A STUDY OF THE IMPACT OF INVESTMENTS IN ECONOMIC VALUE OF THE FIRM IN INTERNATIONAL COMPETITION

Marieta Olaru[1*], Jochen Schmid[2], Alexandra Sârbu[3], Dorin Maier[4]
[1) 2) 3)]BucharestUniversity of Economic Studies,Romania
[4)]TechnicalUniversity of Cluj-Napoca,Romania

Abstract
Investments in plants, innovation, R&D and equipment are key factors for international companies to have a bigger market share and thus a rising economic value. These key factors are basically part of the strategic decision to maintain the competitive position at global level.
The paper highlights the present economic situation in Germany and shows the medium term investment developments. The authors used the public reports of the German companies to have a valid database. The data is analyzed by economic value such as turnaround, Tobin`s Q ratio, EBIT and investments. From the overall database publicly traded German companies were selected for the timeframe 2008 to 2014.
The conclusion of the study is that the analyzed companies used a mixture of investments clearly showing a correlation between the above mentioned key factors and the increase in economic value. However there were also different cases where the outliers were very strong.

Keywords
Economic value, investments, international competition, strategy.

JEL Classification
M1 [M10, M14, M16]

Introduction

One of the biggest challenges for all kind of companies is the dynamic development of the markets. Not only the customer behavior, the complete framework seems like a never-ending story (Bain, 1959). While companies have a slower profit growth in global economy, the absolute number of competitors is still raising(Dobbs & Koller, 2015).
The entrepreneurs in global competition have new challenges. It is called as a „transition from industrial society to a new company“ based on knowledge (Violeta, et al., 2011). This known situation is explained by „rearrangements of values, beliefs, economic and social

* Corresponding author, **Marieta Olaru** – olaru.marieta@gmail.com

structures, political systems and concepts…“ (Drucker, 1999). Violetacounts some different facts of this situation, e.g. the fact of global economy and the fact of the necessity of a sustainable and socially responsible economy (Violeta, et al., 2011)to invest inresearch and development, in assets and in intellectual assets will be the necessary step to prepare for the competition situation (Dobbs & Koller, 2015).

1.1 Current approaches and literature review in analyzing the economic value and the strategic situation

The situation among existing competitors is the basis to generate a successful strategy. As showed, Violeta et al. (2011) defined the knowledge as the most important resource of a company. Porter defined pricing differentiation as a dimension of competition (Porter, 1980). Of course, Porter named some more „familiar forms“ like new product introductions, advertising campaigns and service improvements or other facts like corporate social responsibility (Verjel, et al., 2015). But Porter did not explain what exactly it means (Porter, 1999). Porter`s other dimensions like „product features, support service, delivery time, or brand image“ are given on markets but will not or less erode profitability (Porter, 2008).

Of course, the effect of pricing of a product or a service to profitability is directly measurable. But companies are complex systems, customers change their behaviors (Drucker, 1999). So it will be necessary to find out, if there are some other facts than the known dimensions, which are relevant in a competitive situation.

In addition to Porter there is a very helpful model of Joe Bain (1959), the Structure-Conduct-Performance Paradigma (SCP). This model explains the behavior of companies in different situations. The structure of the markets is the reason of the company performance, which is depending on the strategical market behavior (Bain, 1986).

The causal chain is: Structure of market (S) - market behavior (C) - company performace (P)

Bain shows us a background story, but he does not explain how companies get knowledge of the structure of the markets (Bain, 1959) or even other effects like the "importance of social and environmental responsibility" (Verjel, et al., 2015).

Strategy is one the most important decisions of entrepreneurs and has a huge impact on the performance of the firm (Robert Huggins, 2011). As entrepreneurs act in various industry sectors, the strategies will be different, too. So there is no general valid approach. To know what competitors do, what they plan and how they do it, is an important driver of strategy (Phillip Phan, 2003). Finally, the strategy of the entrepreneur is the instrument to overtop competitors (Akpoyomare, et al., 2012). The two parts of a strategy, differentiation and positioning are the main key facts in framing an entrepreneur`s strategy (Akpoyomare, et al., 2012). While markets become more and more global, companies needs physical and mental differentiation of the product (Akpoyomare, et al., 2012). In a study to measure the intended strategy, the results show the top strategic priorities (Kisfalvi, 2002). These top strategic priorities are among other things, product innovation, accessibility of information and forming/optimizing lucrative partnerships (Porter, 2008). These three named samples are completely dependent on behaviors and give advantages to competitors (Kisfalvi, 2002). So there is a high necessity to know the advantages of the competitors on the markets.

1.2 Tobin`s Q as a characteristic number for measuring the economic value

In order to prove the given theory, the main question for the companies is how to measure and know the present status of the competition. All strategic activities are adjusted based on the degree of competition. The current analysis consists of the characteristic number of "Tobin`s Q" which measures the relation between the equity market value and the equity book value (Gerke, 1994). The market value is the evaluation of shareholders (sum of all shares) and the book value is the sum of reproduction costs. As the reproduction costs are basically hard to measure, literature shows the value of all assets as the book value (Brealey & Myers, 1988). The formula is:

$$q = VM / VB \quad (1)$$

where:

q - Tobin`s Q
VM - equity market value
VB - equity book value

In this approach we use the Tobin`s Q to evaluate if there is a benefit for shareholders and mark this as an economic value. We assume ceteris paribus situations as in some other studies there are other variable factors like the gross domestic product, global environment or critical political situations like war (Gerke, 1994). Other additional effects of the entrepreneurship are for example marketing actions, diversification in product portfolio, interests and taxes and the form of organization. The average of Tobin`s Q for German industrial companies starting from 1968 is always higher than 1, what means that the equity market value is higher than the equity book value (Gerke, 1994; Stevens, 1986). The situation seems clear: these companies have a monopolistic situation with a high market share. Another explanation for Tobin`s Q > 1 is an advantage of a company in the technology area and therefore the opportunity is to obtain higher market prices (Stevens, 1986).

