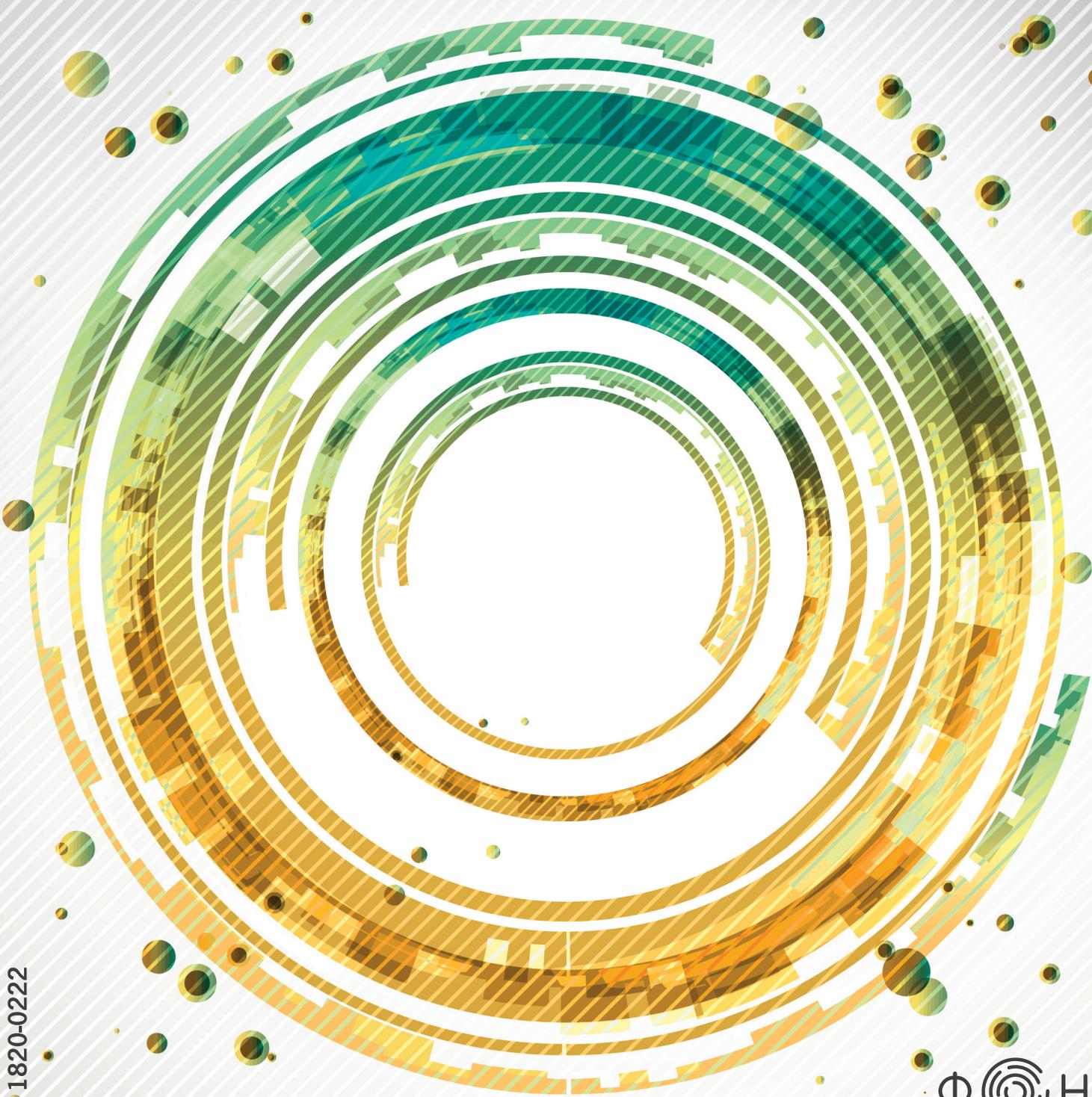


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УНИВЕРЗИТЕТ У БЕОГРАДУ
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SMEs Innovation and Growth in EU

