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EMPIRICAL ANALYSIS OF THE ROLE OF THE FIRMS' VALUE DRIVERS

Empirical study

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Abstract

This paper focuses on the value creation and the value drivers. One of the objectives of this paper is to present the concept of maximizing shareholder value. The main goal is to categorize the most important value drivers, and their role of the firms' value. This study proceeds as follows. The first section presents the value chain, the primary and the support activities. The second part describes the theoretical background of maximizing shareholder value. The third part illustrates the key value drivers. The fourth empirical section of the study analyses the database featuring data from 18 European countries, 10 sectors and 1553 firms in the period between 2004 and 2011. Finally, the fifth section includes concluding remarks. Based on the related literature reviewed and in the conducted empirical research it can be assessed that, the EBIT, reinvestment, invested capital, the return on invested capital, the net margin and the sales growth rate all have a positive effect on firm value, while the tax rate and the market value of return on asset (MROA) has a negative one.

1.   The firm's creation of value

"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)

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. The generic value chain is seen in the Figure 1 (Porter, 1998).

2. The background to the firm theory of maximizing shareholder value

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 had been itself 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 owner 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)

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 β.

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) 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.

At least four major factors will induce management to adopt a shareholder orientation:
1. a relatively large ownership position,
2. compensation tied to shareholder return performance,
3. threat of takeover by another organization,
4. competitive labour markets for corporate executives. (Rappaport, 1998)

3. Identifying of value drivers

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. (Fenyves et al., 2015) The seven value drivers are the macro value drivers according to Rappaport. There are the follows:

1. sales growth rate,
2. operating profit margin,
1. income tax rate,

2. working capital investment,
3. fix capital investment,
4. cost of capital,
5. value growth duration. (Rappaport, 1998)

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. (Tóth, 2014)

Damodaran (2006) identifies four valuation models:

1. discounted cash flow valuation,
2. relative valuation,
3. contingent claim valuation,
4. asset-based approach.

Damodaran (2006) demonstrates two methods of deducing free cash flow. According to one method, we add together all cash flows which belong to the firm's financers, i.e. the free cash flows due to the owners from their own capital, the capital repayments due to creditors, interest expenditure and newly acquired credit, and the preference payments to preference shareholders. With the other method, we add together all cash flows before redistributing them to resource providers. This latter version appears to be easier to use.

$$FCFF = EBIT * (1 - T) - Net\ Capital\ Expenditures - Change\ in\ non\ cash\ Working\ Capital$$

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.

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 the 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):

II. $FCFF = EBIT * (1 - T) - Net\ Capital\ Expenditures - Change\ in\ non\ cash\ Working\ Capital$

III. EBIT (Earnings Before Interest and Taxes

IV. Tax Rate

V. Reinvestment= $(Net\ Capital\ Expenditures + Change\ in\ non\ cash\ Working\ Capital)$

VI. Invested Capital

VII. ROIC (Return on Invested Capital)
   a. $ROIC = \frac{EBIT(1-t)}{Invested\ Capital}$

VIII. Net Margin
   a. $Net\ Margin = Net\ Income\ /\ Sales$

IX. Cost of Capital

X. Market ROA:

XI. $MROA = \frac{Net\ Income}{Market\ Values\ of\ Equity + Market\ Value\ of\ Debt}$

XII. Sales Growth Rate

4. The empirical analysis of the role of factors influencing firms' value

Janiszewski (2011) also examines empirically the choice between the firm-evaluation models. His study refers to the works of essential authors such as Copeland and co-authors, Damodaran and, with the help of their models, tests various methods – the income-based (DCF) models, the multiples models, the book value-based and other models (real options, mixed methods). The article includes theoretical and practical information, as well as the author's wide-ranging professional experience. In his conclusions, he notes that the discounted cash flow model best reflects the future cash-generating

ability of the firm. This methodology is the best way of indicating the true value of the firm, although the condition system is extremely complicated and sensitive to the different assumptions that can be made about the future.

