Value creation by firms and its measurement with respect to the effects of the global financial crisis of 2007-2008

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Debrecen, 2016
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1. The Research Questions of the Dissertation and its Motivation

In the 1980s and 1990s the fields of corporate finance and corporate strategy became significantly interconnected. The transformational processes by which these two areas became interconnected have been highlighted by Copeland et al [1999] and Bartek-Lesi et al [2007]. The theme of my study lies within the field of these interconnected fields.

Takács [2009] and Ulbert [1997] also point out in the introduction to their book that while there is an extensive literature from outside Hungary, from America and from Western Europe on evaluating the firm, thus far the Hungarian literature on the subject is very limited. Ulbert [1994] assigns this to the economic history of our country, since in the planned economy no evaluation of the firm was necessary. The first publications on the subject appeared at the time of the political changes of 1989-1990.

My choice of subject for the dissertation was motivated by the fact that since the year 2000 there has been a plentiful international, and now Hungarian, literature which represents an interesting area for writing the dissertation.

The justification for the research is clear from the fact that the field I have chosen has been the subject of detailed doctoral studies undertaken from several perspectives\(^1\). The novelty of the dissertation is the examination of the new phenomenon of the 2007-2008 global financial crisis and its effects.

The basic aim of writing my doctoral thesis is to answer the question that I have set, which is the following: what are the factors that influence the value of the firm and how does the influencing force of these factors take shape in the various branches of industry and country groups, in the light of the aftermath of the 2007-2008 global financial crisis. Given the complexity of the research question, I have broken it down into the following areas.

1. What are the factors that influence the value of the firm?
2. How has the 2007-2008 financial crisis affected the relationship between the value of the firm and the influencing factors?
3. In terms of the effects of the crisis, are there differences between the different industrial sectors?
4. In terms of the effects of the crisis, are there differences between the country groups?

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\(^1\) Juhász [2004], Kazainé [2008], Takács [2008], Wimmer [2000]
In order to answer the research questions I have formulated the following hypotheses, which I have designed taking into consideration the specialist literature I have studied.

**Hypothesis 1: Earnings Before Interest and Taxes (EBIT), Reinvestment, Invested Capital, Return on Invested Capital, Net Margin, Sales Growth Rate, Tax Rate and Market ROA affected significantly the firm value.**

**Hypothesis 2: It is probable that the 2007-2008 financial crisis negatively affect the firm value of all companies in the whole examined sample.**

**Hypothesis 3: There is some evidence that 2008 was the year when the financial crisis negatively affected the firm value in all economic sectors.**

**Hypothesis 4: The 2007-2008 financial crisis impact on the Anglo-Saxon countries’ financial- and real economies more than on other countries.**

The literature I have studied in my dissertation approaches the subject from the perspective of firm theory, the practical life of the firm, and applied finance and strategy, and I have organised the dissertation on the basis of what they have to say on these subjects.

In the first logical section I deal with the creation of value by the firm, which provides some kind of strategic framework for the dissertation. Following this I concentrate on the maximisation of company value, I demonstrate its grounding in firm theory, and then take into account its practical expression, including the particularities of the differing firm governance and financial systems found in different countries. I then continue with the theoretical approach, by introducing the relevant theories, before considering the differences between the Anglo-Saxon and continental financial systems and concepts of evaluation.

The second part of the dissertation introduces the activities and methods of firm evaluation, considering how it became an effective tool of contemporary management. With the help of firm evaluation we can answer the kind of questions which we can use before we take decisions. These questions include, for example, how much is the company worth; should we buy a company that is being offered for sale, or should we sell our own company, our stake in the company or our shares; how should risk capital and invested capital develop in a portfolio; how much credit can the firm’s capital cover; what advice should the consultancy or stock exchange capital managing firms offer as part of their services, and what actions should they take?
The third part deals with the economic crisis, introducing its financial aspects and the results of the empirical research which has been published on the subject.

