Sofia N. Paklina, Mariia A. Molodchik, Carlos Jardon

STRATEGIC BEHAVIOR OF RUSSIAN COMPANIES WITH REGARD TO INTANGIBLES

Sofia N. Paklina[1], Mariia A. Molodchik[2],

Carlos Jardon[3]

STRATEGIC BEHAVIOR OF RUSSIAN COMPANIES WITH REGARD TO INTANGIBLES[4]

This paper explores strategic behavior of Russian companies with regard to intangible resources and its link to different types of performance. Additionally, the study addresses the question, whether companies in intangible-intensive profiles have specific characteristics in terms of industry, size, company age and type of ownership. Following intellectual capital view, the study provides a cluster analysis considering four attributes: human resources, innovative capabilities, information and communications technology (ICT) capabilities and relational capital. Analysis of more than 1,000 Russian public companies over the period 2004-2014 reveals three profiles of strategic behavior considering the employment of intellectual resources. The majority of Russian public companies (60%) follow the non-intensive intangible strategy. Only 13% of companies constitute the intangible-intensive profile having endowment of all intellectual resources higher than the sample average. The rest 27% of companies also persuade the intangible-intensive strategy with the focus on innovative capabilities.

JEL Classification: L10, O30, G30.

Keywords: intangibles, intellectual capital, strategy, strategic group, cluster analysis, Russian companies, performance.

[1] National Research University Higher School of Economics, International laboratory of Intangible-driven Economy, Research Fellow; E-mail: snpaklina@edu.hse.ru

[2] National Research University Higher School of Economics, Professor on Knowledge Management; International laboratory of Intangible-driven Economy, Senior Research Fellow; E-mail: mmolodchik@hse.ru

[3] University of Vigo, Professor of Econometrics; National Research University Higher School of Economics and at the International Laboratory of Intangible-driven Economy, Leading Research Fellow; E-mail: cjardon@uvigo.es

Introduction

Studying the sources of performance differences is one of the central topics in strategic management field (Anwar and Hasnu, 2016). The mainstream thinking of last decades presented by Barney et al. (2001) and Teece (2000) highlights the power of resource heterogeneity and the importance of managers possessing a firm capability to organize these resources. The latter issue raises the question whether each company has a unique strategy for resource employment or there are groups of companies which possess a similar strategic configuration. The first type of rent creation considers company specific competencies as a source of performance differences, while the second determines strategy specific competencies as a key for outperforming the rivals. This study follows the second approach named strategic group theory.

Strategic group theory proposes a framework for investigating clusters of companies appeared due to similar strategic behavior. The leading contribution to strategic group inquiry includes the typology of Miles et al. (1978) and business strategies proposed by Porter (1980). In the history of new economy, intangibles have been thought of as one of the key factors in the company's activity. Transition from heavy industry to a new technology based economy is accompanied by increasing role of such intangible resources as brands, intellectual property, know-how and copyrights. The intellectual capital based-view suggests that intangible assets are important for the competitiveness of firms, so the competitive strategies should be based on intangible assets (Reed et al., 2006).

Recent work by Shakina and Barajas (2015) develops a company typology with regard to intangible resources claiming that the intangible intensive profile allows outperforming the competitors. Shakina and Barajas (2015) empirically justified three types of intangible intensive strategy: innovative, conservative and moderate profiles. Despite the fact that intangibles are identified as the criteria for companies' typology and three profiles are revealed, there is a room for investigating strategic groups with regard to intangible resources.

The purpose of this study is to reveal and examine the groups of Russian public companies that follow specific strategies concerning the employment of intangibles. The authors attempt to answer the question whether there are clusters of companies with similar strategic behavior with regard to intangible resources in Russian business context; and if so, whether such types of behavior are awarded by superior performance or not. Revealing clusters with regard to intangibles by estimating more than 1,000 public Russian companies over 2004-2014 years, the paper contributes to the empirical justification of strategic group theory. Moreover, linking

established strategic groups with performance this study provides implications for managerial decisions and policy makers.

As a transition economy, Russia seems to be interesting context for investigating the strategic behavior of companies concerning intangibles. During the last century, USSR was one of the world leaders by the number of inventions; however, the successful implementing of novel ideas and technologies requires favorable infrastructure meaning stable economic situation and enforceability of intellectual property protection. Some scholars emphasize the misbalance of accumulated innovation potential and poor efficiency of its fulfilling in modern Russia that complicates building a new economy based on innovation and knowledge (Gokhberg and Roud, 2016; Klochikhin, 2012). Russian government enforces different policies aimed to reverse this trend, in particular, to encourage Russian companies to allocate intangible assets more efficiently. This indicates a need to consider whether there are strategic groups of Russian companies with regard to intangibles; and if it is the case, how different strategies concerning intangibles influence companies' performance.

Although some research has been carried out on the employment of intangible resources in Russia, almost all of them focus only on the one particular type of intangibles. So far, too little attention has been paid to the investigation of Russian companies' behavior concerning the complex allocation of various intangibles. This study is aimed to fill this gap.

The rest of the paper is organized as follows. Firstly, theoretical background of strategic group approach and its special focus to intangible resources is introduced. Next section presents Russian business environment as an interesting case for deriving intangible based strategic groups. Further, the authors justify research design and methodology used in the study. Database description and analysis constitute empirical part of the paper. Last two sections are devoted to results and conclusions.

Theoretical background

Strategic group theory and typologies

Strategic group approach implies identifying the clusters of companies that follow similar business strategies. In the context of the Resource-based view (RBV) framework, some scholars conduct strategic group analysis that considers the firm heterogeneity as the leading determinant of performance differences. Porter (1980) defined strategic group as a group of firms following the same or a similar strategy along the relevant strategic dimensions. This definition provides at

least three companies' competencies that allow gaining competitive advantages: Industry, Strategy-Specific and Firm-Specific Competencies (Tallman and Atchison, 1996). The analysis of strategic groups has contributed to the consideration of the relationship between various strategies and firms' performance.

Paper by Miles et al. (1978) introduces the idea that every company moves through the adaptive cycle and solves the entrepreneurial (product-market domain, growth policy, etc.), engineering (technological objectives and technological scope) and administrative (organizational structure and control) problems. On the basis of how companies deal with these problems Miles et al. (1978) proposed the following typology of organizations: Defenders, Analyzers and Prospectors. These strategies determine the ways companies are marketed, organized and managed. Having said that, it has been demonstrated that companies with hybrid strategies outperform those that follow one specific strategy (Anwar and Hasnu, 2016). This study contributes to existing knowledge about strategic behavior of Russian companies with regard to intangibles by analyzing strategies concerning various combinations of intangible resources.