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The focus of this paper is the analysis of the most important factors for SMEs' performance, survival and growth in EU. The main objective is to consider what determines the potential failure of young companies to innovate and grow. The importance for new, young and thus often still small firms to introduce innovations and grow is commonly claimed. Therefore, factors that would inhibit these small, young companies to achieve their goals can have a huge public impact. The research results show that the age of the firm (which reflects its reputation) is important to the degree to which the firm feels financially constrained. Also, finance barriers can be associated with the market failure. Risk and informational asymmetries create capital market imperfections and a firm's lack of reputation and collateral become crucial elements. Conclusions reveal that the ability of SMEs to grow depends highly on their potential to invest in restructuring, innovation and qualification. All of these investments require capital and therefore access to finance. Recent policy initiatives aim at improving the financial environment for European entrepreneurial activity and, more specifically, at supporting newly-founded innovative firms in order to increase their global competitiveness and spur innovation.

Keywords: SMEs, financing, innovation, growth.

1. Introduction

We are living a period of financial and economic crisis. It is accompanied by widespread pessimism and lack of confidence and trust. Under these circumstances the focus on long-run growth and innovation may appear out of place. This paper is an argument against such a perspective. It is important to take a long run perspective precisely in moments of crisis and turmoil. From the earliest period on record up to the eighteenth century, the standards of living have been quite stable over a long run. Sharp variations in standards of living were associated with disease, famine and war. Nevertheless, they would not persist over a very long run. The Malthus / Ricardo model was able to reconcile long-run stable standards of living with technological progress over time (Lucas, 2002).

The engine of growth is a capitalist society based on competition and change. Joseph Schumpeter characterizes economic development as: "The spontaneous and discontinuous change [...] which forever disturbs the equilibrium state that previously existed".

The Nobel Prize winner Robert Solow showed that for a sustained economic growth technological progress is more important than factor accumulation. For Schumpeter, behind innovation (i.e. the economic application of technological improvements) lies entrepreneurship. Innovation involves the industrial or commercial use of something new: new goods or service, a new production method, a new market or source of supply, a new form of organization or a new method of financial organization. For Schumpeter, innovation is fraught with difficulties. One of them stems from the need for external financing (Levine, 2005).

2. A schumpeterian look at the growth performance of the EU

After a long period of technological catch-up since the WWII, the productivity gap between Europe and the US began widening again in 1995. Structural conditions necessary for Europe to catch-up with the productivity leader, the US, were present from the end of the war to the first oil shock and afterwards. However, conditions needed for creation, innovation and leadership in a knowledge economy worked against Europe (relative to the US).

The recovery of the US productivity growth in the post-1995 period, and the corresponding decline in the EU reflects the influence of key technology and policy factors. Below are discussed three interrelated determinants: ICT (information and communication technology), innovation and firm dynamics.

2.1 The role of ICT as a general purpose in EU productivity growth

Sectoral data suggest that the divergence in productivity growth between the US and the EU in the post-1995 period is primarily explained by differences in the pattern of production and use of ICT.

- Labour productivity growth in *ICT producing manufacturing* industries has been particularly high in both the US and the EU. However, the US benefited from a leading initial position and an increasing growth in the post-1995 period in high-tech industries such as office machinery, electronic valves & tubes, telecom equipment, TVs, and scientific instruments.
- *ICT using services* have been the focus of the most profound technological gap with the US, particularly in the retail and wholesale sectors and in banking and finance. On the other hand, more restrictive regulatory barriers in European countries have been detrimental to the diffusion of ICT.

More recent firm level evidence (Bloom, 2007) confirms that the US productivity advantage is not only related to a higher ICT spending by US firms (in ICT using sectors), but US firms as well as their subsidiaries operating outside the US-specific conditions reap a higher return from their ICT investments. This suggests that other firm-specific advantages are important, such as the quality of management practices.

2.2 The importance of knowledge production and diffusion

In the present context, we need to define the extent to which the example of ICT is an isolated case or is likely to be replicated in other high-growth, high-tech industries. This is a pertinent question if one accepts that the US's lead in ICT is not an isolated case.