The fourth, main, part is the research, including the empirical analysis, the most important aspects of which are:

– The examination of those factors which affect the value of the firm, and the strength of the effects they have;
– How the value of the firm has developed in the aftermath of the 2007-2008 global financial crisis and what effect the influencing factors have on the value of the business in the context of all the firms examined, in separate industries, and in different groups of countries.

To close the dissertation I draw conclusions, demonstrate the validity of my theses, answer the research questions, summarise the new and novel aspects of the dissertation and introduce possible directions for new research.
2. Structure and Methodology of the Dissertation

“The process of value creation is the procurement, management and use of resources with the aim of creating value for the customer.” (Chikán& Demeter, 2006, p.3)

Porter (1998), in his theory of the value chain, focuses on the creation of value. In his opinion all companies carry out their activities in order to create value. These activities can be divided into two large groups; primary and support activities. Primary activities are involved in the physical creation of the product and its sale and transfer to the buyer as well as after-sale assistance. Support activities support the primary activities and each other by providing purchased inputs, technology development, and human resources, and various firm wide functions.

Beginning in the 1980s, the ideology of shareholder value became the ruling principle in firm governance in companies in the USA and Britain. At the end of the 1990s the shareholder value approach also became part of the debate on company governance in European countries; i.e. in Germany, France and Sweden. In 1999 arguments for maximizing shareholder value also received great attention in Japan, and in the same year the OECD published a document, “The OECD Principles of Corporate Governance”, which emphasised that the firm should be primarily governed according to shareholders’ interests. (Lazonick & O’Sullivan, 2000)

The background to the firm theory of maximizing shareholder value goes back to classical economics. According to Adam Smith’s theory of the invisible hand, there is no need to intervene in the processes occurring in the market, because the market operates according to a self-regulating mechanism, governed by the invisible hand, in such a way that each participant has his/her own advantage as his/her goal, and not that of society as a whole. However, it is natural, indeed necessary, that when evaluating their own advantages, the participants will use their capital in a way that is also most advantageous for society. In other words, if the individual acts to satisfy his/her own interests, often society will be moved forward in a more productive way, as if this itself had been the goal, and so a greater social efficiency can also be achieved. (Smith, 1947)

The theory of the firm characteristic of neo-classical economics was long dominant in economics. In standard microeconomics there is no separation between the firm’s legal unity and the person of the shareholder and the manager, the ownership and management function being unified in one decision-making individual. The firm is viewed as a black box, in other
words its internal operations are not subject to examination. Resources enter the black box on one side, and the products and services emerge on the other. The only goal of the firm is to maximize its profit, which is achieved with the help of the market, using a recognised institutionalised method of achieving coordination, the price mechanism. (Chikán, 2005, pp.64-65)

The next milestone was the work of Coase (1937), whose study can be considered the foundation of the contractual firm theory. According to Coase (1937), in the neo-classical firm theory the price mechanism understood as the exclusive coordination mechanism is forced into a complementary role, because on its own it is not sufficient to create a decision-making process. Coase (1937) was the first to give a logical answer to the question of why firms are necessary. The principle which explains why it is worth setting up a company is that there are costs associated with the use of the price mechanism, costs which arise from the need to cover the relevant price, and from entering into individual contracts. These costs can also arise in the case of firms, but on a smaller scale, which is why the firm as an organisation takes over the coordinating function of the market as long as the internal costs of the organisation are lower than the costs of market contracts.

Studies published in the fifties and sixties in the area of company finance had a great influence in the spread of the shareholder value approach and served as the financial basis of the theory. These include Markowitz’s (1952) portfolio selection, Modigliani and Miller’s (1958; 1961; 1963) theory on capital structure and dividend policy, Sharpe (1964), and Lintner’s (1965) model of capital asset pricing.

Markowitz (1952) dealt with portfolio diversification and examined how the variance of returns of investors’ portfolios could be reduced by the choice of securities which do not move completely in harmony with the portfolio returns. He developed the basic principles of portfolio selection.

