Journal of Intellectual Capital

Intangible-intensive profiles of companies: protection during the economic crisis of 2008-2009

Elena Shakina Angel Barajas

Intangible-intensive profiles of companies: protection during the economic crisis of 2008-2009

Elena Shakina
Department of Economics and Finance, National Research University Higher School of Economics, Perm, Russia, and
Angel Barajas
Department of Accountancy and Finance, University of Vigo, Ourense, Spain and IDLab, National Research University Higher School of Economics, Perm, Russia

Abstract

Purpose – This study explores the strategies adopted by companies during the economic crisis of 2008-2009. It investigates whether it is reasonable for companies to intensify their investment in intangibles during recession periods. The purpose of this paper is to find empirical evidence that companies with clear intangible-intensive profiles are likely to outperform those without a clear strategy.
Design/methodology/approach – This paper explores the intangible-intensive strategies of companies in terms of their dynamics during the pre-crisis, crisis and post-crisis periods. Through dummy regression applied to data from more than 1,600 European companies involved in the empirical analysis, the paper aims to show moderating effects from intangible-intensive strategies on company performance, expressed in terms of economic value added and market value added.
Findings – The results established in this study shed some light on the global economic crisis in 2008-2009. The findings of this study demonstrate that companies with a conservative profile towards intangibles outperform both those without a defined profile and those with an innovative one. However, an innovative profile enables faster recovery after a crisis.
Originality/value – This paper contributes to the literature on the strategic management of companies, and highlights the particular importance of intangible-intensiveness when markets experience systematic distresses. It is emphasized that lessons learned during the recent global economic crisis must be taken into account in the strategic vision of any company.

Keywords Performance, Strategy, Intangibles, Crisis
Paper type Research paper

1. Introduction

The failure and success of companies during economic crises is a widely discussed issue. It has been considered in conceptual and empirical research papers, in analytical overviews, and in consulting reports such as those by Krugman (2009) and Elliott (1980). The most recent global economic crisis of 2008-2009 attracted particular attention from researchers, since it led to dramatic structural changes in certain industries and companies. Nevertheless, research into the core strategies of a company which successfully survives an economic crisis has not been frequently undertaken.

It is generally assumed that the larger the number of unique resources at the disposal of a company, the greater the chance that they will weather an economic recession. Unique resources are mainly contained in a company's intangible portfolio (Barney, 1991; Grant, 1991; Wade and Gravill, 2003; Kristandl and Bontis, 2007). The evidence for the crucial role played by intangibles during the economic recession of 2008-2009 was introduced by Guevara and Bounfour (2013). This paper examines whether intangibles become more important during economic turbulence, and which

Journal of Intellectual Capital
Vol. 17 No. 4, 2016
pp. 758-775

1469-1930
DOI 10.1108/JIC-02-2016-0029

specific intangibles increase a company's ability to outperform others under difficult economic conditions. This idea has been tested by numerous researchers like Beltratti and Stulz (2009), Lee and Makhija (2009), Santoro (2009), Schenker-Wicki *et al.* (2010) and Cohen *et al.* (2014). Petkov (2011) notes that the lack of accounting for internally generated intangible assets is one of the factors that originated the 2008 financial crisis.

The current study contributes to the development of this research. In taking this step, it is assumed to be likely that specific, isolated intangible resources do not play a critical role in a company's success, especially in crisis conditions. At the same time, however, companies are likely to intensify those intangibles which are aligned with their strategic vision. These intangibles make up a company's strategic resource portfolio (Kristandl and Bontis, 2007). The question of which combination of intangibles allows companies to survive and even succeed while others fail holds much interest for researchers. An economic crisis offers a unique opportunity for the study of this phenomenon, since it acts as a natural experiment in exogenous shock for all companies and industries.

Shakina and Barajas (2015) have reported that when companies intensify their intangibles, their behaviour has several features in common. In their study, three company profiles were identified, of which two were considered to be intangible-intensive. There were two clusters of companies that showed a clear predominance of a particular combination of intangibles in their resource portfolio. These two profiles were identified as being conservative and innovative. The remaining profile, which was not characterized by a clear strategy with regard to its intangibles portfolio, was termed a moderate profile. This profile was not considered to be intangible-intensive.

The current study examines the change in the performance of each one of these profiles under the conditions of the exogenous shock resulting from the global economic crisis of 2008-2009. This research aims to identify which strategic profile can provide protection or even success for companies during difficult economic conditions.

To answer this question, the results presented by Shakina and Barajas (2015) are used. Based on this study, an empirical test is undertaken to reveal whether a significant difference exists between the performance of the companies in each profile, before and after the crisis. This study considers the economic crisis to be an exogenous interference, and attempts to establish a causal relationship between the performance of the companies, the moderating effect of the crisis and intangible-intensive profiles.

This paper is organized as follows. The next section provides a review of the literature; Section 3 introduces the design of the research and the econometric strategy; Section 4 describes the results of the model estimation; and the final section presents a discussion of the results and the limitations of the research framework, and gives an overview of possible future directions for this study.

2. Theoretical foundation

Economic crises usually attract the attention of academics due to their negative impact on the behaviour of economic agents. The amount of published research on crises increases sharply during the year after the onset of a crisis. Hsu and Chiang (2015), Schenker-Wicki *et al.* (2010) and Cohen *et al.* (2014) have considered shifts in company strategy under market collapse, and financial and investment restrictions. The recent global economic crisis generated particular interest in the investment behaviour of companies. According to Guevara and Bounfour (2013), companies are challenged during a downturn to find the best ways of reallocating their resources. Intangibles are considered priorities, since they provide a "stream for future benefits" (Lev, 2000).

An extensive body of management literature addresses the intangible-intensive strategies of companies. They are examined in research by Williams and Lee (2009), Williams and Nones (2009) and Martínez-Torres (2014). Many recent studies such as those by Clarkson *et al.* (2011) and Bocquet *et al.* (2013) deal with proactive and reactive strategic behaviour in changing environments. However, the analysis of proactive and reactive decisions concerning intangibles is underdeveloped in the literature, hindering a deeper understanding of the role of intangible-intensive strategies in companies during economic crises.

