



### **The growth of companies in the EU: the case for a more sophisticated research and innovation policy**

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November 2011

#### **The issue**

One of the main objectives of the new European research and innovation policy agenda is to favour the creation and growth of EU companies operating in new and knowledge-intensive industries, especially Small and Medium Enterprises (SMEs). These companies play an important role in shaping the dynamism of the economy's sectoral composition by favouring the transition towards more knowledge-intensive activities and contributing to overarching economic growth objectives (i.e. "EU 2020 Strategy") through the creation of more and better jobs. But how should the EU policy agenda be translated into concrete policy actions? Are EU horizontal policy actions which address all types of enterprises and industries appropriate for fostering company growth and orienting the sectoral composition towards a knowledge-intensive economy? Does the recent evolution of the global economy call for more targeted policy measures instead? And if this is the case, what kinds of companies should be aided by policy, and how?

This note<sup>(\*)</sup> relies on up-to-date knowledge on the subject and identifies some policy implications for designing future research and innovation support instruments targeting the growth of innovative firms in Europe.

#### **What do we know from the literature?**

A review of recent economic and policy literature and the work by JRC-IPTS on the dynamics of

industrial structures and the growth of innovative companies describe the following situation in the EU, compared to main competing economies (notably the US)<sup>1</sup>:

- A rather static economic structure that has hardly changed in recent decades.
- A low level of specialisation in highly knowledge-intensive sectors, and a high level of specialisation in medium knowledge-intensive sectors.
- A lower rate of post-entry growth for firms, and in general, reduced capacity among firms to grow beyond certain size thresholds
- Limited numbers of young firms and new large firms.
- A higher share of absolute R&D expenditures outlaid by SMEs. On average, however, EU SMEs are far less R&D intensive as they tend to engage in less R&D-intensive sectors (medium- and low-tech).

Furthermore, the literature indicates that a firm's dynamism is often determined by economic factors - that vary between different entrepreneurial and market environments - rather than by research and innovation (R&I).

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(\*) Based on the paper titled "Companies' growth in the EU: What is research and innovation policy's role?" by P. Moncada-Paternò-Castello, issued in July 2011 in the *IPTS Working Papers on Corporate R&D and Innovation* series, and downloadable at: <http://iri.jrc.ec.europa.eu/papers.htm>. Both the mentioned working paper and the present note ('Policy Brief') have been implemented in the framework of the **IRMA** project – a joint JRC and DG Research and Innovation initiative.



Such findings largely support the rationale of policy interventions to promote the growth of innovative companies in Europe, while making it clear that:

- The focus on innovative companies should be broad enough to examine other factors in addition to R&D (which is just one of the factors that determine and explain growth). This is particularly true for medium- and low-tech sectors that are influenced by other innovation factors and framework conditions (technological, economic and regulatory).
- Start-ups and young firms grow more quickly than their mature counterparts, and the period of rapid growth is limited in many cases. On the other hand, small and young firms are not necessarily more innovative than large established companies. Furthermore, company growth depends on company strategy and entrepreneurial capacity and goals, bearing in mind that many sectors have an optimal company size model. The ultimate viable policy objective should not always be for SMEs to become large companies. Instead, it should be to ensure the presence of a sufficient number of highly innovative, dynamic<sup>2</sup> and competitive companies (of any size) in key sectors which could also enjoy a positive (moderated or high) growth for years.
- An appropriate policy mix also needs to take into account a targeted approach which differs depending on the company's age, size, sector and characteristics. It must also depend on the country's technological and economic position.

The next section analyses the policy implications of the empirical evidence in the

design and application of specific measures aiming to support the growth of innovative companies in the EU.