In Modigliani and Miller’s 1958 work, they came to the conclusion that in a perfect market financing decisions have no significance, since changes in the capital structure do not change the value of the firm.

The capital asset pricing model is associated with Treynor, Sharpe, and Lintner. According to the model, the expected risk premium is proportionate to a value of $\beta$. 
After this introduction to the financial background behind maximizing shareholder value, we turn to the principal-agent theory, which supports maximizing shareholder value.

The theory of the market economy is based on the idea that individuals organise transactions for their own benefit, and in this way bring about an efficient distribution of resources. This assertion is already in itself important, because the condition for the efficient allocation of resources, and thus for the welfare of those affected, is that individuals follow their own interests. There are, however, cases in which the interests and objectives of the firm’s managers are different from those of the shareholder. (Rappaport, 1998)

Jensen & Meckling (1976, p.308) define an agency relationship as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent.

The relationship which exists between the shareholder and the managers corresponds to the principal-agent relationship, since the managers can be considered as the agents of the shareholder. In this way the risk-bearing and decision-making problem also correspond to the principal-agent theory, to which it is the solution, i.e. it states that the managers’ primary goal is maximizing shareholder value.

According to Rappaport (1998), the first task of the leaders of the firm is to grow the shareholder value, which can be achieved by creating a strategy and deciding on operative performance criteria.

The shareholder value approach can be considered universal; it can be used for the analysis of strategies and product lines in private and public limited companies and business units. The direct relationship between the analysis of strategy and shareholder value expresses the idea that the business strategies are “converted” to the amount of finance they create. For the operational managers, one of the most important results of the shareholder value-based analysis is that it helps to decide which activities should receive most attention during the operation of the business.

To achieve this, the main evaluation characteristics of the system used to measure performance are, at the company level, the shareholder return, at the operative level the shareholder value added and the indicators which predict value, and at the lower organisational level, the key value drivers. (Rappaport, 1998)
Copeland and co-authors (1999) are of the opinion that the firm’s value is determined by its ability to generate cash flow and the return of the invested cash flow, and the determining factors of value are referred to as key value drivers. When comparing the firm’s performance indicators they emphasise that there are two methods, the entity DCF-model and the several year economic profit model, which correspond to the achievement of a long term approach and the capital intensive criterion.

Damodaran (2006) considers the discounted cash flow-based analysis to be the basis of all methods of analysis, the one on which all others are built. In order to understand and use both the relative and the option-priced models, we must start with the DCF process.

Grouping and presentation of the company's valuation methods with regard to the literature is not uniform. In view of the major principles is equal, but the details are different, because I write a single way I designed the different methods in which Rappaport (1998), Copeland et al (1999), Damodaran (2006), Ulbert (1997), Fónagy-Árva et al (2003) and Takács (2009) study build on.
In the evaluation, the problem is not that there are not enough models to complete the task but on the contrary, the selection of the appropriate model is the first challenge in the work.

The different approaches lead to significantly different values. It may be the case that there are different results of estimates when a company valuation is based on the discounted cash flow model and the relative valuation at the same time.

Professionals involved in the assessment task explained the reason for the differences, and selection the correct model which is the best fit for the job. Considering the models as described above a best model cannot be identified.

Summarising what can be learnt both theoretically and practically from the above sections, we can state that there is a logical relationship between these processes, starting from Porter’s (1998) value chain theory – i.e. that aim of the firm’s operation is to create value, so the source of the firm’s value creation is its operation –, through Rappaport’s (1998) shareholder value
network and the concept of maximizing shareholder value – with the help of which we can identify value creators –, through Copeland and co-authors’ (1999) key value drivers – which determine the values which are closely related to the firm’s ability to generate cash flow –, to Damodaran’s (2006) evaluation models – including discounted cash flow-based, relative and option analysis and the asset-based analysis models. On all of these theoretical bases we can establish the factors which create the firm’s value.

