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With or without CU: A comparative study of efficiency of European and Russian corporate universities

Petr Parshakov, Elena Anatolievna Shakina,

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# With or without CU

## A comparative study of efficiency of European and Russian corporate universities

Petr Parshakov and Elena Anatolievna Shakina

*National Research University Higher School of Economics, Perm, Russia*

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### Abstract

**Purpose** – The purpose of this paper is to address the issue of efficiency of corporate universities. An efficiency is defined in relative terms: as having relatively better performance in comparison to other companies. Different indicators of performance were employed in order to analyze short-term and long-term efficiency. A comparative analysis of European companies and emerging Russian companies is performed in order to understand if there are country differences in the efficiency of corporate universities.

**Design/methodology/approach** – To avoid potential omitted variable bias, fixed effect within estimator is employed. This estimator enables controlling for a firm-specific time-constant effect which conditions company's performance and is responsible for other individual traits. The rest of the characteristics are controlled with a proxy, which are traditional for corporate finance studies.

**Findings** – There are contradictory results for the efficiency of a corporate university; for the European companies, a corporate university brings positive effect for the short-term performance, nevertheless, as the authors have found that it destructs value in long term. A company with a corporate university has 70 percent less market value added than an average company. There is a negative short-term synergy while the long-term synergy is positive. The results for the Russian sample are very consistent: corporate universities have negative or neutral effect on the performance.

**Originality/value** – This study contributes to the literature about strategic management and human resources management. It addresses the issue on efficiency of corporate universities in companies considering this as one of the key strategic investment in human resource policy. It appears that the corporate university is not a panacea for all companies to develop their human development policy.

**Keywords** Organizational development, Efficiency, Human capital, Intellectual capital, Corporate university

**Paper type** Research paper

### Introduction

The first corporate universities emerged in the early 1980s (Blass, 2005). Despite their growing popularity, there is a limited amount of research on these types of educational institutes that are based within companies. Most of these papers, such as those by Allen (2002), Blass (2005), and Baporikar (2014), focus on the issue of building corporate universities in an effective way, or on analyzing the history and the role of such institutes. It has been demonstrated that this type of learning contributes to the future of education and to the development of traditional universities. With regard to practical issues, corporate universities are supposed to establish specific standards for the learning process within a company. Moreover, campus facilities of corporate universities can be used to earn additional money by offering educational services for clients outside those companies, usually rivals from the same industry. Thus, having a corporate university can be considered a marker of industry leaders.

In the managerial literature, corporate universities are discussed from the strategic investment perspective and are seen as a pivotal asset of HR policy (Patrucco *et al.*, 2017; Allen and McGee, 2004). Seminal papers in resource-based theory, such as those by Barney (1991) and Grant (1991), have discussed investment in employee development and corporate endeavor as a means of creating unique advantages in human resources; however, these studies did not explicitly examine corporate educational programs. Moreover, a set of empirical studies (Molodchik *et al.*, 2014; Shakina and Barajas, 2015) that identified corporate

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universities as key intangible assets have not explored this currently growing phenomenon in depth. The only empirical evidence that exists has identified a positive correlation between companies' performance and corporate universities. However, it appears that this discovery may not be considered in terms of policy implications, since it is not founded on any elucidated causality; neither has an analysis of opportunity costs been comprehensively carried out. The critical supposition of our research is derived from the intuition that corporate universities can be unreasonably costly, and are associated with non-payback investments and high risk. Nevertheless, these investments might be acceptable for corporations, and even bring non-operational benefits that have commercial capacity. However, it is not unconditionally reasonable for companies to establish an internal university in order to enhance human resource development. Companies consider these costs as an investment in intangibles, although in such cases, the question of the efficiency of those investments arises. From the stakeholders' viewpoint (e.g. stock market investors), corporate universities might be considered risky, bounded with high direct and opportunity costs and an unacceptably long payback period. This study attempts to extend the analysis of corporate universities in the framework of resource-based theory by focusing specifically on the conditions under which corporate universities provide competitive advantages and are considered positively by investors. Furthermore, it seeks to investigate the effect of the proximity of alternative educational entities. The research problem of this study refers to the idea that the phenomenon of the corporate university serves as a substitute for educational programs offered by traditional academic and professional institutions. It is also examined whether corporate universities should create synergy with traditional educational institutions, given that both teaching and methodology exchange can occur. The study also specifies additional reasons for studying which conditions might moderate or obstruct corporate universities' ability to become efficient investments. The research question of our study is formulated as follows:

*RQ1.* Do corporate universities create competitive advantages, and are they positively recognized by investors?

For the purpose of this study, the efficiency of corporate universities is interpreted in relation to the benchmark of companies that have not introduced them. Corporate universities are discussed in the literature as a part of human or structural capital, with an emphasis on the long-term focus of investments. Corporate universities, as an investment in intangible capital, are supposed to create competitive advantages for companies; these should be reflected in higher corporate performance. If this is not achieved, investments in corporate universities may not be considered efficient. Among several possible indicators of companies' performance, this study applies two measures that are commonly accepted as having an association with intangibles: economics value added (EVA) and market value added (MVA). EVA is applied to evaluate short-term performance and reflects the competitive advantages created, as it demonstrates whether a company outperforms its rivals. By contrast, MVA represents longer-term outcomes of company activities, and manifests the attractiveness of a company for investors (Naidenova and Parshakov, 2013).

