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Elena Shakina, Mariia Molodchik, Angel Barajas,

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Endogenous value creation: managerial decisions on intangibles

Elena Shakina and Mariia Molodchik

Economics Department, National Research University Higher School of Economics, Perm, Russia, and

Angel Barajas

Accountancy and Finance, University of Vigo, Ourense, Spain, and Department of Economics and Finance, National Research University Higher School of Economics, Perm, Russia

Abstract

Purpose – This study aims to explore value creation through intangibles in corporations, taking into consideration the endogenous nature of managerial decisions. It is stated that intangibles bring extra information asymmetry into a company and make managers and investors' goals less aligned.

Design/methodology/approach – A theoretical model is elaborated and empirically tested on the assumption that managers, while investing in intangibles, simultaneously make a company competitive and attractive to investors. The authors use a conceptual model of endogenous value creation to test how intangibles affect outperforming of a company and provoke the expectations of investors. The research is carried out on a sample of more than 1,650 European companies covering the period from 2004 to 2011. Structural equation modelling is applied for the purposes of empirical analysis.

Findings – The authors reveal a diverse impact of intangibles on outperforming of a company measured by economic value added and its ability to create market value. The study discovers that managers are prone to indicate positive signals to investors rather than create sustainable competitive advantages.

Practical implications – This research emphasizes on the particular importance of awareness of policymakers, namely, companies' top managers, about the outcomes of their decisions. Decision-making in public companies should involve as much deliberation as possible about the potential impact of what is decided.

Originality/value – This work contributes primarily to the field of corporate finance in companies that use intangibles. The endogenous process of value creation is modelled and tested. As a result, a number of essential problems in agent relationships in intangible-intensive corporations are discovered.

Keywords Intangibles, Intellectual capital, Value creation, Structural equation modelling (SEM), Investment attractiveness

Paper type Research paper

Introduction

Value creation is a topic largely discussed within the discipline of strategic management (O'Byrne, 1996; Copeland *et al.*, 2000). A company's value is commonly examined in relation to a number of exogenous drivers. Recent empirical studies, such as Nimtrakoon (2015) and

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Yang *et al.* (2015), seek to find these value drivers among intangibles to explain the difference between market capitalization and the book value of equity. One of the critical problems of the value creation framework refers to the assumption that value drivers are exogenous, despite the rigorous evidence for controversial causality. This study seeks to explore in depth value creation due to intangible drivers. This investigation is focused on the notion that value creation is an endogenous process caused by managerial decisions and expectations of company shareholders under high information asymmetry, which is especially associated with investment in intangibles (Aboody and Lev, 2000).

The increasing information asymmetry in companies that invest in intangibles is one of the persistent problems faced by corporate governance. This problem mostly arises as a result of the additional uncertainty brought by intangibles and enhances the agency problem among different stakeholders (Aboody and Lev, 2000). As stated by Tirole (2001), the increasing role of intangibles in the new economy challenges traditional corporate governance and requires new mechanisms that move towards the alignment of decision-making with the interests of investors. The current study discovers the causality between investment decisions on intangibles and market-value growth on the basis that managers in corporations seek to meet investors' expectations. At the same time, managers aim to bring the company success in creating competitive advantages to outperform competitors. This kind of corporate performance, which originates from competitive advantages, is likewise considered a value driver. Thus, sophisticated simultaneous relationships in the value creation framework constitute an endogenous model.

This model might have a number of valuable implications. It not only allows for exploring value creation but also enables testing of the hypothesis of behavioural issues in the decision-making process in a corporation. In this study, a model of endogenous value creation has been elaborated and tested, focusing on the agency problem aggravated by the use of intangibles.

For the purpose of this research, intangibles of a company are considered as a result of investment in intangibles, in line with Lev (2001). The present study is founded on the value-based concept introduced by O'Byrne (1996), Stewart (1991) and Copeland *et al.* (2000). This paper considers economic value added (EVA) as an indicator of outperforming, which demonstrates that a particular company is in a strong position compared with the industry benchmark. The attractiveness of a specific company to its investors results in an increase in its market value above its book value. Here, this spread is measured by the market value added (MVA).

The objective of this paper, then, is to explore the process of value creation through intangibles, which underlines the essence of managerial decisions. Managers are more aware about the real effectiveness of intangible resources. For this reason, they are prone to handle information related to them as setting signals for shareholders. Meanwhile, shareholders are not involved in companies' quotidian activities and, thus, perceive the information and build their own expectations about a company's future. In turn, the expectations of shareholders generate the market value of companies.

The elaborated endogenous value creation model will be tested on a broad database of listed European companies with the use of structural equation modelling (SEM). Moreover, according to the supposition put forward by this study, it is expected that the markers of the agency problem will draw a line between managers' decisions on intangibles, which are concerned with outperforming, and those that seek to meet the expectations of investors.