Intangibles: definition and measurement

In recent years, there has been an increasing amount of literature on intangibles and related topics; however, there is still no clear agreement on the nature of intangibles and its strategic management among scholars. While a variety of definitions of the term 'intangibles' have been put forward, this paper will use the definition suggested by Kristandl and Bontis (2007) who saw it as 'strategic firm resources that enable an organization to create sustainable value, but are not available to a large number of firms'. Authors argue that intangibles might bring future benefits to the company if these resources are not or hardly imitable by its competitors. This study follows Edvinsson's approach (2002) and considers four types of intangibles: human capital, customer, innovation and process capital. Figure 1 presents the hierarchical structure of intangible resources according to Scandia navigator.
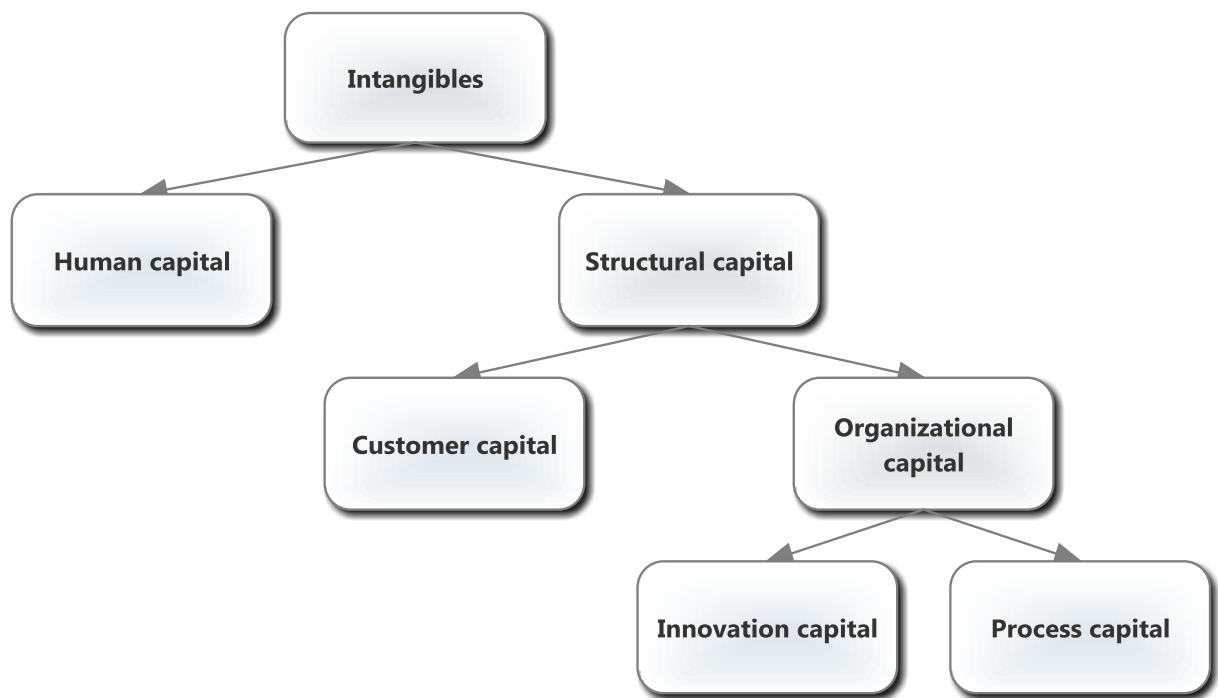
Fig. 1. Types of intangible resources (Edvinsson, 2002)

Edvinsson (2002) considers human capital as competencies, skills and other abilities of employees. Structural capital consists of customer and organizational capital. The former is comprised of relationships with various agents: suppliers, customers and allies. Organizational capital includes both innovative capabilities (patents, intellectual property, trademarks, etc.) and process capital (business processes, computer networks and software, etc.). This study considers intangibles in four dimensions: human capital, information and communications technology (ICT) capabilities, innovative capabilities and relational capital.

This definition and classification implicitly comes from the Resource-based view that was formulated by Barney (1991). RBV implies that a firm can gain the competitive advantage through putting both tangible and intangible resources to its proper use. The basic idea of this approach is that the value of a company arises not from the external factors such as economic situation, but from internal features of a company (Wernerfelt, 1984; Peppard and Rylander, 2001). That is why if companies are willing to be competitive they should develop some strategy concerning the use of tangible and intangible resources.

Several studies have attempted to examine strategy-specific competencies with regard to intangibles (Nickerson et al., 1998; Marr, 2005; Rexhepi et al., 2013). Recent study by Shakina and Barajas (2015) analyzes more than 1,600 European companies from 2004 to 2011 and employs PCA to reveal the coordinates of intangibles in which strategic profiles are found. As a

result, authors identified three strategic profiles: innovative, conservative and non-intangible-intensive profiles.

Intangible based strategic group and performance

Intangible resources are recognized theoretically and empirically as drivers of competitiveness due to their specific nature that makes them valuable, rare, inimitable and nonsubstitutable (VRIN). Many studies have considered how companies' strategic use of intangibles relates to its performance in the context of both developed and developing countries. A number of studies on mature economies have found that there is an unambiguous positive relationship between intangible-intensive behavior and performance. With a foundation of RBV approach, Riahi-Belkaoui (2003) analyzed 81 US multinational firms and confirmed the hypothesis about significant and positive impact of intangibles on firms' performance. In 2005, Chen et al. employed the Value Added Intellectual Coefficient (VAIC) framework with regard to Taiwanese listed companies and found the positive reciprocity between intangibles and firms' market-to-book value ratios (Chen et al., 2005). Similar findings were noted for German (Bollen et al., 2005), Australian (Clarke et al., 2011) and UK companies (Zéghal and Maaloul, 2010).

The analysis of the relationship between firm performance and intangibles in developing countries provides more contradictive results. In their empirical study, Firer and Mitchell Williams (2003) found out that intangibles still have no impact on profitability, productivity and market valuation of traded firms in South Africa. Alipour (2012) adapted the VAIC method to Iran insurance companies; however, the results are appeared to be the opposite. Regression analysis revealed the significant and positive relationship between Value added intellectual coefficient and companies' return on assets ratio.