There are a number of factors regarding corporate policy for human resources that are considered relevant in the literature. For instance, previous studies show that being located in a city with a university might also be considered as a competitive advantage, because companies can benefit by attracting better human resources and fostering relations with that university in order to increase innovation and development (Shakina and Barajas, 2013; Molodchik *et al.*, 2014).

The corporate university is considered to be a way to enhance performance not only in developed countries, but also for companies in emerging economies. In this paper, the efficiency of corporate universities established or run by Russian companies is compared with those in European companies. Russia is chosen as a representative example of an emerging economy: according to World Bank estimates, Russian GDP doubled between

2000 and 2014 (from 0.51 to 0.99 trillion USD). Furthermore, Russia seemed to be an outstanding destination for foreign direct investment until 2013. After the recent dramatic changes in its political situation, Russia has experienced unprecedented capital outflow. Nevertheless, the decade from 2004 until 2013 can be considered an appropriate empirical base for the analysis. According to the World Bank report, the share of foreign direct investment rose from 0.21 percent in 2000 to 4.04 percent in 2013.

The remainder of the paper is organized as follows: the second section provides the theoretical background on corporate universities and intellectual capital. The review concentrates on the features that are important for this specific analysis. The third section presents a model and methodology of the analysis. The fourth section describes the sample and variables, the fifth section presents the results of the research, and the sixth section presents a conclusion.

### **Corporate universities as strategic investments in human resources: the academic discussion**

As one of the most recent organizational innovations within companies, the corporate university does not yet have standard definition. Each case can be regarded as unique and requires in-depth individual study. Nevertheless, some common features in the phenomenon of corporate universities can be taken for comparative analysis, and for this purpose, a definition of corporate universities might be useful. Allen (2002) defined the corporate university as “an educational entity”; however, it is also a strategic investment that is intended to improve corporate culture, enable both individual and organizational learning, and also enrich corporate knowledge and wisdom. There is also a business definition by El-Tannir (2002, p. 77), referring to “a function or department in the company that develops the skills for employees, and integrates them into strategic orientation of the corporation with strong emphasis on leadership and improved work-related performance.”

Blass (2005) defined corporate universities by analyzing the differences between traditional and corporate universities. Table I introduces the summary of his conclusions. For this study, the efficiency of the corporate university is the key issue; therefore, it is necessary to understand the functions of such an institute. Another approach to defining corporate universities is to examine their activities. Allen (2002, p. 4) stated that “I have identified four levels of activity that a corporate university engages in: (1) training only; (2) training plus managerial and/or executive development; (3) courses offered for academic credit; and (4) courses offered that lead to an academic degree.”

Thus, researchers are divided in their different opinions about the role of corporate universities. According to Blass (2005), the corporate university was intended to fill a void which appeared between corporations and universities. He advocates an idea that the requirements of corporations and the supply of employees from traditional universities are “drifting further apart” (p. 58). In addition, corporate universities appear to provide companies with the services and teaching content that traditional universities fail to offer. Moreover, the supporters of such a mission for corporate universities state that they have to create sustainable competitive advantages for companies in their HR policy. Blass mentioned in his work that “while it is probable that not every corporate university will offer every aspect of the ideal, clearly organizations have gained benefit and competitive advantage, if only by leveraging one element” (p. 64). Because competitive advantage, by definition, is the ability to generate added value for a firm and its shareholders, one could easily address corporate performance by studying the efficiency of corporate universities. Supporting this idea, Meister (1998) predicted that the corporate university of the year 2000 and beyond would serve as a strategic hub for organizations seeking cost-benefit solutions. Moreover, analyzing the financial sources of corporate universities, he added that they are supposed to create a business entity that reaches at least break-even point, and moves toward a “self-funded, pay-for-service model” (p. 27). Emphasizing the significance of evaluating the investments

	Public university sector	Corporate university
Title	Originated from scholarly community development into corporations named Universitas	Title conveys culture and community of learning developed in-house
Historical account	Medieval/class roots. Development of old university sectors seventeenth-nineteenth century, new university sectors twentieth century, mass expansion	Developed from in-house training and education departments; offering new services, creativity, research, and development
Aims	To provide liberal and/or professional education at a “higher” level to the public	Expand the knowledge base of their companies, adding to competitiveness, acting as catalyst for change
Outcomes	Qualifications (degrees, professional qualifications) and research	Raised horizons on what can be achieved, conveys the ethics, values, and history of company
Level of education	Undergraduate, postgraduate, and doctoral	Any from low-level functional training to postgraduate study through partnerships
Size and diversity of student body	Any member of the global public who fulfills the entry requirements	Every employee in the organization, some guarantee a minimum amount of training per year
Ownership and control	“Owned” by the state in terms of funding. Reports publicly and is accountable to state organizations. “Control” is loose due to concept of academic freedom	Owned by the company, control varies according to the decentralized nature of in-house buying. Always has to be some business justification
Links with public universities	Primarily collaboration exists in research projects	Links regarding delivery of accredited courses and some research
<b>Source:</b> Differences between public university sector and corporate university adapted from Blass (2005, p. 63)		

**Table I.**  
Differences between  
traditional and  
corporate universities

made in corporate universities, Allen and McGee (2004) concluded that they have to justify their existence, given that they are associated with very high costs. Therefore, corporate universities' outcomes should be measurable, and the purpose of a corporate university is to create competitive advantages and enable strategic vision for companies.

