

# Innovation Strategies as Outcomes of KM Practices and Antecedents of Firm Performance: Evidence from European Economies

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**Abstract:** An organisation's ability to successfully operate in a competitive environment hinges to a large extent on innovation performance. In the paper, knowledge management (KM) practices, including methods stimulating new ideas and creativity, are viewed as antecedents of innovation strategies, and variance in organisational performance is presented as a consequence of implementation of different innovation strategies. Which KM practices contribute to the emergence of the most and least sophisticated innovation strategies? Which methods stimulating new ideas and creativity have the greatest potential in producing innovation? How is KM, via innovation strategies, related to firm performance? Where do the differences in innovation strategies and KM practices lie across countries? The paper is aimed at answering these questions and identifying KM practices typical of innovation strategies with varied levels of sophistication. Here, the sophistication depends on coherence (e.g. positive or negative, strong or weak) between the extent of an innovation strategy of an enterprise and the enterprise's performance indicators. For the identification of innovation strategies, CIS8 database was used. It covers 60 innovation variables across 127,674 organizations from 12 core and 19 additional sectors and from 16 European economies. The innovation variables include different KM practices as well. Two firm performance indicators were also used in the research. For the identification of methods stimulating new ideas or creativity, CIS10 data were used. It covers six such methods; the sample includes enterprises from 24 European economies within innovation core sectors. The methods included exploratory factor analysis, correlation analysis, hierarchical cluster analysis and k-means cluster analysis. At each stage, the analyses were accompanied by rigorous validity and reliability tests. The originality of the paper lies in its attempt to interrelate different KM practices with not only innovation strategies and firm performance, but national economic-institutional contexts as well.

**Keywords:** creativity; economic-institutional context; firm performance; innovation strategy; knowledge management practices; organisation

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## 1. Introduction

Innovation has long been understood as a part of KM that supports organisational excellence. The existing research has much proliferated in demonstrating benefits of interconnecting KM, innovation and firm performance, and has presented many KM practices as prerequisites for successful innovation and/or firm performance. The ability to use knowledge assets effectively is said to be one of the key warranties of enterprises' success. For modern enterprises that are "in constant fight with the rest of competitors and strive to distinguish in the market saturated with innovations, success mostly depends on the use of knowledge-based assets as well as knowledge, innovation management and its integration practice" (Sedziuviene, Vveinhardt 2010, p. 531). Hence, the integration of different kinds of KM and their combinations into firm activities, especially into innovation activities, results in varied firm performance. Just as the nature of innovation conditions firm innovativeness (e.g. new-to-market innovation is considered to be superior to new-to-firm innovation), so too different kinds of KM lead to the implementation of more and less sophisticated innovation strategies, thus resulting in unequal firm performance. To put it differently, superior firm performance indicates the successful implementation of more sophisticated innovation strategies, while worse performance points to the adoption of less sophisticated innovation strategies. And consequently, because different innovation strategies invoke different KM practices, those KM practices can be associated with the performance level: ones as much contributing to the improved firm performance, while others as little helpful in attempts to reach excellent performance.

So, which KM practices contribute to the emergence of the most sophisticated innovation strategies? How is KM, via the innovation strategies, related to firm performance? What methods stimulating new ideas and creativity are the most successful? To answer these questions, the paper is aimed at the identification of KM practices across innovation strategies with different levels of sophistication and, respectively, across different firm performance levels. Thus, the link between kinds of KM and firm performance is not proximate in the paper, and innovation strategies are employed as mediators.

## 2. Literature review

The paper is consistent with the recently emerging approach towards innovation strategies, often also referred to as innovation routines or innovation modes. The approach is typical of this strand of work and stresses the integral

nature of innovation. Hence, whenever “innovation-oriented activities carried out together to create and market a new good or service, or improve on production, delivery and business processes” (Frenz, Lambert 2010, 2012) are implemented purposefully and in a systemic way, these activities can be referred to as an innovation strategy.

Highly successful innovation strategies are often considered as outcomes or consequences of knowledge management (Lee et al. 2013; Aboelmaged 2014). The very definitions of innovation types and innovation strategies are often defined through the lens of knowledge types. For instance, the well known distinction between ‘product technology’ and ‘production technology’ is typically defined by knowledge about how to create or improve products in the first case versus knowledge about how to produce them in the second case (Stankevice, Jucevicius 2013). It is also quite common to differentiate between innovation strategies through the prism of, for example, external or internal knowledge sources. Examples include such strategies as ‘stand-alone (internal sources of knowledge), ‘local buzz’ (external local sources), ‘global pipeline’ (globally external sources) (Stankevice, Jucevicius 2013).