The objective of this article is to answer the question of which factors affect the firm's value.
With this in mind there 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, there 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:

$$LnFV_{i,t} = \alpha + \beta_{lnEBIT} lnEBIT_{i,t} + \beta_{tax} tax_{i,t} + \beta_{lnReinv} lnReinv_{i,t} + \beta_{lnInvC} lnInvC_{i,t} + \beta_{ROIC} ROIC_{i,t} + \beta_{NetM} NetM_{i,t} + \beta_{MROA} MROA_{i,t} + \beta_{dlnRev} dlnRev_{i,t} + u_{i,t} + \varepsilon_i$$

The analysis was prepared with the help of the STATA 11 statistics programme, which is able to produce statistical and econometric calculations and graphic presentations of data.
The results of the calculations are prepared in synthesised form, relating to the entire period (2004-2011) and to all the economic sectors (10 sectors). See Table 1.

On the basis of the estimation of the parameters of the random effect regression model, it can be established that EBIT positively affects the firm value, the 1% change in EBIT increasing it by 0.5504% when other factors remain unchanged. Further positive effects on the dependent variable are reinvestment, the return on invested capital and sales growth rate. The 1% change in invested capital moves firm value in a positive direction by 0.3208%, while a unified change of the net margin produces a 49.24% positive change in firm value, when other factors are unchanged. The tax rate and the MROA used as a proxy have a negative effect on the dependent variable.

5. Conclusions

From an examination of the entire period (2004-2011) it can be established that all independent variables have a significant effect on the profit variable. EBIT, reinvestment, invested capital, the return on invested capital, the net margin and the sales growth rate all have a positive effect on firm value, while the tax rate and the market value of return on asset (MROA) have a negative one.

References

[1] Chikán, A., & Demeter, K. (Ed.). (2006). *Az értékteremtő folyamatok menedzsmentje.* (Management of Value Creation Process). Budapest: Aula Kiadó.

[2] Chikán, A. (2005). *Vállalatgazdaságtan.* (Business Management). Budapest: Aula Kiadó.

[3] Coase, R. H. (1937). The Nature of the Firm. *Economica New Series, 4*(16), 386-405.

[4] Copeland, T., Koller, T., & Murrin, J. (1999). *Vállalatértékelés. Értékmérés és értékmaximalizáló vállalatvezetés*. (Valuation: Measuring and Managing the Value of Companies). Budapest: Panem Könyvkiadó Kft. – John Wiley & Sons, Inc.

[5] Damodaran, A. (2006). *A befektetések értékelése. Módszerek és eljárások.* (Investment Valuation: Tools and Techniques for Determining the Value of Any Asset). Budapest: Panem Könyvkiadó Kft. – John Wiley & Sons, Inc.

[6] Damodaran Database (2014). http://pages.stern.nyu.edu/~adamodar/ Accessed: 31. 01. 2014.

[7] Fenyves, V., Tarnóczi, T., Bács, Z., & Kovács, D. (2015). Comparative Analysis for the Practical Practice of Cost Calculation. *Annals of the University of Oradea Economic Science, 24*(1), 976-981.

[8] Janiszewski, S. (2011). How to Perform Discounted Cash Flow Valuation? *Foundations of Management, 3*(1), 81-96.

[9] Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics, 3*(4), 305-360.

[10] Lazonick, W., & O'Sullivan, M. (2000). Maximizing Shareholder Value: a New Ideology for Corporate Governance. *Economy and Society, 29*(1), 13-35.

[11] Lintner, J. (1965). Security Prices, Risk, and Maximal Gains From Diversification. *The Journal of Finance, 20*(4), 587-615.

[12] Markowitz, H. (1952). Portfolio Selection. *The Journal of Finance, 7*(1), 77-91.

[13] Modigliani, F., & Miller, H. M. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review, 48*(3), 261-297.

[14] Modigliani, F., & Miller, H. M. (1961). Dividend Policy, Growth, and the Valuation of Shares. *Journal of Business, 34*(4), 411-433.