There is a body of literature that treats corporate universities as a part of companies' intangibles; this includes studies such as those by Molodchik *et al.* (2012, 2014), Ahangar (2011), Huang and Wang (2008), Shakina and Barajas (2012), Naidenova and Parshakov (2013), and Shakina and Molodchik (2014). As an intangible resource associated with both human and structural capital, corporate universities have to be paid back and lead to higher performance: “a key goal of an in-house training facility is to solve unique business problems that face the company and to increase the organization's performance” (Nixon and Helms, 2002, p. 147). The paradigm of intangible-driven performance appears to be of particular importance for both researchers (Bontis *et al.*, 2000; Stewart, 1997) and business representatives (Lev, 1999, 2001). Many studies refer to a value-based approach when analyzing intangibles. Thus, the value-based paradigm and intangibles as key value drivers enable a framework to be constructed that tests the impact of corporate universities on companies' performance. Previous studies mainly focus on how entire intangibles influence company performance. However, this study focuses on only element associated with corporate universities. This might be considered a specific contribution of this study, as it provides an insight into the methodology that can be used to reveal the isolated effect of a particular resource on value creation. Another key contribution of this study is to examine the proximity effects of traditional universities. The authors speculate that the close proximity of universities can bring both complementary and substitute effects to investments in corporate universities. Finally, this research seeks to study whether all of the above-mentioned results are relevant to both emerging and developed economies; for this purpose, the research question is empirically tested for European and Russian companies.

**Corporate universities as value drivers: methodological approach and data**

The academic literature considers corporate universities to be a substantial driver of company performance (Molodchik *et al.*, 2014; Shakina and Barajas, 2015; Patrucco *et al.*, 2017). In answering the research question of whether corporate universities create competitive advantages and attractiveness for investors, we identify a model elaborated on a value-based production function (see Formula (1)). This model is estimated empirically using two data sets of European and Russian listed companies: a causal marginal effect of corporate universities is expected, moderated by external factors. The factors selected for the identification of our model are derived from the first step of analysis, based on the qualitative exploration of Russian and European cases of corporate universities, along with discrepancies between the higher education systems of these markets.

At the pre-estimation stage, the statistical significance of the difference between companies with and without corporate universities was identified. For that purpose, a two-group mean-comparison test was performed, which showed that the null hypothesis (that there is no difference) was robustly rejected both in Europe and Russia. However, such tests do provide all the required information, as they do not control for many other relevant factors (e.g. industry, leverage, or growth rate). For that reason, regression analysis was used. When performing a regression analysis, one should keep in mind the exogeneity restriction; specifically, although a researcher is trying to control all significant variables of variance in performance, a potentially important variable might be missed, which can result in the omitted variable bias. To avoid this, a fixed-effect estimator is employed, since the data are longitudinal. With this type of estimator ("within"), it is supposed that there is a firm-specific time-constant effect which implies the company's performance (e.g. quality of management). The remaining characteristics are controlled using proxy indicators, which are traditional for corporate finance studies.

The following equation generally identifies our model:

$$perf_{it} = \beta_1 + \beta_2 \cdot CU_{it} + \beta_3 \cdot U_{it} + \beta_4 \cdot both_{it} + \beta_5 \cdot CV_{it} + f_i + \varepsilon_{it} \quad (1)$$

where  $f_i$  is the fixed effect of the unobservable individual characteristics of each company.  $CV_{it}$  is a vector of the following control variables: financial leverage, calculated as the ratio of total debt to total equity; return on the invested capital, computed as operating profit divided by debt and equity capital invested into the company; and fixed assets of the company, reflecting the company size.  $CU$  is a dummy indicator which is equal to 1 for the company  $i$  which has a corporate university in year  $t$ ;  $U$  is a dummy indicator which is equal to 1 for a company that is located near a city with a top university (we consider top 20 universities in each country, according to the Webometrics rating). A dummy for both having a corporate university and being located near a top university (both) is also included. The purpose is to test whether traditional and corporate universities are substitutes for, or complement, one another.  $perf_{it}$  is an indicator of company performance, using two performance metrics: EVA as an indicator of short-term performance (following the studies of Huang and Wang, 2008; Naidenova and Parshakov, 2013), and MVA as a long-term company performance metric (following the studies of Bontis *et al.*, 1999; Dobbs and Koller, 2005).