I. FCFF (Free Cash Flow to Firm):

\[ FCFF = EBIT \times (1 - T) - Net\ Capital\ Expenditures - Change\ in\ non\ cash\ Working\ Capital \]

1. EBIT (Earnings Before Interest and Taxes)
2. Tax Rate
3. Reinvestment = \( (Net\ Capital\ Expenditures + Change\ in\ non\ cash\ Working\ Capital) \)

II. Invested Capital

III. ROIC (Return on Invested Capital)

\[ ROIC = \frac{EBIT(1 - t)}{Invested\ Capital} \]

IV. Net Margin

\[ Net\ Margin = \frac{Net\ Income}{Sales} \]

V. Cost of Capital

\[ MROA = \frac{Net\ Income}{Market\ Values\ of\ Equity + Market\ Value\ of\ Debt} \]

VI. Sales Growth Rate

The objective of my dissertation is to answer the question of which factors affect the firm’s value. With this in mind was analysed a database featuring data from 18 European countries, 10 sectors and 1553 firms in the period between 2004 and 2011, which can be considered a strongly balanced panel, containing few missing observations. The database is found on Aswath
Damodaran’s website, and several adjustments were made in relation with the database. (http://pages.stern.nyu.edu/~adamodar/, 2014)

The firm value was used for the value of the firm value category, which is the sum of the market capitalization – the best estimate of the market value of equity – and the value of market debt. The factors influencing firm value – as a dependent variable – are those value drivers mentioned above which most determine the value of the firm.

In the case of firm value, EBIT, reinvestment and invested capital, were used natural logarithms of the variables, while the natural logarithms of the revenue difference was used for the sales growth rate, since in this way the distribution of the variables approached a normal distribution.

As a continuation of the empirical research, the specification of the panel model was carried out. The panel model – also referred to as longitudinal data analysis –, accompanied by the use of time series and cross-sectional data, is the most tried and tested method. With the help of the panel model it becomes possible to observe the development over time (time series) of the same firm characteristics (cross-sectional data), since the panel database contains several time periods and several individual category entries (firm, industrial sector, country) in tabular form. (Ramanathan, 2003, pp.498-501)

The next step was to specify the multivariable regression model:

\[
\ln FV_{i,t} = \alpha + \beta_{\ln EBIT} \ln EBIT_{i,t} + \beta_{\ln Reinv} \ln Reinv_{i,t} + \beta_{\ln Inv} \ln InvC_{i,t} + \beta_{\ln ROIC} \ln ROIC_{i,t} + \beta_{NetM} \ln NetM_{i,t} + \beta_{MROA} \ln MROA_{i,t} + \beta_{\ln Rev} \ln Rev_{i,t} + u_{i,t} + \varepsilon_{i}
\]
3. Theses of the Dissertation

I tested the decisive factors of the influencing effects on business value using panel regression analysis for the entire period (2004-2011) and over all the economic sectors (10 sectors). During the examination of the role of influencing factors on business value I also considered whether the importance of these factors had changed during the period under study. To do this I divided the entire period into two parts – pre- and post-crisis, and then analysed them separately to see whether there were any factors which were significant and had later lost importance, or which were unimportant and later became important.

After the empirical examination of the influencing factors on firm value I formulated the following theses.

**Thesis 1:** Examining the entire period (2004-2011), all independent variables had a significant effect on the dependent variable.

**Thesis 1/a:** Examining the entire period (2004-2011), the following had a positive effect on the firm value:

- earnings before interest and taxes (EBIT),
- reinvestment,
- invested capital,
- return on invested capital,
- net margin,
- sales growth rate.

**Thesis 1/b:** Examining the entire period (2004-2011), the following had a negative effect on the firm value:

- tax rate,
- market ROA.

**Thesis 1/c:** Comparing the first period of panel regression analysis, which is the pre-crisis period of 2004-2007 with the second period of panel regression analysis as being the post-crisis period between 2008 and 2011, the following differences can be observed:
• in the first period the tax rate did not affect firm value,
• the sales growth rate produced a positive effect on the firm value,
• firm value was not affected by the net margin in the second period of analysis.

