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INNOVATION and CREATIVITY

“Although technological creativity is quite different from artistic or scientific creativity, it does share with the arts and the sciences its dependence on occasional inspiration, luck, serendipity, genius, and the unexplained drive of people to go somewhere where no one has gone before”

(Mokyr, 1990).

“Additionality refers to a situation in which public funds stimulate firms to invest in R&D up to a level that is higher than the one that would be achieved solely as a result of firms' private considerations”

(Lach et al, 2008).

This is the first issue of a new occasional series, the CASE Knowledge Insights. The series aims to provide a brief discussion of the rationale for and aims of CASE intervention in important thematic areas, consistent with our mission “to provide objective economic analysis and to foster the quality of policy-making to improve the lives of Europeans and their neighbours.” We have chosen “Innovation and Creativity” as an area recognized as critical for the future of Europe, and where CASE has been able to provide substantive contribution, which will hopefully have an impact on the way policy choices are made and resources allocated. We thank **Itzhak Goldberg** and **Iraj Hashi**, two among the several CASE Fellows and associates who have an interest in this area, for their contribution.

INTRODUCTION

In his book “*The Lever of Riches: Technological Creativity and Economic Progress*”, the economic historian Joel Mokyr argues that like science and art, technology changes through human creativity, that rare and mysterious phenomenon in which a human being arrives at an insight or act that has never been accomplished before. Of course, technological creativity is quite different from artistic or scientific creativity. ...Yet it does share with the arts and the sciences its occasional dependence on inspiration, luck, serendipity, genius, and the unexplained drive of people to go somewhere where no one has gone before (Mokyr, 1990). There is now a growing body of literature which aims at identifying the determinants of innovations as well as their relationship with creativity, competitiveness and growth of firms, industries, regions and nations. This literature also provided the rationale for policy makers to develop policies which can facilitate and promote innovation as well as policies that can support innovative SMEs. In this Brief, we report on the work in the area of creativity and innovation which has been undertaken by the CASE team

and proposes a methodology for an impact analysis of EU support to innovative SMEs.

Significance for EU policy making

The productivity gap between Europe and US has been growing over the past two decades: productivity (output per hour) in the EU reached 92 percent of the US in 1995 before falling to 83 percent in 2008 (Gordon, 2010). According to the 2011 Innovation Union Scoreboard, the US is dominating Europe in most indicators capturing business R&D, public-private collaboration, license and patent revenues from abroad and international patent applications. The European Commission program Horizon 2020 states that: “the key driver of the problem is Europe's structural innovation gap: compared to its competitors, Europe's patenting performance is weak and it lags behind in developing new products, new processes and new services. A timely and targeted European policy is needed for bridging the ‘valley of death’ if Europe is to remain competitive”.¹

1. (a) European Council (2011), p. 7 and (b) European Commission (2011), p. 9 and footnote 22 which provides the website for the US SBIR

Last year, the European Commission launched calls for research proposals under two themes: (i) 'unveiling creativity for innovation in Europe' and (ii) 'Interim evaluation of the participation of SMEs in the Seventh Framework Programme for Research, Technological Development and Demonstration activities (2007-2013)'. CASE applied for projects under these two themes. Both themes are essential for stimulating innovation and thus for enhancing growth of Europe and closing the innovation gaps with its competi-

tors. Creativity is important at the early stage of the innovation cycle while the financial support for innovative SMEs is critical for the implementation of innovation at later stage of the cycle. The objective of the evaluation of SME support is generating forward looking implications for improving innovation policies and instruments in Europe.

Creativity and Innovativeness of Firms

In investigating the innovation behaviour of firms (and countries), particular attention should be paid to both the creativity of individuals that lies behind all innovations, and how to encourage and harness this creativity. There is no commonly agreed definition of creativity in different disciplines, but psychologists have highlighted the desire to create something new as a universal human trait. Amabile (2000) refers to creativity as an intra-individual cognitive process that produces ideas which are both novel and useful. In the literature, creativity is referred to as the generation of new ideas and innovation as the implementation of these ideas, a view that has been adopted by the European Council, stating that "creativity is a prime source of innovation, which in turn is acknowledged as one of the key drivers of sustainable economic development" (European Council, 2009).

An important question is whether the meaning of creativity is universal or culture specific. The two components of creativity - novelty and usefulness - are not equally emphasized in different cultures, with certain cultures emphasising novelty more strongly than usefulness. Such differences may lead to different creative outcomes. The former may lead to creativity break-throughs and to innovation break-throughs whereas the latter may lead to creative improvement and to incremental innovation.

Of course, the seemingly universal human needs for exploration and autonomy are manifested differently under different organisational set ups and in different cultures. Some organisations have cultures and management styles which are more conducive to innovative behaviour than others. Similarly, certain national cultural values encourage creativity while others inhibit the demonstration and expression of new ideas – however creative they may be.