Assuming that a failure of EU enterprises to recapture the full potential and benefits related to ICT is a credible risk, the following key questions arise: 1. Does the EU have specific problems regarding its innovation infrastructure?; 2. Does the US have specific features/framework conditions which make it more likely to be the locus for the next future breakthroughs in technology?; 3. Why is the EU less apt to creating and exploiting new technologies in general? In order to better understand the EU-US innovation deficit, discussion beyond ICT importance is needed.

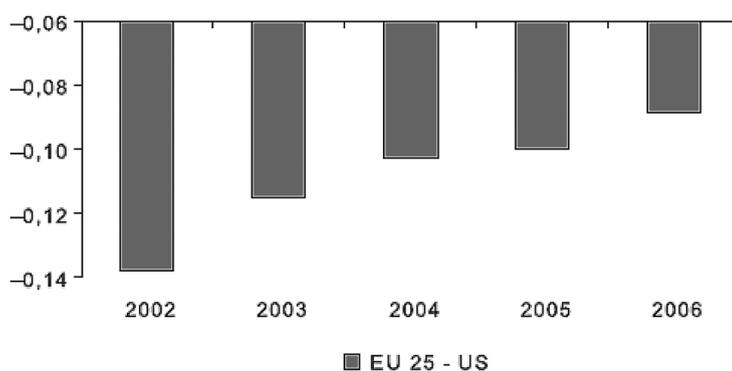


Figure 1: EU's overall innovation performance relative to the US

Source: EIS 2006.

Despite some signs of catching-up, Figure 1 confirms the presence of persistent innovation deficit in the EU. As this innovation indicator comprises several innovation input and output measures, the EU innovation gap goes beyond the deficit in R&D spending. The R&D deficit is a symptom rather than a cause of a weakness in the EU's capacity to innovate; the cause is rooted in the structure and dynamics of industry and enterprise (O'Sullivan, 2007).

A comparison of innovation inputs shows that SMEs represent a larger share of *R&D expenditures* in the EU than in the US and Japan. On the other hand, EU SMEs are less R&D intensive than in the US, although the SME gap is similar to the overall gap in R&D spending. The average R&D intensity of SMEs in Europe is 0.34% versus 0.53% in the US. This compares to an overall average R&D intensity in Europe of 1.17% versus 1.57% in the US (Results are based on DG RTD, 2007).

However, specific contribution of SMEs to innovation goes beyond the share of SMEs in R&D expenditures or in innovation output. SMEs have a very important indirect effect. Usually young small innovating firms create radically new technologies and markets, whose further developments are completed by large players. Baumol (2002) recognizes the complementarity between small and large firms, but at the same time notes the importance of small firms in large innovations. In 1994 the Small Business Administration Office of Advocacy prepared a list of breakthrough innovations made by small firms during the 20th century. It is impressive, going literally from A (airplane) to Z (zipper) with many innovations that have been crucial to the economy. Other studies on the distribution of innovations certified as "significant" by industry experts, confirmed that small (as well as large) firms outperform medium-sized firms for the US (see OECD (2006) for an overview).

According to Baumol, the private sector innovations in the US come from two distinct sources, firstly, from the activities of large firms and secondly, from the efforts of independent inventors and their entrepreneurial partners. Baumol asserts that the active presence of both groups enhances the overall innovation process since their activities are complementary. Independent inventors/entrepreneurs specialise in breakthrough innovations while R&D departments of the larger firms enhance these breakthroughs and add to their overall usefulness.

2.3 Firm demography and the creative destruction process in Europe

EU-US productivity growth differences can be additionally explained by (a change in) the firm's demography. The *churning process* has substantial effects on labour productivity growth because a large part of it results from reallocations from less productive to more productive firms. Industries and/or countries where the churning process is inhibited, exhibit lower productivity and employment rates.

All European industries exhibit a greater number of small firms and also a higher share in total employment than in the US. American manufacturing firms are larger and they display wider size dispersion, particularly in high-tech sectors and in wholesale and retail.

Figure 2 on aggregate entry, exit and net entry rates from the research work of Cincera and Galgau (2005) shows that although both *entry and exit rates* are lower in the EU than in the US, the differences in exit rates are substantially larger. The average *size of entrants* is much smaller in the US. Lower entry as well as lower exit (firing) costs in the US allow benefitting from the experimentation process supplied by the market. While there is a high positive correlation between the entry and exit in the US, the correlation is insignificant in the EU and even negative in France, Italy and Portugal. A positive correlation reflects churning of firms within sectors as part of the creative destruction process. A negative correlation reflects more traditional sectoral shocks (positive for entry, negative for exit).

