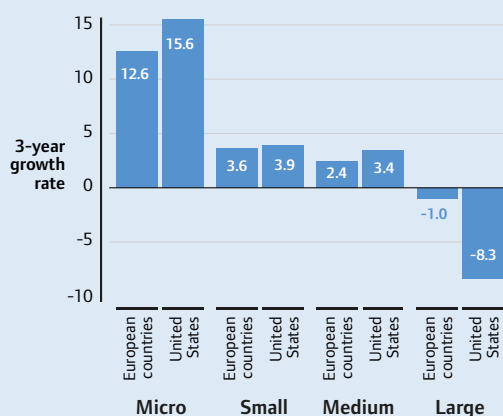
Figure 5 also shows that the main patterns identified hold across most European countries. In summary, the top half of firms grow faster in the US than in Europe while the bottom half shrink faster. As a result, at the end of the period, the gap between successful and unsuccessful firms is larger in the US.

## Box 2: Small vs. large: The distribution of business growth by firm size

The US-Europe differences in business growth dynamics vary across firms of different sizes. Figure 6 shows the average growth rate over the period for all surviving firms by their size at the beginning of the period. Surviving smaller firms grew faster than larger firms on average, both in Europe and the US.<sup>47</sup> But the comparison between both continents highlights some crucial differences.

Micro, small and medium firms grew more slowly in the average European country than in the US (even if there is significant variation within Europe).<sup>48</sup> On the contrary, large European firms did relatively better, shrinking by significantly less than their US peers. For instance, medium firms grew by 3.4 per cent in the US on average, compared to 2.4 per cent in Europe. On the contrary, large firms shrank by 8.3 per cent in the US, but by only 1 per cent in Europe.<sup>49</sup> As a result, the

Figure 6: Average 3-year growth rate by firm size



43. See Figure A5 in the appendix for the US-Europe differences in growth dynamics by sector.

44. The very limited data available for 2004/05-2007/08 also suggest this to be the case. See accompanying working paper for further discussion.

45. Business cycles may also have played a role in some of the other differences identified in this report. For instance, the pro-cyclicality of employment creation may vary for firms of different size, and so comparisons of growth rates for firms of different size may be affected as a result.

46. Canada only provided data for firms that have between ten and 250 employees, so the Canada-US comparison in this figure is adjusted accordingly.

47. Note that the data presented in this report are insufficient to compare the contribution that firms of different sizes make to net job creation. While surviving SMEs create more jobs than larger firms, the database includes no information on the jobs that they destroy through exit. And thus net job creation by firm size cannot be computed (see also footnote 28 for a discussion of the limitations of the job creation measures used here). For the same reason it is not possible to use these data to compare net job creation by young firms and old firms, nor the interaction between size and age (would small firms create more jobs because they are small, or because they are younger on average?). For a detailed analysis of this question in the US, see Haltiwanger, Jarmin and Miranda (2010).

48. See Figure A7 in the appendix for data country by country. Due to potential disclosure issues the largest size class provided by New Zealand is 100+ employees. Therefore the country is missing in some of the figures.

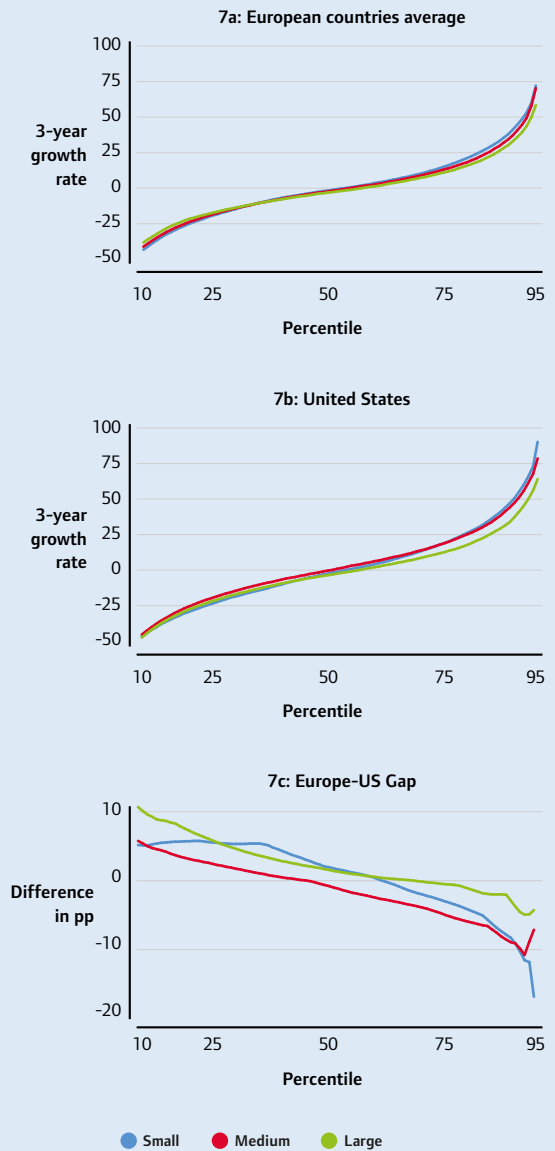
49. Note however that large firms are significantly larger on average in the US than in Europe. The incidence of outsourcing may also vary.

gap between the average growth rate of medium firms and large firms was almost 12 percentage points in the US, compared to less than four percentage points in the average European country. Thus it appears it is more difficult for European SMEs to grow to challenge larger incumbents.

A look at the full distribution sheds more light on this. Figure 7 displays all the percentiles of the growth distribution by firm size for the US and the average European country.<sup>50, 51</sup> Figure 7c reports the difference in percentage points between both continents. A positive value indicates that European firms had a higher growth rate (or shrank by less) than US firms over the period. Regardless of size, firms in the top third of the distribution grew faster in the US than in the average European country, while US firms in the bottom third shrank faster as well.

But the magnitude of the gap varies by firm size. Throughout the distribution, the curve for large firms is around 3-5 percentage points above that for medium firms (the curve for small firms is less steady). Therefore, it appears that, compared to the other firms in their own country, large firms do relatively better in Europe, while medium firms do relatively better in the US. In summary, medium firms grow significantly faster in the US than Europe above the median, but they also shrink significantly faster below the median. On the contrary, US large firms grow only slightly more than their counterparts in Europe, but they contract much more rapidly.

**Figure 7:** Percentiles of the growth distribution by firm size



50. Percentiles for micro firms are not presented here since growth rates for firms with less than 10 employees are not very meaningful because they are extremely dependent on the initial size of the firm (e.g., a firm with one employee that hires another one has a 100% growth rate, a doubling of its workforce).

