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Innovation, institutions and cultures: Exploring the European context**

The aim of this explorative study is to provide a systematic mapping of the most innovative firms in Europe, in order to identify their distinctive local innovation dynamics in terms of geographical, sectoral and cultural distribution. The research seeks to assess whether innovation performance in Europe is "culture-specific". From the findings, it emerges that the most innovative clusters are the Nordic Cluster, the Anglo Cluster and the Germanic Cluster. This supports the idea that innovation performance is indeed "culture-specific".

Key words: **innovative firms, institutional environment, cultural context**
(JEL: M16, Z19)

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1. Introduction

Innovative behavior of firms is powered by a number of conditions that do not relate exclusively to internal resources or owned by them but are grounded in the socio-economic and cultural environment in which these firms operate. In particular, innovation is likely to be affected by national cultures (Hofstede, 1980; Shane, 1993; Hussler, 2004). The existing research on innovation that had an international focus has primarily focused on different corporate and professional cultures (Ulijn, Nagel, & Tan, 2001; Pivoda, 2001), as well as organisational culture (Feldman, 1988) while generally overlooking the importance of national culture as a means to explain and predict innovation performance in a global context (Herbig & Dunphy, 1998). Although it appears that no real substantial effort has been made to study whether innovation is, or should be, managed differently in different national cultures (Hofstede, 1980; Shane, 1993; Hussler, 2004; Authors, 2009) we believe that national culture is equally a relevant lens through which the systematic comparison of similarities and differences would considerably improve our understanding of the innovation performance of European firms. Drawing on our existing work on innovation (Crowe, Vecchi, Brennan, & Coughlan, 2007; Vecchi & Brennan, 2009a, 2009b; Vecchi, Della Piana, & Cacia, 2013), by adopting a cross-cultural perspective (Della Piana & Vivacqua, 2012; Capaldo, Della Piana & Vecchi, 2012a; Vecchi et al., 2013) and by endorsing an institution-based view in this paper we present an important yet understudied field in cross-cultural management - the innovation performance of firms across European countries. In a recent review of cross-cultural management studies over the last five decades (Capaldo, Della Piana, Monteleone, & Sergi, 2012b), it emerges that Innovation Management, as a subject area still remains understudied. Overall, given the relevance of cultural contexts that provide an understanding of firms 'innovation performance, it is important to highlight how different institutional settings affect innovation at firm level, which is critical to detect the local innovation dynamics. The regional systems of innovation approach has heavily influenced policy makers in many parts of the world, both in terms of providing clues as to why innovation occurs and varies so significantly across countries and also in terms of identifying adequate policy responses (McCann & Ortega-Argilés, 2013). To date, though, comparative management research only marginally addresses the issue of the interface between firms and innovation across the different institutional settings and the cultural contexts of the European countries. As such, there is an opportunity to conduct valuable research. Drawing on our existing work on innovation (Crowe et al., 2007; Vecchi & Brennan, 2009a, 2009b; Vecchi et al., 2013) by taking a cross-cultural perspective (Della Piana & Vivacqua, 2012; Capaldo et al., 2012a; Vecchi et al., 2013) and by endorsing an institution-based view (Peng & Pleggenkuhle-Miles, 2009; Luo, Sun, & Wang Lu, 2011) in this paper we seek to assess the innovation performance of firms across sixteen European countries. The aim of this explorative study is to compare from a cross-cultural perspective the innovation performance of firms across sixteen European countries (Austria, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Poland, Portugal, Slovenia, Spain, Sweden, The Netherlands, the UK) in order to identify their distinctive local innovation dynamics. To this end, this study focuses on the ca-

pabilities of these sixteen countries to transform their inputs (Innovation Input Sub-Index namely Institutions, Human Capital & Research, Infrastructure, Market Sophistication and Business Sophistication) into outputs (Innovation Output Sub-Index namely Knowledge & Technology Outputs as well as Creative Outputs), the Efficiency Ratio as they have been identified by the most recent iteration of the Global Innovation Index Report (2013). The study is articulated as it follows. The second section illustrates the institution-based view, the third section provide an overview of cross-cultural studies of innovation, the fourth section illustrates the methods used to select the most European innovative firms and describes the data analysis. While the fifth section deals with the preliminary findings, the last section provides the conclusion, addresses the managerial implications of the findings, their limitations and highlight directions for future research.

2. The institutional environment role

Institutional theory emphasizes the influence of socio-cultural norms and values, as well as the effect of law and the judicial system, on organizational structure and behaviour (North, 1990). Institutions are the formal (such as political rules, economic rules, and contracts) and informal (such as codes of conduct, norms of behaviour, and convention) constraints that regulate economic activities and human behaviour. Informal constraints are embedded in a culture and play a role when formal constraints fail (North, 1990). Institutions limit the set of choices individuals and organizations have, thereby providing a stable structure for economic exchanges and reducing uncertainty (North, 1990). Institutions and the effectiveness of enforcement determine the cost of a transaction. Effective institutions increase the benefits derived from cooperative solutions, while ineffective institutions increase the benefits derived from defection (North, 1991). Institutions evolve incrementally, and the story of an economy's performance can be seen as a story of institutional evolution (North, 1991). According to this theory, the national institutional context has a significant impact on rules of competition, firm strategy, and performance; and a more efficient institutional context favours market exchanges and the growth of the national economy (North, 1990; Wan & Hoskisson, 2003). Peng & Pleggenkuhle-Miles (2009) identifies the emergence of the institution-based view as a third leading perspective in strategic management, the first two being the industry-based and resource-based views. Overall, they suggest that the institution-based view represents the third leg of a strategy tripod, overcomes the long-standing criticisms of the industry-based and resource-based views' lack of attention to contexts, and contributes significant new insights as part of the broader intellectual movement centered on new institutionalism (Peng, 2002; Peng & Delios, 2006). The influence of the "environment" has long been featured in the literature (Lawrence & Lorsch, 1969). However, strategy research has typically favoured a view, which focuses primarily on economic variables such as market demand and technological change (Dess & Beard, 1984). Until the mid-1990s, researchers looked seldom beyond the environment to explore the interactions among institutions, organizations and their strategic choices (Narayanan & Fahey, 2005). Instead, a market-based institutional framework has been endorsed where formal institutions, such as laws and regulations, and informal institutions, such as cultures and norms, have been assumed of