Competitive innovations emerge from the interplay between superior knowledge arising from the repeated application of a few elements and variety generated through distinctive combinations of these elements (Leal-Rodríguez et al. 2013). Hence, varied combinations of knowledge resources address the causes of heterogeneous innovation performance. In order to design a unique input into its future innovation strategy, an enterprise necessitates a set of knowledge activities that it can apply, integrate, re-engineer, etc. It is rather common to differentiate between internal and external sources of knowledge. For example, Urgal, Quintás and Arévalo-Tomé (2013), who investigated the relationship between knowledge resources and innovation performance in 9432 firms and whose research was also based on Community Innovation Survey (CIS), treated R&D manpower, patents and utility models as internal knowledge resources, while cooperation with other firms or entities and R&D contracts were employed as external sources of knowledge. Similarly, other scholars, more often than not, state that ‘innovation is a collective process that, to be successful, requires the integration of complementary external knowledge in order to enhance the firm’s knowledge base’ (Doloreux, Shearmur 2013, p. 723).

The discussed variety of knowledge sources correspond to the variety of knowledge management activities proposed by Community Innovation Survey (CIS8). In this way, continuous engagement in intramural R&D, feasibility studies, testing, routine software development, tooling up, industrial engineering, training for innovative activities are linked with internal knowledge, whereas knowledge born at professional conferences, trade fairs, meetings, commercial labs or R&D institutes can be referred to as external knowledge. Collaboration with different partners also reveals the level of openness of knowledge and innovation management. For instance, firms which source knowledge for innovation from clients, customers and suppliers are more reserved than firms which co-operate with competitors or other enterprises in the same industry.

In addition, Rundquist (2012) distinguishes between domain-specific knowledge, procedural knowledge and general knowledge. Domain-specific knowledge is acquired due to previous or ongoing product development projects. Procedural knowledge is know-how about the process of new product development, it transforms learning into a systematic process. General knowledge is knowledge in fields that may seem peripheral to ongoing innovation projects. Rundquist (2012) finds that domain-specific knowledge, be it initially internal or external, is the only type of knowledge that has a definitely favourable effect on innovation performance. Hence, the author stresses the importance of learning and knowledge exchange. In this respect, CIS8 database is also beneficial because it allows us to make assumptions concerning the intensiveness of learning and exchange. For instance, collaboration between firms and higher education institutions or research institutes produces greater knowledge exchange and better learning than acquisition of external knowledge, machinery, equipment or software. In this paper, the variety of KM activities presented above is distributed into bundles that are then interrelated with core innovation strategies.

It is also important to note that not only varied combination of knowledge management practices leads to unequal innovation performance and distinct innovation strategies, but innovation performance, in turn, has an effect on firm performance. Thus, Aboelmaged (2014) provides evidence that innovation performance plays a mediating role between knowledge management capability and operations performance. Another example is knowledge-based view of the firm (Urgal, Quintás, Arévalo-Tomé 2013), according to which varied knowledge bases among firms are the main determinants of firm performance differences. Hence, the indirect link between kinds of KM and firm performance that is employed in this paper (i.e. via innovation strategies as mediators), is also justified.

### **3. Methodology**

For the identification of the typology of innovation strategies, Community Innovation Survey (CIS8) microdata from 16 European countries, collected by Eurostat, were used. At the point of data collection in 2012, the CIS8 microdata were the newest available source of the required data. Several studies were done in accordance with the similar logic. Nonetheless, they invoked previous CIS editions (CIS3: Shrolec, Verspagen 2008) or more limited spectrums of variables, sectors and/or countries (CIS2 for Denmark and Finland: Leiponen, Drejer 2007). Meanwhile, this paper presents the findings based on 60 innovation variables, 12 core and 19 additional sectors. The total sample size equals 127,674 enterprises.

The innovation variables were subject to EFA. First, factor analyses were carried out individually at the country level. The average factor loading of a variable represented how important the variable was for the whole taxonomy of innovation strategies in each country. Thus, a new sample consisting of 60 variables (i.e. average factor loadings) across 16 countries (Bulgaria (BG), Cyprus (CY), the Czech Republic (CZ), Germany (DE), Estonia (EE), Spain (ES), Hungary (HU), Ireland (IE), Italy (IT), Lithuania (LT), Latvia (LV), Norway (NO), Portugal (PT), Romania (RO), Slovenia (SI) and Slovakia (SK)) was obtained. Again, EFA was performed; principal component analysis was used as an extraction method, Varimax rotation with Kaiser normalisation was used as a rotation method. During EFA, missing values were replaced by means in order not to exclude from the analysis countries with at least one missing value.