In order to test poolability, the random effects test developed by Breusch and Pagan (1980) is employed. Because the sample is highly unbalanced, the Baltagi and Li (1990) modification of this test is used. Panel A of Table II contains the results of this test, which reveal evidence of significant variation in individual effects. The Hausman (1978) specification test is performed (Table II, Panel B) to choose between fixed- and random-effects models. According to the test results for all four samples, the fixed-effect model is chosen, indicating that unobserved firm-level heterogeneity might be correlated with other covariates. From the economic point of view, this means that a company's performance is explained not only with the control

variables, but also to a greater extent by its unobservable characteristics (corporate governance quality, for example). Although it is necessary to control for time-varying factors (leverage, size, and return on capital), it is also crucial to control for time-constant firm-specific characteristics when investigating the causal relation between having a corporate university and company performance. Another benefit of this approach is that companies with corporate universities are compared not only with similar companies, but also with the same company in previous years. Because variation is captured by time-varying indicators within a given company, such an identification strategy can be regarded as valid for estimating the treatment of corporate universities, given that a particular company in previous years can act as the perfect control for itself.

However, because company performance might influence the probability of having a corporate university, the problem of endogeneity arises. To address this issue, the instrumental variables (IV) approach is used. We estimate another regression (Equation (2)) in order to obtain the predicted values for the corporate university dummy. For this equation, an estimator of panel probit with a population-average effect is employed. A fixed-effect model cannot be used, because the statistics are not sufficient to allow the fixed effects to be removed from the equation:

$$Pr[\text{corporate university} = 1|X] = \Phi(X^T\beta + \epsilon) \quad (2)$$

where  $Pr$  denotes probability;  $\Phi$  is the cumulative distribution function of the standard normal distribution; *corporate university* is the dependent variable of having a corporate university in a company; and  $X$  is a vector of covariates. The following covariates are used for this equation:

- company age in years;
- financial leverage, calculated as the ratio of total debt to total equity;
- fixed assets of the company, reflecting the company size;
- market-to-book ratio;
- number of employees;
- fraction of owners on the board of directors;
- location near one of the top universities; and
- enterprise resource planning (ERP) systems implementation (this is a binary variable, which the authors obtained by searching online for the terms “ERP,” “Oracle,” “NAVISION,” “NAV,” “SQL,” and “SAP”).

	Europe	Russia
<i>Panel A: poolability test</i>		
EVA	$\chi^2_{\text{mod}} = 6,032.59$	$\chi^2_{\text{mod}} = 1,413.34$
MVA	$\chi^2_{\text{mod}} = 13,208.67$	$\chi^2_{\text{mod}} = 648.24$
<i>Panel B: Hausman test</i>		
EVA	$\chi^2 = 40.36$	$\chi^2 = 27.46$
MVA	$\chi^2 = 127.49$	$\chi^2 = 19.25$ ( $p$ -value = 0.0017)
<b>Note:</b> $p$ -values less than 0.0000 are not reported		

**Table II.**  
Model specification  
tests

The question of the validity of using continuous IV for binary variables can arise. Usually, ordinary least squares (OLS) in the first stage is an approximation of the underlying nonlinear conditional expectation function (Angrist and Pischke, 2008). However, because a dummy indicator of having a corporate university is used, the conditional expectation function of the first stage is probably nonlinear. Although the OLS approach of the first stage with the correct IV is supposed to produce residuals that are uncorrelated with fitted values and covariates, the estimated corporate university indicator may exceed 1 or even be negative. Therefore, the binary model is used for the first stage. As a robustness check of consistency for this estimator, the correlation between the fitted values is calculated from the probit estimation and from the linear regression in the first stage. The coefficient is 0.94, which is statistically significant. It is therefore concluded that the nonlinear first stage does not have a significant effect on the consistency of the result; hence, the results will be easy to interpret. Moreover, Kelejian (1971) concludes that the consistency of IV estimates does not depend on the correct specification of the first-stage regression.

Because coefficients do not represent marginal effects in the probit regression, the margins are also calculated, and are reported together with the coefficients. The next section demonstrates the key findings of this study: it begins by presenting some highlights of the qualitative exploration of the Russian and European systems of corporate and traditional universities; it then presents descriptive statistics; and finally provides an estimation of the models identified, in order to answer our main research question.

### **Corporate vs traditional universities: empirical results for Russia and Europe**

In this study, the researchers have designed and estimated a model in which corporate universities within two rather different markets serve to provide an intensive strategy in human resources. A comparative analysis of Russia and Europe is performed, in order to demonstrate that a divergence in institutional and economic conditions might bring significantly different or even opposite effects in terms of risky and resource-consuming investment which may be associated with corporate universities.