secondary importance. While some scholars argue that this treatment of institutions as background is insufficient to gain a deeper understanding of strategic behaviour in developed economies, its deficiency becomes even more striking when the strategy research starts to probe into the business landscape of emerging economies (Lau & Bruton, 2008). Within this context Luo et al. (2011) note a sustained and systematic pattern of strategic management issues at country-level. In particular they explicate that a unique bundle of country-level institutional, competitive and socio-cultural conditions function together with a set of distinctive capabilities or weaknesses for most firms, incubating certain country-level patterns of corporate, business and international strategies adopted by most firms within the same country. Similarly Lu, Tsang, Eric, & Peng, (2008) by adopting an institution-based view, they argue that the institutional environment in the Asia Pacific region plays a multi-faceted role behind firms' knowledge management and innovation strategy. More recently, Prota et al. (2012) provide a more empirical discussion of how to analyse the specific configuration of formal institutions and their respective innovation outputs. In particular drawing on the European experience, according to the authors formal institutions can foster regional innovation systems by means of issuing policies to facilitate the creation of clusters, to foster cooperation between universities and firms, to encourage the creation of spin-off and the ability of academic researchers to register patents, to facilitate the creation of new innovative firms and to ease the brain circulation (Prota et al., 2012).

3. The cultural context relevance

Two main hypotheses seem to dominate cross-cultural studies of innovation (Vecchi & Brennan, 2009a). The "convergence" hypothesis (Form, 1979) asserts that learning will lead managers from different cultures to adopt the same efficient management practices. Competitive pressures will eliminate those who resist convergence, consequently with the increased dissemination about best practices around the world, one would expect each country's respondent to embrace the same approach of their overseas counterparts. The "culture-specific" argument (Hofstede, 1980) contends that even if managers located in different societies face similar imperatives for change, deep-embedded cultural factors will still affect the way managers approach innovation and react to the need for change. Both these hypothesis find equivocal support in empirical studies of innovation. The "convergence" hypothesis is supported by several empirical studies. Historically, the "technology gap" theory (Gerschenkron, 1962; Fagerberg, 1994) first stipulated that the potential for knowledge imitation was positively linked to the development gap (often measured in terms of GDP per capita) between countries. According to this theory, a less developed a firm or a country, the smaller is its knowledge stock and therefore the bigger its potential to increase through learning from the leading countries. Other empirical studies later argued that the intensity of knowledge flows among developed countries could be explained by their technological proximity. Orlando (2000) and (Smith, 1995) , for instance investigate the importance of technological proximity for R&D spillovers and their findings indicate that although technological proximity is positively correlated with innovation performance, knowledge spillovers are not necessarily geographically bound. On the

other hand, there is a critical mass of empirical research that supports the "culture-specific" argument according to which culture has profound influence on the innovative capacity of a society. Barnett (1953) postulates a positive correlation between the individualism of a society and its innovative potential: the greater the freedom of the individual to explore and express opinions, the greater the likelihood of new ideas coming into being. Hofstede (1980) indicated that societies which score high on individualism and low on power distance tend to display higher growth and innovation rates. Similarly, Shane using Hofstede's definition of culture (Shane, 1993) shows that specific cultural dimensions provide crucial support for innovation performance: in particular, he finds that individualistic societies which accept uncertainty and which exhibit a low level of power distance are those who attain better innovation performance. Hussler (2004) by looking at European patent citations shows how culture - if compared to other drivers such as geographical proximity, technological proximity and economic proximity - strongly affects the geography of knowledge flows and innovation performance. Hussler in particular introduces a culture-based taxonomy of innovation performance, according to which societies which accept uncertainty and which exhibit a low level of power distance are those who attain better innovation performance. These societies are those that succeed by innovating on their own as they possess a "culture of endogenous innovation". Vice-versa, those countries with high uncertainty avoidance and high power distance can be defined as "cultures of imitation". Finally, Hussler defines those societies displaying high uncertainty avoidance regardless of their level of power distance as possessing a "less innovative culture". Overall, the importance of innovation to firms, nations and regions is reflected in the myriad of policies and strategies which strive to nurture it and reap its benefits. Innovation itself may be defined as the process of making changes, introducing or adopting new ideas, methods or behaviours (Damanpour & Gopalakrishnan, 1998; Hornby, 1995) and may include a product's or service's design, production, marketing and support (Porter & Van der Linde, 1995). The European Commission (2007) endorses the view by which growth and jobs are determined by framework conditions such as the endowment of infrastructure of various kinds — physical, in the form of transport and telecommunication networks, human, in the form of the skills and know-how of the work force, and social, in the form of care and other support services. They also include the capacity for innovation, which is an increasingly important determinant of competitiveness and which is linked to human resource endowment but which encompasses as well the resources devoted to R&D and the effectiveness with which they are used. In line with this view, the literature has identified a number of resources that are critical for innovation. For example within this context, Cooke, Uranga, & Etxebarria (1997) by acknowledging the major contribution of research on National Innovation Systems (NIS), it suggests that for conceptual and methodological reasons, mostly concerning problems of scale and complexity, that approach may be complemented in important ways by a subnational focus. Taking an evolutionary economics standpoint, they specify the concepts of 'region,' 'innovation' and 'system' as the prelude to an extended discussion of the importance of financial capacity, institutionalised learning and productive culture to systemic innovation. Building on the notion of regions as occupying different positions on a continuum referring to processes consti-