The appropriateness of principal component analysis requires the KMO MSA be greater than 0.5 for individual variables as well as for the set of variables. It also requires the probability associated with Bartlett's test of sphericity to be less than the level of significance  $p = 0.05$ . Hence, informed post hoc tests were performed to validate the results. In addition, communalities were estimated. These represent the proportion of the variance in the original variables accounted for by the factor solution, meaning that the communality value for each variable should be 0.5 or higher. The obtained solutions were verified for the proportion of variance explained: the cumulative proportion of variance criterion was met when it explained 60% or more of the total variance. The solutions were also examined for internal consistency within each component. Cronbach's alpha was used to measure this consistency with a value 0.6 or higher the minimum acceptable level. Ultimately, the obtained solutions were also verified for the absence of outliers and if their elimination from the sample did not alter the composition of emerged innovation strategies. The more detailed methodology and statistical results (i.e. for each of the six emerged strategies) are presented in my previous works (Stankevice 2013a, 2013b; Stankevice 2014).

What makes this paper original is its focus on KM activities as integral parts of the innovation strategies. Even though innovation strategies are the key elements of the research, the paper is concerned with which KM practices contribute to the emergence of the most sophisticated innovation strategies and how KM, via the innovation strategies, is related to firm performance. Hence, first, the innovation strategies were assessed and KM practices incorporated into them were discussed. And second, the innovation strategies were ranked from the least to the most sophisticated. Here, an assumption was made that the more an innovation strategy was related to firm performance, the more sophisticated it was. In KM literature, organisational performance is associated with the achievement of a number of strategic and financial goals (Makore, Eresia-Eke 2014). Regrettably, CIS8 dataset that was used in my research provides little information about firm performance, and therefore, two available firm performance indicators were used to measure firm performance: total turnover and expenditure on innovation. To rank the innovation strategies in accordance with firm performance, correlation analysis between the given variables and the factor scores of strategies was employed.

Based on even newer CIS data (CIS10), the findings were enriched by including methods stimulating new ideas and creativity: brainstorming sessions, financial incentives for employees to develop new ideas, job rotation of staff, multidisciplinary or cross-functional work teams, non-financial incentives for employees, and training employees on how to develop new ideas or creativity. All innovative enterprises from 24 European economies (Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Hungary, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Sweden, Turkey) and innovation core sectors (according to NACE Rev. 2, they correspond to B-M71) were included into the sample. From the publicly available aggregated data provided by Eurostat it is not possible to identify whether a same enterprise provided several positive answers at a time. However, 'yes' to the given methods as being good in stimulating new ideas or creativity sounded 258,668 times.

For further analysis of methods stimulating new ideas and creativity, rates as opposed to numbers were used in order to make the countries comparable. Hierarchical cluster analysis and dendrogram (Ward's methods, Squared Euclidean distance) let us to visually identify countries-outliers (Cyprus, Luxemburg, Italy and Sweden) and the most appropriate

number of clusters, i.e. 2. Based on the data from the remaining countries, 2-means cluster analysis was performed in order to distribute the countries into groups. ANOVA table showed the result to be reliable ( $p = [0.000; 0.016]$ ), except job rotation of staff that by both groups was almost equally considered as a method stimulating new ideas or creativity ( $p = 0.428$ ). Ultimately, the country clusters were interrelated with the previous findings.

#### 4. Innovation strategies and their KM practices

Let us explore the first innovation strategy that is referred to as semi-open, knowledge-intensive leadership innovation strategy (IS01). It:

- is aimed at improving communication and information sharing, and reducing labour costs per unit output (*objectives of innovation*);
- includes innovating products and/or processes (*targets of innovation*);
- sources knowledge from universities or other higher education institutions, and competitors or other organizations in the same industry, and received funding from FP6 or FP7 (*foundations of innovation*);
- includes continuous engagement in intramural R&D (*pace/scope of innovation*).

Hence, firms that embark onto IS01 are continuously engaged in intramural R&D and networking. One can conclude that, by means of collaboration with universities or other higher education institutions, firms engaged into IS01 are not in severe shortage of well educated and skilled workers. Besides, university-industry-competitor collaboration and are popular topics, especially in emerging countries (e.g. Brazil in Medeiros Rocha's et al. 2012 study or Turkey in Temel's et al. 2013 study) and SMEs (Hemert, Nijkamp, Masurel 2013). Moreover, Spithoven (2013) found that registering patents (as opposed to out-licensing) depended strongly on R&D staff having a doctoral degree. Let us explore the next assessed innovation strategy – expansive, marketing-intensive leadership innovation strategy (IS02). It:

- is aimed at entering new markets and, to a lesser extent, increasing capacity for producing goods or services (*objectives of innovation*);
- includes developing new methods of pricing goods or services, and new methods of workplace organization (*targets of innovation*);
- sources knowledge from government or public research institutes (*foundations of innovation*);
- includes developing innovations that are new to the market (*pace/scope of innovation*).

Hence, IS02 invokes marketing innovations. Interestingly, Drechsler et al. (2013) demonstrate “that the relationship between marketing capabilities and innovation performance is generally mediated by the decision influence of marketing on NPD [new product development]. In particular, both marketing research quality and the ability to translate customer needs into product characteristics serve to increase marketing's influence on NPD. This increased influence, in turn, positively contributes to overall firm innovation performance.” (p. 298). In IS02, marketing capabilities are coupled with organisational innovation: firms introduce new methods of organising work responsibilities and decision making, such as the first use of a new system of employee responsibilities, teamwork, decentralization, the integration or de-integration of departments or education/training systems.