As noted by Dahlmann and Brammer (2011), companies do not generally change their strategies considerably regarding intangibles. This implies that intangible-intensive strategies that were chosen before an economic crisis either provide companies with sustainable competitive advantages or aggravate the situation during a recession. These findings were confirmed by surveys carried out by Wilson and Eilertsen (2010). However, as discussed by Kunc and Bhandari (2011) some companies follow reactive strategies by reducing a substantial part of the expenses associated with their intangible portfolio. Thus, proactive strategies in combination with reactive ones are of particular interest when considering economic distress.

This study attempts to fill a gap in the literature with regard to the analysis of proactive company strategies for intangibles. In putting forward a hypothesis that intangibles create competitive advantages, intangible-intensive strategies are considered in this paper to be protective from the distress brought by the global economic crisis of 2008-2009. Several papers exist which consider various elements of strategic company investments: in innovations by Wright and McMahan (2011), Paunov (2012) and Archibugi *et al.* (2013); in human resources by Wright and McMahan (2011) and Unger *et al.* (2011); and in marketing by Svendsen *et al.* (2011).

Most of these studies are based on surveys and reveal the attitudes of decision makers to external economic shocks and the outcomes of these attitudes towards company performance. Behavioural factors are undoubtedly among the most relevant when turbulent conditions are present. However, this research does not dispute the objective capacity of different intangible-intensive strategies to keep a company performing well in an economic crisis.

This paper assumes that different companies have common features and strategies with regard to intangibles. Some idiosyncratic assets must support each strategic position (Nickerson and Silverman, 1997). Intangible assets are among those unusual assets that can provide a company with competitive advantages and allow it to outperform its rivals, meaning that they are core strategic resources for a business. They enable an organization to differentiate itself from rivals and consequently to create sustainable value (Lev, 2000; Kristandl and Bontis, 2007). In this sense, Curado *et al.* (2014) use intellectual capital scores to predict future financial results throughout a financial crisis and conclude that a company's intellectual capital can predict its economic performance.

Intangible-intensive strategy deals with these idiosyncratic assets, and is a primary counterpart to the strategic behaviour of any company. It is argued by Bottani (2010) that these common features form a strategic profile of a cluster of companies; the intangible-intensive profile is therefore the focus of this investigation. According to Shakina and Barajas (2015), an intangible-intensive profile is associated with prioritized investments in certain types of intangibles. In this research, it is important to distinguish a moderate (or low) profile from an intangible-intensive one. A moderate profile is the projection of an even allocation of investment in intangible resources, while intangible-intensive profiles present the clear majority of a particular coherent group of intangibles.

The research question examined in this paper requires the study of company profiles without their idiosyncratic characteristics. For the purposes of this study, the strategic profile of a company is used as the unit of observation. This research approach is also employed by Cho *et al.* (2012).

3. Research design and methodology

Based on the theoretical reasoning and empirical results presented in studies by Archibugi *et al.* (2013), Paunov (2012), Wilson and Eilertsen (2010) and Shakina and Barajas (2014), two hypotheses are put forward in this research:

H1. Companies with intangible-intensive strategies had, on average, lower drawdown and faster recovery after the global economic crisis of 2008-2009.

H2. Intangible-intensive strategies protected companies during the crisis and marginally moderated their recovery process.

In order to test these hypotheses, this study undertakes a comparative analysis of the different strategic profiles in intangibles across three periods: before the global economic crisis (2006-2007), during the crisis (2008-2009) and after the crisis (2010-2011).

As noted in the previous section, the company intangible-intensive profile forms the unit of observation for this study. The research agenda of this paper is based on the empirical findings established in the study by Shakina and Barajas (2015). The major findings of the exploratory analysis conducted in that paper are as follows:

- Three strategic profiles were identified, which were empirically validated for a sample of European companies observed between 2004 and 2011.
- Two of these newly discovered profiles use intangible-intensive strategies. The first intangible-intensive profile, with a clear predominance of innovation and networking capabilities, was termed the innovative profile. The second profile considers management capabilities and business process capabilities as vital strategic intangible resources, and this profile was termed the conservative profile.

This research study is carried out using the following steps:

(1) In order to test the first hypothesis, a statistical description and dynamics analysis of the data in each profile is carried out.

(2) In order to test the second hypothesis, the model is elaborated and empirically estimated. This forms a test of whether a marginal negative or positive gain in performance due to the use of intangibles in each profile could be registered during the crisis, and forms a measure of how fast companies in each profile recovered after the crisis.

The central results from the paper by Shakina and Barajas (2015) are presented and interpreted as follows:

- Figure 1 illustrates the coordinates of clusters with regard to intangibles. Each coordinate is associated with a number of indicators describing company intangibles: human resource capability (ih_HRC), management capability (ih_MC), customer loyalty (ir_CL), network capability (ir_NWC), business process capability (is_BPC) and innovative capability (is_InnC). The precise description of the indicators involved into the analysis is demonstrated in Table AI.

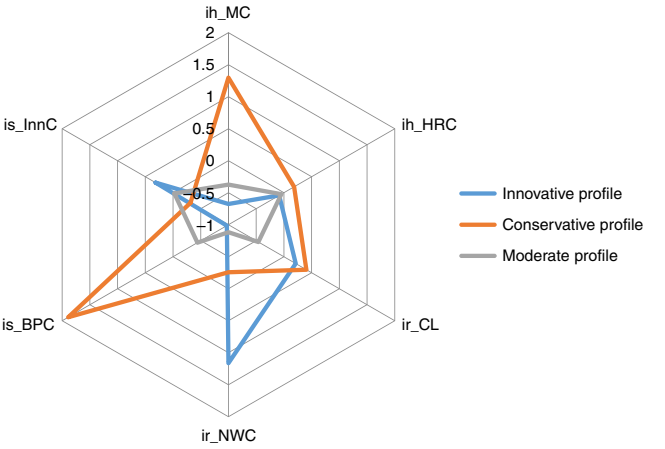

Figure 1.
Radar diagram of three intangible-intensive clusters

- The results of clustering are presented in Table I and Figure 1. These findings give a clear picture of the three corporate profiles in intangibles: conservative (CP), innovative (IP) and moderate (MP). These profiles form the focus of investigation of this paper.