tuting them and their powers *vis-à-vis* innovation policy, they conclude by advocating strengthening of regional level capacities for promoting both systemic learning and interactive innovation. Lundvall (2009) provides alternative conceptualizations of innovation system. In particular, he reflects on the origin and use of the national innovation system concept in terms of both theory and practice. He argues that the concept has some characteristics in common with an engineering approach but also with critical theory and grounded theory. According to his view, the intuition behind the Aalborg-version of the NSI-concept pointed in the right direction but the concept was certainly not fully worked out when first introduced. Some of the major weaknesses have been repaired but some remain. By contrast Lundvall (2009) presents the idea whereby there is a core of the system that is defined and it is illustrated and that it is necessary to both to understand micro-behavior in the core and understand "the wider setting" within which the core operates. Here special attention is given to institutions and capabilities supporting learning. He particularly points to the need to give more emphasis to the distribution of power, to institution building and to the openness of innovation systems. Similarly, Hii & Neely (2000) conclude that a broad range of factors, including culture, technological resources and competence influence innovation. There is a comparatively small body of research that has examined innovation across cultures. This research stream has focussed primarily on the diffusion rate across borders (Ghoshal & Barlett, 1988) or differences in innovative activities (Carlsson & Hansen, 1982). In terms of innovation performance, complementarity and fit between strategies are important drivers for sustained innovation and performance, as in the case of internal and external innovation strategies (Cassiman & Veugelers, 2002) and of manufacturing and business/marketing strategies (Milling & Hasenpusch, 2000). Formalization of manufacturing strategies and standardization of work processes in manufacturing also positively influence firm performance (i.e. Demeter, 2000). Collaboration and networking have also been identified as key elements in fostering innovation (i.e. Roper, 2000). Customer and supplier relationships (Oliver, Delbridge, & Barton, 2002) and use of external collaboration for design (co-design) (Zotteri, Spina, & Verfanti, 2000) have a considerable impact on innovation performance improvement and the wider the spectrum of integration the stronger the association with improvement (Frolich & Westbrook, 2001). Since both the "convergence" and "culture-specific" hypotheses find equivocal support in empirical studies of innovation, the purpose of this study is to assess the validity of the "culture-specific" argument for explaining innovation performance across countries. This paper specifically examines similarities and differences by comparing innovation performance across GLOBE cultural clusters in twenty European countries.

4. Methodology

The aim of this explorative study is to compare the innovation performance of firms across sixteen countries (Austria, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Poland, Portugal, Slovenia, Spain, Sweden, The Netherlands, UK) in order to identify their distinctive local innovation dynamics and, specifically, to understand the extent to which innovation occurs across different institutional settings. In particular, we are keen to explore the relationship that there is between the most

innovative firms and the most innovative countries to assess how different institutional settings allow innovation to thrive. By taking an institution-based view of innovation we endorse the idea that the innovative behaviour of firms is powered by a number of conditions that do not relate exclusively to internal resources or owned by them but are grounded in socio-economic and cultural environment in which these firms operate (Peng & Pleggenkuhle-Miles, 2009; Luo et al., 2011). Data collection mainly relied on three sources: the world's 142 countries ranked by the Global Innovation Index (2013) that provides information about the sixteen European countries; the Joint The 2013 EU Industrial R&D Investment Scoreboard listing the 1000 EU's top innovative firms ranked by their investments in R&D; the GLOBE survey that was conducted in 61 countries by involving more than 950 firms and the main respondents were 17,300 middle managers (House, Javidan, Hanges, & Dorfman, 2002; Chhokar, Brodbeck, & House, 2007). Data collection on the 16 European countries relied on a very robust sampling frame as it relied on the 2013 EU Industrial R&D Investment Scoreboard listing the EU 1000 world's top innovative firms ranked by their investments in R&D[1]. It consists of a sample of 1000 firms based in the EU[2] across 20 countries with R&D investments above €5.2 million across 39 sectors[3] and were

1 The Member States countries of European Union are currently 28 but the 2013 EU Industrial R&D Investment Scoreboard deals only with 20. Out of the 28 EU countries - Austria (AT),Belgium (BE), Bulgaria (BG), Cyprus (CY), Croatia (HR), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Poland (PL), Portugal (PT), United Kingdom (GB), Czech Republic (CZ), Romania (RO), Slovakia (SK), Slovenia (SL), Spain (ES), Sweden (SE), Hungary (HU) - 8 countries have never been listed in the Scoreboard. Croatia (HR) and Bulgaria (BG) have been mentioned in the previous ranking (respectively in 2008, 2009, 2010 and in 2010, 2011). Cyprus (CY), Estonia (EE), Latvia (LV), Lithuania (LT), Romania (RO), Slovakia (SK) have never been mentioned by the JCR Scoreboard in the last five years.

2 Uncertainty Avoidance is defined as the extent to which members of a society strive to avoid uncertainty by reliance on social norms, rituals and bureaucratic practices to mitigate the unpredictability of future events. Power Distance is defined as the degree to which members of society expect and agree that power should be equally shared. Institutional Collectivism reflects the degree to which societal practices encourage and reward collective distribution of resources and collective action. In-Group Collectivism reflects the degree to which individuals express pride, loyalty and cohesiveness in their organisations. Gender Egalitarianism is the extent to which a society minimises gender role differences and gender discrimination. Assertiveness is the degree to which individuals in societies are assertive, confrontational and aggressive in their social relationships. Future Orientation is the degree to which individuals in societies engage in future-oriented behaviours such as planning, investing in the future, and delaying gratification. Performance Orientation refers to the extent to which a society encourages and rewards group members for performance improvement and excellence. Humane Orientation is the degree to which individuals in organisations or societies encourage and reward individuals for being fair, altruistic, friendly, generous, caring and kind to others