Erez and Nouri (2010) highlight three aspects of cultural values – tolerance of ambiguity, low power distance and individualism as important determinants of creativity and innovation. Tolerance of ambiguity (or uncertainty) indicates to what extent members of a culture (or employees and management of an organisation) feel comfortable in unstructured situations, which are novel, unknown, surprising, and different from the common. People with low tolerance of ambiguity tend to avoid exploration which may limit their ability to come up with breakthrough ideas.

Power distance reflects the way in which power is distributed amongst members of a society (or organisations). In some cultures power is more equally distributed than others, and employees feel freer to express their ideas openly and to criticize their bosses when they disagree with their decision. In contrast, in high power distance cultures employees (and citizens) are expected to follow their superiors and to comply with their boss's instructions. In such cultures employees will not be motivated to think independently and creatively.

Individualism represents being unique and different from others. Collectivists define their self-image as "We" whereas individualists define it as "I". High collectivism encourages conformism and may constrain deviations from the norm, thus prevent the expression of creative novel ideas. It is therefore expected that cultures emphasizing the values of uncertainty avoidance, high power distance, collectivism and conformity to social rules may restrain individuals from expressing unique ideas and deviations from the norm (Harzing and Hofstede, 1996). In contrast, cultures that emphasize the values of high tolerance of ambiguity, low power distance and individualism create a cultural environment that supports the expression of unique ideas and the exploration of new ways of doing things. It is

therefore not surprising that the former socialist countries (where collectivism and conformity was the norm) ranked very low in terms of innovation (however measured).

That creativity is strongly influenced by national cultures has been studied and confirmed by many scholars. Ronen and Shenkar (1985, 2008) clustered countries according to their cultural values, by Meta-analyzing eight large-scale studies, identifying eight cultural clusters, six of which include EU member states and candidate countries: Eastern Europe (Poland and the Czech Republic); Germanic (Germany and Austria); Near Eastern (Israel and Greece); Latin European (Italy and France); Anglo (UK and Ireland); and Nordic (Netherlands and Denmark). This indicates that even within the European Union, one can expect relatively large cultural differences which may affect the extent of creativity, its meaning and its expression. Another study establishing that European countries differ from each other in their cultural values is the so-called GLOBE study (House et al., 2004) which examines the social values in a large number of countries including European countries. The latter appeared in five of these clusters: Anglo, Latin Europe, North Europe, East Europe, and Germanic. These differences in cultural values are likely to have implications for the creativity of employees and the motivation to generate novel and useful ideas. Cultures that permit creative actors to be exposed to a large number of ideas will be more likely to foster creativity (Dijkstra, 2010). Openness is another characteristic of an economic environment which influences creativity. Openness to trade, FDI, tourist arrivals and networking create possibilities for exchange of ideas and knowledge spillovers which positively influence creativity. The ethnic diversity and the degree of tolerance in a society may contribute positively to fostering creativity (Florida, 2002).

A comprehensive definition and measure of creativity is missing in the relevant economic literature (Villalba, 2010) and the few studies considering this concept have ignored the multidimensional nature of creativity. The Creativity Project submitted by CASE aims to explore and elaborate the role of creativity as a driver of innovation and the factors and forces that influence creativity and creative thinking, thus making a contribution to the economic analysis of creativity. It is clear that the analysis of creativity and its fostering requires a multidimensional approach that would take into account the characteristics of the individuals, firms and their

environment.

The links between creativity and innovation and the channels through which creativity affects innovation have not been explored sufficiently in economic literature either. The limited existing research suggests that these channels consist of research and development and design activities (Swann and Birke, 2005; Cereda et al., 2005). Empirical research, however, has not provided much evidence on the relative importance of these channels and further examination is needed for a better understanding of the process.

The exploration of the relationship between creativity and innovation behaviour of firms and their performance constitutes the central part of the submitted project. Creativity of firms can be explained by a wide range of factors and forces, including characteristics such as skills and education of employees, cognitive styles of management, cultural values of the organization, size and the nature or type of technology predominantly used in the firm. The ethnic origin of the dominant owners of companies may also exert an influence on the creativity of the enterprise, reflecting the concepts of 'tolerance', 'heterogeneity' and 'diversity'. The interactions between firms and their external environment, especially the institutional and regional differences would also have to be taken into account.

In terms of empirical work, given the absence of any cross country indicator of creativity, the project proposed a large enterprise survey of 1500 companies in eight countries (4 larger and four smaller countries) in order to collect fresh firm level data. The survey will consist of several parts, with questions related to areas such as: cognitive styles; cultural values; meaning of creativity; novelty and usefulness; innovation activities; inputs and outputs of the innovation process; factors facilitating and inhibiting innovation; education and training levels; biographical data; and the financial performance of the firms. The database collected through the survey can be merged with other databases such as Amadeus (which offer more detailed data on financial performance of firms).