51. These figures exclude percentiles at the extremes (above 95 and under ten), since they are mostly based on extrapolating the data collected (see accompanying working paper for an estimate for them).

## Part 3: Business growth dynamics matter for productivity growth

This section seeks to explore whether the higher inertia of Europe's business population matters. Research highlights that business growth dynamics have an important impact on productivity growth, and the analysis of the database supports this. A very static firm growth distribution betrays the fact that firms are not experimenting and pursuing new opportunities. And it reveals also that the reallocation of resources towards more productive firms is slow. This implies that the persistence of Europe's larger share of static firms could have potentially damaging consequences for its long-term economic performance.

### Productivity growth requires both experimentation and the reallocation of resources towards successful innovators

Countries can increase productivity by accumulating capital and imitating what others have invented elsewhere. But once these sources of growth have been exhausted, innovation is the main engine left to drive productivity growth.<sup>52</sup> It is also the most appropriate response to increasing competition from emerging markets, which forces firms and countries to move up the value chain.

But innovation requires experimentation in the real world, going beyond the R&D lab. It is about putting new ideas into practice. Trying a new business model, exploiting a new technology or launching a new product often requires expanding a firm's current capabilities, which may mean for instance setting up a new plant or hiring a new marketing team. But since experimentation is uncertain and market selection harsh, a 'wait and see' approach often replaces risk-taking if failure is too costly.<sup>53</sup> The larger proportion of static firms in Europe suggests that more European firms are following this risk-averse approach. Too many appear either unwilling or unable to experiment and exploit new growth opportunities. As a result, they fail to innovate effectively.

The benefits of innovation are only maximised when firms build on it. This means expanding and replacing less successful firms, driving productivity growth in the process. The reallocation of resources towards more productive plants directly accounts for about half of total factor productivity growth in US manufacturing.<sup>54</sup> But European firms grow and shrink more slowly than US firms. And, as a result, the process of job reallocation across

firms is slower, hampering productivity growth in Europe.

A more dynamic business growth distribution also reflects a more competitive market, which in turn impacts on incentives to innovate.<sup>55</sup> An environment with higher levels of entry and growth results in increased competitive pressures, forcing firms either to improve their performance or to shrink and exit.<sup>56</sup> The higher proportion of static European firms suggests lower competitive pressures, potentially damaging long-term productivity growth.<sup>57</sup> This is consistent with research showing that the limited turnover of big businesses, which is quite typical in Europe, damages economic growth.<sup>58</sup>

### A more dynamic growth distribution is associated with higher productivity growth

The academic literature thus suggests that the reallocation of resources across firms is one of the main drivers of productivity growth, and further analysis using this new database supports this finding.<sup>59</sup> A basic regression is used to examine the relationship between a dynamic growth distribution and productivity growth. Specifically, total factor productivity (TFP) growth at the industry-country level in 2002–2005 is regressed on the share of firms that remain completely static,<sup>60</sup> which is used as a proxy for the dynamism of the growth distribution. Controls for initial productivity and average employment growth as well as for industry and country characteristics are also included.<sup>61</sup>

52. See for instance Acemoglu, Aghion and Zilibotti (2006) or Aghion (2006).
53. See for instance Bartelsman, Perotti and Scarpetta (2008).
54. See Baily *et al.* (1992) and Haltiwanger (1997). Other studies have reached similar conclusions in other countries. For instance, Disney, Haskel and Heden (2003) undertakes a similar study for the UK and finds that entry, exit and the reallocation of resources across existing establishments jointly accounted for 80–90 per cent of TFP growth and 50 per cent of ALP growth in UK manufacturing, while the remaining growth on both measures was attributed to internal improvements within firms.
55. See for instance Aghion *et al.* (2005) or Gilbert (2006).
56. See for instance Bartelsman, Haltiwanger and Scarpetta (2004).
57. See for instance Nicoletti and Scarpetta (2003).
58. See Fogel, Morck and Yeung (2006), which concludes that big business turnover is correlated with (and appears to cause) economic growth. Interestingly, the result is driven more by disappearing behemoths than by rising stars.
59. For a review of the literature, see Ahn (2001). For additional evidence, see also Baldwin and Gu (2006) and Foster, Haltiwanger and Krizan (2006).
60. Growth rate between -1 per cent and 1 per cent per annum on average over the period.
61. Specifically, the following model is estimated:  
$$TFP \text{ growth}_{i,t} = \beta_0 \text{share}_{i,t} + \beta_1 \text{distancefrontier}_{i,t} + \beta_2 \text{empgrowth}_{i,t} + \text{countrydummy}_i + \text{industrydummy}_i + \varepsilon_{i,t}$$
  
Distance to the technology frontier at the beginning of the period controls for potential convergence effects while average employment growth controls for industry-country specific shocks (excluding both of them does not affect the results). The coefficient for the share of static firms is -0.194. If instead both the share of growing firms and the share of shrinking firms are included in the regression, the coefficients are 0.252 and 0.172 respectively. All coefficients are significant at the 5 per cent level, with the residuals clustered at the industry and country level. The EU KLEMS Database (O'Mahony and Timmer, 2009) and the GGDC Productivity Level Database (Inklaar and Timmer, 2008) are used for industry-level total factor productivity data. See accompanying working paper for further discussion.

The estimation finds that the greater the share of firms that do not expand or contract, the lower the productivity growth observed. Specifically, a 1 percentage point (pp) increase in the share of firms remaining completely static is associated with 0.2pp lower annual TFP growth.<sup>62</sup> When splitting non-static firms between those that expand and those that contract, the estimation suggests that both growing and shrinking firms are associated with faster productivity growth.

The magnitude of the coefficients is non negligible. In the decade prior to the financial crisis, Europe's annual TFP growth lagged the US by 1.1pp on average.<sup>63</sup> If taken at face value and under very generous assumptions, the coefficients would suggest that Europe's more static growth distribution could potentially account for over two-thirds of its recent productivity growth underperformance.

But correlation does not imply causation. In other words, these estimates do not imply that a reduction in the share of firms that remain static causes TFP growth. Rather they highlight a wider correlation between business dynamism and productivity growth, which is consistent with findings presented elsewhere.

### **There can be both productive and unproductive churn**

While a dynamic business growth distribution is generally a positive sign, it is not a sufficient condition for productivity growth if the reallocation of resources is not directed towards the most productive firms. This may occur when less productive firms have better access to finance, better government or supplier contacts, managers who care more about empire-building than improving performance, or when a speculative bubble distorts the allocation process.