3 In this report, the term EU company refers to companies whose ultimate parent has its registered office in a Member State of the EU.

therefore deemed by the 2013 EU Industrial R&D Investment Scoreboard as being the most innovative firms. To the purpose of our paper, data collection relies on the most recent EU Industrial R&D Scoreboard available (2013), from which we identified the 952[4] most innovative European firms across 16 countries[5].The literature usually takes R&D expenditures primarily as an input indicator and the patent data as an output indicator; these indicators can be used individually or combined to measure firms innovative performance (Hagedoorn & Schakenraad, 1990; Hagedoorn & Cloodt, 2003). Similarly, R&D expenditures are also relevant for comparing productivity measures for firms as well as for countries (Griffith, Redding, & Van Reenen, 2000). The Global Innovation Index (GII) provides valuable guidance to assess the key role of innovation as a driver of economic growth for countries. The method used relies on the Global Innovation System (GIS) that provides composite indicators that are apt to classify in rankings the most innovative countries of the world. The GIS relies on the GII specific indexes and sub–indexes that identify different levels of innovation of the countries. To the purpose of this work, secondary data was collected from the latest GII Report 2013 and it is relies on four of its sub-indexes, the Innovation Input Sub-Index (II), the Innovation Output Sub-Index (IO), the Global Innovation Index and the Innovation Efficiency Ratio (IER). Five input pillars capture the key elements of the national economy that tend to enable innovative activities: Institutions, Human Capital and Research, Infrastructure, Market Sophistication, and Business Sophistication. Two output pillars capture the actual evidence of innovation outputs: Knowledge and Technology Outputs and Creative Outputs. Each pillar is divided into several sub-pillars and each sub-pillar consists of several individual indicators. Sub-pillar scores are calculated as the weighted average of the individual indicators; pillar scores are calculated as the weighted average of sub-pillar scores The II is calculated as the simple average of the first five pillar scores. The IO is calculated as the

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4 The sectors of the firms ranked in JRC Scoreboard 2013 are the following: Aerospace & Defence; Alternative Energy, Automobiles & Parts; Banks; Beverages; Chemicals; Construction & Materials; Electricity; Electronic & Electrical Equipment; Equity Investment Instruments; Financial Services; Fixed line Telecommunication; Food & Drugs Retailers; Food Producers; Forestry & Paper; Gas, Water & Multi-utilities; General Industrials; General Retailers; Health Care Equipment & Services; Household Goods & Home Construction; Industrial Engineering; Industrial Metals & Mining; Industrial Transportation; Leisure Goods; Life Insurance; Media; Mining; Mobile Telecommunication; Nonlife Insurance; Oil & Gas Producers; Oil Equipment, Services & Distribution; Personal Goods; Pharmaceuticals & Biotechnology; Real Estate Investment & Services; Software & Component Services; Support Services; Technology Hardware & Equipment; Tobacco; Travel & Leisure. Companies are in industry sectors according to the NACE Rev. 222 and the ICB (Industry Classification Benchmark).

5 From the initial sample of 1000 firms listed in the 2013 EU Industrial R&D Investment Scoreboard we had to eliminate 48 firms that were respectively based in Belgium, Hungary, Luxemburg and Malta since these countries are not classified in the GLOBE survey. From the initial sample of 20 countries listed in the 2013 EU Industrial R&D Investment Scoreboard, we restricted our analysis only to 16 since Belgium, Hungary, Luxembourg and Malta are not classified in the GLOBE survey.

simple average of the last two pillar scores. The GII is calculated as the simple average of the Input and Output Sub-Indices. Each Index, Sub-Index and the relevant individual sub-pillar rankings are presented on a scale from 1 to 100 (with 1 being the highest ranking).The IER is the ratio of the IO over the II and it ranges from 0 to 1, with 0 being the lowest and 1 being the highest score. For the purpose of our research we adopt the GLOBE survey (House, Hanges, Javidan, Dorfman, & Gupta, 2004; Chhokar et al., 2007). GLOBE's intent is to explore the cultural values and practices in a wide variety of countries and to identify their impact on organisational practices and leadership attributes. To this end, House et al. (2004) examine national cultures in terms of nine dimensions: Uncertainty Avoidance, Power Distance, Institutional Collectivism, In-Group Collectivism, Gender Egalitarianism, Assertiveness, Future Orientation, Performance Orientation, Humane Orientation. On the basis of these cultural dimensions, the GLOBE survey identifies ten societal clusters: South Asia, Anglo, Middle-East, Germanic Europe, Latin Europe, Eastern Europe, Confucian Asia, Latin America, Sub-Sahara Africa and Nordic Europe. Only those relevant to our research were considered. These were namely Germanic Europe, Latin Europe, Eastern Europe, Nordic Europe and the Anglo cluster. National culture provides a fruitful area for research on innovation performance. We argue that extending this line of enquiry to innovation performance holds great potential to gain a fuller insight on whether innovation performance differs across different national cultures. Accordingly, the GLOBE survey has been deemed as an appropriate methodological tool to corroborate the results of the 2013 EU Industrial R&D Investment Scoreboard and the GII Report 2013 in order to provide in-depth insights on the issue of innovation performance across the European countries.

To assess the influence of institutional settings on innovation performance we cross-referenced the data from the latest GII Report which provides the rankings in 2013 for the sixteen European countries with data from the 2013 EU Industrial R&D Investment Scoreboard that identifies the 952 most innovative firms in 2013. Given that the aim of the paper is to compare from a cross-cultural perspective the innovation performance of firms in Austria, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Poland, Portugal, Slovenia, Spain, Sweden, The Netherlands and the UK and focuses on the capabilities of these sixteen countries to transform their inputs into outputs, we compared these sixteen countries on the basis of their respective II, the IO, the GII and the IER. Additionally, in order to identify the local innovation dynamics we critically assessed their geographical, sectoral and cultural distribution by corroborating the findings with the aid of the GLOBE survey.