Russian business environment as a context for strategic behavior

The effect of strategy-specific competence mentioned above was empirically investigated in the context of Russian companies. There are few papers concerning intangibles and strategic behavior of companies. More often researchers focus on how firms in Russia develop their innovation strategies. Gurkov (2004) provides a snapshot of current innovation behavior of Russian companies and puts industrial companies in four groups: companies that accomplish (1) marketing innovations and changes in human resource management practices; (2) changes in any

area of enterprise management; (3) changes in both products and technology and (4) only cosmetic changes in product mix.

Podmetina et al. (2011) classifies 150 Russian companies from a perspective of their strategies in acquisition and commercialization of technologies. It appeared almost a half of companies (40%) rely on their own R&D production. 51% and 9% of companies acquire technology from the external sources sometimes or on the regular basis respectively. Kuznetsova & Roud (2014) considers the relationship between competitiveness and innovation behavior of Russian companies. Four profiles of companies emerged: actively innovative companies (33%), developing new products (29%), organizational innovations and new approaches to marketing (23%) and multidimensional innovation (16%). Study by Gokhberg et al. (2015) describes seven different clusters of Russian companies based on various innovations effects for industrial companies during ten year.

Together these studies provide the important insights into the strategic behavior of Russia companies concerning their innovative capabilities. Relying on government activity aimed at innovation development and the findings of previous investigations, the authors *expect that there are strategic groups of Russian companies with regard to the use of intangibles.*

A number of authors have also examined how the use of intangibles influences the performance of Russian companies (Tovstiga and Tulugurova, 2009; Shakina et al., 2017). A recent study by Andreeva and Garanina (2016) demonstrates that structural and human capitals positively enhance such companies' performance indicators as intellectual enterprise value, price per share, revenue growth rate, share of new products in product line and return on sales. In view of all that has been mentioned so far, the authors *suppose that strategic behavior of Russian companies with regard to intangible resources significantly and positively influences companies' performance.*

Research design and methodology

Only few studies investigated intangible based strategic behavior and most of them were oriented to the empirical justification of strategy typologies. It appears challenging to propose a general approach for searching intangible based strategic groups. This study supposes that there are groups of Russian companies with similar strategic behavior with regard to intangible resources. Some companies might enhance some particular type of intangibles. For instance, there might be the companies that have an endowment of human capital higher than the average

and endowment of other types of intangibles can be at average level or less. In such case, we assume these companies follow human-centric strategy. Alternatively, some companies might have higher (or lower) levels of all intangibles than the average; hence, these companies are likely to be intangible-intensive (or generic).

In order to find out strategic groups empirically the authors use cluster analysis as an econometric tool. Organizing data into sensible groups is one of the most fundamental modes to understand and investigate strategic behavior of companies. A large body of studies were conducted using cluster analysis by grouping similar companies across the different dimensions. This study applies one of the most widely used algorithms for clustering, that is the K-means method independently proposed by Steinhaus (1956), Ball and Hall (1965), MacQueen (1967) and Lloyd (1982). This method uses centroids to automatically partition a data set into k groups by optimizing the squared error function (Ding and He, 2004).

K-means clustering has gain popularity because of its simplicity, efficiency and empirical success; however, there are certain drawbacks associated with the use of this technique. A major problem with the K-means clustering is that the number of clusters is set by a researcher. Determining the structure of clustered data appears to be complicated task without prior knowledge of the actual number of clusters. Another limitation of this approach lies in its assumptions: the clusters are expected to be spherical and of similar size, that is not always the case. Despite this, K-means clustering continues to be parsimonious technique and has been employed in many econometric studies.

To verify whether obtained clusters differ from each other we perform a multivariate test of means. This test compares means of variables used for cluster analysis across different profiles of companies and validates the statistical significance of differences between clusters.

Measurements of the study

For measurement of intangible resources, the authors use proxy indicators available in open sources and principal component analysis (PCA). Several studies provide the metrics for the elements of intangibles. Using structural equation modeling Molodchik et al. (2014) propose a subdivision of human, relational and structural capital into human resources capabilities, management capabilities, innovative capabilities, internal process capabilities, customer loyalty and reputation, and networking capabilities. Paper by Shakina and Barajas (2015) identifies the elements of intangible resources by employing PCA. The core idea of PCA is to convert a large

set of interrelated variables into a smaller number of uncorrelated variables called principal components, while maintaining as much as possible of the variation present in the data (Jolliffe, 2002). One advantage of the principal component analysis is that it allows avoiding any imposed taxonomy of intangibles. As was mentioned above, there are a lot ways to classify intangible resources; however, all of them remain artificial. In this study, we conduct PCA to reveal various dimensions with regard to intangibles and expect to consider companies' strategy through these dimensions.

One of the aims of this study is to examine how different profiles of Russian companies concerning intangibles are related to its performance. A variety of methods are used to assess company's performance. In this study, we refer to such performance indicators as return on assets, operating margin, turnover, productivity and Economic Value Added to Book value ratio.

Database and descriptive statistics

To serve the goals of this study we analyzed financial and operational information about more than 1,000 Russian public companies during the period from 2004 to 2014. The data was obtained from the companies' income and balance sheets statements, websites and other open sources. Various financial and non-financial indicators were extracted to evaluate intellectual capital of Russian public companies and reveal their strategies in the terms of intangibles management. Besides, the dataset consists of performance variables in order to consider the relationship between possible strategic behavior and achievements of companies.

Descriptive statistics

The final sample for the study includes information about 1,096 Russian public companies observations. The means, standard deviations, minimum and maximum values of the variables are shown in Table 1. The majority of companies in the database are classified as large (80%), while medium and small companies are 11% and 9% respectively. The average number of employees amounts to about 4,240 workers.

Considering various indicators of companies' human capital, we obtained that the average Russian public company in the sample spends about 7,630 euros per employee annually and only 2.4% of companies have a corporate university. Moreover, the board of directors of most companies usually consists of one third of directors who have postgraduate level

qualifications or more than 5 years' experience. As far as relational capital of the companies is concerned, almost a half of them participate in different business associations and every fourth company employs the foreign capital. The average Russian company in the sample owns about 12 subsidiaries.