The current evidence base suggests that not only is churn low throughout Europe, but also that it is not always productivity enhancing. Recent research finds that there are large differences across countries in the correlation between firm growth and initial productivity levels. For instance, in the UK the most productive 25 per cent of firms grow three times faster than the median firm, while the 25 per cent least productive firms shrink very fast too.<sup>64</sup> In contrast, in other European countries such as Italy, France or Spain, firms in the bottom quartile of the productivity

distribution (i.e. the least productive firms) continue to exhibit positive growth, or shrink only marginally.<sup>65</sup>

The consequence is a more inefficient allocation of resources in Europe.<sup>66</sup> While large firms are generally more productive than small firms, the slower expansion of the most productive firms and the limited contraction of unproductive incumbents in many European countries results in a much weaker correlation between size and productivity than in the US.<sup>67</sup> In other words, too often in Europe the more productive companies are not the ones with the largest market share. Consequently, the potential to increase productivity by simply reallocating resources between existing firms is significantly larger in European countries.

62. Alternatively, a one-standard deviation increase in the share of static firms is associated with 1.1pp lower annual TFP growth.

63. Van Ark, O'Mahony and Timmer (2008).

64. These figures are based on growth in value added by quartiles of the multi-factor productivity distribution of firms over 1998-2004 (Arnold, Nicoletti and Scarpetta, 2008).

65. Spain appears to be an extreme case of unproductive churn, since according to Arnold, Nicoletti and Scarpetta (2008) the growth rates for firms at the top and the bottom quartile of the productivity distribution are very similar. Several factors, such as the housing bubble, product market regulation or Spain's dual labour market (both extremely flexible and inflexible simultaneously), may lie behind this puzzling finding. But regardless of the cause, it can help to explain why Spain's dynamic growth distribution did not translate into higher productivity growth, experiencing instead one of the worst productivity performances across developed countries, the consequences of which have now become clear.

66. Bartelsman, Haltiwanger and Scarpetta (2004).

67. Bartelsman, Haltiwanger and Scarpetta (2009).

## Part 4: Driving business growth – causes and policy responses

The debate on high-growth firms often considers them in isolation. The argument frequently highlights Europe's inability to generate an equivalent to Google or Microsoft, those few companies that start small and quickly grow to dominate their respective markets. And so it focuses on targeted policy responses. But the analysis presented in this report highlights that the malaise is much more widespread, with a significant impact on productivity growth. This section briefly discusses what policymakers can do about it, focusing on three key areas: reforming product and labour market regulation, reducing market fragmentation across Europe, and improving access to finance.

In recent times, European policymakers have focused on encouraging entrepreneurship, and progress has been made on lowering barriers to entry.<sup>68</sup> Less attention has been paid however to addressing barriers to growth and contraction. The analysis in this report highlights that tackling these barriers will be important if Europe is to close the productivity gap.

To do so, action must go beyond a narrow focus on high-growth firms. Policies targeted more specifically at them, such as stimulation of private venture capital, are necessary, but they are not on their own sufficient to address the wider failure to thrive and failure to shrink that hampers Europe's productivity performance.

Policymakers should encourage an environment that rewards experimentation, penalises inertia and reduces the costs of failure: that is, an economy in which innovative firms experiment with new ideas, exploit new growth opportunities and, if successful, supplant less productive firms, which shrink and exit. This is creative destruction at work.<sup>69</sup> Of course, it is not without downsides. A larger share of shrinking firms, even if offset by a group of faster-growing companies, can generate significant adjustment costs,<sup>70</sup> so the appropriate mechanisms also need to be in place to facilitate the transition and protect those that lose in the process.

The list of potential responses to improve business dynamism in Europe is not short, but in light of current debates it is worth highlighting some of them:

- **Labour market regulation**, if badly designed, can become a major barrier to

growth. Inflexible employment protection legislation hampers both firms' incentives to experiment with uncertain growth opportunities and the reallocation of labour to more productive uses.<sup>71</sup> A better alternative is the much cited but yet not very widely adopted 'flexi-security' model, which protects individuals instead of jobs, and so allows for the higher flexibility intrinsic to a more dynamic business structure while providing the stronger safety net for individuals that this higher flexibility also requires.<sup>72</sup>

- **Product market regulation** continues to be higher in Europe than in the US, hampering competition and keeping the cost of inaction low.<sup>73</sup> The result is stagnant firms. Those that should shrink manage to stay afloat, and many with the potential to grow prefer not to take the risk if their shareholders, often undiversified and risk-averse in family firms, already enjoy a satisfactory lifestyle. Increasing competition through further product market liberalisation would encourage greater ambition and result in a more dynamic growth distribution.
- **The fragmented market** that European firms face constrains their ability to grow, reducing as well competitive pressures across Europe. While the single market has made it easier to sell goods across borders in the EU, the liberalisation of the market for services, where much of the US-EU productivity gap originates,<sup>74</sup> is too slow. And even after ongoing reforms have been implemented, differences in regulation across member states will still make it difficult for firms, particularly SMEs, to operate across different jurisdictions.<sup>75</sup> The approval of the proposed European Private Company (SPE)<sup>76</sup> and the

68. Barriers to entrepreneurship have been falling across most OECD countries over the last decade, with European economies making significant progress and converging with the US (Wölfl *et al.*, 2009).
69. Schumpeter (1942).
70. See for instance Mortensen and Pissarides (1994), Hall (1995) or Caballero and Hammour (2000).
71. As a result, high-risk innovative sectors are relatively smaller in countries with strict employment protection legislation (Bartelsman, de Wind and Gautier, 2010). See also Saint-Paul (2002) or Bartelsman, Perotti and Scarpetta (2008).
72. There also more indirect benefits from favouring labour expenditures instead of employment protection regulation as a mechanism for providing worker insurance, such as stronger private equity activity (Bozkaya and Kerr, 2009), which in turn is associated with improved management practices that lead to better firm performance (Bloom, Sadun and Van Reenen, 2009).
73. The OECD aggregate Product Market Regulation indicator ranks the US better than any other European country (Wölfl *et al.*, 2009).
74. Van Ark, O'Mahony and Timmer (2008).
75. Some barriers are the result of differences in culture, tastes, languages or networks, but many others (e.g. regulation, legal frameworks or tax rules) are within the reach of policymakers. For instance, a foreign firm willing to set up a subsidiary in Spain, the worst performer among developed countries, required 13 procedures and 61 days to be able to do so (The World Bank, 2010). Similarly, a business wishing to establish a subsidiary with just two employees in Belgium or Italy would have to pay 2,000-3,000 Euros only in notary costs (Bernecker, 2010). Moreover, set-up costs ignore the substantial costs of dealing with different jurisdictions on an ongoing basis.
76. Proposed by the Small Business Act, the Societas Privata Europaea or SPE is an attempt currently being discussed to create a single legal form for SMEs valid across Europe. This new parallel regime would sit alongside national regimes without replacing them, giving SMEs the choice between both of them. See European Commission (2008) and Bernecker (2010).



expansion of this approach to other areas of regulation would thus be useful steps to help reduce the fragmentation of the European market.