The remainder of the paper is organized as follows. The next section provides a review of the relevant literature. The next section describes the research framework and outlines the theoretical model of the impact of managers' investment on knowledge, which is oriented

towards outperforming of companies and their attractiveness to investors. The following section introduces the methodology and data for the empirical portion of the research. The final section interprets the empirical results in relation to the theoretical model designed in the study. Finally, the conclusions are presented.

Theoretical background

An overview of the relevant research papers that discuss issues of the agency problem and management of intangibles shows that many of those studies refer to the value-based concept. As in many emerging areas, a strong theoretical foundation does not yet exist. This kind of research requires an interdisciplinary approach. Academics and analysts conduct their studies within the context of differing frameworks. Three of these are of a particular importance to the present topic. Indeed, this research rests on the following three pillars:

- (1) intangibles as factors of outperforming (EVA) and value creation (MVA);
- (2) EVA as a key value driver; and
- (3) disclosure of intangibles as a requirement to solve the agency problem.

Each of the pillars is supported by relevant recent studies. Intellectual capital (IC) as a factor of outperforming and value creation is presented in studies by Coombs and Bierly (2006), İşeri and Kayakutlu (2007), Huang and Wang (2008), Yang and Chen (2010), Colak (2010), Garcia-Nogueira *et al.* (2010), Pal and Soriya (2012), and Shakina and Barajas (2014). Despite a common approach to exploring value creation through intangible drivers, different authors reach contradictory results.

Yang and Chen (2010) and Huang and Wang (2008) found that management decisions concerning IC affect the market value of a company. Other researchers, such as Colak (2010) and Pal and Soriya (2012), did not find such a relationship. The discrepancies in the results can be interpreted through the ambiguity of certain intangibles examined in the above studies. In this work, it is expected that the origin of the contradictions displayed in previous empirical analysis will be found. For this to happen, the process of transformation of intangibles into a company's value is specified in this study as a *simultaneous isolated influence on EVA and MVA*.

The second pillar of this research framework is supported in papers that examine EVA as the most important value driver (Athanasakos, 2007; O'Byrne, 1996). According to the value-based view, MVA can be explained by the company's ability to create abnormal profit expressed in EVA (Stewart, 1991). EVA appears to be one of the main indicators of company performance for investors, as it reflects the overall capability of a company to succeed. For this reason, EVA is considered to be one of the key value drivers of MVA. This idea is introduced in a number of studies, including Chen and Lin (2006) and Kyriazis and Anastassis (2007). At the same time, other studies, such as Biddle *et al.* (1999) and Fernandez (2002), note that MVA has either a weak or no statistical relationship with the EVA generated in the past. This phenomenon is likely to be explained by the low predictable power of historical EVA. It is believed that shareholders' awareness about a company's past is not sufficient when they decide where to invest. Investors must be sure about the future growth of a company. This research assumes that EVA drives MVA and gears intangibles into MVA.

The third class of studies challenges the issue of the disclosure of information about intangible resources used in companies. The origin of this discussion is in information asymmetry, which poses the following problem to company CEOs: how to manage intangibles that they find to be reasonable investments while still following shareholders'

preferences (Holmstrom and Milgrom, 1991; Tirole, 2001). These two goals are equally important for managers who are making investment decisions. If these goals are not aligned, managers must accept the challenges of the principal-agent conflict. In the case of controversial goals, managers should either not invest in potentially profitable intangibles or ignore investors' expectations. The first decision would deprive a company of the possibility to outperform, while the second decision leads to the destruction of market value and negative influence on the availability of capital. This conflict is aggravated further by an inadequate motivation system, including managers' compensation and shortening their employment cycle (Bebchuk and Jesse, 2003; Edmans *et al.*, 2012). All of these issues require an in-depth study to improve our understanding of how managers' decisions about intangibles are actualized in the conditions of the new economy. The results of papers devoted to disclosure demonstrate that managers' decisions in relation to investment in intangibles decrease information asymmetry by setting signals for investors. Orens *et al.* (2009) and Vergauwen *et al.* (2007) support the idea that a company provides investors with essential and valuable information when it voluntarily reports on its intangible resources. The disclosure is likely to be important for establishing transparent relationships between managers and shareholders and, thus, contributes to the improvement of corporate governance.

Building on the findings of the above-mentioned papers, we hope to contribute to the discussion about the value creation process. This study seeks to modify the classical approach to value creation based on exogenous drivers by developing a model with endogenous factors. The results of this model will be interpreted with regards to the practical implications of making managerial decisions.

Research framework

The research framework of this study addresses the outcomes of managers' decisions in public companies by investing in intangible resources. Two outcomes are suggested for consideration:

- (1) the contribution of managers' decisions to the creation of competitive advantages through intangibles, which in turn leads to intangible-driven outperforming (EVA growth); and
- (2) the contribution of managers' decisions to investment attractiveness, which enables intangible-driven value creation (MVA growth).