As can be seen from the list below, each of the intangibles is measured by a set of indicators that reflect one of the core features of this intangible resource. All of the indicators used in the analysis can be estimated from publicly available information. Core six elements of companies' intangibles (source: own elaboration from Shakina and Barajas, 2015):

(1) Human resource capability:
- productivity; and
- earnings per employee.

(2) Management capability:
- qualification of the board of directors;
- corporate university; and
- strategy implementation.

(3) Customer loyalty
- brand power;
- citation in search engines;
- site quality; and
- number of subsidiaries.

(4) Networks capability:
- proximity of the university;
- location in the city with the population of more then 1 million;
- foreign capital employment; and
- subsidiaries.

Company profile	Principal component of intangibles	Management capability	Human resources capability	Customer loyalty	Networks capability	Business processes capability	Innovative capability
Innovative profile	Min	−7.52	−63.05	−3.01	−0.60	−1.48	−0.61
	Mean	−0.68	−0.09	0.21	1.16	−0.97	0.31
	Max	9.94	36.62	9.35	2.25	4.41	14.41
Number of companies	2,529						
Conservative profile	Min	−2.30	−1.92	−1.95	−5.14	−0.48	−1.03
	Mean	1.30	0.18	0.41	−0.26	1.89	−0.32
	Max	2.91	28.71	11.05	2.24	9.86	19.88
Number of companies	3,001						
Moderate profile	Min	−3.85	−2.46	−2.43	−2.18	−1.48	−1.03
	Mean	−0.37	−0.05	−0.46	−0.88	−0.44	−0.03
	Max	1.91	20.63	6.71	0.79	2.09	5.44
Number of companies	3,302						
Total	Min	−7.52	−63.05	−3.01	−5.14	−1.48	−1.03
	Mean	0.11	0.02	0.03	−0.08	0.20	−0.03
	Max	9.94	36.62	11.05	2.25	9.86	19.88

Source: Shakina and Barajas (2015)

Table I. Results of cluster k-means analysis

(5) Innovation capability:
- intangible assets;
- patents; and
- R&D expenditures.

(6) Internal process capability:
- ERP system;
- knowledge management system; and
- strategy implementation.

3.1 Econometric strategy

The examination is carried out on the data set of European companies operating in the five largest countries in Europe (UK, Germany, France, Spain and Italy). Data from these companies were recorded from 2004 to 2011. To correctly control for the crisis effect, three short panels are used: 2006-2007, 2008-2009 and 2010-2011. The first panel is associated with the pre-crisis period, the second panel the epicentre of the crisis and the last the post-crisis recovery.

The empirical analysis is carried out in two steps. First, a comparative exploration is conducted to investigate company performance across these three periods: before, during and after the crisis. It is reasonable to consider two performance indicators when analysing intangible-intensive profiles of companies: economic value added (EVA) as a metric of intangible-driven output, and market value added (MVA) as a metric of intangible-driven value creation. These indicators were employed in studies

by Chen *et al.* (2013), Huang and Liu (2005), Huang and Wu (2010) and Molodchik *et al.* (2014). EVA and MVA are mainly associated with company intangibles, meaning that they are appropriate measurements of the success of an intangible-intensive strategy. The dynamics of EVA and MVA are explored for average representatives of the high-performing and the low-performing companies in each of the three profiles.

At the second stage of the investigation, the causality between MVA, EVA and the moderation effect of intangible-intensive profiles is examined. According to Stern *et al.* (2001) and Copeland *et al.* (2000), EVA is an important value driver. For that reason, a suitable model should represent the relationship between EVA, MVA and all other value drivers simultaneously. The details of this model are presented in the following equation:

$$\begin{cases} \text{MVA} = f\left(\text{EVA},\ \text{CP},\ \text{IP},\ \text{ME}_{\text{CP}_{bc}}, \text{ME}_{\text{CP}_{dc}},\ \text{ME}_{\text{CP}_{ac}}, \text{ME}_{\text{IP}_{bc}},\ \text{ME}_{\text{IP}_{dc}},\ \text{ME}_{\text{IP}_{ac}}, \text{CV}\right) \\ \text{EVA} = g\left(\text{CP},\ \text{IP},\ \text{ME}_{\text{CP}_{bc}}, \text{ME}_{\text{CP}_{dc}},\ \text{ME}_{\text{CP}_{ac}}, \text{ME}_{\text{IP}_{bc}},\ \text{ME}_{\text{IP}_{dc}},\ \text{ME}_{\text{IP}_{ac}}, \text{CV}\right) \end{cases}, \quad (1)$$

where MVA is the market value added, EVA the economic value added, CP the conservative profile, IP the innovative profile, $\text{ME}_{\text{CP}_{bc}}$ the moderation effect of the conservative profile before the crisis, $\text{ME}_{\text{CP}_{dc}}$ the moderation effect of the conservative profile during the crisis, $\text{ME}_{\text{CP}_{ac}}$ the moderation effect of the conservative profile after the crisis, $\text{ME}_{\text{IP}_{bc}}$ the moderation effect of the innovative profile before the crisis, $\text{ME}_{\text{IP}_{dc}}$ the moderation effect of the innovative profile during the crisis, $\text{ME}_{\text{IP}_{ac}}$ the moderation effect of the innovative profile after the crisis, and CV the control variables (country, industry, crisis years).

The model is generated using two dummy-variable regressions. Simultaneous estimation of two equations enables accounting for the endogenous interrelation of EVA, MVA and the intangibles used. Meanwhile, taking intangible-intensive profiles as the units of observation results in the bias caused by endogeneity being decreased significantly. A three-stage least-squares estimator is applied to obtain results for these simultaneous equations. To interpret the results, the moderation effects are examined using the moderate profile as a benchmark.