5. Findings

As illustrated on Table 1, by considering the GII 2013, the most innovative countries are namely Sweden (2), the UK (3), the Netherlands (4) and Finland (6). These countries that tend to outperform the others for their overall innovation performance both in terms of innovation inputs and innovation outputs. The previous year the GII rankings 2012 were very similar with Sweden (2), Finland (4), the UK (5) followed by the Netherlands (6). In relation to the II rankings, the most innovative countries are respectively the UK (4), Sweden (5), Finland (6) and Denmark (8). These countries are

the ones that tend to have better relatively better Institutions, Human Capital and Research, Infrastructure, Market Sophistication, and Business Sophistication - all of those innovation inputs that should potentially better support the countries' innovation performance. As for the IO rankings, the most innovative countries are namely the Netherlands (2), Sweden (3), the UK (4) and Finland (8). These countries are the ones that tend to perform better in terms of IO such as Knowledge and Technology Outputs, and Creative Outputs. In relation to the IER, the better performing countries are Hungary (23, ratio 0.9), the Netherlands (26, ratio 0.9), Sweden (55, ratio 0.8) and Ireland (57, ratio 0.8). These countries are the ones that tend to most effectively transform innovation Inputs into innovation outputs. By relying on the 2013 EU Industrial R&D Investment Scoreboard we then assessed at the geographical concentration of the most innovative firms by country, as outlined in Table 1, the big majority of the most innovative firms can be found in the UK (26.5% of the total firms), Germany (23.5% of the total firms), France (13%) and Sweden (9.2%). These four countries alone account for the 72.2 % of the most innovative firms in the sample. All the other innovative firms all quite evenly spread out across the remaining European countries.

Table 1: Countries by numbers of innovative firms and main indexes

Country	N° of firms	% of total firms	GII 2013		II		IO		IER	
			S	R	S	R	S	R	S	R
UK	252	26,5	61.2	3	68.2	4	54.3	4	0.8	60
DE	224	23,5	55.8	15	59.8	20	51.9	10	0.9	40
FR	124	13,0	52.8	20	59	23	46.6	17	0.8	63
SE	88	9,2	61.4	2	67.9	5	54.9	3	0.8	55
NL	55	5,8	61.1	4	64.2	10	58.1	2	0.9	26
IT	46	4,8	47.8	29	53.3	28	42.4	29	0.8	62
FI	45	4,7	59.5	6	66.7	6	52.4	8	0.8	67
DK	37	3,9	58.3	9	66.3	8	50.4	14	0.8	78
AT	28	2,9	51.9	23	60.6	17	43.2	27	0.7	98
ES	22	2,3	49.4	26	57.9	24	41	35	0.7	101
IE	16	1,7	57.9	10	64.1	12	51.7	11	0.8	57
PT	6	0,6	45.1	34	52.1	31	38.1	39	0.7	92
PO	4	0,4	40.1	49	47.8	39	32.4	64	0.7	110
GR	2	0,2	37.7	55	45.7	45	29.7	82	0.7	118
SL	2	0,2	47.3	30	53.2	29	41.4	34	0.8	70
HU	1	0,1	46.9	31	48.5	36	45.4	23	0.9	23

The 2013 EU Industrial R&D Investment Scoreboard and Global Innovation Report 2013

Drawing on the 2013 EU Industrial R&D Investment Scoreboard we then considered the most innovative firms in Europe according to their sectoral distribution. This allowed us to provide in-depth insights over the local dynamics of innovation across the

16 European Countries. The top 10 most innovative European sectors (out of a total of 39 sectors) in order of importance are - Software & Computer Services (111 firms, 12% of the sample), Industrial Engineering (108 firms, 11% of the sample), Pharmaceuticals & Biotechnology (107 firms, 11% of the sample) ,Electronic & Electrical Equipment (71 firms, 7% of the sample), Automobile & Parts (50 firms, 5% of the sample), Technology Hardware & Equipment (44 firms, 5% of the sample), Chemicals (38 firms, 4% of the sample), Support Services (38 firms, 4% of the sample), Health Care Equipment & Services (35 firms, 4% of the sample) and Construction & Materials (33 firms, 3 % of the sample)

If we look at the distribution of the 952 firms listed in the 2013 EU Industrial R&D Investment Scoreboard by Globe cultural cluster, as shown in Table 2 below, the Germanic cluster tends to be the most populated cultural cluster (32.2%), followed by the Anglo cluster (28.2%), Latin Europe (20.80%) and Nordic Europe (17.90%). The innovation dynamics of these clusters is assessed more in detail in the next sections.

Table 2: The most innovative European firms by cultural cluster

Cultural cluster	*N. of firms*	*%*	*GII 2013*	*II*	*IO*	*IER*
Germanic Europe	307	30,70	56.26	61.53	51.06	0.83
Anglo	268	26,80	59.55	66.15	53	0.8
Latin Europe	198	19,80	48.77	55.57	42.02	0.75
Nordic Europe	170	17,00	59.73	66.97	52.56	0.8
Eastern Europe	9	0,90	43	48.8	37.22	0.77

Source: The 2013 EU Industrial R&D Investment Scoreboard, Global Innovation Report 2013 and GLOBE Project

The Germanic European cluster

Austria, Germany, the Netherlands, and Switzerland German-speaking are part of the Germanic Europe cluster. In our analysis, this cluster is represented by Germany, Austria and The Netherlands. The Germanic cluster tends to be the most innovative cluster if we consider the number of firms (32.2%). It only ranks third in terms of GII (56.26), II (61.53) and IO (51.06) but it has the highest IER (0.83) of the entire sample. This means that the Germanic cluster tends to be highly efficient in its capacity to transform innovation inputs into innovation outputs. By looking at the institutional environment[6] of the cluster as outlined in Table 3, the Germanic cluster is characterized by relatively good political environment, with political stability and government effectiveness. The regulatory environment also presents relatively

6 For such country of our sample is possible to assign score and rank value for Institutions Sub-pillars and there are: Political environment (PE);Political stability (PS); Government effectiveness (GE); Press freedom (PF);Regulatory environment (RE); Regulatory quality (RQ); Rule of law (RL); Cost of redundancy dismissal, salary weeks (CR); Business environment (BE); Ease of starting a business (EB); Ease of resolving insolvency (ER); Ease of paying taxes (EP).