A proper identification of the model has been preceded by an in-depth case analysis of leading corporate universities in Europe (i.e. the Daimler Chrysler Services Academy, Alcatel University, Unilever, and Heineken University) and Russia (Sberbank, Vimpelcom, Rostelecom, and Ingosstrakh). All of these educational institutions within the leading companies represent the best of breed in corporate universities. Importantly, an overview of the strategies and models of corporate universities enabled the following common features of the aforementioned cases to be identified. All of them have been established in corporations with a widely distributed net of subsidiaries, a relatively large number of employees, and pronounced leadership within their industry. Though these factors could have been predicted, there were a number of other, more unexpected common characteristics of companies with the strongest corporate universities in Russia and Europe. For instance, it has been revealed that a comprehensive strategic statement of those companies may be treated as conventional, placing an insignificant stress on both innovations and aggressive financial policy. Notably, these similarities are evident for different industries and countries present in the subsample that was studied qualitatively. With regard to dissimilarities, the majority of these are attributed to distinctions between Russian and European markets. For instance, it can be seen that all leading Russian corporate universities have been launched by companies with significant state interventions, in terms of ownership, governmental support, and purchasing. Moreover, the data shows that the small number of corporate universities in Russia has led to an exclusive representation of not more than two universities in each business sector. This, on the one hand, might provide these companies with a strong advantage, in terms of enhancing learning and becoming pioneers in implementing new standards of HR in



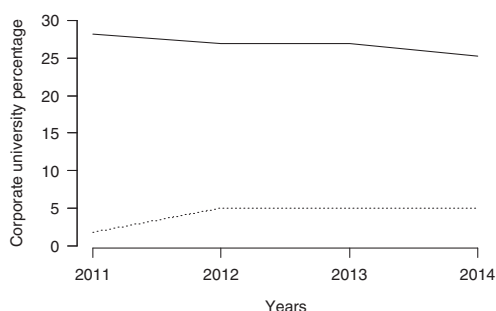
their industry. On the other hand, it may deprive them of opportunities to reallocate financial resources to alternative use. Another major distinction of Russia is that, due to its Soviet Union heritage, its higher education system has developed a very strong infrastructure of universities, institutions, and colleges over the whole country. Almost every Russian city and even town has a traditional (non-corporate) university or one of its branches, which offers a range of professional education programs with a reservation to their quality (Gounko and Smale, 2006; Heyneman, 2010). European countries, however, are not equally saturated with traditional educational entities. The five largest European countries represented in our sample – namely the UK, Germany, France, Spain, and Italy – normally locate universities in major cities with a big population, and they clearly distinguish those universities that offer professional education, these being universities of the applied sciences or their analogs (Lepori and Kyvik, 2010; Salmi, 2015).

The descriptive statistics for companies featuring in our data set are shown in Table III. Figure 1 shows the dynamics of corporate universities' establishment in Russia and Europe.

Variable	Obs.	Mean	Europe SD	Min	Max	Obs.	Mean	Russia SD	Min	Max
<i>Universities</i>										
Corporate university	17,465	0.275	0.447	0	1	11,824	0.024	0.154	0	1
City with university	17,914	0.578	0.494	0	1	12,056	0.390	0.488	0	1
Both	16,878	0.129	0.336	0	1	11,824	0.013	0.112	0	1
<i>Performance</i>										
Price-to-book ratio	1,588	2.007	2.011	0	15.994	2,576	1.420	1.665	0	14.661
MVA	16,459	923.469	5,471.759	-55,716.25	121,260.5	2,664	-76.275	5,878.588	-141,586	109,820
EVA	13,834	-26.968	146.740	-999.631	975.223	8,756	-6.597	70.029	-994.465	982.040
<i>Company characteristics</i>										
Age	18,623	41.737	40.127	0	209.000	12,056	30.075	35.637	0	303.000
Financial leverage	16,417	1.134	3.175	0	93.212	9,254	2.228	6.102	0	93.528
Fixed assets	17,703	2,360.018	10,669.980	0	220,107	9,905	506.473	5,912.496	0	241,040
Number of employers	16,337	10,938.52	39,550.830	0	592,586	9,924	4,237.858	375.630	1	456,000
Owners directors	1,651	0.325	0.346	0	2.000	1,1581	0.204	0.229	0	1
ERP	17,108	0.322	0.467	0	1.000	1,2056	0.130	0.337	0	1
ROIC	16,321	0.048	0.121	-0.500	0.987	9 421	0.087	0.139	-0.945	2.916

**Note:** Financial indicators are represented in millions of euros

**Table III.**  
Descriptive statistics



**Notes:** Solid line represents European companies;  
dotted line represents Russian companies

**Figure 1.**  
Percentage of  
companies with  
corporate university

One can conclude that after the global financial crisis, the number of corporate universities in Europe declined, whereas in Russia there was a positive trend.

According to the test carried out, the difference between European and Russian companies is significant. This findings are reported with respect to location (Europe in comparison with Russia), and with respect to the type of indicator (university, performance, and company characteristics). In the studied sample, 28 percent of European companies have corporate universities, whereas only 2 percent of Russian companies have this kind of intangible resource. The number of companies located in cities with leading universities is also higher in Europe than in Russia. This might be explained by the high geographical concentration of Russian universities in Moscow and Saint Petersburg, whereas in Europe there are more education and research centers distributed across the different cities and regions.