3.2 Data description

This empirical analysis is based on data from more than 1,600 European public companies observed over an eight-year period from 2004 to 2011. The companies are located in UK, Germany, France, Spain and Italy. The total GDP of these countries is valued at more than 70 per cent of the GDP of Europe as a whole. The composition of this database represents these countries in proportion to the industrial structure of the European economy. The proportion of SMEs and large enterprises in the database is 36 and 64 per cent, respectively.

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

As a result, 22 variables are involved in the empirical investigation carried out in this study. Attachment 1 gives a description of these variables, with reference to previously published papers which have employed the same, or almost the same, indicators in their analysis of intangibles.

Most of the indicators included in the exploration of intangibles in this study are measured by continuous variables. They are not all normally distributed; they show skewness and are long-tailed. Nevertheless, significant outliers are observed only in financial indicators. This can be easily explained, since the database included all listed companies, placing no restrictions on the scale of their activity.

4. Results

According to the research algorithm described in the previous section, the first step of the analysis explores the dynamics of EVA and MVA for the different profiles; it also allows for testing of the first hypothesis (*H1*). The comparative dynamics of EVA and MVA are shown in Figure 1.

The variables EVA and MVA were initially divided into percentiles. This expression of EVA and MVA distribution enables an appropriate smoothing for the purposes of this stage of analysis.

As can be seen from Figure 2, companies with a conservative profile have greater mean values and variation of both EVA and MVA across all the observation periods. On average, an innovative profile allowed companies to undergo less drawdown during the economic crisis. A moderate profile demonstrates relatively low average values and variation of EVA and MVA in contrast with the conservative intangible-intensive profiles.

Figures 3-5 represent the dynamics of EVA and MVA for the average, high-performing and low-performing companies in each profile, respectively.

According to Figure 3, a representative company with a conservative profile underwent equal decreases in EVA and MVA in the crisis years of 2008-2009. This means that financial markets recognized negative trends in company performance and reacted to this expectation. In view of this, an excessive response from investors to the downwards economic trend for an average company with a conservative profile was not shown. Meanwhile, the growth in both EVA and MVA began in 2009, and this facilitated an almost full recovery by 2012. The high-performing companies with a conservative profile show a negligible fall in performance and a complete recovery after the crisis. Low-performing companies, on the other hand, showed a considerable drop in MVA. This may be evidence that investors were inclined to sell the shares of these companies under difficult financial conditions.

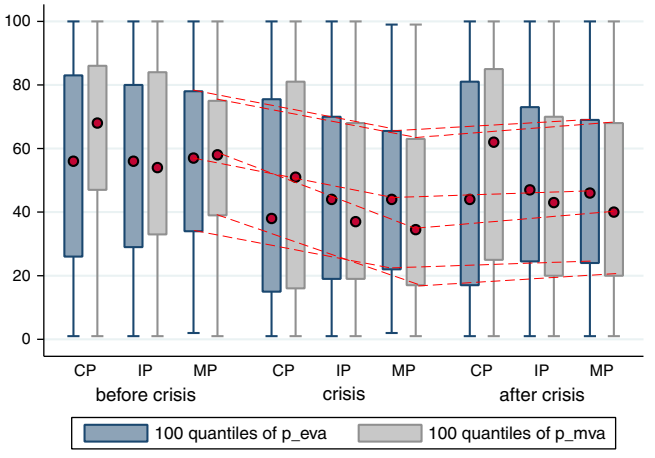

Figure 2.
Dynamics of market value and economic value added before, during and after the crisis of 2008-2009

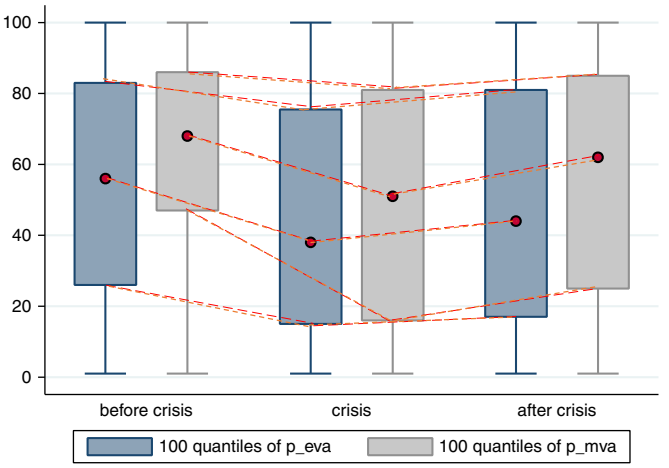

Figure 3.
Dynamics of market value and economic value added in companies with conservative profile

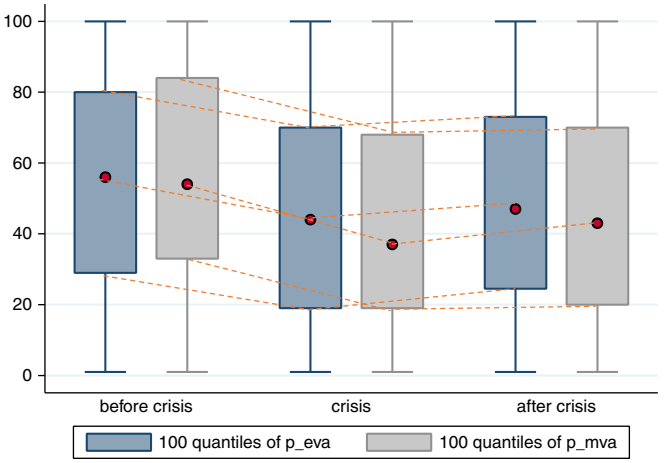

Figure 4.
Dynamics of market value and economic value added in companies with innovative profile

Figure 4 illustrates the slight volatility of EVA and MVA values during the crisis years. This is likely to indicate that companies with an innovative profile were more protected during the recent economic recession. However, the recovery process for both high- and low-performing companies with an innovative profile appears to be slow, and these growth rates did not enable them to reach their pre-crisis positions.