Another marketing-related innovation strategy is product marketing- & scale-based follower innovation strategy (IS03). It:

- is aimed at replacing outdated products or processes, improving the quality of goods or services and increasing their range, and introducing products to new customer groups (*objectives of innovation*);
- includes the development of new media or techniques for product promotion, and new methods of organising external relations (*targets of innovation*);
- sources knowledge from professional conferences, trade fairs, meetings, etc., and engages in training for innovative activities (*foundations of innovation*);
- includes cooperation with other enterprises or institutions in process development and innovations that are new at firm level (*pace and scope of innovation*).

The results illustrate also that innovations in case of IS03 are more new-to-firm than new-to-market. Firms look for leftover markets and customer groups in order to realize their production because the major target markets and customer groups are lead by other firms. The major obstacles to organisations in becoming leaders in existing markets is that they lack a wider range and better quality of goods or services and do not always replace outdated products or processes in a timely manner. Similarly, Paananen (2012) argues that firms constrained by finance tend to search for innovation knowledge both internally (e.g. training) and externally (e.g. professional conferences, trade fairs).

One more innovation strategy to discuss is process- & cost-oriented incremental innovation strategy (IS04). It:

- is aimed at improving ability to develop new products or processes (*objectives of innovation*);
- includes the introduction onto the market of a new or significantly improved logistics, delivery or distribution system (*targets of innovation*);
- sources knowledge from clients or customers, suppliers of equipment, materials, etc., receives public funding for innovation from the EU, but not local or regional authorities, and includes engagement in the acquisition of external knowledge, machinery, equipment and software (*foundations of innovation*);
- includes the production of products that were developed originally by other enterprises or institutions and are new at firm level (*pace/scope of innovation*).

However, Guisado-González et al. (2013) find that the acquisition of machinery has a statistically significant negative impact on innovation performance. Hence, when firms lack the ability to develop new products or processes, they engage in the acquisition of external knowledge, such as the purchase or licensing of patents and non-patented inventions, know-how and other types of knowledge. The present findings demonstrate that market sources, such as those from customers or suppliers, provide more information for new innovation projects or better contribute to the completion of existing ones. In other words, local sources of information and direct ties prevail. However, these sources have negligible impact on firm performance and are not strong predictors of innovative performance (Kafouros, Forsans 2012; Kesidou, Snijders 2012). Another estimated finding to discuss is transformative, strategic innovating (IS05) that is mostly oriented towards organisational innovation. It:

- is aimed at reducing labour costs per unit output, increasing market share, improving flexibility for producing goods or services, and, to a lesser extent, increasing capacity for producing goods and services, improving communication or information sharing and the quality of goods or services, and entering new markets (*objectives of innovation*);
- includes the implementation of new business practices for organizing work or procedures (targets of innovation);
- foundations of innovation depend on the innovation strategy (-ies) that are concomitant with IS05;
- pace/scope of innovation depends on the innovation strategy (-ies) that are concomitant with IS05, but new-to-market innovations prevail.

Interestingly, incentives implemented by many firms in order to embark on other innovation strategies can be associated with IS05. This insight is also supported by the recent findings of Trigo (2013). Based on the analysis of 10 innovation types and five innovation activities, a taxonomy composed of two R&D-intensive and two non-R&D-intensive clusters is proposed. The findings indicate that organisational innovations count for three of the four proposed clusters, with “the new management techniques being the most common organisational innovation in all clusters” (Trigo 2013, p. 46). This result is also consistent with previous findings that show that a synergy of organisational and non-organisational innovations results in better economic performance (Battisti, Stoneman 2010; Filippetti 2011).

Finally, the empirical findings point to the existence of one more innovation strategy, i.e. responsive, service-oriented innovation strategy (IS06). It:

- is aimed at reducing time to respond to customer or supplier needs (*objectives of innovation*);
- includes introducing onto the market a new or significantly improved service (*targets of innovation*);
- sources knowledge for innovation from consultants, commercial labs or private R&D institutes and is not sponsored by local or regional authorities; it includes such activities as feasibility studies, testing, routine software development, tooling up, industrial engineering, etc. (*foundations of innovation*);
- includes processes that were originally developed by other enterprises or institutions (*pace/scope of innovation*).

Hence, the major concern of IS06 is reducing time in order to better respond to customer or supplier needs. Bettencourt and Brown (2013), who investigated the service innovations of product-dominant companies, also concluded the following: “As such, the primary goal of a product-dominant company seeking service innovation should not be to innovate service. Rather, it should be to help customers get a specific job done better or to help them get more jobs done” (p. 277). It is also interesting that IS06 relies on either internal or globally distributed sources of information, with some recent findings (Doran, Jordan, O’Leary 2012) showing this pattern to be effective.