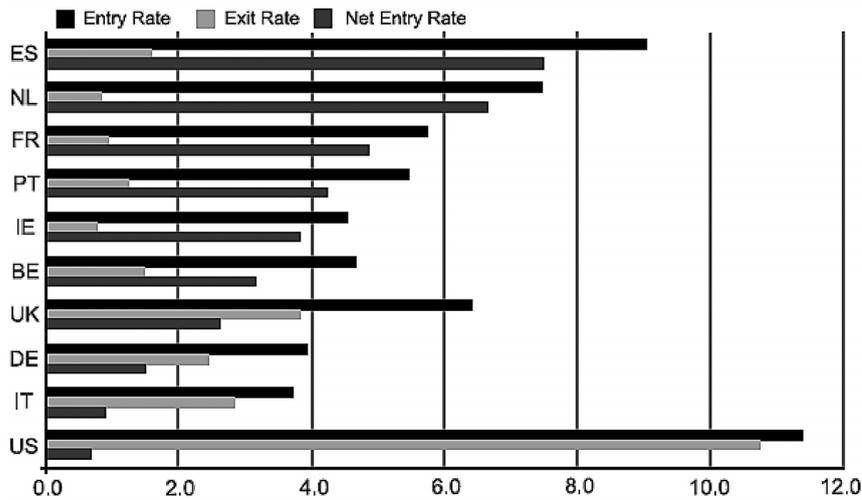


Figure 2: Aggregate entry, exit and net entry rates (in %) by country (1997-2003)

Source: M. Cincera and O. Galgau (2005), "Impact of Market Entry and Exit on EU Productivity Growth Performance", EC Economic Papers p. 222

Post entry performance also differs between Europe and the US as shown in Figure 3: net employment gains amongst surviving firms at different limits, from the empirical research of Bartelsman et al. (2004). The short-term survival rate (2 years) for American entrants is very low, but after this market experimentation period, the conditional survival rate of successful firms becomes high. In addition, the growth for firms that survive for 7 years is higher in the US than in Europe. These results are a clear indicator that there are also higher barriers to growth for SMEs in Europe.

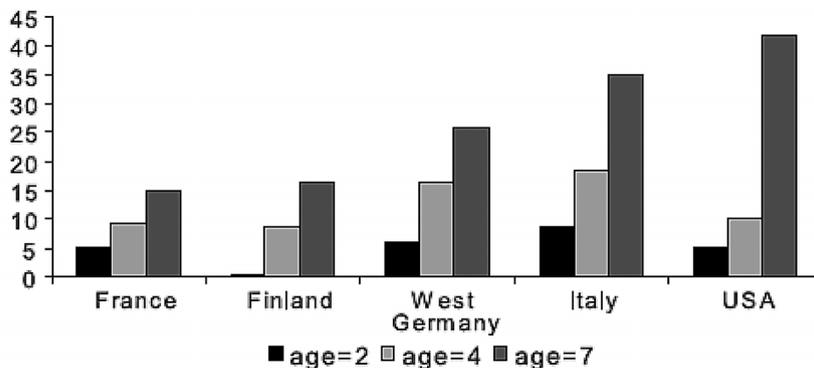


Figure 3: Net employment gains among surviving firms at different lifetimes (net gains as a ratio of initial employment)

Source: Excerpt from Bartelsman et al. (2004).

2.4 The impact of the creative process on productivity growth

The overall labour productivity growth originates mainly from the growth of incumbent firms, both in the US and the European manufacturing sector. However, the EU-US differential growth performance can be explained by the reallocation effect between firms and the net entry component. This seems to be a clear indicator that creative destruction process is less effective in European countries than in the US in both low and high tech industries.

- The *exit effectis* always positive, both in the US and the EU, which means that exiting firms are the least productive firms.