At the same time, they ought to create competitive advantages and assure shareholders and potential investors that the company is likely to succeed. In terms of the framework of this research, managers should provide both EVA and MVA growth.

One principal advantage of the framework of this study is related to the self-sufficiency and consistency of the EVA concept for our research purpose. EVA indicates the outperforming of a company while simultaneously driving value creation (MVA). Moreover, EVA is an indicator that is very closely associated with the unique knowledge generated in companies. Numerous studies, such as Meek and Gray (1998) and Donaldson and Preston (1995), agree that economic profit reflects the efficiency in the management of intangibles. The EVA concept implies that the company succeeds when returns on invested capital exceed the average level in the industry. This reasoning motivates the assumption that a positive EVA stems from unique capabilities is possessed by companies.

Shareholders consider all available information when they make decisions regarding their capital allocation. EVA as an indicator of outperforming is one of the most important factors in investment decisions. At the same time, EVA mainly reflects a company's

historical path, in which information is not always sufficient. Investors take into account those drivers that can potentially provide a company with competitive advantages. Intangibles are regarded by investors as key drivers of future success (Yang and Chen, 2010; Colak, 2010; Huang and Wang, 2008). Moreover, there are several external factors that impact EVA and MVA.

The above-described framework is represented by the conceptual model of endogenous value creation (Figure 1).

It should be noted that this study explores only those relationships that are observed (solid arrows). Dashed lines are unobservable but influence the relationships that are examined in the study.

The elaborated model of endogenous value creation allows for discovering the ambidexterity of managers' decisions about investing in intangible resources. With the help of the elaborated model, the authors aim to *discover that managers with their decisions about intangibles are prone to set positive signals to investors, rather than improve a competitive position measured by EVA*. In other words, the authors expect discrepancies in the impact of intangible resources upon MVA and EVA.

One of most contentious issues which must be challenged in this research is the identification and measurement of intangible resources. This study applies a slightly modified version of the typology introduced and elaborated on in previous studies. Molodchik *et al.* (2014) introduce six elements of intangibles and establish that because of their sophisticated nature, it is difficult to express intangibles in terms of a single indicator. A multiple-factor measurement model was applied to establish relationships between elements within each of the components of IC. As stated in the quoted paper, each construct of intangible resources is described by a number of variables, which separately reflect different features of a company's intangibles. This approach takes advantage of data generally available in companies' annual reports, their websites, information bureaux and rating agencies. Here, in line with Molodchik *et al.* (2014), latent constructs for the core intangible resources of the company are elaborated (Figure 2).

As seen in Figure 2, each element of the intangible resources in this research is introduced as an aggregated latent construct. Five elements are described by a system of corresponding indicators.

In addition to indicators that reflect unique intangibles of a company, the triangle model of endogenous value creation considers external factors. Essentially, it is important to identify whether external conditions might have a significant impact on companies' outperformance and investment attractiveness.

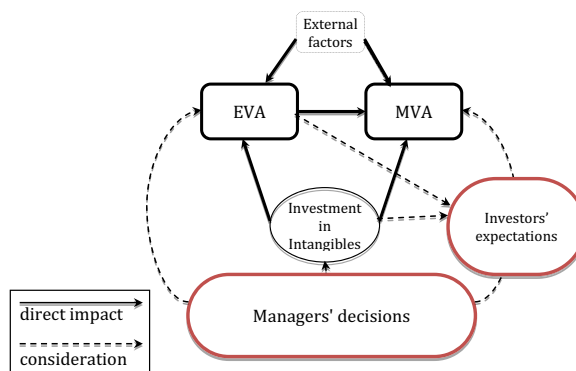


Figure 1.
The research
framework of the
study: the conceptual
model of endogenous
value creation

Human Resource Capability	Qualification of board of directors
	Cost of employees
	Productivity
	Brand_Human
Innovation Capability	Intangible Assets
	Patents
	Awards for innovation performance
	R&D expenditures
Internal process Capability	ERP system
	knowledge management system
	Strategy implementation
	Qualification of board of directors
Customer Loyalty and Reputation	Advertising expenditures
	Brand value
	Citation in search engines
Networking Capability	Associations
	Foreign capital employment
	Subsidiaries

Figure 2.
Core elements of
intangibles in
companies

Source: Self-elaboration from Molodchik *et al.* (2014)

To accomplish this, the company's industry and location, in addition to time effects, should be considered. To find out which external factors concerning a company's location might influence its activities, several studies devoted to spatial economy, such as [Porter \(1996\)](#), [Abramovsky and Simpson \(2011\)](#) and [Audretsch and Dohse \(2007\)](#), are addressed. This element is referred to as "spatial opportunities" and is defined in respect of the following items:

- location in a country with a highly developed labour market (measured by Global Competitiveness Index);
- location in the capital of the country; and
- proximity to a university.