### 5. KM and firm performance: Any patterns?

Based on the correlations of the factor scores of emerged innovation strategies with firm turnover and expenditure on innovation (i.e. measures of firm performance), the strategies can be ranked as following (Stankevica 2013a, 2014):

- Most sophisticated: semi-open, knowledge-intensive leadership innovation strategy;
- Sophisticated: expansive, marketing-intensive leadership innovation strategy;
- Medium-sophisticated: process- & cost-oriented incremental innovation strategy and transformative, strategic innovating;
- Less sophisticated: responsive, service-oriented innovation strategy;
- Least sophisticated: product marketing- & scale-based follower innovation strategy.

Accordingly, KM practices, as inner components of the innovation strategies, can be ranked by the degree by which they contribute to better firm performance (Table 1). In the table, the KM activities are coloured according to the degree of sophistication of the innovation strategies where the KM activities are used as their inner component: the darker the colour, the higher the degree of sophistication.

**Table 1:** KM practices and firm performance

	Higher firm performance	Medium firm performance	Lower firm performance
KM aimed at technological / product / process innovations 	<b>IS01:</b> continuous engagement in intramural R&D; sources of knowledge from universities other higher education institutions; sources of knowledge from competitors or other enterprises in the same industry	<b>IS04:</b> acquisition of external knowledge, machinery, equipment and software knowledge for innovation from clients or customers, suppliers of equipment, materials, etc.	<b>IS06:</b> knowledge for innovation from consultants, commercial labs or private R&D institutes feasibility studies, testing, routine software development, tooling up, industrial engineering, etc.
	<b>IS02:</b> new methods of pricing goods or services new methods of workplace organisation sources of knowledge from government or public research institutes	<b>IS05:</b> new business practices for organising work or procedures	<b>IS03:</b> new media or techniques for product promotion training for innovative activities sources of knowledge from professional conferences, trade fairs, meetings, etc.
KM aimed at organisational / marketing innovations 			
	new-to-market innovations ←————→		new-to-firm innovations

As Table 1 indicates, KM activities that are used to produce technological, product and/or process innovation, more often than not, contribute to the production of new-to-market innovations and to better firm performance more than KM activities employed for organisational or marketing innovations. Product-, process- and/or technology-oriented KM activities include continuous engagement in R&D, acquisition of external knowledge, machinery, equipment and software, and feasibility studies, testing, routine software development, tooling up, industrial engineering, etc. On the other hand, marketing- and organisation-oriented KM activities include the development of new methods of pricing goods or services and new media or techniques for product promotion, workplace organization, new business practices for organising work/procedures, as well as training for innovative activities.

However, this distinction concerning “hard” or “soft” KM orientation and new-to-market or new-to-firm innovations is rather conditional. For example, the most sophisticated innovation strategy (IS01) includes improving communication and information sharing, i.e. organisational innovations; IS02, the second most sophisticated innovation strategy, is predominantly based on marketing and organisational innovations, but it is more sophisticated than IS04 or IS06 and conditions better firm performance; IS05 that is based on organisational changes better contributes to firm performance than IS06 that includes feasibility studies, testing, routine software development, tooling up, industrial engineering, etc. In general, one could agree with the statement that the synergy of technological and non-technological innovation activities is concomitant with firm performance and that firms that introduce complex innovation strategies show better economic performance (Frenz, Ietto-Gillies 2009; Battisti, Stoneman 2010; Filippetti 2011; Hollen, Van Den Bosch, Volberda 2013).

Figure 1 illustrates factor scores of the emerged innovation strategies in the sample economies. The scores vary from -3 to +3 (0 = average). The factor scores, in turn, indicate the extents of the strategies in the countries. Hence, the greater a factor score of a strategy in a country, the greater the strategy’s extent in that country, i.e. a greater number of organisations embark onto this strategy. As mentioned above, different innovation variables constitute the obtained factor solutions: the variables related to the objectives of innovation activity, the variables related to the pace and scope of innovation, the variables related to KM practices for innovation, etc. Thus, each innovation strategy incorporates KM practices typical of it. Therefore, the extents of innovation strategies in the CIS8 countries represent the extents of different sets of KM practices as well.