Interestingly, Russian companies are larger in terms of fixed assets and number of employees, but the price-to-book ratio is higher for European companies. Therefore, this might be an indicator of higher productivity in Europe. However, the return on invested capital is lower for European companies. With respect to other performance indicators, one can see that both EVA and MVA are negative for Russian companies, on average. This might be partially explained by the recent economic crisis of 2008-2009, given that the presented means are averaged across the years. Descriptive statistics for the rest of the indicators perform as one would expect, with the exception of company age. For Russian companies, the maximum is higher than for the European companies; however, the mean is lower, which could also be expected. According to Russian standards, company age does not change with changes in legal status: this might be a reason for the existence of one outlier company of a higher age (namely the "Open Joint-Stock Company Machine Building Plant Arsenal").

It is interesting to compare the geographical distribution of corporate universities. In Russia, there are only four cities with corporate universities: Moscow (19), Cherepovets (2), Krasnodar (2), and Saint Petersburg (2). Therefore, corporate universities are very much concentrated in Moscow. In Europe, corporate universities are also most commonly found in capitals to some extent, but the concentration is significantly lower. Figure 2 presents a map showing the European corporate universities. As can be seen, there are a number of corporate universities located far from the capitals. Germany is the country with the most dispersed structure of corporate universities.

Table IV reports the estimated results for the determinants of probability of having corporate universities (Equation (2)). In Panels (1) and (2), the second column represents marginal effects. It is important to analyze them in order to understand the managerial implications of the explained variables.

First of all, it can be stated that the model is statistically significant. Moreover, there are several individually significant coefficients. The coefficient for company age rejects the null hypothesis that it will be 0, and it is negative. Therefore, it can be concluded that relatively young companies are more likely to have a corporate university. However, the marginal effect is small in absolute terms: given the sample's average age of 42, the effect will be less than 4 percent. The nonlinear effect of age is also tested (with squared terms); but with such specifications applied, linear and squared terms do not reject the null hypothesis.

The coefficient for financial leverage is statistically significant and positive. However, the marginal effect is low: for the average leverage, it is less than 1 percent. Similarly, although the coefficient for fixed assets is statistically significant, it is not significant from the managerial point of view. One can, however, conclude that the larger the company, the more likely it is that a corporate university is a reasonable investment.

Interestingly, the coefficient for price-to-book ratio is negative and statistically significant. A lagged model of this ratio is also used in order to test the accuracy of the results; in this model, the coefficient and marginal effect are very similar. This could indicate



**Notes:** The size of the circle indicates the number of universities in a city. Since our sample consists only of companies from UK, Germany, France, Spain, and Italy, cities from the other countries are not highlighted on this map

**Figure 2.**  
Map of corporate  
universities in Europe

	(1) Europe		(2) Russia	
	Coefficients	Margins	Coefficients	Margins
Age	-0.0027*** (0.000)	-0.0009343	-0.0036 (0.005)	-0.0002581
Age <sup>2</sup>	—		0.0000 (0.000)	1.10e-06
Financial leverage	0.0024*** (0.000)	0.0008309	0.0093 (0.007)	0.0006665
Fixed assets	0.0000*** (0.000)	3.62e-07	0.0000 (0.000)	8.30e-07
Price-to-book ratio	-0.0009* (0.001)	-0.0003159	-0.0005 (0.036)	-0.0000323
Number of employers	-0.0000 (0.000)	-1.08e-08	0.0000*** (0.000)	5.68e-07
Owners directors	0.0853*** (0.010)	0.0297118	-0.9431** (0.370)	-0.0675994
City with university	-0.0601*** (0.007)	-0.0209387	0.1777 (0.171)	0.0127336
ERP	0.2071*** (0.003)	0.0721273	0.9340*** (0.133)	0.0669431
Constant	-0.4688*** (0.035)		-2.0811*** (0.191)	
Observations	11,666		2,382	
Number of number	1,482		531	

**Notes:** Standard errors in parentheses. \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

**Table IV.**  
Estimation results for  
the determinants of  
having corporate  
university

that companies which are already regarded by investors as effective and attractive will be less likely to make such a risky investment as establishing a corporate university.

The owners-to-directors ratio might be considered an indicator of the involvement of the board in the decision-making process. The coefficient is positive and statistically significant; however, as for the previous indicators, the marginal effect is low, at less than 1 percent.

Dummy variables for being located in a city with universities and for having an ERP system are statistically significant. However, the signs are different. The existence of a university in the city where a company is located decreases its probability of starting a

corporate university by 2 percent. One could therefore conclude that traditional universities can be considered substitutes for corporate ones. In this case, it might be more effective to start a joint program, or to collaborate with a traditional university in different ways. Companies with ERP systems will be more likely to have a corporate university: here, the marginal effect is 7 percent. This is an indicator that companies do not invest in a particular type of intangible asset, but that some investments are conditioned and tied to each other. Thus, if a company invests in ERP, it is more likely to invest in a corporate university. Both investments are responsible for an accumulation of structural capital; they are also resource intensive, and indicate a particular strategic orientation of such companies. Moreover, it is arguable that corporate universities can be classified as part of a particular type of intangible resource. On the one hand, this resource contributes to the development of the company's HR policy, so it might be classified as human capital. On the other hand, it helps to codify knowledge and to facilitate staff turnover, and thus could be regarded as structural capital.