It is expected that spatial factors may play a critical role, especially for companies that take advantage of their location.

The research framework described here is empirically tested on panel data from listed European companies, covering the period from 2004 to 2011. The methodology and data are introduced in the next section.

Methodology

The endogenous value creation model requires the estimation of the following simultaneous equation system:

$$\left\{ \begin{array}{l} EVA = f(HC, InC, BPC, CL, NC, Opp, year_{2008}, year_{2009}) \\ MVA = f(EVA, HC, InC, BPC, CL, NC, year_{2008}, year_{2009}) \end{array} \right. \left(\begin{array}{c} HC \\ InC \\ BPC \\ CL \\ NC \end{array} \right) = f(Ind, age)$$

- where:
- EVA = economic value added;
 - MVA = market value added
 - HC = human resources capability;
 - InC = innovation capability;
 - BPC = business processes capability;
 - CL = clients' loyalty and reputation;
 - NC = networking capability;
 - Opp = spatial opportunities;
 - Ind = industry; and
 - Age = age of the company.

The model requires the estimation of a number of latent constructs and their relationships with endogenous observed variables as an examination of the introduced system of equations shows. For that purpose, the study applies SEM. This methodology enables simultaneous estimation of the relationship between MVA, EVA and the intangibles used in companies. It uses covariation analysis and applies the maximum likelihood technique. The key criteria for the interpretation of the results are the statistical significance of the coefficients and the goodness-of-fit, which indicates that the empirical model is a good reflection of the theoretical supposition put forward in the study (Bollen, 1989). STATA 12 is used to calculate both formative and reflective constructs of the latent constructs and structural relationships.

The analysis has been conducted using data from more than 1,650 European public companies during the eight-year period from 2004 to 2011. The empirical portion of this research aims to test the theoretical model presented in the previous section (Figure 1). The information has been collected from companies located in five European countries: UK, Germany, France, Spain and Italy.

The data set for this study has been collected from a combination of detailed longitudinal databases, namely, the Bureau Van Dijk (Amadeus) and Bloomberg. The database consists of financial and non-financial indicators underlying the variables that reflect several quantitative and qualitative characteristics of intangibles in a company. The database includes figures from annual statistics and financial reports. Other information has been collected from publicly available sources such as company websites, rating agencies and patent and information bureaux.

The study includes 23 variables. Table I introduces the description of these variables with references to papers that have used the same or nearly the same indicators in their analyses of investment in IC.

Some of the variables involved in the analysis have been slightly modified. Those variables that introduced a larger bias from the normal distribution were logarithmically smoothed. Those variables are “productivity” and “MVA”. The next section presents the results of the empirical analysis and provides an interpretation of the most relevant findings.

Variable/construct	Variable/indicator	Authors that mentioned the same or similar indicator	Information source and estimation algorithm
Indicator of value creation	Market value added (MVA)	Stern <i>et al.</i> (2001) Chen <i>et al.</i> (2005)	$MVA = EV - BV^a$
Indicator of the outputforming	Economic Value Added (EVA) ⁶	Coombs and Bierly (2006) Stern <i>et al.</i> (2001) Riahi-Belkaoui (2003) Garcia-Nogueira <i>et al.</i> (2010) Shakina and Barajas (2012) Orens <i>et al.</i> (2009) Sydlar <i>et al.</i> (2014) Orens <i>et al.</i> (2009)	$EVA_t = IC_{t-1} \times (ROIC_t - WACC_t)^b$
Human resource capability	Cost of employees Productivity Qualification of board of directors	Tseng and Goo (2005) Orens <i>et al.</i> (2009) Kamukama (2010) Shakina and Barajas (2012) Thomson (2006)	Company's Annual Report*, section Financial data Company's Annual Report, section Financial data Earnings before interest and taxes divided by Sales Company's Annual Report, section Directors information If more than one-third of directors have postgraduate level of qualification and more than five years of experience – 2 points If more than one-third of directors have postgraduate level of qualification or more than five years of experience – 1 point Another – 0 Search on company name in the ranking LinkedIn's Most In Demand Employers on the website: http://www.rankingthebrands.com/ If it has a rank – 1 point, otherwise – 0 point Company's Annual Report, section Financial data
Innovation capability	R&D expenditures Intangible assets Awards for innovation Patents, licenses, trademarks	Gleason and Klock (2003) Huang and Wang (2008) Huang and Liu (2005) Sydlar <i>et al.</i> (2014) Sellers-Rubio <i>et al.</i> (2007) Shakina and Barajas (2012) Anton and Yao (1989) Tseng and Goo (2005) Sellers-Rubio and Mas-Ruiz (2007) Shakina and Barajas (2012)	Company's Annual Report, section Financial data Company official websites, sections "Awards" and "Press releases" Search on company name and number of patents on the website QPAT: http://www.orbit.com

(continued)

Endogenous value creation

Table I.
Variables and indicators involved in the empirical analysis

Table I.