In summary then, over the whole period (2004-2011) my first hypothesis was satisfactorily proved; however, in the first and second periods it was only partially proved.

In the second part of my empirical research I examined how the 2007-2008 financial crisis affected the relationship between business value and the value-creating factors. To do this I first used the original, random-effect starting panel regression model, expanding it by introducing, in addition to the predictors, the effects of the years as a “time dummy” variable in the model, and by placing the one-year-delayed dependent variable among the independent variables, with the help of which I was able to examine its application. With this expanded model I ran the panel regression.

In the year 2008 the effect of the crisis was visible, and it negatively affected firm value.

Subsequently I assembled my panel model, in order to be able to also observe the cross-effects during the examination. The marginal effect of one independent variable can also depend on other variables. To show this, Ramanathan ([2003] 264-265) recommended that the mutual effects of the variables should also be grasped, so as to show the cross-effects.

When examining cross effects, in this case when all the variables of the 2008 time dummy are distributed, it is clear that the 2008 cross effects of invested capital and the return on invested capital positively affect the value of businesses, while when the 2008 time dummy variable is distributed reinvestment effects business value positively; for the other variables the distribution of the 2008 time dummy is not significant.

Following this, I carried out a panel regression which in some cases was supplemented by a starting regression model, the year effects, the one-year-delayed dependent variable, and separately, the distributions of the time dummy variable of the individual predictors.

Summarising the conclusions above, I formulated the following thesis.

**Thesis 2: An examination of the changes following the 2007-2008 financial crisis and their relationship with the value drivers allows us to conclude, that**
2008 can be seen unambiguously as the year of the crisis. Based on the half-time ratio it can be concluded that the majority of the effects caused by the crisis ceases within not more than one year. After the financial crisis had broken out, compared with previous years, more independent variables remained in the model explaining firm value.

In summary, the results of the empirical examination support my second hypothesis, which was consequently proved.

I restructured the starting panel database so that it would be able to examine the changes caused by the crisis in the different industrial sectors. Consequently, I examined the sectors separately.

On the basis of the results it can be said that among the 10 sectors, it was in the financial sector that there was felt the greatest negative effect in the year 2008, i.e. this was the worst affected sector. The next sectors in the list were the energy sector and information technology, followed by basic consumer goods, raw materials, the health services sector, and then public works and industrial, and finally, consumer goods. On the basis of the regressions it can be stated that the year 2008 had no significant effect on the business value of the telecommunications sector.

If we look at the sectors to see what effect the individual value-creating factors have on business value, we can see that there are differences between the sectors and between the individual sectors and the cross-sectoral branches. While in the regression model which included all sectors all the value-creating factors had a significant effect on the profit variable, the significant effect was not characteristic when examining the individual sectors one by one.

Summarising the analysis of the variables following the effects of the crisis in the 10 industrial sectors, I formulated the following thesis:

**Thesis 3: Examining the effects of the 2007-2008 financial crisis in individual industrial sectors also shows that, with the exception of the telecommunications sector, 2008 was the year of the crisis in all sectors. The crisis was felt most keenly in the financial sector. Among the factors influencing value many predictors lost significance, and only in the consumer goods sector did all independent variables have a significant effect on firm value.**
To summarize, my third hypothesis was only demonstrated in part, since the empirical examinations in the telecommunications sector did not prove that firm value decreased in 2008.

For the last empirical test I organised the starting panel database so that it would be appropriate to examine the effects of the crisis on the changes in the financial and real economy variables. To do this I divided the countries in the sample into two groups on the basis of the financial system characteristic of the country. The United Kingdom and Ireland belong to the Anglo-Saxon countries. The continental countries is the other group, these countries are Austria, Belgium, Dania, Finland, France, Greece, Netherland, Luxembourg, Hungary, Germany, Norwegian, Italy, Portugal, Spain, Switzerland and Sweden.