The results for the Russian companies are substantially different. This is an important finding, as it indicates differences in the determinants of having corporate universities, at least for the data sets employed in the present analysis.

Taking into account the established differences, it might have been expected that the coefficient of number of employees would not be statistically significant for the European sample, but that it would be positive and significant for the Russian sample. However, the marginal effect for Russia is notably low: 0.2 percent for the mean of the sample. Nevertheless, this result might be interpreted in the following matter: for European companies, the number of employees does not indicate company size, whereas for more traditional Russian companies it is still a good proxy for size. This theory must be taken into account when productivity effect is interpreted.

The results for the owners-to-directors ratio are similarly different in the two regions. It is positive for the European sample, but negative and statistically significant for Russian companies: the marginal effect is 1 percent for the sample average. Considering this indicator as being a proxy of board involvement, one could conclude that in Russia the board protects shareholders by preventing companies from making risky investments in corporate universities.

The only result that is similar in the two regions is the existence of an ERP system. The sign, statistical significance and even marginal effect are all very similar. This fact contributes to the significance of the finding that synchronous investments are made in different types of similar intangibles. In other words, if a company is deciding to switch to a new "intangible-intensive" strategy, it will invest in tied types of intangible resources. This explanation is in line with the findings of this study.

Table V contains results for the estimated efficiency of investments in corporate universities. The effect of each company is controlled by a fixed-effect estimator. The results are described taking into account the long-term performance indicator, i.e. MVA; and the short-term performance indicator, i.e. EVA. They are displayed both for developed European companies and for emerging economies in the Russian, for example. Two models for the Russian sample with EVA as the dependent variable are estimated, namely, with and without a dummy for being located in a city with a university. This is done in order to test the joint effect of being located in a city with a university and also having a corporate university. It is impossible to include all three indicators of universities in one regression model, because the indicator "both" is a nearly a linear combination of two other university indicators. This might be explained by the peculiarities of the Russian educational system, in that most universities are concentrated in capital cities.

Fixed assets are included as an indicator of company size. The coefficients are statistically significant for almost any specification. As can be expected, the size of the

**Table V.**  
Estimation results for  
the impact of  
corporate university  
to company  
performance

	Europe			Russia	
	(1) EVA	(2) MVA	(3) EVA	(4) EVA	(5) MVA
Fixed assets	-0.0099*** (0.001)	-0.0062* (0.003)	-0.0018*** (0.000)	-0.0016 (0.001)	0.1071*** (0.022)
Financial leverage	-0.3231 (0.227)	-4.4490 (2.880)	-0.4225*** (0.124)	-0.4380*** (0.131)	0.6435 (2.422)
ROIC	224.7088*** (7.139)	670.6316*** (75.429)	106.7434*** (5.203)	102.9934*** (5.346)	326.8143*** (85.600)
Corporate university	12.0944* (6.704)	-270.5552*** (76.647)	-20.4470** (7.946)	-20.1841** (8.368)	-72.2758 (97.968)
City with university	14.0848** (6.300)	-251.4639*** (71.927)	-11.4293** (4.637)		
Both universities	-18.9898** (8.864)	215.7667** (99.008)	-101.3966*** (15.459)	-74.1239*** (17.373)	138.9452 (187.921)
Constant	-32.4364*** (3.887)	584.5960*** (44.431)	-12.4407*** (2.801)	-14.3006*** (0.891)	55.8387*** (15.649)
Observations	11,953	12,232	8,516	8,516	2,237
R <sup>2</sup>	0.108	0.010	0.087	0.057	0.022
Number of					
number	1,486	1,548	981	981	528

**Notes:** Standard errors in parentheses. \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

company affects its performance; however, the signs are different. For the European sample, the smaller the company, the greater its performance, both long-term and short-term. However, for Russia, the findings are controversial: size negatively affects the short-term performance, whereas it has a positive effect on long-term performance. Another interpretation is that the larger the company, the more attractive it is for investors, and consequently, the higher its market capitalization.

Regarding return on invested capital as an indicator of efficiency, the findings are largely as predicted. Its coefficient is statistically significant and positively affects the performance, both long- and short-term. Unsurprisingly, the size of effect is different for EVA and MVA: it is larger for MVA, both in Europe and Russia. This might be explained by the fact that a 1 percent change in return is valued almost three times more by stock market investors than by the other stakeholders of a company.

Notably, financial leverage is a statistically significant determinant of performance only for Russian companies. The coefficient is negative, which might reflect the high costs of debt and default risk. Its effect is considerable only for short-term performance, which is consistent with the fact that current leverage affects current financial results more than long-term performance.

For the indicators of having different types of universities, the results are contrary to those expected. For the European companies, corporate universities are beneficial for their short-term performance: the coefficient is positive and statistically significant. The marginal effect of having corporate universities is about 12 million euros of EVA. However, having a corporate university severely damages its long-term performance: the coefficient for MVA is statistically significant and negative. The marginal effect is 271 million euros, which is almost 30 percent of the average MVA.