The poorest comparative dynamics are observed for companies without an intangible-intensive profile (moderate profile). According to these results, these companies were considerably worse off during the crisis in comparison to previous years. MVA fell more significantly than EVA. If financial markets overestimate negative trends, this causes investors to have a pessimistic perception of strategies that are not intangible-intensive. High-performing companies among those with a moderate profile in intangibles demonstrated a lesser fall in value. Low-performing companies, however, showed no recovery after the crisis, after undergoing a sharp decrease in EVA and MVA during 2008-2009.

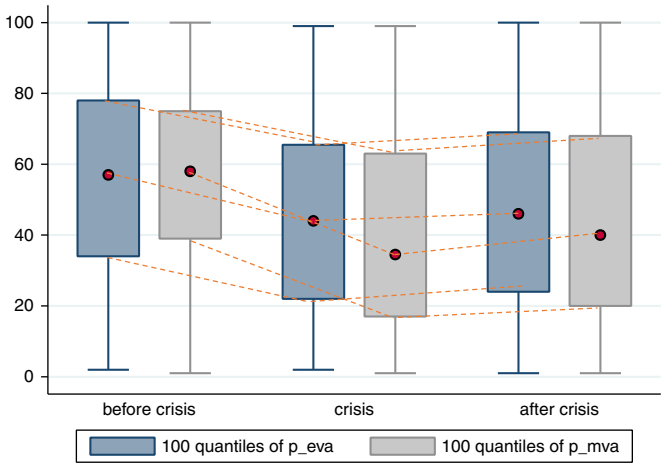

Figure 5.
Dynamics of market value and economic value added in companies with moderate profile

Overall, the first hypothesis put forward in this paper is confirmed, since the dynamics of company performance are noticeably different for different profiles, with intangible-intensive profiles having a clear advantage. However, the results should be interpreted with a certain amount of caution. At this stage of the analysis, only the companies clustered in the profiles according to intangibles used have common features in the dynamics of their performance, and these show a clear distinction between clusters according to this criterion. In addition, it can be said that the moderate profile fails to outperform intangible-intensive conservative and innovative profiles under turbulent conditions. However, an estimation of causality is required, in order to test the second hypothesis (*H2*) in regard to the ability of an intangible-intensive profile to generate sustainable protection for companies during an economic crisis and to moderate its effect on the recovery process.

The second step of the analysis allows the estimation of two simultaneous equations. Following the theory of the value-based concept, the model is estimated according to Equation (1). It is noted above that this specification is a valid indicator of causality as it is not significantly influenced by endogeneity. Company profiles, as well as the moderating effects of the crisis, are exogenous with regard to the values of the MVA and EVA of the companies. The model presents the interrelation between MVA, EVA and a number of value drivers that apparently influence both of these performance indicators. The results of the three-stage least-squares estimation are shown in Table II.

As can be seen from Table II, both estimated equations are significant, with a 99 per cent confidence interval. Despite the low level of predictive power reflected by an R^2 of about 5-6 per cent, the model still demonstrates the ability to explore causality consistently. Unfortunately, this analysis fails to justify the cohesion between MVA and EVA on the level of company profile, and the estimated coefficient is not significant in this model. However, this relationship was established in the study by Shakina and Barajas (2014) using the same data set. It is clear from the findings of this study that both innovative and conservative intangible-intensive profiles are more attractive for investors and may have a longer term payback horizon. This is in line with previous studies such as those by Kristandl and Bontis (2007), Orens *et al.* (2009) and Shakina and Barajas (2014). Meanwhile, the conservative profile does not outperform the benchmark in EVA in a profile which is not intangible-intensive. In addition, a

Factors	MVA	EVA
EVA	0.52 (0.59)	
Conservative profile	933.22 (290.56)***	−229.67 (69.21)***
Innovative profile	468.27 (271.72)*	−53.19 (73.61)
Moderation effect of CP before the crisis	1,169.13 (321.51)***	−48.21 (87.30)
Moderation effect of CP during the crisis	398.79 (374.30)	−214.57 (96.05)**
Moderation effect of CP after the crisis	397.35 (406.75)	−450.28 (84.34)***
Moderation effect of InnP before the crisis	976.64 (357.24)***	61.19 (96.85)
Moderation effect of InnP during the crisis	159.21 (386.17)	2.62 (105.30)
Moderation effect of InnP after the crisis	−120.09 (350.22)	41.19 (95.16)
Crisis period	−276.20 (161.17)*	−24.27 (43.81)
Intercept	57.78	94.22
R^2	6.02%	5.11%
Number of observations	11,741	11,741
χ^2	443.40***	632.63***

Notes: *,**,***Significant levels < 0.10; < 0.05; < 0.01, respectively

Table II.
Results of the three-stage least square estimation

conservative profile appears to be an aggravating factor during the crisis, since it shows a negative moderation effect for crisis and recovery periods. It is likely that this phenomenon is caused by the high-level investment commitment of a company with a conservative intangible-intensive profile. According to the framework of this research, the conservative profile is associated with high investment in human capital and business processes. These intangibles are relatively illiquid and are usually characterized by significant switching costs. Even under difficult financial conditions, companies with a conservative profile might be bound to follow this resource-consuming strategy, and this is likely to lead to rigid overinvestment in intangibles, both during and after the crisis.

The results did not provide evidence that the innovative intangible-intensive profile either outperforms or underperforms the moderate profile. The estimates in the model are insignificant. This could be explained by the high heterogeneity of companies with an innovative profile. This is justified by the first step of the above analysis. It has been demonstrated that an innovative profile cannot protect a typically representative company during a crisis. However, the dynamics of high-performing and low-performing companies with an innovative profile are considerably different.

5. Conclusions

This study addresses the question of the protective role of a company's strategic profile in difficult economic conditions. For this purpose, the recent economic crisis 2008-2009 was explored. As a result of an empirical investigation of public European companies observed during the eight years before, during and after the global economic recession a number of findings should be emphasized:

(1) Three studied profiles – two intangible-intensive and one non-intangible-intensive – have demonstrated significantly different dynamics in performance, specifically for EVA and MVA. A lower drawdown in MVA and EVA has been observed for high-performing companies with a conservative profile. However, this is not shown for an average company with a conservative profile. On the contrary, a conservative profile has shown a clearly negative moderation effect, both during and after the crisis.