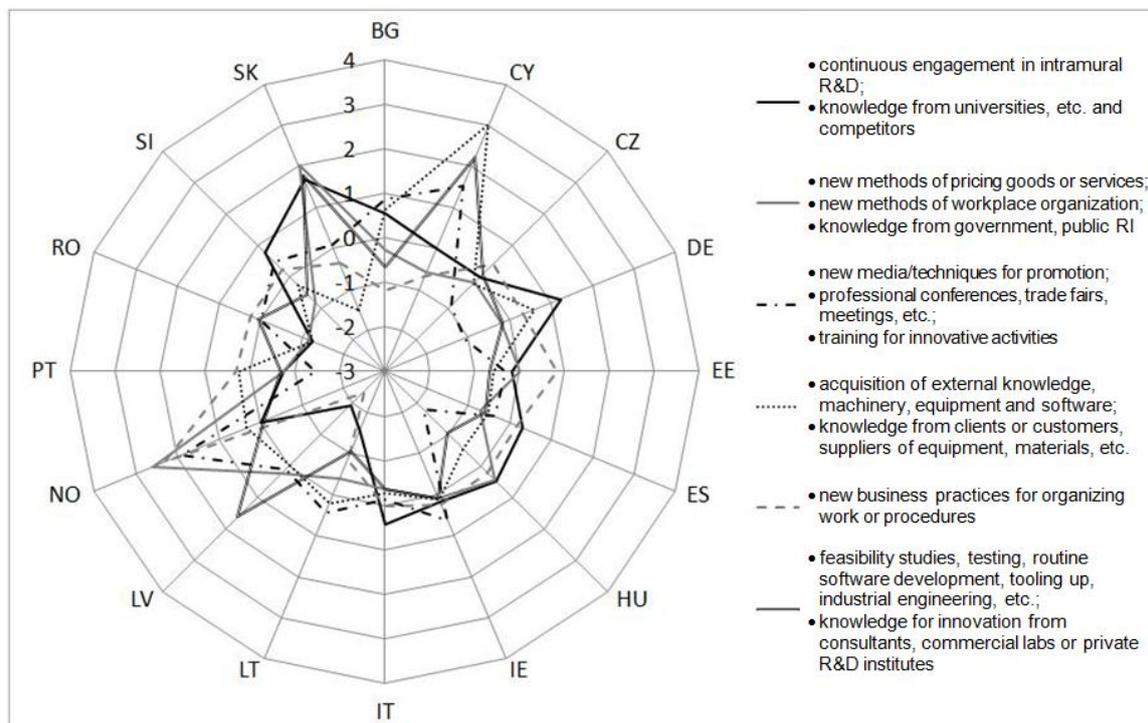


Figure 1: KM practices across CIS8 countries

As Figure 1 indicates, the sample countries include varied innovation strategies and, consequently, varied KM practices at a time. It is important to note that KM practices that are associated with better firm performance (i.e., IS01 or IS02: continuous engagement in intramural R&D, new methods of pricing goods or services, new methods of workplace organisation, etc.) can also be associated with more economically and institutionally advanced economies (e.g. Germany, Norway), if to rely on the terminology of the varieties of capitalism. On the other hand, KM practices that are associated with poorer firm performance (IS03 or IS06: training for innovative activities, participation in conferences, trade fairs, etc., private consultations, feasibility studies, etc.) are mostly observed in less advanced economies (e.g. Romania, Latvia).

However, this distinction is also conditional. For example, in addition to the high factor scores on IS02-related KM practices, Norway also scores high on the medium competitive KM practices, such as new business practices for organising work or procedures. These business practices relate to IS05 innovation strategy that was estimated to be medium-competitive. Similarly, Ireland scores highest on new media or techniques for product promotion and training for innovative activities that both relate to the least sophisticated KM practices (IS03 innovation strategy).

On the other hand, Slovakia, a less developed European economy, scores very high on the most sophisticated KM practices (KM practices related to IS02 and IS01 innovation strategies), and Slovenia scores high on continuous engagement in intramural R&D (an integral part of IS01 innovation strategy). This means that organisations are not always restricted by their dominant imperfect institutional environments and can find a strategic leeway towards more competitive KM practices that result in greater innovativeness.

To sum up, beyond some general conditional observations, there is no consistent cross-country KM-for-firm-performance pattern typical of more or less institutionally and economically advanced economies.

## 6. Methods stimulating new ideas and creativity

According to the methods that innovative enterprises considered being successful in stimulating new ideas or creativity, two groups of countries emerged. The first group included Belgium, Estonia, Finland, France, Ireland, Malta, Netherlands, Norway, and Slovenia. The second group included Bulgaria, Croatia, Czech Republic, Hungary, Lithuania, Poland, Portugal, Romania, Serbia, Slovakia, and Turkey. Once again, with a few exceptions, the groups can be traditionally recognised as more developed economies in the first case, and as less developed economies in the second case. Interestingly, opinions about the success of methods that stimulate new ideas or creativity differ across the clusters as well. This is illustrated by Figure 2.