Once data on creativity is generated and synthetic indices of creativity constructed for firms and countries, then various econometric techniques can be used to explore its relationship with innovation activities and performance of firms in each country and across countries.

CASE activity at a glance

- Does Government Support for Innovation Matter? The Effectiveness of Public Support for Private Innovation

- Compilation of SME policy measures and assessment of the SBA implementation within the SME Performance Review 2011

- PICK-ME: Policy Incentives for the Creation of Knowledge: Methods and Evidence

- SERVICEGAP - The Impact of Service Sector Innovation and Internationalisation on Growth and Productivity

- AEGIS - Advancing Knowledge-Intensive Entrepreneurship and Innovation for Economic Growth and Social Well-being in Europe

CASE's Involvement in INNOVATION

During the last years CASE has been actively involved into projects focused on the analysis and assessment of the importance of innovation-element for the economic activity and well-being of various countries. The linkages between the governmental policies and the incentives for innovative activities have gained the particular interest in these researches. The experience of a number of countries has been used for developing and suggesting the ways for advancing European countries into the innovation and knowledge-based economies. Among CASE projects in this research area there are the following:

Does Government Support for Innovation Matter? The Effectiveness of Public Support for Private Innovation [03.2012 - 03.2013]: the aim of the project is to analyze in a comparative perspective the government support for innovation in form of instruments of financial support for innovation in Turkey and Poland, and to assess their effectiveness by applying recent econometric techniques (a CDM model) to firm-level data from the last three runs of the Community Innovation Survey (CIS).

Compilation of SME policy measures and assessment of the SBA implementation within the SME Performance Review 2011 [01.2012 - 12.2012]: the aim of the project is to prepare SME Fact Sheets for the EU Member States and ten additional European countries, compile SME policy measures undertaken in 2011 in Croatia, Macedonia, Poland, Serbia, Slovenia and to write an assessment of the state and implementation of policies within the Small Business Act for Europe for Poland;

PICK-ME: Policy Incentives for the Creation of Knowledge: Methods and Evidence [01.2011 - 06.2014]: the aim of the project is to analyze the role played by demand in the generation and exploitation of technological knowledge, introduction of technological and organizational innovation, and in fostering productivity growth, at a theoretical and especially at an empirical level;

SERVICEGAP - The Impact of Service Sector Innovation and Internationalisation on Growth and Productivity [03.2010 - 02.2013]: the aim of the project is to produce a comprehensive study on the impact of market services on aggregate economic growth in the EU and its comparative performance relative to competitor regions, especially the US;

AEGIS - Advancing Knowledge-Intensive Entrepreneurship and Innovation for Economic Growth and Social Well-being in Europe [01.2009 - 09.2012]: the aim of the project is to study the interactions between knowledge, innovation, economic growth and social well-being in Europe, in particular, it focuses on knowledge-intensive entrepreneurship as a necessary mechanism and an agent of change mediating between the creation of knowledge and its transformation into economic activity.

Selected CASE publications related to innovations

- *What are service sector innovations and how do we measure them?* by Krzysztof Szczygalski
- *Innovation Systems and Knowledge-Intensive Entrepreneurship: a Country Case Study of Poland* by Richard Woodward, Elżbieta Wojnicka and Wojciech Pander
- *Knowledge-Intensive Entrepreneurship and Opportunities in Two Polish Industries* by Richard Woodward, Elżbieta Wojnicka and Wojciech Pander
- *Innovation Activities and Competitiveness: Empirical Evidence on the Behaviour of Firms in the New EU Member States and Candidate Countries* by Iraj Hashi, Nebojsa Stojcic and Shqiponja Telhaj
- *Knowledge based firms from Central and East European countries: A comparative overview of case studies* by Slavo Radosevic, Richard Woodward and Deniz Eylem Yoruk

Useful Links

1) *Final Report: Impact assessment of the participation of SMEs in the Thematic Programmes of the Fifth and Sixth Framework Programmes for RTD, RTD-T04-SME-THEMAT-2008*

2) *The impact of government support to industrial R&D on the Israeli economy-Final Report*

3) *How do Creativity and Design Enhance Business Performance? A Framework for Interpreting the Evidence. 'Think Piece' for DTI Strategy Unit.*

4) *The impact of innovation support programmes on SME innovation in traditional manufacturing industries: an evaluation for seven EU regions.*

References

1) "The Rise of the Creative Class and how its transforming work, leisure, community and everyday life" by Richard Florida

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