### **A case for new policy measures**

As acknowledged in the new research and innovation agenda ('Europe 2020 strategy' and follow-up initiatives such as the 'Innovation Union' flagship initiative and the new 'Industrial policy for a globalisation era' flagship initiative), there is an urgent need to establish long-term business sector policies in Europe. These policies mainly address framework improvements that are conducive to knowledge creation, transfer and diffusion. In fact, *the radical improvement of framework conditions is probably the most important strategic undertaking for supporting the growth of innovative firms*. The main framework condition topics identified as meriting priority attention by policy-makers are: a) skills upgrading, b) common and better access to markets and to suppliers and users of knowledge, c) access to financial capital, and d) entrepreneurial innovation culture and economy.

Without neglecting the crucial role of the framework conditions mentioned above, this policy brief discusses opportunities, approaches and possible new means for a *targeted* policy to support firm growth and competitiveness through research and innovation.

### *Rationale for targeted policy interventions*

As amply supported by the literature, not all types of firms face similar market imperfections since their characteristics with regard to size, age, and the sectors and countries in which they operate differ substantially. It is therefore



inefficient to employ only a general-purpose policy to address the market imperfections encountered by companies aiming at growing and becoming more competitive. Nonetheless, it should be recognised that targeting specific companies or sectors is difficult due to the uncertainties of *ex ante* choices (including avoiding picking winners). Nor it is always clear to what extent policy intervention should target specific sectors, technologies, or firm sizes/ages when designing instruments to foster R&D and innovation. We are convinced, however, that the elaboration of a new, more sophisticated policy mix which also considers to focus on particular sectors and subgroups of companies is in many cases justified. This is particularly true when it tackles major societal challenges (e.g. ageing society, climate change, energy supply, safety and security), when relevant market failures are present (e.g. difficult access to capital, knowledge and infrastructures), and possibly when such more targeted policies only intervene during a limited period of time.

### Which companies should be supported?

The evidence suggests that not all small firms should be aided simply based on their size, and that supporting R&D activities will not always help them to grow more or faster<sup>3</sup>. In addition, R&D is only a relevant driver for growth in specific types of firms and in particular sectors and economic environments (e.g. SMEs; New Technology Based Firms, NTBF; Knowledge-Intensive Business Services, KIBS). Promoting R&D investments and company dynamics (creation and growth) in new highly innovative/high-tech sectors is important to boost economy-wide employment and growth, but it is not enough. Both larger and smaller

companies operating in medium- or low-tech sectors have considerable potential for innovation, mainly through the absorption of new technology and through the creation and dissemination of non-technological innovation (knowledge spillover effect). Therefore, policies in Europe should strike the right balance between the need to shift industrial structures towards new and highly technological sectors, and the need to modernise mature and traditional sectors.

The above statement implies that a new, targeted firm-level support policy intended to make innovative companies grow should consider an entire array of factors. Within this framework, a multi-attribute "identification index"<sup>4</sup> could be employed by policy-makers for the purpose of identifying groups of companies which need support in order to grow quickly. It would be based on the *combination* of all of the following criteria (criteria values could be adapted according to the policy objectives of the given country/region):

- **Size.** Growth rates tend to be higher for smaller firms than for larger ones.
- **Age.** The age of the firms seems to be a factor linked to innovation and growth.
- **Innovativeness.** Measured not only in terms of the R&D intensity level over a number of years, but also in terms of a company's ability to launch new or substantially improved products on the market<sup>5</sup>.
- **Sector.** The company's operating sector should be considered. For example, R&D investment is the most effective at raising a firm's productivity in R&D-intensive sectors, whereas technological change embodied in



the physical capital stock is crucial for increasing productivity in low-tech and services sectors<sup>6</sup>.

- **Business phase.** Companies in start-up, expansion or maturity phases demonstrate different needs. For example, supporting R&D investment in newly launched NTBFs is not as crucial for rapid growth as it is in established SMEs<sup>7</sup>.
- **Country-specific techno-economic factors.** For example, public support for innovation granted to SMEs in developed countries at the forefront of technology or having an appreciable R&I specialisation/base should not be handled in the same way as in developing economies that are still far from the technological forefront or which do not benefit from a sound R&I specialisation/base<sup>8</sup>.
- **Internationalisation.** Internationalisation strategies appear to have a direct effect on the growth, survival and competitiveness of SMEs<sup>9</sup>.