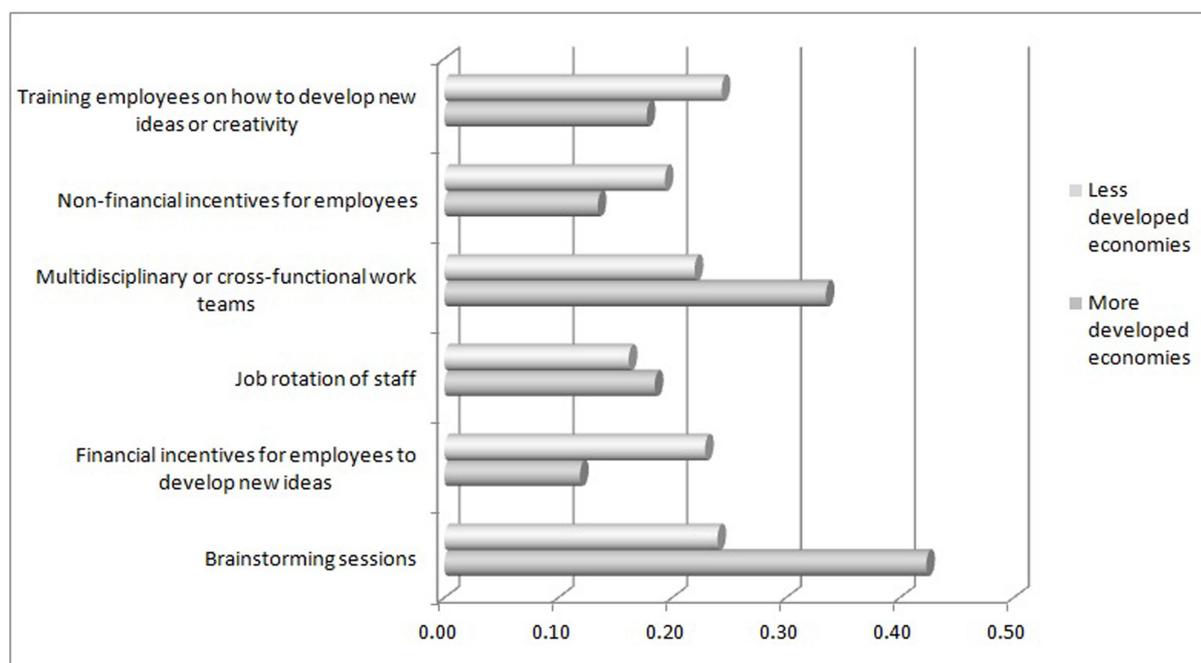


Figure 2: Methods stimulating new ideas or creativity

Figure 2 illustrates that, on average, less than 20% of all the sample countries consider job rotation of staff as successful method stimulating new ideas or creativity, and there are no significant differences ( $p = 0.428$ ) between the two groups. It is also clear that non-financial incentives for employees are less popular methods stimulating creativity: on average, less than 20% of enterprises support such opinion in both groups; however, enterprises in latecomer economies are more prone to stimulating creativity by non-financial means than the ones in developed economies.

Further, greater differences between the two groups should be noted. In countries that are recognised as less developed, all methods of stimulating new ideas or creativity are evaluated almost equally, and four out of six methods fall into the range between 20-25% (on average). On the contrary, enterprises in more developed economies rely much more heavily on multidisciplinary or cross-functional work teams (on average, 33,52% of enterprises in the group find this method successful) and brainstorming sessions (on average 42,35% enterprises consider this method successful in stimulating new ideas or creativity).

The difference in attitudes to financial incentives is also impressive and equals 11% on average - enterprises in latecomer economies tend to promote financial motivation to employees more actively. Different trainings are also quite commonly acknowledged in less developed countries as successfully stimulating new ideas. Besides, precisely employee trainings and financial incentives can be associated with greater corruption and money laundering rates in the given less developed economies.

To sum up, the key distinction between the two groups is that enterprises from more developed economies put greater effort into methods that promote knowledge sharing and exchange, such as brainstorming and multidisciplinary or cross-functional teamwork. Contrarily, enterprises from less developed economies rely on methods that are based on individual rewards for new ideas or creativity (e.g. financial and non-financial incentives), or on knowledge-input methods (e.g. employee training) without being sure about outputs.

## 7. Discussion

KM practices that contribute to the best firm performance inevitably include continuous engagement in intramural R&D. Moreover, they are combined with collaboration between private and public sectors, between industry and science, and with competitors, thus reconfirming the significance of *open innovating*. The importance of knowledge sharing and learning is also supported by the methods considered successful in stimulating new ideas or creativity. They are predominantly oriented at learning, cross-fertilisation of knowledge and knowledge sharing. However, typically, the extent of the given KM practices is less in less advanced economies, such as Romania, Latvia or Lithuania. Currently, these competitive innovation activities and KM practices are enhanced by external funding from the EU and participation in FP6, FP7, Horizon 2020, etc. Some countries, i.e. Bulgaria, have much benefited from the given framework programmes. However, one might question whether innovation strategies based on continuous intramural R&D can remain sustainable in these countries without the external funding from the EU.