In this study, information and communications technologies are represented through three indicators: Enterprise Resource Planning (ERP) systems implementation, the presence of intellectual capital (IC) or knowledge management (KM) strategy and the quality of companies' websites. The analysis of these indicators showed that 13% Russian public companies employ Enterprise resource planning system and almost 4% firms have a strategy concerning intellectual capital or knowledge management. Finally, we examined the factors that characterize the innovation behavior of Russian public companies. Most enterprises in Russia do not own any patents; in addition, on average Research and development (R&D) investments and intangible assets of public companies in Russia amount to 0.03% and 0.058% of company's book value correspondingly.

Tab. 1. Descriptive statistics

VARIABLES	Mean	Std. dev.	Minimum	Maximum
Common information				
Company age	30.749	35.694	0	303
Number of employees	4237.858	19375.63	1	456,000
Presence of state owners	2.8%	0.165	0	1
Book value	717.8	7,571	0	301,148
Company performance				
ROA	0.0411	0.128	-0.979	0.998
ROS	0.0741	0.203	-1.964	1.300
Turnover	1.2625	1.202	0	8.992
Productivity	0.0299	0.067	-0.779	0.992
EVA/BV	-0.0380	0.129	-0.979	0.696
Board of directors' qualification	0.920	0.694	0	2
Existence of corporate university	2.4%	0.154	0	1
Costs per employee (thou euros)	7.626	8.003	0.001	70
Relational capital				
Participation in associations	43.4%	0.496	0	1
Citation in search engines	2.963	1.516	0	7
Employment of foreign capital	25.6%	0.437	0	1
Number of subsidiaries	12.39	23.97	0	347
Advertising expenses to Sales	1.531	0.450	1.373	6.342

ICT

ERP systems implementation	13%	0.337	0	1
IC or KM strategy	3.87%	0.193	0	1
Site quality	2.105	1.131	0	4

Innovation capital

Number of patents	17.88	103.2	0	3,290
R&D investments to BV	0.000305	0.00165	0	0.0143
Intangible assets to BV	0.005796	0.02567	0	0.2126

All financial indicators are in mln euros unless stated otherwise.

Figure 2 represents the distribution of Russian public companies among various industries. The majority of companies are involved in electricity, gas, steam and air conditioning supply (12.6%). Other most frequent industries of Russian companies are financial services (8.8%) and construction of buildings (8.3%). More rarely Russian companies manufacture textile (0.5%) and furniture (0.8%) and provide other personal services (0.9%).
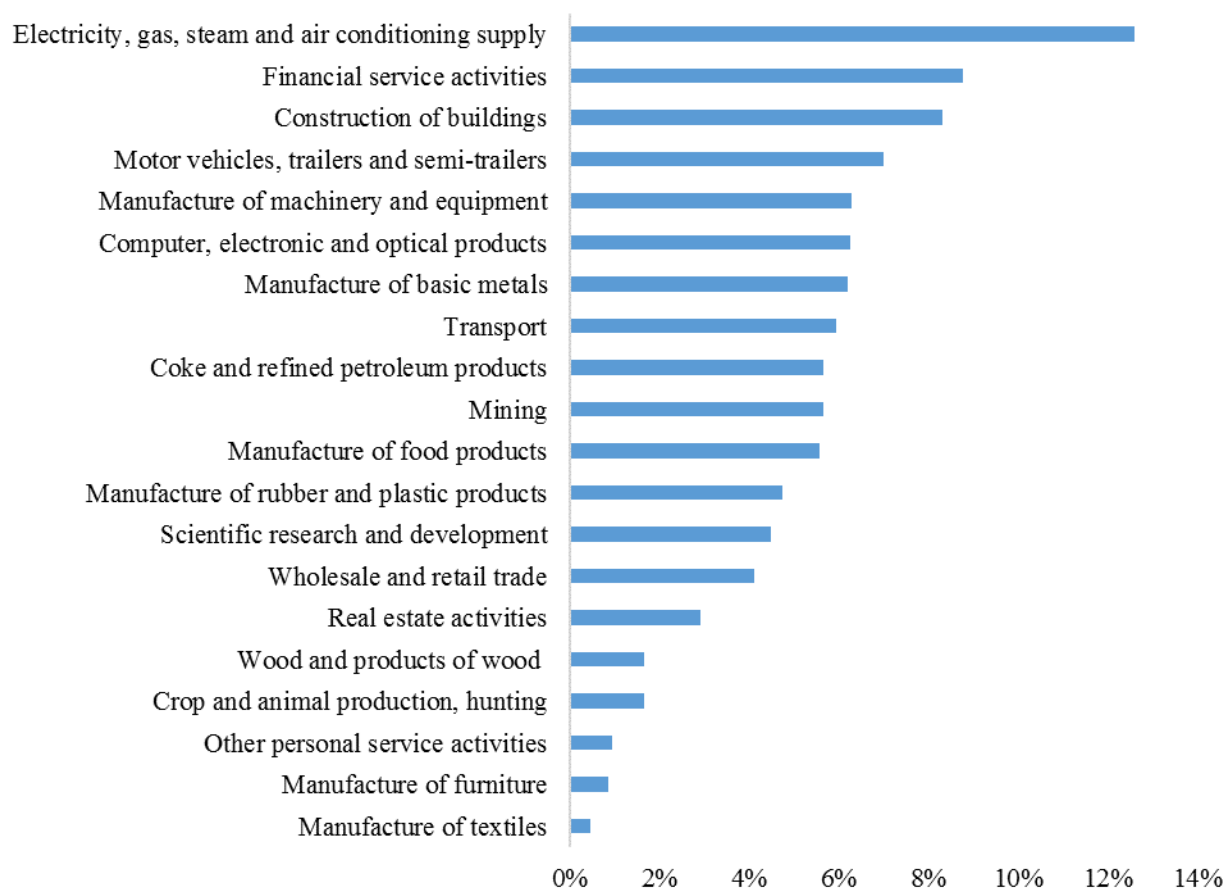

Fig. 2. Distribution of Russian public companies among industries

Results

Measurement of intangibles

Table 2 represents the results of PCA for different indicators of intangibles. Summary statistics for these indicators are shown in Table I. Four principal components emerged from fourteen initial variables: human capital, relational capital, ICT and innovative capabilities. Obtained dimensions are used in the further analysis of strategic behavior of Russian public firms with regard to intangibles.