Table 3: The institutional environment (score) by cultural cluster

		Germanic Europe			*Anglo Cluster*		*Latin Europe*				*Nordic Europe*			*Eastern Europe*			
	Institutions Sub Pillars	**DE**	**AT**	**NL**	**GB**	**IE**	**FR**	**PT**	**ES**	**IT**	**DK**	**FI**	**SE**	**HU**	**GR**	**PO**	**SL**
Institutions		**82.5**	**88.5**	**92.8**	**88.4**	**91.9**	**79.0**	**72.9**	**77.4**	**73.6**	**95.3**	**95.3**	**89.9**	**73.5**	**67.8**	**74.4**	**78.4**
PE	PE	**85.8**	**89.9**	**91.5**	79.7	86.0	78.4	77.2	71.8	68.3	**94.7**	**97.9**	**93.3**	**72.0**	**62.5**	**78.9**	**77.3**
	PS	87.3	95.3	93.6	75.3	90.6	81.1	83.3	69.4	80.5	93.3	100	97.1	84.5	64.5	92.8	86.8
	GE	80.4	83.9	87.5	80.8	77.4	75.8	65.1	66.4	50.7	97.9	100	92.2	57.7	51.5	56.9	65.4
	PF	89.8	90.6	93.5	83.1	89.9	78.4	83.3	79.5	73.9	92.9	93.6	90.8	73.9	71.5	86.9	79.5
RE	RE	**81.3**	**95.6**	**97.9**	**95.7**	**96.9**	**87.6**	**59.3**	**80**	**81.9**	**99.7**	**96.8**	**92.8**	**80.8**	**73.5**	**74.6**	**82.1**
	RQ	89.0	86.5	97.7	91.9	92.6	78.5	66.7	78.1	69.2	100	95.9	97.5	76.9	62.9	74.7	66.1
	RL	90.8	96	96.4	92.2	95	87.5	74.5	79.6	58.3	98.9	100	99.7	68	62.7	67	76.1
	CR	21.6	8.0	8.7	8.4	8.0	11.8	33.9	17.4	8.0	8.0	10.1	14.4	13.4	15.9	18.8	11.4
BE	BE	**80.3**	**80**	**88.9**	**89.9**	**93**	**70.9**	**82.1**	**80.3**	**70.7**	**91.6**	**91.2**	**83.6**	**67.6**	**67.3**	**69.7**	**75.8**
	EB	82.2	79.5	89.1	88.4	92.7	91.5	91.7	77	87.6	92.4	93.2	92.6	92.3	76.5	82.2	95.1
	ER	82.9	88.4	94.1	93.9	92.8	51.8	79.2	81.2	67.5	92.3	95.1	79.4	41.7	47.7	58.2	53.2
	EP	75.7	72.1	83.4	87.4	93.5	69.3	75.4	82.8	56.9	90	85.3	78.8	68.7	77.7	68.8	79.1

Source: The Global Innovation Report 2013

high scores, except for Germany that has a remarkably lower score than the rest of the cluster. The business environment has been also assessed favorably by the GII Report (2013), especially in relation to the Netherlands that has a remarkably higher score vis-à-vis the rest of the cluster. The high scores for the Netherlands in terms of its political, regulatory and business environment may explain the consistent country's positioning in relation to GII Score, IO and IER.

By looking at the R&D expenditure[7] for the Germanic cluster as illustrated in Table 4, it is worth highlighting that while Germany tends to spend considerably more in R&D (61.5) than Austria and the Netherlands, the country has also more R&D which is performed (1.9 along with Austria) and financed by business (65.6). By contrast, the Netherlands tend to have better innovation linkages (45.8).

Table 4: The R&D expenditure (score) by cultural cluster

	Germanic Europe			Anglo Cluster		Latin Europe				Nordic Europe			Eastern Europe			
	DE	**AT**	**NL**	**GB**	**IE**	**FR**	**PT**	**ES**	**IT**	**DK**	**FI**	**SE**	**HU**	**GR**	**PO**	**SL**
R&D	**61.5**	54.2	48.8	**62.6**	45.4	**54.6**	44.7	39.2	31.3	71.2	**74.2**	67.5	**25.5**	20.9	21.5	**35.2**
FT	35.4	n/a	n/a	n/a	73.2	n/a	31.9	51.3	n/a	n/a	**n/a**	n/a	14.8	20	**60.9**	47.5
R&D p	**1.9**	**1.9**	1.1	1.1	**1.2**	**1.4**	0.7	0.7	0.7	2.1	**2.7**	2.3	**0.7**	0.2	0.2	**1.9**
R&D f	**65.6**	44.6	45.1	44.6	**48.1**	**53.5**	44.1	43	44.7	60.2	**67**	58.2	**47.5**	31.1	28.1	**61.2**
IL	42.2	43.3	**45.8**	**50.3**	49	**37.8**	23.8	27.8	33.6	45.3	**50.6**	49.8	**29.7**	24.9	24.6	**31**