Variable/construct	Variable/indicator	Authors that mentioned the same or similar indicator	Information source and estimation algorithm
Business process capability	Strategy implementation	Tseng and Goo (2005)	Search on company location on their website using the following words as strategy, strategy implementation If company has news about these as listed above – 1 point, otherwise – 0 points Important to put 1 or 0 in the year of implementation 1. Search on the web-site of the company using the following words as “ERP”, “Oracle”, “NAVISON”, “NAV”, “SQL”, “SAP” 2. If company has news about these things – 1 point, otherwise – 0 points. Important to put 1 or 0 in the year of start implementation 3. Search on the web-site of the company using the following words as “knowledge management”, as “intellectual resources”, If company has news about these things – 1 point, otherwise – 0 points. 4. Important to put 1 or 0 in the year of start implementation
	ERP implementation	Kamukama (2010) Shakina and Barajas (2012) Kamukama (2010)	
		Murthy and Mouritsen, (2011)	
Customer loyalty and reputation	Knowledge management system	Shakina and Barajas (2012) Kamukama (2010)	Search on company name in the ranking BrandFinance Global 500 on the website: http://www.rankingthebrands.com/ If it has a rank – 1 point, otherwise – 0 point Search on company’s name and its score in the web-site: http://www.prchecker.info/check_page_rank.php
	Brand value	Murthy and Mouritsen, (2011) Shakina and Barajas (2012) Riahi-Belkaoui (2003)	
		Murthy and Mouritsen, (2011)	
	Citations in search engines	Shakina and Barajas (2012) Shakina and Barajas (2012) Molodchik <i>et al.</i> (2012)	
	a. Advertising expenditures	Hirschey (1982) Johnson and Soenen (2003)	

(continued)

Variable/construct	Variable/indicator	Authors that mentioned the same or similar indicator	Information source and estimation algorithm
Networking capability subsidiaries	Associations	Molodchik <i>et al.</i> (2012)	Company Annual Report, section Common information + Company Website For those who involved in business associations it is given 1 point and otherwise 0 points
	Foreign capital employment	Shakina and Barajas (2012)	Company Annual Report, Section Shareholder name, vertical vector country If company has foreign investors it gains 1 point and otherwise 0 points
	Subsidiaries	Shakina and Barajas (2012)	Company's Annual Report, section "Subsidiary name" If company has less than 100 subsidiaries put the total number, otherwise use the following vector "First 100 out of Y subsidiaries"
Spatial opportunities	b. Proximity of University	Huang and Liu (2005) Swartz and Firer (2005) Orens <i>et al.</i> (2009)	Company's Annual Report, section Common information, The main activity
	c. Location in the capital of a country	Shakina and Barajas (2012)	Search on company's location on their website, see the status of the city location in Wikipedia If it is the capital of the state or region) – 1 point, otherwise – 0 points
	d. Global Competitiveness Index – Labour markets	Molodchik <i>et al.</i> (2014)	Search on the website of World Economic Forum in the relevant reports. The scores are different within countries and years
Year	e. Dummy variables for 2008 and 2009	Molodchik <i>et al.</i> (2012)	If year = 2008, the variable year_2008 is 1, otherwise 0 If year = 2009, the variable year_2009 is 1, otherwise 0

Notes: ^a Where: EV = market capitalization + D; enterprise value equals market capitalization and companies debts (market value); BV = E + D; book value of a company equals a sum of companies' equity and debts (book value); ^b where: $IC_{t-1} = D_t + E_t$; book value of equity and debts; $ROI C_t = NOPAT_t / IC_{t-1}$; return on invested capital; $NOPAT_t = EBIT_t(1 - T)$; net operation profit after taxes; $WACC_t = D_t / (D_t + E_t) \times kd(1 - T) + E_t / (D_t + E_t) \times ke$; weighted average cost of capital; D_t : book value of debt; E_t : book value of equity; $kd = krf + \text{default spread of the company} + \text{default spread of the country}$; cost of debt $ke = krf + \beta \times (km - krf)$; cost of Equity; krf : risk free rate – return on the treasury bonds of US Government; β : bottom-up build beta (adjusted by Hamada's equation); km : historical return on the market portfolio (market index); T : effective tax rate; ERP = enterprise resource planning

Table I.

MRR
40,4

420

Results

Before entering the analysis of the results of the model, [Tables II, III and IV](#) present the summary statistics for these variables presented in [Table I](#).