- **Access to finance** continues to be a major barrier to business growth, and the tightening of financial regulation risks restricting it further in the short term.<sup>77</sup> Thus it is important to have a better understanding of the value added of different types of financial activities to avoid damaging the sources of finance that support the development and growth of European firms. Similarly, regulatory attempts to rein in some of the excesses linked to financial innovation should be mindful so as not to impede the emergence of new innovative models, as venture capital once was, which could potentially help to alleviate the perennial financial constraints that growing businesses face, and provide the financial services that facilitate their expansion.

Several other factors, internal or external to the firm, could also help explain Europe's underperformance, and should be taken into account when developing the right policy mix. For instance, European firms appear to be much less effective than their US peers at taking advantage of new technologies, such as IT.<sup>78</sup> They are also more likely to be poorly managed, particularly those with second-generation family management or in low competition markets.<sup>79</sup> Europe's less entrepreneurial culture, unforgiving bankruptcy regimes, underperforming research base and weak university-industry links, among others, have also been mentioned as potential barriers to growth to be addressed.<sup>80</sup>

There are however differences within Europe. While several barriers are common across the continent, policymakers in various countries have been successful at overcoming some of them.<sup>81</sup> European countries have thus much to gain from learning from their neighbours that are further ahead, as well as from experiences elsewhere.

## Summary

Measures to avert a full blown sovereign debt crisis, reduce deficits and consolidate the nascent recovery are rightly priorities for policymakers now. But the weaknesses of the European economy preceded the financial

crisis. So a return to 'business as usual' will not be enough if Europe is to maintain living standards in an ever more competitive global economic environment.

This report shows that Europe's inability to generate an equivalent to a Google or Microsoft is part of a wider European picture which includes also more static firms and fewer shrinking firms. Measures specifically targeted at high-growth firms, such as improving the climate for venture capital, are necessary. But they will be insufficient without wider reforms, including deepening the single market, improving product and labour market regulation and reducing a wide array of barriers to growth and exit.

Policymakers need to quickly fix the underlying structural issues that constrain businesses across Europe and hinder productivity growth, helping in the process to rebuild confidence in the European economy. After all, the sooner we start addressing Europe's long-term growth challenge, the easier it will be to navigate today's uncertainties. In the months ahead, NESTA and partners will seek to use the newly developed database to provide the evidence base for policymakers seeking to give Europe a competitive edge again.

77. See for instance FSB-BCBS (2010).

78. Bloom, Sadun and Van Reenen (2009).

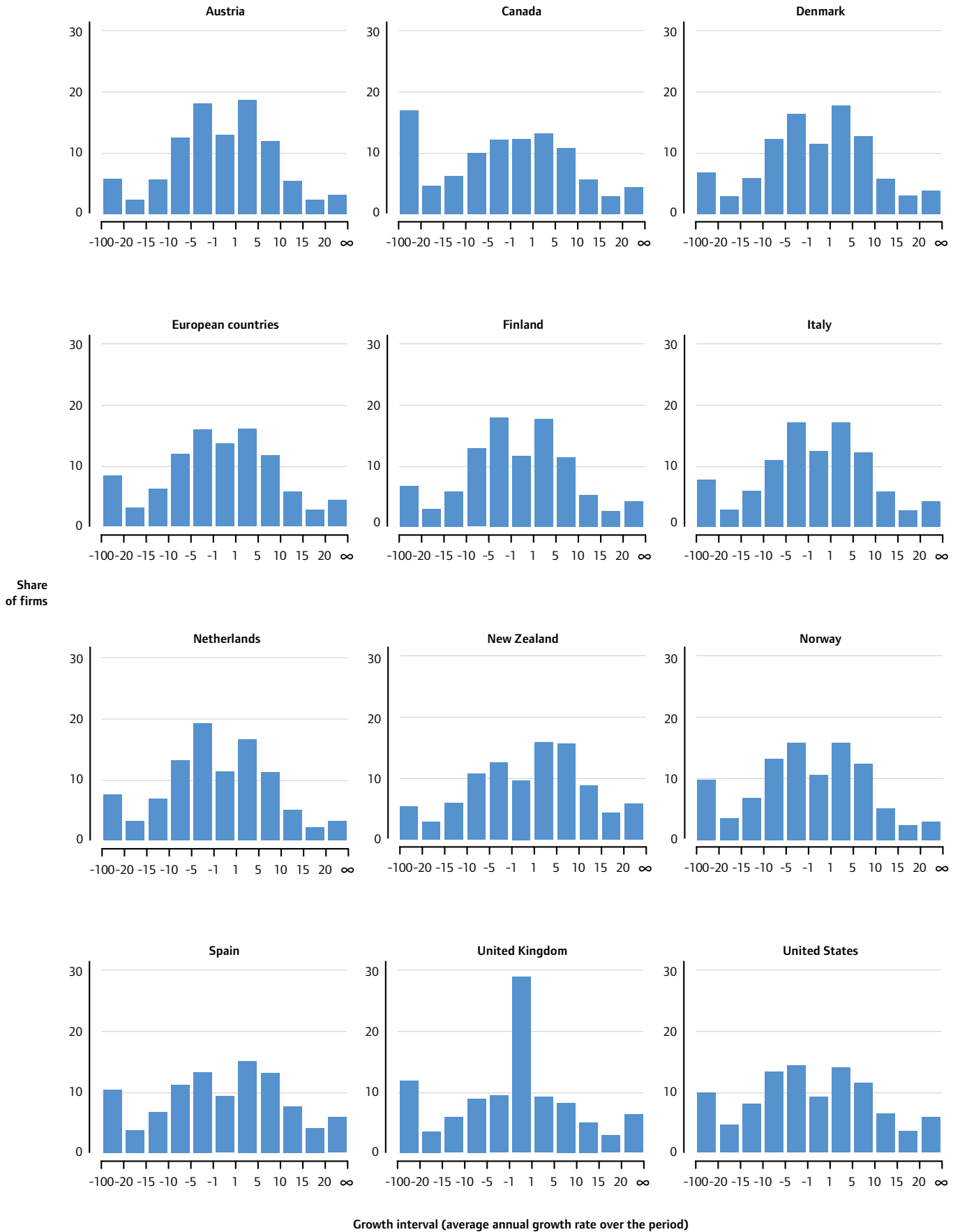
79. Bloom and Van Reenen (2007).