In summary, it seems that in addition to focusing on young, innovative and fast-growing firms operating in high-tech sectors, a renewed, more sophisticated EU R&I policy mix, would also need to address the potential of high-growth companies operating in less R&D-intensive sectors which could well become and remain large enterprises in the short- or medium-term thanks to innovation. The use<sup>10</sup> of such a differentiated approach (complementary to the policies addressing the framework conditions) should be adequately calibrated, previously tested and efficiently managed in order to avoid any potential drawbacks.

How should these companies be aided?

In order to tackle different groups of innovative companies, as described above, it might be advisable to implement a policy which combines measures for stimulating corporate R&I investment in medium- and high-tech sectors, while implementing incentive schemes to reinforce the absorption capacity of its results in low-tech sectors and supporting company formation and growth. Examples of policy mixes would include:

- For medium-high and high R&D-intensive sectors, support would entail measures such as temporary tax incentives, fostering participation in public R&D support programmes and setting up international cooperation agreements.
- For medium-low and low R&D-intensive sectors, support would include measures aimed at stimulating investment in fixed capital formation including stimulating bank investments, injection of public funds in risk capital formation and alternative stock markets.
- Measures to favour companies' internationalisation, targeting in particular SMEs (e.g. providing financial incentives and assistance such as grants for marketing products, as well as finance and insurance assistance and export consortia support).
- Measures to favour cluster development (e.g. providing a support mechanism for SMEs that promotes knowledge transfer partnerships as a primary method of improving SME cluster effectiveness).
- Protection of intellectual property (e.g. lowering intellectual property costs).
- Improvement of innovation management (e.g. through training).



Table 1 in the annex provides further examples of policy actions in support of innovative SME's growth.

Overall, such actions would need to be promoted jointly by Member States and the EU, and their policy instruments should strive for synergy and coordinated implementation.

### **New policy experimentation and evaluation**

Providing differentiated and targeted support for innovative company growth is a complex (and sometimes controversial) undertaking, future policy measures in this domain should therefore be designed so as to address new public objectives and business approaches (e.g. internationalisation, open innovation, mass customisation).

A modern and innovative policy design is required, in which new policy measures<sup>11</sup> are tested prior to being launched and then systematically subjected to monitoring and evaluation mechanisms. They may then be adjusted or terminated if testing and intermediate evaluations show them to be inefficient, or if the market conditions that justified the intervention happen to change.

To monitor and evaluate effectiveness of the policy measures and the achievement of new policy objectives, policy-making should rely on adequate (new) data and analyses.

Unfortunately, firm-level data (statistical and stakeholder-based) and databases that fully facilitate EU-level monitoring and analysis of business and innovation activity and growth (for SMEs, for example), and which account for the factors determining growth (including firm

type, sector and country/region) are very scarce and often inappropriate (scattered, incomplete, not representative).

In light of the above, future firm-level data-gathering, research and analyses should include the following policy relevant issues:

- a) Companies' ability to absorb new technologies (including ICTs) as an important innovation and growth factor, particularly for low R&D-intensive sectors and smaller firms.
- b) Growth rates of young or mature firms to determine if they are rapid (especially for young SMEs) or constant and sustained (for older SMEs), and if rates are linked to R&D and/or innovation activities. Analysis of which other business/economic/financial factors may have contributed to the observed growth behaviour. This type of research may also help detect new and growing firms and sectors.
- c) The degree of innovation of a company or sector, considering investments in the broad range of intangible assets related to strengthening and using a company's knowledge capital, including its workers' education and skill levels.

These examples of matters for further investigation are being considered by the JRC-IPTS.