The coefficients for the interaction of corporate and traditional universities also have different impacts on EVA and MVA. For short-term performance, having a corporate university and being located in a city with a university are both beneficial, but the existence of both at the same time negatively affects short-term performance. The possible explanation is as follows: if one has a good university nearby, one should not make the large and risky investments associated with corporate universities. However, the results for long-term performance are the reverse; therefore, the only way for a company to benefit from a university of any type is include both factors. This result should be interpreted with a certain amount of caution, and requires further investigation. Nevertheless, one possible explanation might relate to those investors who do not value being located in a city with a university, since

this cannot be a stock-screening factor: there are numerous companies in such cities. Moreover, such investors do not appreciate making investments in corporate universities, which might be considered risky. However, the existence of both factors at the same time might create an image of knowledge-oriented, knowledge-intensive, innovative companies, which could be attractive for investors.

The results for the Russian companies are very consistent across different models: corporate universities severely damage short-term value and do not affect long-term performance. Moreover, the interaction effect is not significant statistically. Probably, there are other, less risky ways for Russian companies to raise their performance than by establishing corporate universities. The fact that corporate universities do not have a statistically significant effect on the MVA might indicate a lack of interest from investors in this type of intangible resource.

### Conclusion

In this study, the question of the efficiency of the corporate university has been addressed. Efficiency has been defined as better performance in relation to rival companies. Different indicators of performance have been employed in order to analyze short-term and long-term corporate performance. Employing a value paradigm jointly with a resource-based framework, the researchers used EVA and MVA as indicators of short-term and long-term performance, respectively. This study investigated whether corporate universities constitute a part of companies' structural and human capital, and can thus create sustainable competitive advantages which in turn positively affect companies' performance.

Previous papers that have studied corporate universities have represented them as an alternative to traditional universities. The present study has followed this research direction, seeking to identify positive or negative synergies in order to examine substitution and complementary effects. To study these questions under different conditions, this paper has presented a comparative analysis of the efficiency of corporate universities in developed European countries and in the Russian economy, the latter being an example of an emerging market.

In order to conduct a proper statistical analysis, it was necessary to study the determinants of establishing corporate universities; therefore, the model of value-based production function was identified and statistically estimated for the panel data set of more than 2,500 corporations.

The key findings of our study are as follows: price-to-book ratio as an indicator of efficiency is a negative and statistically significant determinant of corporate universities. This might be a result of investors' negative expectations of the efficiency of running a corporate university. Therefore, companies which are considered attractive to invest in will be less likely to make such risky investments. Another interesting finding concerns the factor of companies being located in a city with a university. As demonstrated in Table V, a substitutional effect is observed for Russian corporations; in comparison, the European educational system is likely to complement corporate universities in the short term, but deprives companies from this driver from the investor's perspective.

As one could expect, the existence of an ERP system, being a part of companies' structural resources, plays a substantial role for corporate universities. This implies that companies do not invest in only one isolated intangible resource, but compile a portfolio of different types of intangibles that might be reasonable for making associated investments.

One of the contradictory results of this study refers to the impact of having a corporate university on short- and long-term performance. Companies with corporate universities have on average 70 percent less MVA than those without. Regarding the issue of synergy, there is a negative short-term effect of synergy, whereas long-term synergy has a positive effect. This result might be contrary to expectations, because it seems that the question of

efficiency is far from being settled. However, the aim of this study is to investigate whether such an investment is efficient, and to examine the arguments on each side of the debate. Interestingly, the results for the Russian sample are very consistent: corporate universities have a negative or neutral effect on companies' performance.

To conclude, the main finding of this study is that the results were different between the two cases. There is no doubt that the subject of corporate universities is becoming more popular and topical. However, this study shows that the issue of outperforming through corporate universities should be also studied. It seems that the corporate university is not a panacea for all companies that choose to invest in intangibles in order to maximize their performance. The main implication from the intellectual capital perspective is that human capital is not always optimally managed through running corporate universities, in terms of the substantial investment expenditures associated with them. In the worst cases, they even may destroy company value, bringing uncovered risk for the investors. One of the identified reasons why corporate universities may not be an optimal investment is due to the absence of strong partnerships with traditional universities, as such links might significantly reinforce corporate educational entities, thereby decreasing investors' risk. Thus, relational capital and networking are pivotal factors in corporate universities' success. Moreover, it is found out that even clearly positive short-term performance that results from investments in corporate universities does not always provide long-term benefits. With regard to policy recommendation, it is suggested that precise planning and evaluation is carried out before the creation of a corporate university is considered as a strategic development of companies' human resources.

The findings of this research are subject to at least three limitations. First, although the proxies used for performance seem to be suitable, it would be useful to collect tests on non-financial indicators of performance. Second, the authors estimated linear models; however, there might be reasons to suppose nonlinearity. Moreover, although it is necessary to note that linear approximation is still correct, a nonlinear model could have more descriptive power. Third, the findings for the Russian economy might be not transferrable to other emerging economies due to the peculiarities of this country.

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**Corresponding author**

Petr Parshakov can be contacted at: [parshakov.petr@gmail.com](mailto:parshakov.petr@gmail.com)

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