80. See for instance Bosma and Levie (2009), Armour and Cumming (2008), Aghion *et al.* (2007) and European Commission (2007).

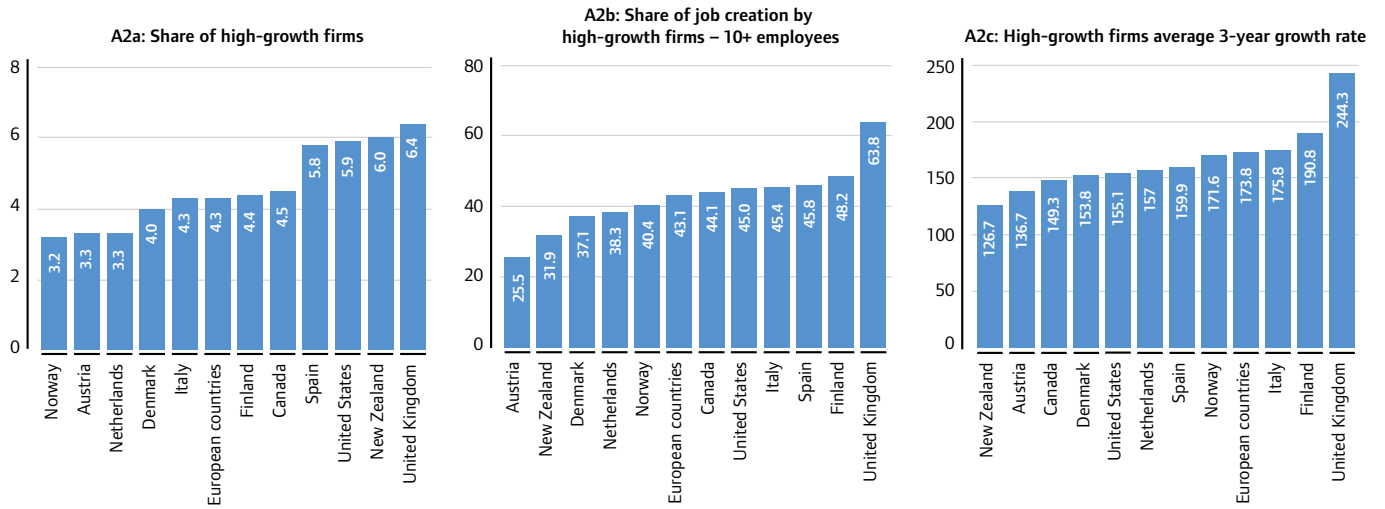
81. See for instance McKinsey & Company (2010).

# Appendix figures

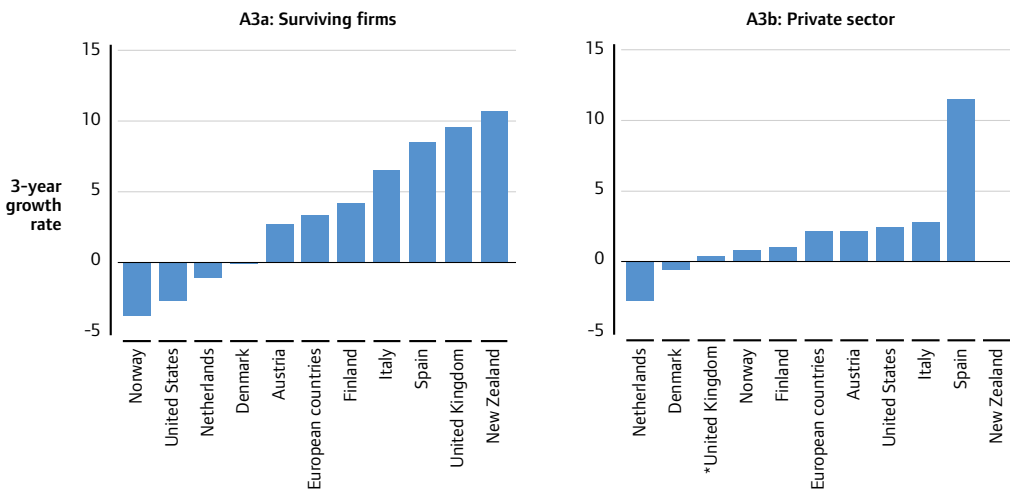
Figure A1: Distribution of firm growth – firms with ten or more employees



**Figure A2: High-growth firms and job creation**



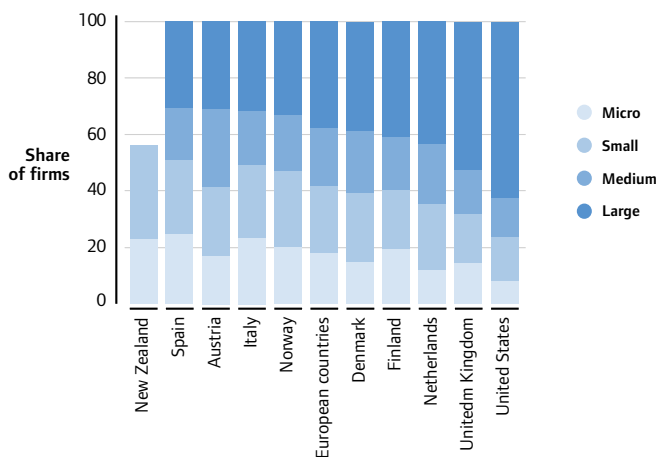
**Figure A3: 3-year employment growth rate – surviving firms vs. private sector**