### **Concluding remarks**

Changes in the direction of technological processes along with changes in the world economy resulted in a structural shift affecting all industrialised countries' economies. Since the 1970s, this shift has led to the downfall of mass production, the promotion of flexible



specialisation and a more important role for small (or smaller) firms. In some sectors (e.g. biotech), SMEs are able to generate new and abundant knowledge and innovative solutions and supply them to large-sized enterprises (LSEs), co-existing in synergy and remaining healthily competitive for many years even if they do not become LSEs. In this new business model, SMEs take advantage of their small size and considerable dynamism by rapidly establishing or shifting their R&D infrastructure, spurring knowledge creation and advances and relying on a new open innovation system, to cite a few examples. This is also why we cannot expect a large percentage of SMEs, which make up nearly all (99.8%) of the firms in the EU, to become innovative LSEs. Instead, the goal should be for the EU's SMEs and LSEs alike to become more competitive by producing and absorbing more science and technology progress to create higher added value and new and better jobs. Naturally, this purpose also includes more young SMEs becoming LSEs in new knowledge-intensive sectors. This would imply a more dynamic 'creative-destruction' business demography and increasing firms' capacity to create and to gain access to knowledge and to markets (technology, labour, financial, consumer).

Recent literature and JRC-IPTS studies indicate that R&D is one of the most important investments affecting firm growth, firm productivity and firm survival, and enabling companies to contribute to EU innovation and competitiveness. Nevertheless, R&D is not the most important investment for certain firms and sectors. In fact, other economic factors (e.g. other intangibles) also determine the growth of

an innovative company, and these factors in turn are very much dependent on company, technological, sectoral, socio-economic and market environment characteristics. Furthermore, making complementary investments (in R&D, human capital, ICTs, physical capital, internationalisation) is more important to a firm than devoting its resources to any single investment area.

The 'Europe 2020 Strategy' and the follow-up initiatives have identified the right priorities and areas for policy intervention. To translate the EU policy agenda into effective policy actions, EU support policies need to foster R&D investment on the part of a specific type of innovative company, and only where there are market failures and clear valuable social returns.

With this aim in mind, the future EU support instruments should continue to address the improvement of the framework conditions but also take a targeted approach in the context of a new and more sophisticated mix of R&I policies. In this context, the deployment of an 'identification index' would allow policy-makers to know what targeted group of companies is to be addressed. In addition, policy experimentation and evaluation based on new data and related policy-relevant analyses should be at the core of policy design and implementation in this area.

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### Acknowledgements

This work has benefited from the review of F. Bogliacino, D. Ciriaci, M. Del Sorbo, I. Goldberg, A. Tuebke, P. Voigt, (all from the European Commission, JRC-IPTS), M. Cincera (Université Libre de Bruxelles, B), R. Ortega-Argiles (Instituto Superior Técnico, P) and E. Santarelli (University of Bologna, I). The author is particularly grateful to F. Hervás for the text editing suggestions as well as for the support provided.



### Notes

- <sup>1</sup> For a literature review on the subject, including JRC-IPTS work, please refer to Moncada-Paternò-Castello (2011).
- <sup>2</sup> It refers to their ability to grow but also to shift their technology base and product & service/sector of activities. The objective also includes a large share of SMEs which are able to survive and become highly competitive.
- <sup>3</sup> It can be also the case that helping the small inefficient firms reduces social welfare, therefore also consumer surplus. In fact, small firms seem to have their own strategic incentive to invest in R&D because, despite the more moderated economies of scale in R&D activities, in the more efficient small firms it causes higher returns than in large efficient firms (Matsumura and Matsushima, 2010)
- <sup>4</sup> A synthetic evaluation index can be elaborated allowing combining the qualitative and quantitative evaluation input. As a methodological example, see Moncada-Paternò-Castello, *et al.* (2003).
- <sup>5</sup> Any indicator or group of indicators selected to measure the degree of “innovativeness” of the firms should not only capture both input (e.g. R&D investments) and output (e.g. new products launched) factors but should also take into account the degree of technological and commercial risk of its innovation activities. Reward to risk taking and reward to the commercial exploitation potential of R&D & innovation planned activities should be considered (often more than the scientific excellence expected).
- <sup>6</sup> Ortega-Argilés *et al.*, 2010.
- <sup>7</sup> Stam and Wennberg, 2009.
- <sup>8</sup> Large exporting firms are typically the primary mechanism through which technologies are adapted from abroad to local circumstances in developing countries. This implies that, from a developing economy perspective, the firm-level evidence does not favour SMEs subsidization as a mechanism for boosting in a short term innovation & productivity growth (Ross, 2005). Moreover, Saublens & Walburn (2009) suggest that policy interventions should be implemented in already successful regions if the objective is to boost small business performance in aggregate.
- <sup>9</sup> Internationally active SMEs report an employment growth of 7% versus only 1% for SMEs without any international activities. Furthermore, 26% of internationally active SMEs introduced products or services that were new for their sector in their country; for other SMEs this is only 8%. However, only 16% of SMEs are aware of public support programmes for internationalisation and only few SMEs use public support (European Commission, 2010).
- <sup>10</sup> For example, the 'identification index' can be first calibrated according to the objective of the policy measure in a given region, and then used to identify group(s) of companies that are candidate to be beneficiaries of the policy intervention.
- <sup>11</sup> For example, the convenience of targeting to specific companies and/or sectors using age rather than size or both as an eligibility factor should be valued for possible support instruments and eventually tested.