Tab. 2. Results of PCA

| PRINCIPAL COMPONENTS	Scoring coefficients
Human capital	
Board of directors' qualification	0.5258
Existence of corporate university	0.4464
Costs per employee	0.7241
Relational capital	
Participation in associations	0.2544
Citation in search engines	0.4160
Employment of foreign capital	0.3301
Number of subsidiaries	0.5302
Log(Advertising expenses to Sales)	0.6100
ICT capabilities	
ERP systems implementation	0.6570
IC or KM strategy	0.6129
Site quality	0.4390
Innovative capabilities	
Log(Number of patents)	0.5924
R&D investments to BV	0.5671
Intangible assets to BV	0.5722

Deriving strategic groups: cluster analysis

To identify groups of enterprises that exhibit various' profiles concerning specific intangible management strategies, we employed the K-means cluster analysis. Table 3 and Figure 3 represent the results of the clustering for Russian public companies. It emerged that three clusters give the most realistic picture: we identified Smart companies, Innovators and Generics among public enterprises in Russia.

First cluster called 'Smart companies' is appeared to be the smallest group of companies – 13.3% organizations intensify all types of intellectual resources with special emphasis on ICT development. Second cluster represents companies that pay special attention to ICT capabilities. Almost every fourth Russian public firm in the sample (23.2%) refers to this profile. Besides, Innovators also accumulate human and relational capital. Third cluster 'Generics' consists of over a half of companies (64.5%). These enterprises do not have any specific strategy concerning intangibles management.

Tab. 3. Results of cluster analysis

CLUSTERS	Human capital	ICT capabilities	Innovative capabilities	Relational capital
Smart companies (13.3%)	0.255	0.604	0.153	0.239
Innovators (23.2%)	0.228	0.161	0.272	0.193
Generics (64.5%)	0.158	0.117	0.046	0.159
Mean	0.187	0.193	0.113	0.178
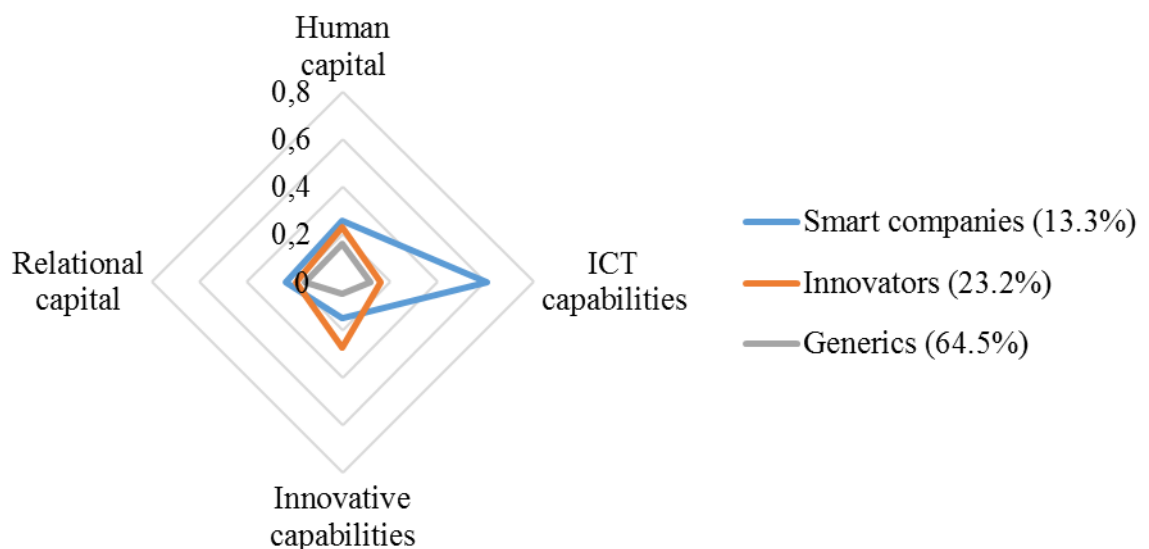
Fig. 3. Results of cluster analysis

Before going to further analysis, it is necessary to check whether obtained profiles significantly differ from each other. In order to validate the results of cluster analysis we perform multivariate (MV) test of means. Findings from the MV test showed that there are statistically

significant differences in human and relational capital, innovative and ICT capabilities across the three companies' profiles at the 0.01 level.

Analysis of specific features of companies belonging to particular cluster

In order to describe emerged clusters of companies concerning their intellectual capital strategies we analyzed these profiles in terms of companies' size, industry, age and government ownership.

Figure 4 represents the structure of each cluster with regard to companies' size. Unlike other profiles, Smart companies cluster primarily consists of large and huge companies whose number of employees exceeds 250 persons. The proportion of large companies ranges from 58% to 68% across profiles; however, the huge enterprises are less involved in cluster Generics. At the same time, companies from cluster Generics more often refer to small and medium business comparing to other profiles.
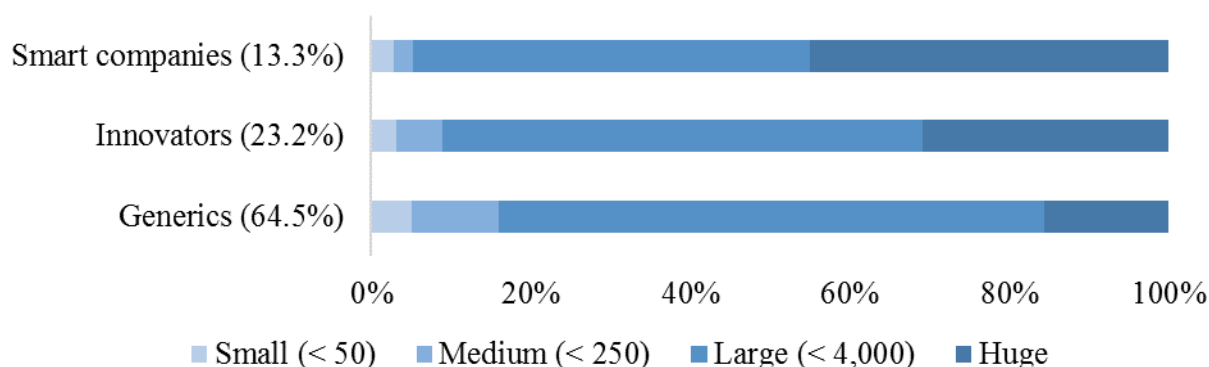

Fig. 4. Clusters with regard to size

Next step of the research is to analyze obtained clusters in terms of industries. Figure 5 shows percentage of clusters for Russian public companies within each industry. Smart companies who intensify all types of intellectual resources with emphasis on ICT capabilities are more frequent in such sectors as Manufacture of basic metals, Mining and Electricity, gas, steam and air conditioning supply. As far as Innovators are concerned, Russian enterprises from this cluster are mostly engaged in the production of Motor vehicles, trailers and semi-trailers, Machinery and equipment and Computer, electronic and optical products. The largest cluster that has no specific strategy concerning intellectual capital more often than others operates in the

following industries: Crop and animal production, hunting, Manufacture of furniture and Financial services.