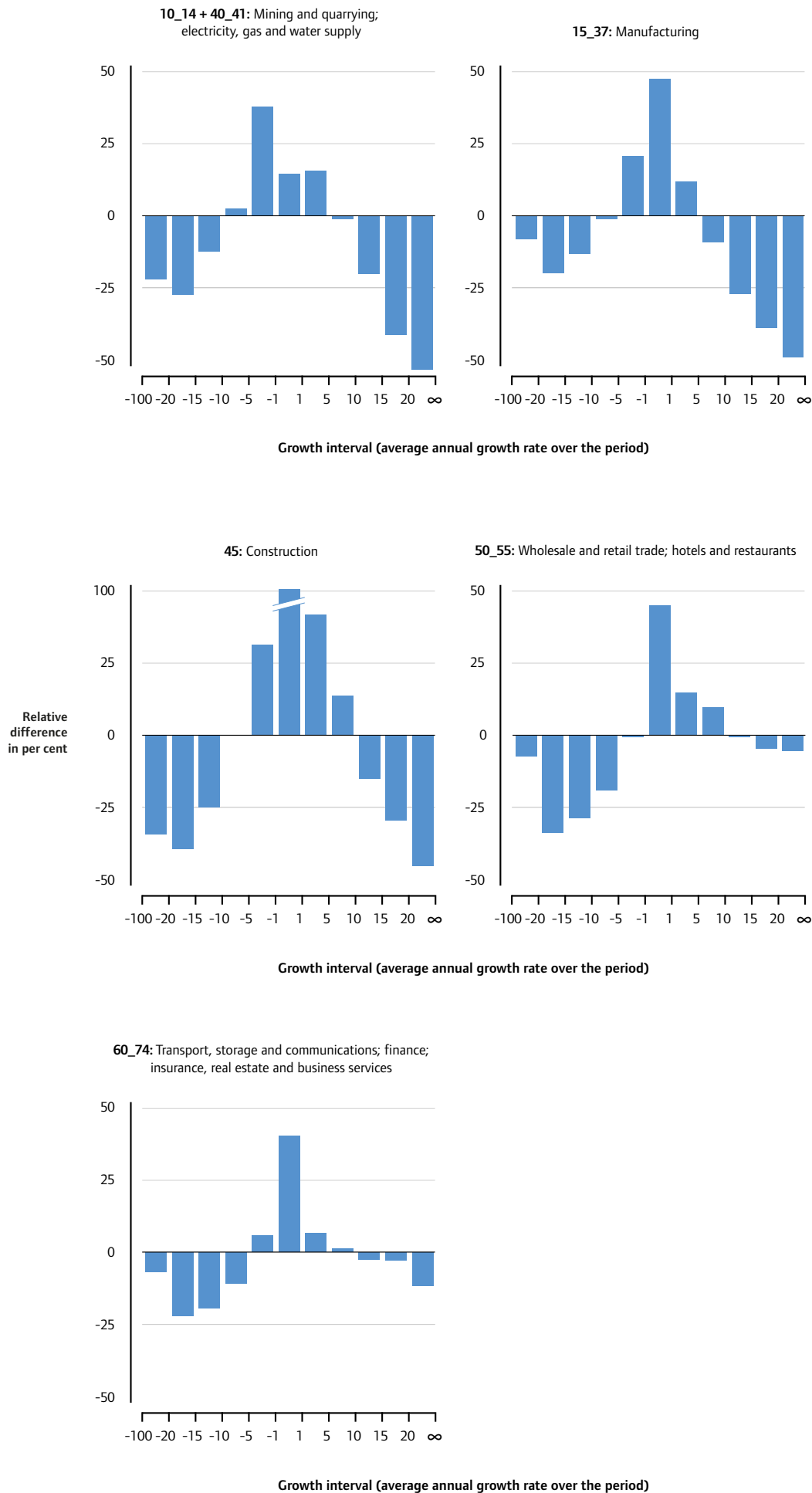
**Note:** OECD Structural Analysis Database used for private sector employment growth.

\* UK private sector employment growth excludes self-employment. Because of this the UK is not included in the European average of private sector employment growth.

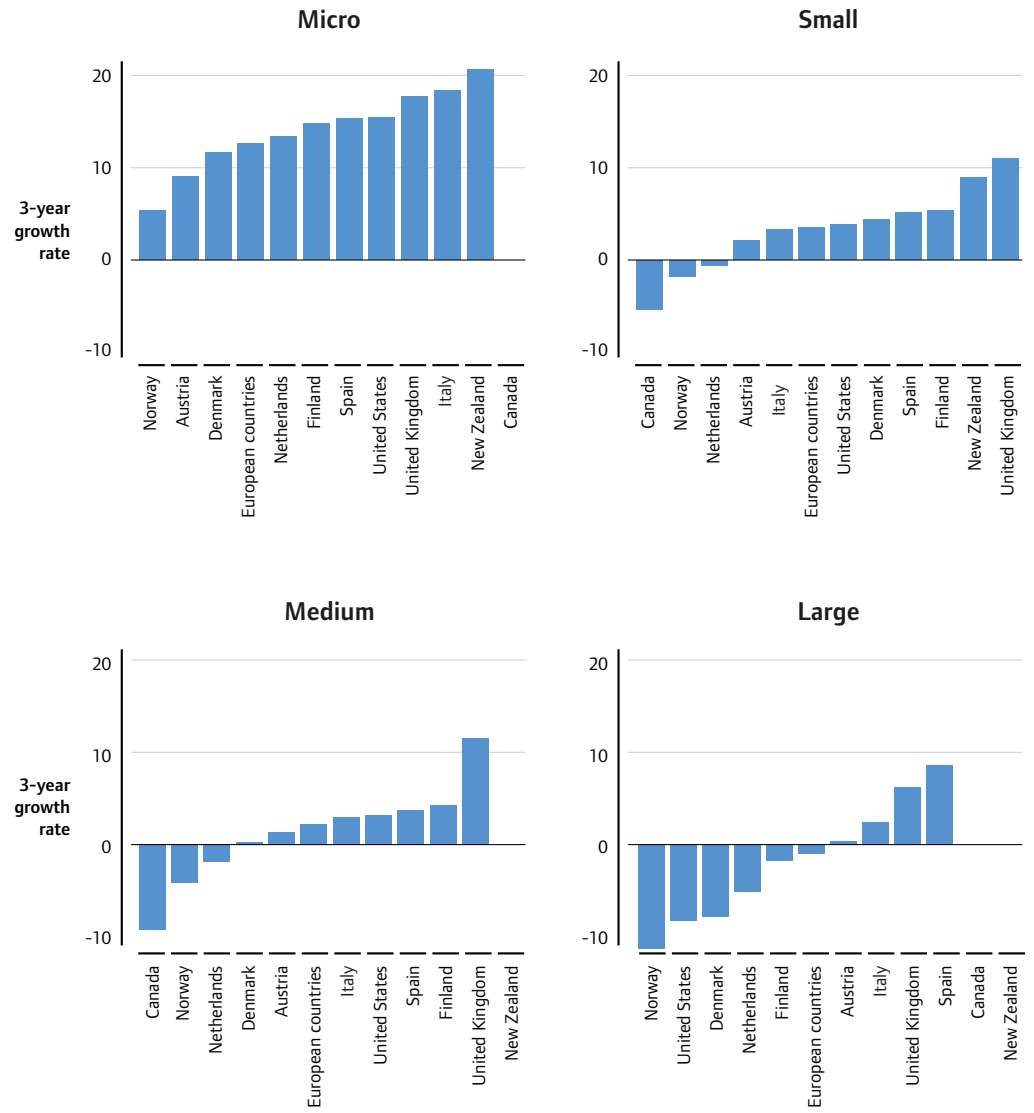
**Figure A4: Share of employment by firm size – survivors**