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### ANNEX

Table 1. Examples of policy actions to support SME growth through R&I

<b>Framework conditions / Horizontal support</b>	<b>Skills upgrading</b>	<ul style="list-style-type: none"> <li>• Education and training</li> </ul>	
	<b>Better access to markets &amp; knowledge</b>	<ul style="list-style-type: none"> <li>• Incubation</li> <li>• Clustering &amp; cooperation</li> <li>• Internationalisation</li> <li>• Lead <i>new</i> market Initiative</li> <li>• Tax incentives, State aids, Public procurements</li> <li>• Standardisation, Regulation &amp; Certification, IPR policy</li> <li>• Internal Market, Trade &amp; Competition</li> </ul>	
	<b>Improved access to financial and human capital</b>	<ul style="list-style-type: none"> <li>• Risk venture capital</li> <li>• Loan guarantees</li> <li>• Mobility programmes</li> </ul>	
	<b>Promoting innovation &amp; entrepreneurial culture &amp; economy</b>	<ul style="list-style-type: none"> <li>• Entrepreneurial culture</li> <li>• Foster the development of a 'EU Research &amp; Innovation Society'</li> </ul>	
<b>Targeted policy actions</b>		<b>SMEs operating in high- &amp; medium-high tech sectors</b>	<b>SMEs operating in medium-low &amp; low-tech sectors</b>
	<b>Support for R&amp;D investment by SMEs based on their competitiveness and growth</b>	Provide temporary tax incentives, foster participation in public R&D support programmes and provide risk-sharing loans for R&D activities focused on EU societal challenges	Support setting up cooperation agreements with external R&D sources. Increasing internal absorptive capacity
	<b>Support for Innovation investment by SMEs based on their competitiveness and growth</b>	Arrange financial support for later-stage high-tech innovation funding through grants combined with equity finance to facilitate subsequent commercial funding	Actions aimed at stimulating capital expenditure on innovation by offering companies better and more targeted financial measures, including stimulating bank investments, injecting public funds in risk capital formation and alternative stock markets
<b>Policy experimentation and evaluation</b>	<p><b>Experimentation</b> Implementation of an <i>experimental test</i> for targeted policies promoting R&amp;I-led growth of SMEs would prioritise those firms with a high appraisal score according to a multi-attribute "identification index" considering newness; capacity for developing or absorbing products and processes which are technologically new or substantially improved and which carry a risk of scientific, technological or commercial failure or have had a high R&amp;D intensity (compared to the sector average) for a number of years; evaluation of sectoral characteristics, business phase (for example, start-up, expansion or maturity phase), internationalisation potential, and techno-economic/market environment.</p> <p><b>Evaluation</b> Assessment of the effectiveness of the abovementioned <i>experimental test</i>.</p>		

Source: compiled by author