Industry analysis showed that each industry consists of companies that belong to different clusters. The results of Pearson's chi-squared test proved this preposition, so we can conclude the obtained clusters do not replicate the industry specificity of the database.
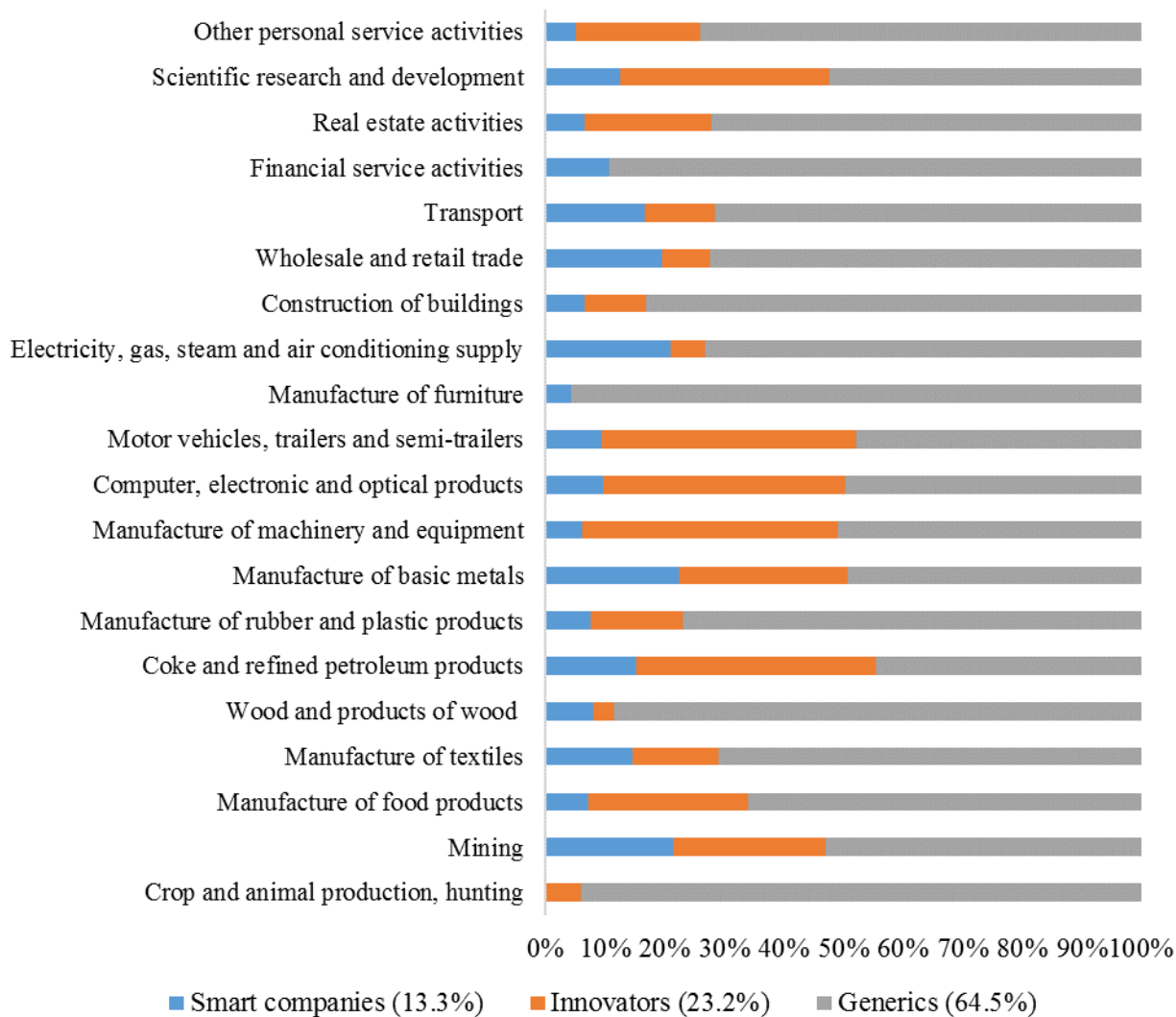

Fig. 5. Clusters with regard to industry

The proposition that there is the relationship between company's age and its intangibles management strategy is supported by our analysis (Figure 6). Companies that belong to cluster Innovators are appeared to be older comparing to other profiles – the average age of Innovators equals to 39 against 30-31 among Smart companies and Generics. MV testing proved the statistical significance of these differences in means at 1% significance level.
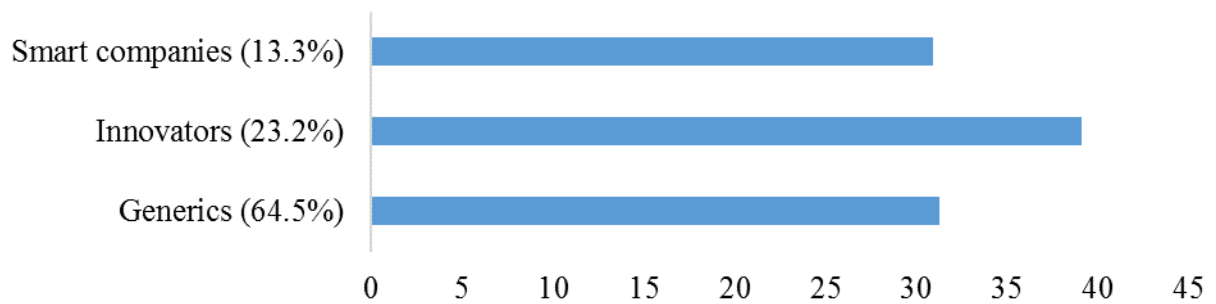
Fig. 6. Average companies' age in each cluster