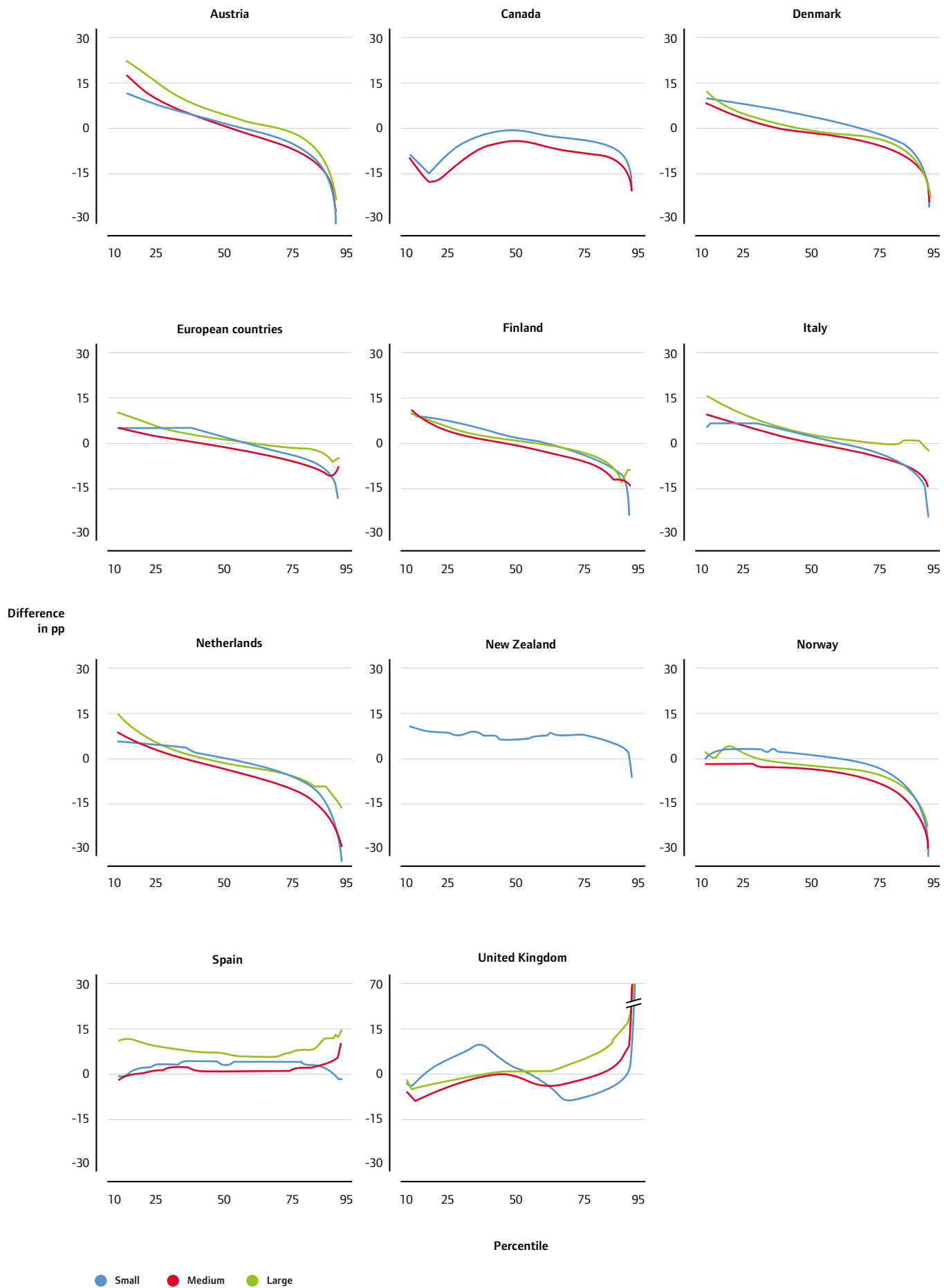
**Figure A5: Europe-US gap by sector**



**Figure A6: Average 3-year growth rate by firm size**



**Figure A7:** Percentiles of the growth distribution relative to the US by firm size and country



## References

- Acemoglu, D., Aghion, P. and Zilibotti, F. (2006) Distance to Frontier, Selection and Economic Growth. *Journal of the European Economic Association.* 4(1), pp.37-74.
- Aghion, P. (2006) 'A primer on innovation and growth.' Bruegel Policy Brief 2006/06. Brussels: Bruegel.
- Aghion, P., Bloom, N., Blundell, R., Griffith, R. and Howitt, P. (2005) Competition and Innovation: An Inverted-U Relationship. *Quarterly Journal of Economics.* 2005 120:2, pp.701-728.
- Aghion, P., Dewatripont, M., Hoxby, C., Mas-Colell, A. and Sapir, A. (2007) 'Why reform Europe's universities?' Bruegel Policy Brief 2007/04. Brussels: Bruegel.
- Ahn, S. (2001) 'Firm Dynamics and Productivity Growth: A Review of Micro Evidence from OECD Countries.' OECD Economics Working Paper No. 297. Paris: OECD.
- Armour, J. and Cumming, D.J., (2008) 'Bankruptcy Law and Entrepreneurship.' *American Law and Economics Review*, 10, (2), pp.303-350.
- Arnold, J., Nicoletti, G. and Scarpetta, S. (2008) 'Regulation, Allocative Efficiency and Productivity in OECD Countries: Industry and Firm-level Evidence.' OECD Economics Department Working Paper No. 616. Paris: OECD.
- Baily, M., Hulten, C., Campbell, D., Bresnahan T. and Caves, R. (1992) Productivity Dynamics in Manufacturing Plants. *Brookings Papers on Economic Activity: Microeconomics.* Vol. 4, pp.187-267. Washington, DC: Brookings Institution.
- Baldwin, J.R. and Gu, W. (2006) 'Competition, Firm Turnover and Productivity Growth.' Economic Analysis Research Paper Series 042. Ottawa: Statistics Canada.
- Bartelsman, E., de Wind, J. and Gautier, P. (2010) 'Employment Protection, Technology Choice, and Worker Allocation.' CEPR Discussion Papers 7806. London: CEPR.
- Bartelsman, E., Haltiwanger, J. and Scarpetta, S. (2004) 'Microeconomic Evidence on Creative Destruction in Industrial and Developing Countries.' The World Bank Policy Research Working Paper No. 3464. Washington, DC: The World Bank.
- Bartelsman, E., Haltiwanger, J. and Scarpetta, S. (2009) 'Cross-Country Differences in Productivity: The Role of Allocation and Selection.' NBER Working Paper No. 15490. Washington, DC: World Bank.
- Bartelsman, E., Perotti, E. and Scarpetta, S. (2008) 'Barriers to exit, experimentation and comparative advantage.' June 2008. Bonn: IZA and Amsterdam: Tinbergen Institute.
- Bernecker, A. (2010) 'A European Private Company.' Deutsche Bank Research Briefing. Frankfurt am Main: Deutsche Bank Research.
- Bloom, N., Sadun, R. and Van Reenen, J. (2009) 'Americans Do I.T. Better: US Multinationals and the Productivity Miracle.' NBER Working Paper 13085. Cambridge, MA: NBER.
- Bloom, N., Sadun, R. and Van Reenen, J. (2009) 'Do Private Equity Owned Firms Have Better Management Practices?' CEP Occasional Paper 24. London: CEP.
- Bloom, N. and Van Reenen, J. (2007) Measuring and Explaining Management Practices across Firms and Countries. *Quarterly Journal of Economics.* 122(4), pp.1341-1408.
- Bosma, N. and Levie, J. (2009) 'Global Entrepreneurship Monitor. 2009 Global Report.' London: Global Entrepreneurship Research Association.