- The *long-run effect of entry* on aggregate manufacturing productivity growth has a smaller magnitude in the EU than in the US. Furthermore, the effect of entry depends on the industry's distance to the technology frontier. The positive effect of entry on productivity growth is more significant the closer a country or sector is to the technological frontier.
- In high-tech sectors, the entry effect is positive in all countries and this suggests an important role for new firms in more *technology intensive industries*. In these industries, the entry effect is much stronger in the US than in the European countries. Similar observations apply to exit barriers.
- New and small firms contribute to aggregate productivity growth directly through their own growth performance, and indirectly by affecting the growth of large incumbents. Thus, the US firms' post-entry growth and productivity performance is higher. Moreover, beneficial interactions between small and large firms, especially in sectors where technical ideas and innovations are an important ingredient of growth, could be at the heart of different effects that entry has on aggregate productivity growth.

In summary, Europe's growth gap results partly from an inappropriate industrial structure in which small and new firms, occupying the main part of total employment, fail to play a significant role in the dynamics of the industry, especially in the high-tech intensive sectors. This is illustrated by their inability to enter, but most importantly, for the most efficient innovative entrants, to grow. The churning that characterizes the creative destruction process in a knowledge based economy encounters significant obstacles in the EU, suggesting barriers to growth for small innovating firms which ultimately weakens Europe's growth potential. Economic analysis suggests the following "problem drivers" for the insufficient exit and low post-entry growth:

- weaker product market competition (e.g. barriers to cross-border trade in services, national regulations, etc);
- protection of inefficient firms through subsidies, bail-outs, etc.;
- labour market and other regulations that kick in when a firm grows beyond a certain size threshold;
- financial market developments.

3. Financing of small and young innovative companies

The literature generally supports the importance of new, young and therefore often still small firms for innovations and growth, even if they are small in number. Therefore, factors that would inhibit these small, young companies to innovate and grow can have a huge public impact.

In the analysis of the (failing) contribution of small and young firms to innovation and growth, *access to finance* is a priority issue. Survey data for the EU confirm the importance of access to finance. Excessively high economic risks are the major hampering factors for innovation for all types of firms, but somewhat more for small than for large firms. A second tier of barriers is formed by the *access to skills*, which again impedes both small as well as large firms. *Regulatory burden* is also included in the second tier of barriers. The empirical evidence suggests that this burden is somewhat stronger for small firms.

	Excessive perceived economic risks	Innovation costs too high	Lack of appropriate sources of finance	Organisational rigidities within the enterprise	Lack of qualified personnel	Lack of information on technology	Lack of information on markets	Insufficient flexibility of regulations or standards	Lack of customer responsiveness to new goods or services
Small	16	21	16	6	13	5	5	10	8
Medium-sized	13	19	13	5	14	4	4	8	6
Large	18	21	10	6	13	3	4	7	5

Table 1: Proportion of enterprises that regard selected hampering factors as highly important (% of all enterprises); by size class

Source: Eurostat (2004).

The analysis of survey data on firms' financial constraints perceptions show that the age of the firm, which reflects its reputation, is more important than its size in determining the degree to which the firm feels financially constrained. A possible interpretation of this result is that age might reflect reputation of the firm which, in turn, significantly affects access to finance.

The access to finance barrier can be associated with the *market failure*. Risk and informational asymmetries create capital market imperfections, and a firm's lack of reputation and collateral become crucial elements. Existing literature demonstrates substantial differences between small and large firms in this respect. Hall (2005) shows that imperfections in capital markets usually affect small firms more than large ones which can rely on internal financing. Young firms are even more likely to be constrained than other small firms as reputation and collateral are important to mitigate capital market imperfections. More radical investment projects further exacerbate the imperfect, incomplete and asymmetric information problem. Thus, young innovative companies, which combine the disadvantages of a small scale, a short history, less retained earnings and more risky innovative projects, are even more likely to be financially constrained than other small, young and/or innovating firms.

Along with this financial market failure, particular for the EU, stands the highly fragmented nature of its venture capital market with 27 different operating environments adversely affecting both fund raising and investing. Complexity in operating across borders means that some funds have difficulties in expanding, growing and reaching a critical mass. This makes access to financing even more difficult and more expensive in the EU.