Figure 7 represents the share of companies that have state owners in each cluster. The highest share of state owners is specific to Smart companies (4.9%). 3.7% and 3.1% of Innovators and Generics respectively are partially owned by government. These differences are statistically significant at 5% level.
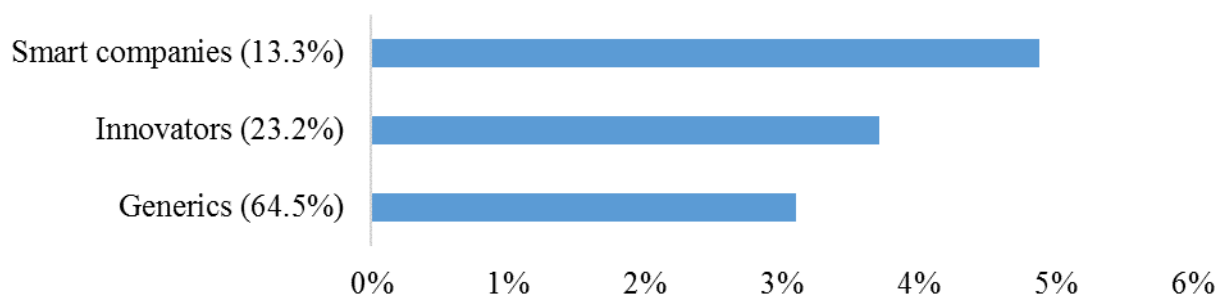

Fig. 7. Share of state owners among clusters

Link between intangible based strategic groups and performance

If intangibles provide companies with competitive advantage, then these advantages are likely to be translated into higher performance. One reason for this is that competitors can hardly replicate intangible resources. To verify this suggestion we investigate how companies' performance differs across three profiles: Smart companies, Innovators and Generics. Table 4 represents the median of performance indicators used in the study for each cluster: return on assets (ROA), return on sales (ROS), turnover, productivity and Economic Value Added to Book Value ratio (EVA/BV).

Smart companies who intensify all intellectual resources demonstrate higher productivity and EVA/BV comparing to other profiles. However, the enterprises that oriented on intangible-driven growth have the lowest turnover. Companies that refer to Innovators stand out from other

clusters in terms of ROA and ROS. The absence of any specific strategy concerning intangibles results mainly in low performance. On the other hand, Generics show roughly the same ROA as other profiles do and even anticipate them in terms of turnover.

Tab. 4. Median of performance indicators across clusters

VARIABLES	Median		
	Smart companies	Innovators	Generics
ROA	0.0348	0.0354	0.0296
ROS	0.0809	0.0873	0.0695
Turnover	0.8866	0.9466	1.0212
Productivity	0.0167	0.0156	0.0105
EVA/BV	-0.0317	-0.0334	-0.0394

In order to verify the statistical significance of these differences in performance we employed Mood's median test (Table 5). It is appeared that ROS, turnover and productivity are statistically differ across profiles at 1% significance level and ROA and EVA to BV – at 5% and 10% significance levels respectively. To sum up, we can conclude that there is a relationship between firms' strategies concerning intangibles and performance.

Tab. 5. Results of Mood's median test

INDICATORS	Pearson's chi-squared	p-value
ROA	6.947	0.031
ROS	34.961	0.000
Turnover	32.973	0.000
Productivity	185.47	0.000
EVA/BV	5.812	0.055

Conclusion

The present study was designed to investigate strategic behavior of Russian companies with regard to intangibles. We use strategic group theory and resource based view as a framework to identify strategic groups of companies in Russia that follow the same or similar strategies. To serve the purpose of this study the authors performed the K-means cluster analysis on the aggregate measures of four dimensions: human capital, customer capital, innovation and

process capital. These types of intangibles are measured through public available data using principal component analysis. Empirical part of the study uses a database of more than 1,000 Russian public companies over the period 2004-2014.

Returning to the question posed at the beginning of this study, it is now possible to state that there are several clusters of Russian public companies that follow particular strategies concerning the allocation of intangible resources. The current study reveals three profiles among public enterprises in Russia: Smart companies, Innovators and Generics. The first strategic group called 'Smart companies' is appeared to be the smallest – 13.3% enterprises intensify all types of intangibles with focus on ICT development. More than a half of Russian public companies (64.5%) are generics and follow non-intensive intangible strategy. The rest 23.2% of enterprises (Innovators) also follow intangible-intensive strategy with the special emphasis on innovative capabilities. Besides, Innovators accumulate human and relational capital.

The analysis of obtained clusters enables to reveal specific features of companies that follow certain strategy concerning intangibles management. These findings suggest that in general Smart companies (13.3%) consists of large and huge companies whose number of employees exceeds 250 persons and are mostly engaged into such industries as Electricity, gas, steam and air conditioning supply, Manufacture of basic metals and Mining. In addition, Smart companies demonstrate the highest share of state owners – 4.9% against 3.1-3.7% among other clusters. Innovators (23.2%) are more frequent in such sectors as Motor vehicles, trailers and semi-trailers, Machinery and equipment and Computer, electronic and optical products. Companies that intensify innovative capabilities are appeared to be older than others are – the average age of Innovators is 39 years against 30-31 years in the case of Smart companies and Generics. The majority of enterprises in Generics group refers to large companies and mostly operates in the following industries: Electricity, gas, steam and air conditioning supply, Construction of buildings and Transport.

To sum up, it seems that the size of company plays important role in the decision of company on strategy concerning intangible resources. Smart companies are likely to be large and huge companies with highest share of state owners. This might occur from the fact that such companies can be in a better position to intensify all types of intellectual resources. Besides, among large and huge Russian public companies there are many state companies that also operate in such industries as Electricity, gas, steam and air conditioning supply, Manufacture of basic metals and Mining.

The second major finding was that the following of certain strategy with regard to intangible resources is related to the performance of companies. The study has shown that Generics that have no specific strategy concerning intangibles usually perform more poorly than companies in other clusters do. This finding corroborate the results of a great deal of the previous work in this field. As far as differences between Smart companies and Innovators are concerned, we found the intriguing results. Innovators stand out from other clusters in terms of return on assets and return on sales, while Smart companies demonstrate higher productivity and EVA to BV ratio. We suppose this finding indicates companies that are concentrated on the development of innovative capabilities are looking toward the success in the short run, whereas enterprises that intensify all types of intangibles aim to benefit in the long run. The results of this research support the idea that the strategic behavior of companies should be analyzed from the complex view on the employment of intangible resources.