Source: The Global Innovation Report 2013

The Anglo cluster

The Anglo cluster consisted of Australia, Canada (English speaking), England, Ireland, New Zealand, South Africa (White sample), and the United States. In our analysis, this cluster is represented only by England and Ireland. The Anglo cluster tends to be the second most populated cluster if we consider the number of firms (28.8%). It ranks second in terms of GII (59.55), II (66.15) and for the IER (0.80). This means that the cluster tends to be highly efficient in its capacity to transform innovation inputs into innovation outputs. In particular the country ranks first for the IO (53).By looking at the institutional environment of the cluster as outlined in Table 3, the Anglo cluster is characterized by relatively good political environment, with political stability and government effectiveness. The regulatory environment also presents relatively high scores. The business environment has been also assessed favourably by the GII Report (2013), especially in relation to the Ireland that has a remarkably higher score vis-à-vis the UK. The high scores for the UK in terms of its political, regulatory and business environment may explain the country's positioning in relation to its GII Score, IO and its IER. By looking at the R&D expenditure for the Anglo cluster as illustrated in Table 4, it is worth highlighting that while the UK tends to spend considerably

7 For such country of our sample is possible to assign score and rank value for R&D Expenditure and there are: Research & development (R&D), Firms offering formal training, % firms (FT), R&D performed by business (R&D p), R&D financed by business (R&D f), Innovation linkages (IL)

more in R&D (62.6) and seems to have better innovation linkages (50.3) than Ireland (49), Ireland has also more R&D which is performed (1.2) and financed by business (48.1).

The Latin European cluster

The Latin European cluster consists of France, Israel, Italy, Portugal, Spain, and Switzerland (French-speaking). In our analysis, this cluster is represented only by France, Portugal, Spain and Italy. The Latin European cluster tends to be the third populated cluster if we consider the number of firms (20.80%). It ranks fourth in terms of GII (48.77), II (55.57), IO (42.04) and has the lowest IER (0.75) of the sample. This means that the cluster tends to be highly inefficient in its capacity to transform innovation inputs into innovation outputs. By looking at the institutional environment of the cluster as outlined in Table 3, the Latin European cluster is characterized by relatively weak political environment, with relatively poor political stability and government effectiveness. On the contrary, the regulatory environment, apart for Portugal (59.3), presents a relatively high score. The business environment presents more of a mixed picture with France (70.9) and Italy (70.7) underperforming Portugal (82.1) and Spain (80.3). By looking at the R&D expenditure for the Latin European cluster as illustrated in Table 4, it is worth highlighting that only France tends to spend considerably more in R&D (54.6) and seems to have better innovation linkages (37.8), also more R&D which is performed (1.4) and financed by business (53.5) then the rest of the cluster.

The Nordic cluster

The Nordic Europe cluster consist of Denmark, Finland, and Sweden. All of these countries are present in our analysis. The Nordic cluster tends to be the second least populated cluster if we consider the number of firms (17.90%). However it ranks first in terms of both GII (59.73) and II (66.97) has the second highest IER (0.80 along with the Anglo cluster) and the IO (52.56) of the sample. This means that the cluster tends to be relatively more efficient in its capacity to transform innovation inputs into innovation outputs vis-à-vis the other clusters. By looking at the institutional environment of the cluster as outlined in Table 3, the Nordic cluster is characterized by a very favorable political environment, with very high political stability and very high government effectiveness (100% for Finland). Similarly, the regulatory environment presents a a very high score across the 3 countries. The business environment has been assessed slightly less favourably by the GII Report (2013), especially in relation to Sweden (83.6) that has a remarkably lower score vis-à-vis the other countries. The high scores for the Nordic countries in terms of their political, regulatory and business environment may explain their positioning in relation to their high GII Score, IO and their IER. By looking at the R&D expenditure for the Nordic cluster as illustrated in Table 4, it is worth highlighting that Finland tends to spend considerably more in R&D (74.2), it seems to have better innovation linkages (50.6) and has also more R&D which is performed (2.7) and financed by business (67) vis-à-vis the rest of the cluster.

The Eastern European cluster

The Eastern European cluster consisted of Albania, Georgia, Greece, Hungary, Kazakhstan, Poland, Russia, and Slovenia. In our analysis, this cluster is represented by only by four countries. These were namely Poland, Slovenia, Greece, Hungary. The Eastern European cluster tends to be the least populated cluster if we consider the number of firms (0.90%). It also ranks as the lowest in terms of GII (43), II (48.8), IO (37.22) and has the second lowest IER (0.77) of the sample after Latin Europe. This means that the cluster tends to be highly inefficient in its capacity to transform innovation inputs into innovation outputs.By looking at the institutional environment of the cluster as outlined in Table 3, the Eastern European cluster is characterized by relatively unfavorable political environment, with relatively little political stability and government effectiveness. On the contrary, the regulatory environment presents a relatively higher score with Hungary (80.8) and Slovenia (82.1) leading the way. The business environment has been assessed less favourably by the GII Report (2013), especially in relation to Hungary (67.6) and Greece (67.3) that have a remarkably lower score vis-à-vis the rest of the cluster. By looking at the R&D expenditure for the Eastern European cluster as illustrated in Table 4, it is worth highlighting that while Slovenia (35.2) and Hungary (25.5) tend to spend considerably more in R&D and seems to have better innovation linkages, more R&D which is performed and financed by business than the rest of the cluster, Poland has the largest number of firms offering formal training (60.9).