(2) The worst comparative dynamic in intangible-driven performance has been found, as expected, for the moderate profile. These companies declined significantly in 2008-2009 and had not recovered from the crisis by 2012.

(3) Companies with an innovative profile demonstrated lower drawdown in EVA, although there was a high decrease in MVA for all companies. This could be explained by the high-risk aversion of investors under strong financial constraints. Innovative profiles generated slower recovery processes in comparison with companies with a conservative profile.

This analysis provides general results indicating that a long-term investment commitment aggravates the condition of companies. However, intangible-intensive strategies provide them with highly sustainable performance in the long run.

The study is subject to some limitations. As with any other research on intangibles, the selection of suitable measures is open to question, although the indicators used in this paper have previously been used in the literature. On the other hand, in working with profiles, information related to specific companies is lost. The marginal effect found in this study may be applicable to an average company in one profile but may fail for a specific firm.

The findings established in this study may be valuable for future research on crisis issues. From a practical point of view, there are some implications for policy makers in promoting strategies for different sectors or groups of companies. According to these results, it is clear that they should encourage intangible-intensive strategies.

These unexpected conclusions about the intangible-intensive strategies of companies open the way for future research, and should be accurately investigated with more homogeneous samples, by taking into account common patterns in company behaviour. Furthermore, indicators could rotate to examine whether the profiles remain the same and whether the results are robust.

Acknowledgement

The authors thank the researchers of the IDLab (NRU Higher School of Economics – Perm Campus) for their useful comments and remarks during preparations and discussions of the paper. The authors also thank the assistants of the IDLab for their work creating the database and their support. The results of the project " Comparative study of intangible endowment of Russian and EU companies", carried out within the framework of the Basic Research Program at the National Research University Higher School of Economics (HSE) in 2016, are presented in this work.

References

Anton, J.J. and Yao, D.A. (1989), "Split awards, procurement, and innovation", *RAND Journal of Economics*, Vol. 20 No. 4, pp. 538-552.

Archibugi, D., Filippetti, A. and Frenz, M. (2013), "Economic crisis and innovation: is destruction prevailing over accumulation?", *Research Policy*, Vol. 42 No. 2, pp. 303-314.

Baiburina, E.R. and Golovko, T.V. (2008), "Empirical investigation of intellectual enterprise value and its factors for big Russian companies", *Corporate Finance*, Vol. 2 No. 6, pp. 5-23.

Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-120.

Beltratti, A. and Stulz, R.M. (2009), "Why did some banks perform better during the credit crisis? A cross-country study of the impact of governance and regulation", NBER Working Paper No. 15180, National Bureau of Economic Research, Inc., Cambridge, available at: https://ideas.repec.org/p/nbr/nberwo/15180.html (accessed 27 February 2016).

Bocquet, R., Le Bas, C., Mothe, C. and Poussing, N. (2013), "Are firms with different CSR profiles equally innovative? Empirical analysis with survey data", *European Management Journal*, Vol. 31 No. 6, pp. 642-654.

Bottani, E. (2010), "Profile and enablers of agile companies: an empirical investigation", *International Journal of Production Economics*, Vol. 125 No. 2, pp. 251-261.

Chen, H.-L., Ho, M.H.-C. and Hsu, W.-T. (2013), "Does board social capital influence chief executive officers' investment decisions in research and development?", *R&D Management*, Vol. 43 No. 4, pp. 381-393.

Cho, D.W., Lee, Y.H., Ahn, S.H. and Hwang, M.K. (2012), "A framework for measuring the performance of service supply chain management", *Computers & Industrial Engineering*, Vol. 62 No. 3, pp. 801-818.

Clarkson, P.M., Li, Y., Richardson, G.D. and Vasvari, F.P. (2011), "Does it really pay to be green? Determinants and consequences of proactive environmental strategies", *Journal of Accounting and Public Policy*, Vol. 30 No. 2, pp. 122-144.

Cohen, S., Naoum, V.C. and Vlismas, O. (2014), "Intellectual capital, strategy and financial crisis from a SMEs perspective", *Journal of Intellectual Capital*, Vol. 15 No. 2, pp. 294-315.

Copeland, T., Koller, T. and Murrin, J. (2000), *Valuation: Measuring and Managing the Value of Companies*, 3rd ed., John Wiley & Sons Inc., Mc Kinsey and Company Inc., Hoboken, NJ.

Curado, C., Guedes, M.J. and Bontis, N. (2014), "The financial crisis of banks (before, during and after): an intellectual capital perspective", *Knowledge and Process Management*, Vol. 21 No. 2, pp. 103-111.

Dahlmann, F. and Brammer, S. (2011), "Exploring and explaining patterns of adaptation and selection in corporate environmental strategy in the USA", *Organization Studies*, Vol. 32 No. 4, pp. 527-553.

Elliott, J.E. (1980), "Marx and Schumpeter on capitalism's creative destruction: a comparative restatement", *The Quarterly Journal of Economics*, Vol. 95 No. 1, pp. 45-68.

Gleason, K.I. and Klock, M. (2003), "Intangible capital in the pharmaceutical and chemical industry", *Department of Economics and Finance Working Papers 1991-2006*, No 10, New Orleans, February, available at: http://scholarworks.uno.edu/cgi/viewcontent.cgi?article=1009&context=econ_wp (accessed 13 March 2014).

Grant, R.M. (1991), "The resource-based theory of competitive advantage: implications for strategy formulation", SSRN Scholarly Paper No. ID 1504481, Social Science Research Network, Rochester, NY, available at: http://papers.ssrn.com/abstract=1504481 (accessed 27 February 2016).

Guevara, D. and Bounfour, A. (2013), "Monitoring intellectual capital: a case study of a large company during the recent economic crisis", *Knowledge Management Research & Practice*, Vol. 11 No. 2, pp. 196-207.