The study has gone some way towards enhancing our understanding the strategic behavior of Russian public companies concerning intangibles and consequences of intangible-intensive strategies in terms of different types of performance. The findings of the research will serve as a base for future studies and might have some managerial implication.

The most important limitation lies in the sample of Russian public companies that might limit the generalization of obtained results. Nonetheless, the approach proposed in this study can be used for analyzing outcomes of intangible-intensive strategies in other contexts. The issue of strategic behavior with regard to intangible assets is an intriguing one which could be usefully explored in further research.

References

Alipour, M., 2012. The effect of intellectual capital on firm performance: an investigation of Iran insurance companies. Measuring Business Excellence 16, 53–66.

Andreeva, T., Garanina, T., 2016. Do all elements of intellectual capital matter for organizational performance? Evidence from Russian context. Journal of Intellectual Capital 17, 397–412.

Anwar, J., Hasnu, S., 2016. Business strategy and firm performance: a multi-industry analysis. Journal of Strategy and Management 9, 361–382.

Ball, G.H., Hall, D.J., 1965. ISODATA, a novel method of data analysis and pattern classification.

Barney, J., Wright, M., Ketchen, D.J., 2001. The resource-based view of the firm: Ten years after 1991. Journal of Management 27, 625–641.

Barney, J.B., 1991. Firm Resources and Sustained Competitive Advantage. Journal of Management 17, 99–120.

Bollen, L., Vergauwen, P., Schnieders, S., 2005. Linking intellectual capital and intellectual property to company performance. Management Decision 43, 1161–1185.

Chen, M.-C., Cheng, S.-J., Hwang, Y., 2005. An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. Journal of Intellectual Capital 6, 159–176.

Clarke, M., Seng, D., Whiting, R.H., 2011. Intellectual capital and firm performance in Australia. Journal of Intellectual Capital 12, 505–530.

Ding, C., He, X., 2004. K-means clustering via principal component analysis. Proceedings of the twenty-first international conference on Machine learning 29.

Edvinsson, L., 2002. Corporate Longitude: What you need to know to navigate the knowledge economy. Financial Times, Prentice Hall.

Firer, S., Mitchell Williams, S., 2003. Intellectual capital and traditional measures of corporate performance. Journal of intellectual capital 4, 348–360.

Gokhberg, L., Roud, V., 2016. Structural changes in the national innovation system: longitudinal study of innovation modes in the Russian industry. Economic Change and Restructuring 49, 269–288.

Jolliffe, I., 2002. Principal component analysis, John Wiley & Sons. ed.

Klochikhin, E.A., 2012. Russia's innovation policy: Stubborn path-dependencies and new approaches. Research Policy 41, 1620–1630.

Kristandl, G., Bontis, N., 2007. Constructing a definition for intangibles using the resource based view of the firm. Management Decision 45, 1510–1524.

Lloyd, S., 1982. Least squares quantization in PCM. IEEE transactions on information theory 28, 129–137.

MacQueen, J., 1967. Some methods for classification and analysis of multivariate observations. Proceedings of the fifth Berkeley symposium on mathematical statistics and probability 1.

Marr, B., 2005. Strategic management of intangible value drivers. Handbook of Business Strategy 6, 147–154.

Miles, R.E., Snow, C.C., Meyer, A.D., Coleman, H.J., 1978. Organizational strategy, structure, and process. Academy of management review 3, 546–562.

Molodchik, M., Shakina, E., Barajas, A., 2014. Metrics for the elements of intellectual capital in an economy driven by knowledge. Journal of Intellectual Capital 15, 206–226.

Nickerson, J.A., Silverman, B.S., Trucking, U.S., 1998. Economic Performance, Strategic Position and Vulnerability to Ecological Pressures Among US Interstate Motor Carriers. Advances in strategic management 15, 37–62.

Peppard, J., Rylander, A., 2001. Using an intellectual capital perspective to design and implement a growth strategy:: the case of APiON. European Management Journal 19, 510–525.

Porter, M., 1980. Competitive Strategy. Techniques for Analyzing Industries and Competitors, The free press. ed. New York.

Reed, K.K., Lubatkin, M., Srinivasan, N., 2006. Proposing and Testing an Intellectual Capital-Based View of the Firm. Journal of Management Studies 43, 867–893.

Rexhepi, G., Sadudin, I., Nexhbi, V., 2013. Role of intellectual capital in creating enterprise strategy. Procedia-Social and Behavioral Sciences 75, 44–51.

Riahi-Belkaoui, A., 2003. Intellectual capital and firm performance of US multinational firms: a study of the resource-based and stakeholder views. Journal of Intellectual capital 4, 215–226.

Shakina, E., Barajas, A., 2015. Intangible-intensive profile of a company: the key to outperforming. Journal of Intellectual Capital 16, 721–741.

Shakina, E., Barajas, A., Molodchik, M., 2017. Bridging the gap in competitiveness of Russian companies with intangible bricks. Measuring Business Excellence 21.

Steinhaus, H., 1956. Sur la division des corp materiels en parties. Bull. Acad. Polon. Sci 1, 801.

Tallman, S.B., Atchison, D.L., 1996. Competence-based competition and the evolution of strategic configurations. Pergamon 349–375.

Teece, D.J., 2000. Strategies for Managing Knowledge Assets: the Role of Firm Structure and Industrial Context. Long Range Planning 33, 35–54.

Tovstiga, G., Tulugurova, E., 2009. Intellectual capital practices: a four-region comparative study. Journal of Intellectual Capital 10, 70–80.

Wernerfelt, B., 1984. A resource-based view of the firm. Strategic management journal 5, 171–180.

Zéghal, D., Maaloul, A., 2010. Analysing value added as an indicator of intellectual capital and its consequences on company performance. Journal of Intellectual Capital 11, 39–60.

Sofia N. Paklina
National Research University Higher School of Economics, International laboratory of Intangible-driven Economy, Research Fellow;
E-mail: snpaklina@edu.hse.ru

Mariia A. Molodchik
National Research University Higher School of Economics, Professor on Knowledge Management; International laboratory of Intangible-driven Economy, Senior Research Fellow;
E-mail: mmolodchik@hse.ru

Carlos Jardon
University of Vigo, Professor of Econometrics;
National Research University Higher School of Economics and at the International Laboratory of Intangible-driven Economy, Leading Research Fellow;
E-mail: cjardon@uvigo.es

Any opinions or claims contained in this Working Paper do not necessarily reflect the views of HSE.