- Bozkaya, A. and Kerr, W. (2009) 'Labor regulations and European private equity.' NBER Working Paper No. 15627. Cambridge, MA: NBER.
- Bravo Biosca, A. (2010) 'Firm growth dynamics across countries: Evidence from a new database.' Mimeo, November 2010. London: NESTA.
- Caballero, R. and Hammour, M. (2000) 'Creative Destruction and Development: Institutions, Crises, and Restructuring.' NBER Working Paper no. 7849. Cambridge, MA: NBER.
- Disney, R., Haskel, J. and Heden, Y. (2003) Restructuring and productivity growth in UK manufacturing. 'Economic Journal.' Vol. 113(489), pp.666-694.
- European Commission (2008) 'Proposal for a council regulation on the Statute for a European private company.' COM(2008) 396/3. Brussels: European Commission.
- European Commission (2007) 'Improving knowledge transfer between research institutions and industry across Europe: embracing open innovation'. COM(2007) 182. Brussels: European Commission.
- Eurostat-OECD (2007) 'Eurostat-OECD Manual on Business Demography Statistics.' Luxembourg: Office for Official Publications of the European Communities.
- Fogel, K., Morck, R. and Yeung, B. (2006) 'Big Business Stability and Economic Growth: Is What's Good for General Motors Good for America?' NBER Working Paper No. 12394. Cambridge, MA: NBER.
- Foster, L., Haltiwanger, J.C. and Krizan, C.J. (2006) Market Selection, Reallocation and Restructuring in the U.S. Retail Trade Sector in the 1990s. 'The Review of Economics and Statistics.' Vol. 88, Issue 4, pp.748-758.
- FSB-BCBS (2010) 'Assessing the macroeconomic impact of the transition to stronger capital and liquidity requirements.' Basel: Bank for International Settlements, Financial Stability Board and the Basel Committee on Banking Supervision.
- Gilbert, R. (2006) Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate? 'Innovation Policy and the Economy.' Vol. 6, (2006), pp.159-215.
- Hall, R. (1995) 'Lost Jobs.' Brookings Paper on Economic Activity 1 (1995), p.221-256. Washington, DC: Brookings Institution.
- Haltiwanger, J., Jarmin, R. and Miranda, J. (2010) 'Who Creates Jobs? Small vs. Large vs. Young.' NBER Working Paper No. 16300. Cambridge, MA: NBER.
- Haltiwanger, J. (1997) Measuring and analyzing aggregate fluctuations: the importance of building from microeconomic evidence. 'Review.' May issue, pages 55-78. St Louis: Federal Reserve Bank of St Louis.
- Inklaar, R. and Timmer, M.P. (2008) 'GGDC Productivity Level Database: International Comparisons of Output, Inputs and Productivity at the Industry Level.' Groningen Growth and Development Centre Research Memorandum GD-104. Groningen: University of Groningen.
- McKinsey & Company (2010) 'Beyond austerity: A path to economic growth and renewal in Europe.' McKinsey Global Institute: McKinsey & Company.
- Mortensen, D. and Pissarides, C. (1994) Job Creation and Job Destruction in the Theory of Unemployment. 'The Review of Economic Studies.' 61, No. 3 (July 1994), pp.397-415.
- Nicoletti, G. and Scarpetta, S. (2003) Regulation, productivity and growth: OECD evidence. 'Economic Policy.' Volume 18, Issue 36, pp.9-72.
- O'Mahony, M. and Timmer, M.P. (2009) Output, Input and Productivity Measures at the Industry Level: the EU KLEMS Database. 'Economic Journal.' 119(538), pp.F374-F403.
- OECD (2009) 'Measuring entrepreneurship: a digest of indicators, 2009 edition.' Paris: OECD.
- Saint-Paul, G. (2002) Employment protection, international specialization, and innovation. 'European Economic Review.' 46(2), pp.375-395.
- Schumpeter, J. (1942) 'Capitalism, Socialism and Democracy.' New York: Harper & Brothers.
- The World Bank (2010) 'Investing Across Borders.' Washington, DC: The World Bank.
- Van Ark, B., O'Mahony, M. and Timmer, M.P. (2008) The productivity gap between Europe and the United States: Trends and Causes. 'Journal of Economic Perspectives.' Volume 22, Number 1, Winter 2008, pp.25-44.
- Véron, N. (2008) 'The Demographics of Global Corporate Champions.' Bruegel Working Paper No. 2008/03, July 2008. Brussels: Bruegel.
- Veugelers, R. and Cincera, M. (2010) Europe's missing yollies. 'Policy Brief.' 2010/06. Brussels: Bruegel.
- Wölfl, A., Wanner, I., Kozluk, T. and Nicoletti, G. (2009) 'Ten Years of Product Market Reform in OECD Countries – Insights from a Revised PMR Indicator.' OECD Economics Department Working Paper No. 695. Paris: OECD.





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