Most of the companies in the sample are run by top managers with relatively high qualifications; more than 80 per cent of them have either a postgraduate degree or significant experience in a directorial position, or otherwise meet all requirements of this criterion.

The variable “citations in search engines” is approximately normally distributed. It means that most of the companies involved in the analysis are well-represented on the internet.

[Table III](#) reflects that approximately 30 per cent of the companies included in the sample have embedded ERP and knowledge management (KM) systems, participate in business associations and have a corporate university (increasing to 50 per cent). On the other hand, a major portion of enterprises (60 per cent) have implemented a strategy and attracted foreign capital (88 per cent). Well-known brands account for only 3 per cent of the companies implicated in the analysis.

Most of the indicators included in the exploration of intangible resources in this study are measured by continuous variables. None of them is normally distributed, exhibiting skewness and being long-tailed. Nevertheless, significant outliers are observed only in

Table II.

Summary statistics for the categorical variables

Categorical variable	No. of observations/frequencies
Qualification of board of directors	12,419
0	0.156
1	0.430
2	0.414
Citations in the search engines	13,456
0	0.001
1	0.037
2	0.082
3	0.193
4	0.303
5	0.228
6	0.112
7	0.038
8	0.005

Table III.

Summary statistics for the binary variables

Variable	Rate of 1	No. of observations
Outperforming (positive EVA)	0.37	13,545
ERP systems	0.30	12,097
Knowledge management system	0.28	12,258
Participation in associations	0.30	12,336
Brand human	0.01	13,544
Brand value	0.03	13,544
Foreign capital	0.88	13,140
Strategy	0.61	12,468
Location in the capital	0.50	13,496
University proximity	0.50	12,696

Variable	No. of observations	Mean	SD	Min	Max	Endogenous value creation
Value creation (Logarithm of MVA)	8,557	4.45	2.52	−5.80	11.75	<div>421</div> <div> Table IV. Summary statistics for the continuous variables </div>
Cost of employees (million Euro)	12,414	418.50	1,547.33	0.00	26,646	
Logarithm of Productivity	11,980	−1.59	1.07	−13.45	6.35	
Advertising expenses (million Euro)	13,471	24.96	320.91	0	11,325.15	
Subsidiaries	13,544	71.03	175.66	0	2437	
Awards	12,005	0.30	2.38	0	100	
Intangible Assets (million Euro)	13,385	737.41	4,100.83	0	121,204.90	
Patents	12,856	274.20	2,844.96	0	73,417	
R&D expenditures (million Euro)	13,545	38.05	307.33	0	7,203	
Development of the labour market	13,544	4.71	0.57	3.51	5.41	

financial indicators. This appears to be easily explained, as listed companies in the database are introduced without restrictions on the scale of their activities.

The system of simultaneous equations introduced in the previous section was estimated using SEM in the STATA 12. For acceptance, the model we use is [Steiger's \(1990\)](#) root mean square error of approximation (RMSEA), which represents a real advance in the evaluation of the model fit from both a statistical and conceptual viewpoint. The level of RMSEA of the estimated model in this study is equal to 0.087 and reflects a reasonably good fit between the sample and the theoretical model, accounting for degrees of freedom ([Browne and Cudec, 1993](#), [Tennant and Pallant, 2012](#)).

The latent variables established in this study describe companies' intangibles and spatial opportunities. All the paths connecting the measurements with the latent variables present significant values. [Table V](#) shows the contribution of each item in the corresponding latent variable. Industry and age of a company were controlled. These variables were included in the model as factors that influence the investment in companies' intangibles.

[Table VI](#) and [Figure 3](#) present the results of modelling the simultaneous economic and market value creation process driven by intangibles.

First, the study reveals the empirical evidence of the endogenous value creation model. The significant links between investment in intangibles, EVA and MVA, which are presented in the system of equations, have been proven.

Second, as seen in [Table VI](#), there are differences in the influence of investment in intangibles on EVA and MVA. "Human resource capabilities" and "business process capabilities" lead to a positive significant impact upon both EVA and MVA. At the same time, "innovation and networking capabilities" have a significant but opposite effect on outperforming and value creation. Although these intangibles are positive signals for shareholders, they also decrease a company's competitiveness. "Customer loyalty" increases investment attractiveness and has no significance for outperforming.

Third, the external factors were taken into account by modelling the value creation. The factors associated with spatial opportunities did not show a significant impact on companies' activities. It should also be noted that markets reacted very quickly to the financial crisis. This is reflected in the significantly negative influence of the year 2008 on companies' attractiveness to investors. However, these corporations did not ultimately "go down" until 2009; only in 2009 was the impact of the crisis palpable.

When interpreting the results of model estimation, it is important to highlight that the supposition of the study was confirmed.