By summarising the analysis of the changes following the effects of the crisis in the financial and real economy spheres in the countries with Anglo-Saxon and continental financial systems, I formulated the following thesis:

**Thesis 4: It can be empirically supported that the 2007-2008 crisis – comparing the financial- and real economies – was most keenly felt in the financial sector. Comparing countries with Anglo-Saxon and continental financial systems one by one it can also be stated that 2008 can be considered the year of the crisis in both the financial- and real economies. In the Anglo-Saxon countries the decline was much greater in the financial sector, while in the real economy it was almost the same size in both country groups.**

In summary, the fourth hypothesis can only be partly demonstrated, since during the empirical examination a similar decline was experienced in the firm value operating in the real economies in the Anglo-Saxon and in the continental countries.
4. Conclusions, Further Research Directions

The basic aim of the dissertation was that after a study of the literature relevant to the theme, I examined the value-creating factors in the firm which most influence the value of the firm. After having identified the value creators, I analysed the changes following the effects of the 2007-2008 financial crisis in their industrial sector and country group dimensions.

While writing my dissertation I concentrated on dealing with four key areas.

The first was the theoretical part, in which, after introducing the value creation of the firm and the processes involved I summarised the background to the literature of firm evaluation and its historical development. This section expressed support for the justification of the maximisation of shareholder value which is a feature of firm theory, and introduced the theory itself. I focused on works of Porter, Prahalad – Hamel, Rappaport, Copeland et al., Black et al., Pratt, Bélyácz, Ulbert, Smith, Coase, Markowitz, Modigliani – Miller, Jensen – Meckling, Freeman, Donaldson – Preston, Friedman.

The second was the practical part, which included the description and categorisation of the activities and methods of the evaluation of the firm, and which introduced in detail the tools used in evaluating the firm, and the advantages and disadvantages of their application.

The third part concentrated on the economic crisis, particularly its financial aspects. After introducing the development of and reasons for the crisis I considered the processes which had an effect on them, and then the previous empirical studies.

Finally in the fourth empirical part, I examined the value-creating factors through the data in the firm database. During the analysis I also examined the effects of the 2007-2008 global financial crisis, in the various industrial sectors and in the different country groups.

The basic aim of my dissertation was to find an answer to the question of which factors influence the value of the firm and how the influencing strength of these factors develop in the individual industrial sectors and in the country groups, and also following the 2007-2008 global financial crisis.

In order to achieve this I analysed the database which included 1553 firms from 10 sectors from 18 European countries between 2004 and 2011. In downloaded the database from Aswath
Damodaran’s\textsuperscript{2} website, and carried out numerous transformations to it. In order to unify the groups of the industrial sectors I used the Global Industry Classification Standard (GICS) categorisation. I tested various regression models on this database. The conclusions drawn on the basis of the empirical results I summarised in the theses.

The results of the thesis can be summarised below:

- I described the process of the creation of firm value with the help of the relevant literature;
- I introduced those firm theories which guarantee the justification of the maximisation of shareholders’ value;
- I summarised the theories and concepts involved in the approaches which feature in the literature;
- I introduced the practical methods of the evaluation of the firm;
- I analysed the effects of the 2007-2008 global financial crisis on firm value, which I reinforced with a new aspect, the creation and measurement of value, and its relationship to the crisis.

The existence of the database also ensures that, after some adaptation, I was able to test the strength of the influencing factors not only in the country groups but in the 18 individual European countries, and I drew conclusions from them, which constitute the subject of further research. My future plans include an extension of the database, inserting data from after 2011, with the help of which I already have more than 10 years of results at my disposal to carry out further analyses.

\textsuperscript{2} http://pages.stern.nyu.edu/~adamodar/
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The Candidate’s List of Publications

List of publications related to the dissertation

Article(s), study(ies) (3)


   NIS. 3 (2), 91-96, 2015. ISSN: 2344-1712.

Conference presentation(s) (1)


The Candidate's publication data submitted to the iDEa Tudóstár have been validated by DEENK on the basis of Web of Science, Scopus and Journal Citation Report (Impact Factor) databases.

21 April, 2016