Hirschey, M. (1982), "Intangible capital aspects of advertising and R&D expenditures", *The Journal of Industrial Economics*, Vol. 30 No. 4, pp. 375-390.

Hsu, C.-L. and Chiang, C.-H. (2015), "The financial crisis research: a bibliometric analysis", *Scientometrics*, Vol. 105 No. 1, pp. 161-177.

Huang, C.J. and Liu, C.J. (2005), "Exploration for the relationship between innovation, IT and performance", *Journal of Intellectual Capital*, Vol. 6 No. 2, pp. 237-252.

Huang, C. and Wang, M. (2008), "The effects of economic value added and intellectual. Capital on the market value of firms: an empirical study", *International Journal of Management*, Vol. 25 No. 4, pp. 722-731.

Huang, Y.-C. and Wu, Y.-C.J. (2010), "Intellectual capital and knowledge productivity: the Taiwan biotech industry", *Management Decision*, Vol. 48 No. 4, pp. 580-599.

Kamukama, N., Ahiauzu, A. and Ntayi, J. (2010), "Intellectual capital and performance: testing interaction effects", *Journal of Intellectual Capital*, Vol. 11 No. 4, pp. 554-574.

Kristandl, G. and Bontis, N. (2007), "Constructing a definition for intangibles using the resource based view of the firm", *Management Decision*, Vol. 45 No. 9, pp. 1510-1524.

Krugman, P. (2009), "Fighting off depression", *The New York Times*, 4 January, available at: www.nytimes.com/2009/01/05/opinion/05krugman.html (accessed 27 February 2016).

Kunc, M. and Bhandari, R. (2011), "Strategic development processes during economic and financial crisis", *Management Decision*, Vol. 49 No. 8, pp. 1343-1353.

Lee, S.-H. and Makhija, M. (2009), "Flexibility in internationalization: is it valuable during an economic crisis?", *Strategic Management Journal*, Vol. 30 No. 5, pp. 537-555.

Lev, B. (2000), *Intangibles: Management, Measurement, and Reporting*, Brookings Institution Press, Washington, DC.

Martínez-Torres, M.D.R. (2014), "Identification of intangible assets in knowledge-based organizations using concept mapping techniques", SSRN Scholarly Paper No. ID 2372191, Social Science Research Network, Rochester, NY, available at: http://papers.ssrn.com/abstract=2372191 (accessed 27 February 2016).

Molodchik, M., Shakina, E. and Bykova, A. (2012), "Intellectual capital transformation evaluating model", *Journal of Intellectual Capital*, Vol. 13 No. 4, pp. 444-461.

Molodchik, M., Shakina, E. and Barajas, A. (2014), "Metrics for the elements of intellectual capital in an economy driven by knowledge", *Journal of Intellectual Capital*, Vol. 15 No. 2, pp. 206-226.

Murthy, V. and Mouritsen, J. (2011), "The performance of intellectual capital: Mobilising relationships between intellectual and financial capital in a bank", *Accounting, Auditing & Accountability Journal*, Vol. 24 No. 5, pp. 622-646.

Nickerson, J. and Silverman, B. (1997), "Intellectual capital management strategy: the foundation of successful new business generation", *Journal of Knowledge Management*, Vol. 1 No. 4, pp. 320-331.

Orens, R., Aerts, W. and Lybaert, N. (2009), "Intellectual capital disclosure, cost of finance and firm value", *Management Decision*, Vol. 47 No. 10, pp. 1536-1554.

Paunov, C. (2012), "The global crisis and firms' investments in innovation", *Research Policy*, Vol. 41 No. 1, pp. 24-35.

Petkov, R.R. (2011), "The current financial crisis and its potential impact on internally generated intangible assets", *International Journal of Business and Management*, Vol. 6 No. 3, pp. 37-44.

Poletti, L.J. (2003), "Effects of intangible capital on firm performance", working paper, March, available at: www.econ.kuleuven.be/smye/abstracts/p49.pdf (accessed 13 March 2014).

Riahi-Belkaoui, A. (2003), "Intellectual capital and firm performance of US multinational firms", *Journal of Intellectual Capital*, Vol. 4 No. 2, pp. 215-226.

Santoro, E.G. (2009), "Business failures, macroeconomic risk and the effect of recessions on long-run growth: a panel cointegration approach", *Journal of Economics and Business*, Vol. 61 No. 6, pp. 435-452.

Schenker-Wicki, A., Inauen, M. and Olivares, M. (2010), "Unmastered risks: From crisis to catastrophe: an economic and management insight", *Journal of Business Research*, Vol. 63 No. 4, pp. 337-346.

Sellers-Rubio, R. and Mas-Ruiz, F (2007), "An empirical analysis of productivity growth in retail services: evidence from Spain", *International Journal of Service Industry Management*, Vol. 18 No. 1, pp. 52-69.

Shakina, E. and Barajas, A. (2012), "The relationship between intellectual capital quality and corporate performance: an empirical study of Russian and European companies", *Economic Annals*, Vol. LVII No. 192, pp. 79-98.

Shakina, E. and Barajas, A. (2013), "The contribution of intellectual capital to value creation", *Contemporary Economics*, Vol. 7 No. 4, pp. 41-56.

Shakina, E. and Barajas, A. (2014), "The dynamics of intellectual resources during the economic crisis", *Economic Research-Ekonomska Istraživanja*, Vol. 27 No. 1, pp. 861-881.

Shakina, E. and Barajas, A. (2015), "Intangible-intensive profile of a company: the key to outperforming", *Journal of Intellectual Capital*, Vol. 16 No. 4, pp. 721-741.

Stern, J.M., Shiley, J.S. and Ross, I. (2001), *The EVA Challenge: Implementing Value Added Change in an Organization*, JohnWiley & Sons Inc., New York, NY.

Svendsen, M., Haugland, S., Grønhaug, K. and Hammervoll, T. (2011), "Marketing strategy and customer involvement in product development", *European Journal of Marketing*, Vol. 45 No. 4, pp. 513-530.