[15] Modigliani, F., & Miller, H. M. (1963). Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review, 53*(3), 433-443.

[16] Porter, M. E. (1998). *Competitive Advantage: Creating and Sustaining Superior Performance: with a New Introduction.* New York: The Free Press.

[17] Ramanathan, R. (2003). *Bevezetés az ökonometriába alkalmazásokkal*. (Introductory econometrics with application). Budapest: Panem Könyvkiadó Kft.

[18] Rappaport, A. (1998). *Creating shareholder value: a guide for managers and investors.* 2nd ed., New York: The Free Press.

[19] Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *The Journal of Finance, 19*(3), 425-442.

[20] Smith, A. (1947). *The Wealth of Nations.* London: J.M. Dent & Sons Ltd.

[21] Tóth, K. (2014). The Effect of Derivative Financial Instruments on Bank Risks, Relevance and Faithful Representation: Evidence from Banks in Hungary. *Annals of the University of Oradea Economic Science, 23*(1), 698-706.

Table 1
Random effect panel regression results between 2004 and 2011 for all sectors

	lnFirm_V		
	Coef.	**z**	**P>|z|**
lnEBIT	0.5504	25.40	0.000***
Tax_r	-0.2267	-2.78	0.005***
lnReinv	0.0392	5.78	0.000***
lnInv_C	0.3208	17.13	0.000***
ROIC	0.0376	5.48	0.000***
Net_M	0.4924	2.81	0.005***
MROA	-3.5142	-6.88	0.000***
dlnRev	0.0473	4.69	0.000***
cons.	2.7067	40.40	0.000***
R^2 overall	0.9209		
R^2 within	0.6349		
R^2 between	0.9427		
Wald (chi^2)	15728.09***		
Number of observations	5504		

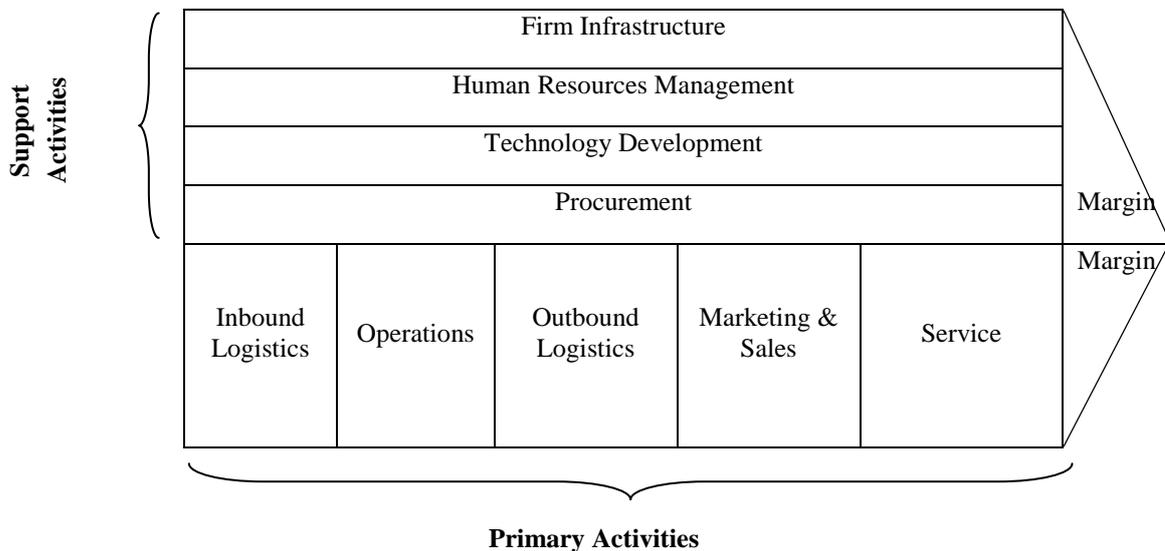*Note.* At the levels of significances *** 1 %, ** 5 %, * a 10% respectively

Figure no. 1. The Generic Value Chain
Source: Porter (1998) p. 37