Conclusion

To date, very limited attention has been devoted to address the issue of the institutional interplay between cross-cultural management and innovation performance in Europe in order to identify its distinctive local innovation dynamics. As such, there was the valuable opportunity to conduct further research. Drawing on our recent work on innovation (Crowe et al., 2007; Vecchi & Brennan, 2009a, 2009b) by endorsing an institution-based view (Peng & Pleggenkuhle-Miles, 2009; Luo et al., 2011) and by taking a cross-cultural perspective (Della Piana & Vivacqua, 2012; Capaldo et al., 2012a; Vecchi et al., 2013) we assessed the innovation performance of 952 firms across sixteen countries in order to identify their distinctive local innovation dynamics. By considering the Global Innovation Index 2013, the most innovative countries are namely Sweden, the UK, the Netherlands and Finland. These countries that tend to outperform the others for their overall innovation performance both in terms of innovation inputs and innovation outputs. In relation to the Innovation Input Sub-Index rankings, the most innovative countries are respectively the UK, Sweden, Finland and Denmark. In relation to IER, the better performing countries are Hungary, the Netherlands, Sweden and Ireland. These countries are the ones that tend to most effectively transform innovation Inputs into innovation outputs. By relying on the 2013 EU Industrial R&D Investment Scoreboard we then assessed at the geographical concentration of the most innovative firms by country, the very vast majority of the most innovative firms can be found in the UK, Germany, France and Sweden. These four countries alone account for the 72.2 % of the most innovative firms in the sample. The top 4 most innovative sectors are Software & Computer Services, which is

the most innovative sector, followed by Industrial Engineering, Pharmaceuticals & Biotechnology and Electronic & Electrical Equipment. If we look at the distribution of the firms by Globe cultural cluster, the Germanic cluster tends to be the most populated cluster, followed by the Anglo cluster, Latin Europe and Nordic Europe. The Germanic cluster tends to be the most innovative cluster if we consider the number of firms. It only ranks third in terms of GII, II and IO but it has the highest IER of the entire sample. This means that the Germanic cluster tends to be highly efficient in its capacity to transform innovation inputs into innovation outputs. The Anglo cluster tends to be the second most populated cluster if we consider the number of firms. It ranks second in terms of GII, II and for the IER. This means that the cluster tends to be highly efficient in its capacity to transform innovation inputs into innovation outputs. In particular the country ranks first for the IO. The Latin European cluster tends to be the third populated cluster if we consider the number of firms. It ranks fourth in terms of GII, II, IO and has the lowest IER of the sample. This means that the cluster tends to be highly inefficient in its capacity to transform innovation inputs into innovation outputs. The Nordic cluster tends to be the second least populated cluster if we consider the number of firms. However, it ranks first in terms of both GII and IO, it has the second highest IER and the IO of the sample. This means that the cluster tends to be relatively more efficient in its capacity to transform innovation inputs into innovation outputs vis-à-vis the other clusters. The Eastern European cluster tends to be the least populated cluster if we consider the number of firms. It also ranks as the lowest in terms of GII, II, IO and has the second lowest IER of the sample after Latin Europe. This means that the cluster (except for Hungary) tends to be highly inefficient in its capacity to transform innovation inputs into innovation outputs. The findings are relevant to all firms (from SMEs to large firms) wishing to set-up R&D facilities in Europe. Examining the local innovation performance might offer new and valuable insights into how the heterogeneity of European institutional settings and cultural contexts influences firms' behaviour. It also allows us to extend conceptual insights from the institution-based and cross-cultural perspectives. In particular, the paper seeks to contribute to a wider debate concerning the cluster aspects (i.e. the issue of positive externalities to the firms belonging to a given cluster) are the main reason for why the cultural issues become important for innovations and firm growth, as assessed in the classical literature of industrial districts, starting with Marshalls work in the late 19th century. Within this context, cross-referencing data from the Global Innovation Index Report 2013 with the Scoreboard has been a fruitful exercise as it has allowed us to provide an accurate description of firms innovation performance in Europe. However, several methodological limitations need to be acknowledged. First, the Scoreboard relies on disclosure of R&D investment in published annual reports and accounts. Therefore, companies which do not disclose figures for R&D investment or which disclose only figures which are not material enough are not included in the Scoreboard. Due to different national accounting standards and disclosure practice, companies of some countries are less likely than others to disclose R&D investment consistently. In some countries, R&D costs are very often integrated with other operational costs and can therefore not be identified separately. Second, the focus of the Scoreboard on R&D investment as reported in business group accounts means that

the results can be independent of the location of the R&D activity. The Scoreboard indicates the level of R&D funded by companies, not all of which is carried out in the country in which the company is registered. The Scoreboard refers to all R&D financed by a particular company from its own funds, regardless of where that R&D activity is performed. This last point is particularly important since one of the important aspects of studying local innovation dynamics is associated with the tracking of the movements of the tacit knowledge that prevails in such localized environments and that is mostly insulated from outside world. These localized innovation systems do not always correspond to well-defined innovation parameters such as R&D expenditure or patents or publications. This paper contributes to the literature based on institution-based view and cross-cultural perspective, in particular we present an important yet understudied field in cross-cultural management - the innovation performance of firms across European countries. A recent review of cross-cultural management studies over the last five decades (Capaldo et al., 2012b), shows that the interest for cross-cultural research is especially increasing in Innovation Management subject areas which increasingly have began to offer non-trivial publishing opportunities for cross-cultural management research. Given the relevance of the interface between firms and innovation across the different institutional settings and the cultural contexts, a better appreciation of the variety of institutional factors and the intensity of the cultural dimensions characterizing the countries can help develop understanding of the spectrum of firms' governance models observed in these economies and their implications for innovation. The findings lend themselves to some policy considerations. Despite the over-performance of some countries over other in relation to all the Innovation Indexes, European countries could potentially learn from each other. For example, some of them should change their regulatory environment to facilitate R&D investments in more dynamic and modern sectors so to diversify their industrial base by strengthening their creative output; by contrast, others should improve their infrastructure and their educational system to facilitate a more pragmatic approach to innovation in the more traditional sectors. These would not be beneficial to innovative firms only but it could also bring remarkable benefits to firms of all sectors and sizes.

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