Swartz, N.P. and Firer, S. (2005), "Board structure and intellectual capital performance in South Africa", *Meditari Accountancy Research*, Vol. 13 No. 2, pp. 145-166.

Thomson, M. (2006), "Human brands: investigating antecedents to consumers' strong attachments to celebrities", *Journal of Marketing*, Vol. 70 No. 3, pp. 104-119.

Tseng, C.-Y. and Goo, Y.-J.J. (2005), "Intellectual capital and corporate value in an emerging economy: empirical study of Taiwanese manufacturers", *R&D Management*, Vol. 35 No. 2, pp. 187-201.

Unger, J.M., Rauch, A., Frese, M. and Rosenbusch, N. (2011), "Human capital and entrepreneurial success: a meta-analytical review", *Journal of Business Venturing*, Vol. 26 No. 3, pp. 341-358.

Wade, M.R. and Gravill, J.I. (2003), "Diversification and performance of Japanese IT subsidiaries: a resource-based view", *Information & Management*, Vol. 40 No. 4, pp. 305-316.

Williams, C. and Lee, S.H. (2009), "Exploring the internal and external venturing of large R&D-intensive firms", *R & D Management*, Vol. 39 No. 3, pp. 231-246.

Williams, C. and Nones, B. (2009), "R&D subsidiary isolation in knowledge-intensive industries: evidence from Austria", *R&D Management*, Vol. 39 No. 2, pp. 111-123.

Wilson, J.W. and Eilertsen, S. (2010), "How did strategic planning help during the economic crisis?", *Strategy & Leadership*, Vol. 38 No. 2, pp. 5-14.

Wright, P.M. and McMahan, G.C. (2011), "Exploring human capital: putting 'human' back into strategic human resource management: exploring human capital", *Human Resource Management Journal*, Vol. 21 No. 2, pp. 93-104.

Appendix

Name of the variable	Reference to the literature	Source of the information
Cost of employees	Baiburina and Golovko (2008) Orens *et al.* (2009)	Company's annual report, section financial data
Productivity	Baiburina and Golovko (2008) Orens *et al.* (2009)	Company's annual report, section financial data Earnings before interested and taxes divided by sales
Qualification of board of directors	Tseng and Goo (2005) Orens *et al.* (2009) Kamukama *et al.* (2010) Shakina and Barajas (2012)	Company's Annual report, section directors information If more than one-third of directors have postgraduate level of qualification and more than 5 years experience – 2 points If more than one-third of directors have postgraduate level of qualification or more than 5 years experience – 1 point Another – 0
Human brand	Thomson (2006)	Search on company name in the ranking LinkedIn's Most In Demand Employers on the website: www.rankingthebrands.com/ If it has a rank – 1 point, otherwise – 0 point
R&D expenditures	Poletti (2003) Gleason and Klock (2003) Sellers-Rubio and Mas-Ruiz (2007) Huang and Wang (2008) Huang and Liu (2005)	Company's annual report, section financial data
Intangible assets	Sellers-Rubio and Mas-Rubio (2007) Shakina and Barajas (2012)	Company's annual report, section financial data
Awards for innovation	Anton and Yao (1989)	Company official websites, sections "awards" and "press releases"
Patents, licenses, trademarks	Tseng and Goo (2005) Sellers-Rubio and Mas-Ruiz (2007) Shakina and Barajas (2012)	Search on company name and number of patents on the website QPAT: http://library.hse.ru/e-resou rces/e-resources.htm
Strategy implementation	Tseng and Goo (2005) Kamukama *et al.* (2010) Shakina and Barajas (2012)	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
ERP implementation	Kamukama *et al.* (2010) Murthy and Mouritsen (2011) Shakina and Barajas (2012)	Search on the website of the company using the following words as "ERP", "Oracle", "NAVISION", "NAV", "SQL", "SAP" If company has news about these things – 1 point, otherwise – 0 points Important to put 1 or 0 in the year of start implementation

(*continued*)

Table AI. Short description of the variables involved in the analysis

Name of the variable	Reference to the literature	Source of the information
Knowledge management system	Kamukama *et al.* (2010) Murthy and Mouritsen (2011) Shakina and Barajas (2012)	Search on the website 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 Important to put 1 or 0 in the year of start implementation
Brand value	Riahi-Belkaoui (2003) Murthy and Mouritsen, (2011) Shakina and Barajas (2012)	Search on company name in the ranking BrandFinance Global 500 on the website: www.rankingthebrands.com/ If it has a rank – 1 point, otherwise – 0 point
Citations in search engines	Shakina and Barajas (2012)	Search on company's name and its score in the website: www.prchecker.info/check_page_rank.php
Advertising expenditures	Hirschey (1982)	From Bloomberg (according to the company ticker)
Associations	Molodchik *et al.* (2014)	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"
Proximity of university	Huang and Liu (2005) Swartz and Firer (2005) Orens *et al.* (2009) Shakina and Barajas (2012)	Company's annual report, section common information The main activity
Location in the capital of a country	Shakina and Barajas (2013)	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
Global competitiveness index – labor markets	Molodchik *et al.* (2014)	Search on the website of World Economic Forum in the relevant reports. The scores are different within countries and years
Dummy variables for 2008 and 2009	Molodchik *et al.* (2012)	If year = 2008 or 2009, is 1, otherwise 0

Table AI.

Source: Shakina and Barajas (2015)

About the authors

Elena Shakina got her first PhD in 2008 from the National Research University Higher School of Economics and since that time she has been working as a Head of the Department. She is also the Head Researcher in the research project of the International Laboratory of Intangible-driven Economy. In 2016 she has successfully completed her second PhD in Economics from the University of Vigo, Spain. Elena Shakina is the corresponding author and can be contacted at: eshakina@hse.ru

Angel Barajas, PhD in Business Administration, an Associate Professor at the Department of Financial Economics and Accountancy, University of Vigo, Leading Researcher at the International Laboratory of Intangible-driven Economy, National Research University Higher School of Economics, Perm, Russia.