3.1 Characterizing YICs

Young Innovative Companies (YICs) are defined in the EU State Aid Rules as small enterprises, less than 6 years old, being "certified" by external experts on the basis of a business plan as capable of developing products or processes which are technologically new or substantially improved and which carry a risk of technological or commercial failure, or have R&D intensity of at least 15% in the last three years or currently (for start-ups). The YIC dummy takes a value of 1 if an innovation active company is less than 6 years old, has fewer than 250 employees and spends at least 15% of its revenues on R&D.

Out of the sample of 1342 German innovation-active companies (A research done by the Catholic University of Leuven, 2006), only 51 companies qualify for YIC status, using the EU State Aid definition. This confirms the "rareness" of YICs, representing only 3.8% of all innovation-active companies in West-Germany in 2006. Even within the group of small innovators or young innovators, YICs are rare (4.3% and 24%, respectively). A "typical" YIC has a micro size, with about 20 employees. This is considerably smaller than other innovating SMEs, as well as young innovators. Also on R&D intensity and basicness of its R&D profile, a "typical" YIC scores much higher than any of these reference categories. This statistics confirms that it is a combination of age, size and R&D profile that composes the particularity of YICs. YICs are not the same as innovative SMEs or young innovators. Finally, YICs are overrepresented in knowledge-intensive, technological sectors, specifically services (ICT and R&D engineering) while they are absent in more traditional manufacturing industries.

3.2 YICs and barriers to innovation

Table 2 presents the results on whether YICs perceive differently obstacles to innovation. Respondents were asked to give a score to each (potential) hampering factor on a scale going from zero (not relevant) to three (high). The first column indicates the share of firms that considered this factor to be relevant (i.e. firms that scored one or more), while the second column reports the mean score.

Barriers to innovation	YICs		Other Innovators		mean diff. with YICs
	%	mean score	%	Mean score	
External financial constraints	95.65%	2.283	75.75%	1.234	-1.049***
Internal financial constraints	93.30%	2.457	66.42%	1.382	-1.074***
Innovation costs too high	93.33%	2.356	87.71%	1.862	-0.493***

Table 2: Obstacles to innovation

Source: Schneider and Veugelers (2008)

As expected, YICs face, on average, higher obstacles to innovation than other innovating firms. When comparing across barriers, results confirm the presumption that financial constraints (both internal and external) are the most important barriers to innovation for YICs. Although this ranking also holds for other innovating firms, the YIC-differential is the largest and highly statistically significant on both financial constraints. The evidence presented by Schneider and Veugelers (2008) shows that young innovative companies, combining newness, smallness and high R&D intensity are rare in the sample of innovative firms. They view financial constraints, both internal and external, as an important factor hampering their innovation activities, significantly more so than other innovation-active firms.

Conclusion

We have argued that innovation is an important determinant of competitiveness and important to address global challenges, such as sustainable development. The importance of innovation has been reinforced by a fast development of new technologies (ICTs in particular), which enabled new forms of competition and opened new markets for creation of innovative products. Nevertheless, despite the importance of innovation, as well as new opportunities offered by globalisation and new technologies, improvement in productivity in the EU, the EU seems to be lagging behind the US in this area.

We try to document the importance of SMEs and young innovative companies (YICs) for the innovation process. Both of them are source of dynamism and, in particular, YICs are directly related with research activities and are a key component of the innovation system, facilitating the emergence of new products and markets. However, evidence shows that in Europe small and new firms fail to play a significant role in the dynamics of the industry, although they account for a majority of employment. Not only do they face significant entry barriers, but also successful entrants face difficulties to grow.

However, the ability of SMEs to grow depends highly on their potential to invest in restructuring, innovation and qualification. All of these investments require capital and therefore access to finance. Recent policy initiatives, such as the creation of the YICs status at the European level, aim at improving the financial environment for European entrepreneurial activity and, more specifically, at supporting newly-founded innovative firms in order to increase their global competitiveness and spur innovation.

Empirical research on access to finance for SMEs and young innovative companies has been limited, however, a recent analysis confirms the presumption that young, small, innovation-intensive firms are a very small but distinct segment in the group of innovative companies. Furthermore, access to finance is the most important factor that hampers YICs' innovation activities, significantly more than other innovating firms.

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