The next most sophisticated KM activities are the ability to introduce new methods of pricing goods or services and new methods of workplace organisation. They are the inner parts of the expansive, marketing-intensive leadership innovation strategy. The given KM practices are rather uncommon in the investigated economies, except Norway, Slovakia and, to a lesser extent, Hungary. Actually, the informed KM practices could be seen as highly dependent on internal sources and especially on marketing competence. On the other hand, the marketing capabilities are supported by strong local R&D infrastructure that provides knowledge for marketing and organisational innovations. For example, in 2011 and 2012, the Budapest Winter Invitation promotion – with EUR 1 million – welcomed the application of hotels for a joint partnership in order to enhance winter tourism of Budapest.

Further, KM practices that are a part of medium-sophisticated innovation strategies can include acquisition of external knowledge, machinery, equipment and software, as well as new business practices for organising work or procedures. In other words, such innovation strategies are focused on learning and accumulation of knowledge, innovations are developed by others. Thus, innovations resulting from such learning are typically more new-to firm than new-to-market, except the introduction onto the market of new or significantly improved logistics, delivery or distribution systems. Besides, acquisition of external knowledge, machinery, equipment and software is often aimed at the reduction of costs and the maintenance of existing positions more than innovating. Therefore, the informed KM practices are medium-competitive. It is also interesting to note that the implementation of new business practices is concomitant with acquisition of knowledge or machinery in better-off countries, such as Germany or Portugal, thus meaning that, again, complex innovations benefit from strong innovation infrastructure.

Ultimately, KM practices that little contribute to better firm performance are of two types. In service-oriented enterprises, feasibility studies, testing, routine software development, tooling up, industrial engineering, etc. are quite common (e.g. in Latvia, Cyprus). Consultants, commercial labs or private R&D institutes help to implement the informed KM activities. On the other hand, production- and/or trade-oriented enterprises concentrate on new media or techniques for product promotion (e.g. in Norway, Cyprus, Ireland, Slovenia). However, in this case, innovations are new-to-firm more often than new-to-market. Usually, new-to-firm ideas are found at professional conferences, trade fairs, meetings, etc., and enterprises engage in trainings for innovative activities as well. However, the enterprises are typically constrained financially to embark onto KM activities that better contribute to excellent firm performance, e.g. R&D.

An economy may include varied KM practices at a time, with different levels of firm innovativeness and strength of contribution to firm performance. However, one should note that strong internal competence of enterprises, be it R&D in a certain field or unique marketing competence, coupled with strong R&D infrastructure and with networking, is most likely to become a success story. Therefore, organisations may be recommended to engage into continuous R&D and to build a strong marketing competence. Alternatively, organisations with intense R&D effort may want to establish a network with organisations characterized by strong marketing capabilities. On the other hand, policymakers may be recommended to further invest into the development of national or regional innovation infrastructures. As the results indicate, the most sophisticated KM practices and the most competitive innovation strategies require strong research infrastructure and effective mechanisms aimed at fostering innovation.

It is also important to note that KM activities which are used to produce technological, product or process innovations contribute to the production of new-to-market innovations and to better firm performance more often than KM activities employed for organisational or marketing innovations. More often than not, this could be explained by a greater added value of technological innovations. However, this trend is based on a generalised observation of the results and could not be confirmed in each and every case. For instance, expansive, marketing-intensive leadership innovation strategy (marketing innovations predominate) better contributes to firm performance and its innovativeness than process- & cost-oriented incremental innovation strategy (process innovations predominate). Hence, whether KM activities are new-to-firm or new-to-market depends on an innovation strategy in which they are integrated.

## 8. Conclusion

Cross-country KM pattern typical of more or less institutionally and economically advanced economies is not very consistent. Typically, the extent of the given KM practices is less in less advanced economies. However, an economy may include varied KM practices at a time, leading to varied organisational performance. This paper has indicated the most typical sets of KM practices across European economies, as well as which of them are associated with the best firm performance and vice versa. Hence, the presented results could be used as a guideline for further KM and innovation development. Further research on the dynamics of KM practices and innovation strategies is also attractive for a scientific mind.

Concerning new-to-market as opposed to new-to-firm pattern, it is important to note that product or process innovations better contribute to the production of new-to-market innovations and higher firm performance than other innovation types. However, more often than not, the success of product and process innovations depends on what KM practices they are combined with and what methods stimulating new ideas and creativity are used alongside. Therefore, for organisations, it is important to be able to design a competitive mix of KM practices, be they aimed at organisational innovations, product innovations, technological innovations, etc., or, preferably, several at a time.

Probably the most important insight of this paper is that it highlights the importance of being open. The most sophisticated innovation strategies include collaboration between private and public sectors, between industry and science, between different industrial sectors, and with competitors. In addition, the most potentially successful methods stimulating new ideas and creativity are also based on knowledge creation and exchange during brainstorming sessions, mutual and collective learning, knowledge decomposition and knowledge re-engineering, and new applications of knowledge due to multidisciplinary or cross-functional teamwork.

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