MRR
40,4

422

Latent construct	Measurements	Standard coefficient (standard error)
Human resources capabilities	Qualification of board of directors	0.096*** (0.017)
	Cost of employees	0.551*** (0.019)
	Productivity	0.169*** (0.020)
	Human brand	0.570*** (0.021)
Innovation capabilities	Intangible assets	0.476*** (0.014)
	Number of patents	0.513*** (0.014)
	R&D expenditures	0.849*** (0.018)
	Awards for innovation	0.049*** (0.016)
Business process capabilities	ERP	0.798*** (0.009)
	Knowledge management system	0.780*** (0.009)
	Strategy implementation	0.539*** (0.011)
	Qualification of board of directors	0.371*** (0.012)
Customer loyalty	Advertising expenditures	0.156*** (0.015)
	Brand	0.456*** (0.015)
	Citation in search engines	0.734*** (0.017)
Networking capabilities	Business associations	0.089*** (0.017)
	Foreign capital	0.133*** (0.017)
	Subsidiaries	0.601*** (0.023)
Opportunities	Location in capital	0.820*** (0.016)
	University	0.659*** (0.014)
	Development of labour market	0.292*** (0.014)

Table V.
Latent variables

Note: ***Significance level < 0.01

Observed endogenous variables:	MVA	EVA
EVA	0.172*** (0.012)	
<i>Latent variables</i>		
Human resources capabilities	0.137*** (0.028)	0.097*** (0.029)
Innovation capabilities	0.035** (0.018)	−0.080*** (0.020)
Business process capabilities	0.088*** (0.011)	0.025** (0.015)
Customer loyalty	0.539*** (0.018)	0.011 (0.020)
Networking capabilities	0.488*** (0.023)	−0.120*** (0.028)
Opportunities	–	0.018 (0.015)
<i>Control time-effect) variables:</i>		
2008 year	−0.405*** (0.010)	0.005 (0.012)
2009 year	−0.007 (0.010)	−0.059*** (0.012)
Constant	1.290 (0.060)	0.924 (0.026)

Table VI.
Results of SEM

Notes: ***significance level < 0.01; **significance level < 0.05

Conclusions

This study sought to explore the process of endogenous value creation driven by investment decisions on intangibles in corporations where the agency problem is a crucial issue. This paper provides empirical analysis that contributes to the understanding of cohesion between managerial decisions that referred to intangibles, competitive advantages of companies resulting in EVA and value creation expressed in MVA. It advocates the proposed idea that managerial decisions for intangibles not only result in a direct impact on the outperforming

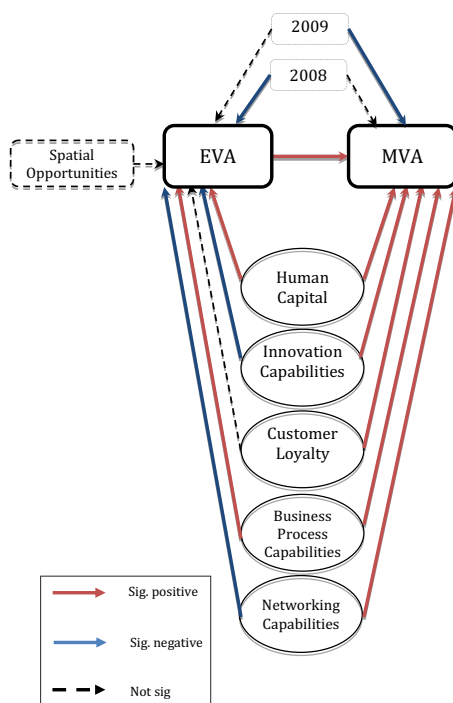


Figure 3.
Results of SEM

of companies but also generate certain signals to strategic investors. It has been found that markers of the agency problem are aggravated by intangibles, while evidence has been discovered showing that managers are likely to follow investor expectations that sometimes contradict the generation of sustainable competitiveness of companies expressed in the positive growth of EVA.

The model does not imply any particular mechanisms for the improvement of corporate governance in intangible-intensive companies. However, the aspects to be considered when designing rules and incentives that allow for proper communication between managers and investors, together with driving both outperforming and sustainable value creation, are emphasized.

Theoretical questions concerning the agency problem have been developed, which consider the value creation process driven by investment in intangibles. The elaborated model of endogenous value creation helps to underline the simultaneous impact of intangibles on the outperforming of companies measured by EVA and the value creation expressed by MVA, as well as the impact of EVA on MVA. The well-known principal-agent conflict described by [Holmstrom and Milgrom \(1991\)](#), [Tirole \(2001\)](#) and others was specified in this study for a particular case of decision-making by investing in intangibles.

Other contributions made by this paper refer to the methodology. The gap discovered in the literature lies in the separate analysis of three kinds of relationships: intangibles and MVA; intangibles and EVA; and MVA and EVA. The application of SEM enables the simultaneous estimation of the triple linkage of intangibles, EVA and MVA by constructing endogenous latent factors of intangibles. This technique decreases the bias that exists in models where intangibles are considered exogenous drivers, thereby disregarding the

origins and nature of managerial decisions on intangibles. Moreover, the paper develops an approach to the measurement of intangibles. A group of latent constructs has been elaborated to identify the phenomenon of different groups of intangibles through a joint set of metrics by a single indicator. It should be noted that the information for all metrics comes from publicly available sources.

The third set of findings is established by the empirical testing of the endogenous value creation model. As expected, the triple linkage of intangibles, EVA and MVA has been revealed. *Evidence of discrepancies* in value drivers and factors of outperforming has also been found. All groups of intangibles positively contribute to MVA creation, although some of them appeared to be irrelevant or even negative for EVA. The apparent discrepancy established in this research is that managers tend to accumulate intangible resources that are positively recognized by investors. These empirical results justify the presence of the agency problem in the value creation process driven by intangibles.

Only two out of five constructs of intangibles (“human resources capabilities” and “business process capabilities”) have shown a significant positive influence on EVA and MVA. The investments in “innovation and networking capabilities” increase shareholders’ expectations, while seeming to be inefficient in respect of companies’ outperforming. These results partly corroborate with those from [Coombs and Bierly’s \(2006\)](#) study, which found a negative influence of technological capabilities (measured by the number of patents, average number of scientific papers, R&D expenditures and other indicators) on EVA and positive on MVA. Taking into account that companies’ investors positively recognize EVA as a value driver, being this negative, one can expect MVA to decrease. The open question in this discussion concerns the possible time delay in the transformation of “innovation and networking capabilities” in companies’ outperformance. A more precise examination of lag effects is required to consider this issue.

Turning to the contribution of each intangible driver to value creation, the biggest contribution comes from “customer loyalty and networking capability”, meaning that investors particularly recognize these drivers. At the same time, “customer loyalty” does not show a significant influence on outperformance, while “networking capabilities” decreases company performance. Moreover, despite the apparent importance of “human resources” and “business process capabilities” for the outperforming of companies, these factors are much less influential for investors (according to the estimated standard coefficient). We suppose that the information on “human resources” and “business process capabilities” is not sufficiently disclosed. This fact results in investors’ underestimation of these factors. In line with [Aboody and Lev \(2000\)](#), the authors emphasize on the importance of the disclosure of intangible resources, as well as reporting outcomes by investing in these resources.

The interpretation of the evidence revealed in this study shows that public companies are significantly influenced by distorted incentives created in corporate governance for company managers. They are likely trying to satisfy the perceptions of investors instead of creating real competitive advantages for their respective company, which means that managers are oriented towards the short-term when setting positive signals for investors.

Implications and limitations

The agency problem in the value creation process driven by intangibles has been discovered. Managers tend to accumulate intangible resources positively recognized by investors.

As it has been already mentioned, this paper contributes to the understanding of managerial decisions referred to intangibles. Moreover, making visible the decisions on

intangibles provides information for investors. For that reason, the disclosure of intangible resources and the outcomes obtained by investing on them become crucial for investors.

This research emphasizes on the particular importance of the awareness of policymakers in companies, namely, the top managers, about the outcomes of their decisions. The decision-making process in public companies should be as deliberative as possible and should consider all the potential ramifications of any particular decision.

These results should be interpreted with some caution, mainly because of the general lack of factors involved in the analysis. Still, there is room for discussion and interpretation of the estimates introduced in the paper.

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About the authors

Elena Shakina is an Associate Professor at National Research University Higher School of Economics, in Perm Campus, Russian Federation. She is lecturing at Financial Management Department and is a Senior Research Fellow in applied corporate finance. Since 2010, Elena is involved in international research group, and her research line is related with intellectual capital evaluation.

Mariia Molodchik is an Associate Professor at National Research University Higher School of Economics, Russian Federation. She gives lectures on knowledge management. Professional interests include intellectual capital evaluation, self-organization and sustainable innovation. The research results are published in international scientific journals and conferences. For further information, visit <http://www.hse.ru/en/org/persons/189393>

Angel Barajas is an Associate Professor at the Department of Accountancy and Finance, University of Vigo, Spain. He is a Visiting Lecturer at Universities in Germany, Russia and UK. He is currently the Director of the MBA in Sport at University of Vigo and a Researcher for the Spanish Economic Observatory of Sport. His research interests include investment valuation, intellectual capital and finance of sports. He is the Academic Supervisor of the ID Lab (NRU Higher School of Economics – Perm Campus). Angel Barajas is the corresponding author and can be contacted at: abarajas@uvigo.es