2. Research methodology applied for analyzing and defining the effect of investments on economic value

We used a sample of the public reports of the years 2008 to 2014 of German companies listed in the indices DAX, MDAX and SDAX. The data sample includes all branches except the banking sector. We clearly separated the performance of turnover, investments in R&D and assets, the EBIT, the market value and the book value. To calculate the results we used the absolute yearly value, the percentage difference of each year in the analyzed period and the average of each characteristic number and highlighted it in the following study. In order to drive a better understanding of the logic applied, the methodology is also presented in several graphs.

Further, it was examined in the analysis of whether over time the investments affect the results of the company. Investments are made during a fiscal year, and depending on the type and size of an investment, the effects might be delayed. This "time lag" is also a subject of the present analysis.

3. Research results

We extracted the investment in plant and equipment, innovation, research and development (R&D) and calculated the relation to turnover. Usually there are similar approaches available showing this effect, but all of them are done for the US market and with data samples of US companies (Kim & Lyn, 1986). These studies show a significant correlation betweeninvestments and Tobin`s Q. Additionally, these studies are made in the 1980s, so it is not clear if the results are transferable to German industry of today with all the changes in global and local competition and political challenges. Following this approach, we added the relation between turnover and investment to the given findings of Tobin`s Q. The formula is:

$$qUa = (VMa / VBa) / (IASSETsa / Ua) \quad (2)$$

where all characteristic numbers a = average 2008-2014:
qUa - Tobin`s Q investment ratio
VMa - equity market value
VBa - equity book value
IASSETa - investment in plant, equipment, innovation, research, development
Ua - turnover

Our result is shown in following figure:

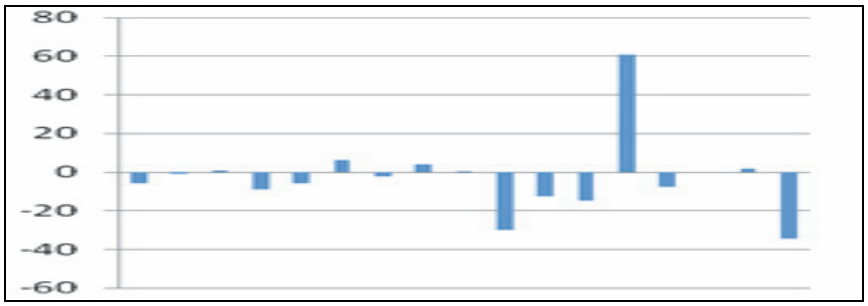

Figure no. 1: Tobin`s Q investment ratio 2008-2014
Source: according to the study conducted by the authors

The Y-Axis shows the Tobin`s Q ratio in percentages, the X-Axis shows the different selected companies. The new characteristic number of the Tobin`s Q investment ratio shows the absolute relation between the Tobin`s Q and the relation of investment to turnover. This analysis shows the economic value of the investments in the timeframe 2008-2014. The full average is -2,49% and it gives us the information that in most cases the investments are not a positive economic value if we only focus on this aspect. The results are basically different to other studies where a clear and overall positive result is shown (Kim & Lyn, 1986). With only this result, we ask the question: Why do companies invest if the result is mostly negative? To answer this question, we have to look in more detail to other factors that might have an influence on our analysis.

3.1 Correlations to the economic value of a company

To find out if there is a statistical correlation between the investments and the economic value, we used the below graphical representation. The analysis shows following results:

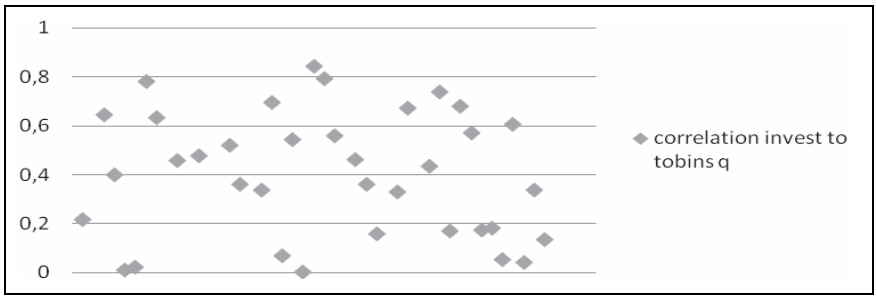

Figure no. 2: Correlation of Investments to Tobin`s Q, 2008-2014
Source: according to the study conducted by the authors

We concluded that there is a wide range of results for the timeframe 2008 - 2014 for the German companies and we interpreted the results as a mid-correlation ratio. The results with a very low correlation (lower than 0,2) are companies with very low investments. We found out, that these companies are mostly services companies. This does not mean necessarily that services companies have a lower Tobin`s Q compared to the industrial companies. It implies that these services companies can raise their economic value, the Tobin`s Q with lower investments. The nature of services companies is characterized by human capital while industrial companies have to invest in machines and new production technology. In addition to the results shown above, we found out that especially industrial companies have a mid to high correlation of the characteristic numbers of Tobin`s Q and investment. As this result is only one indicator of the economic value, we decided to additionally analyze the correlation of the investments and the yearly turn over in the years 2008 to 2014.

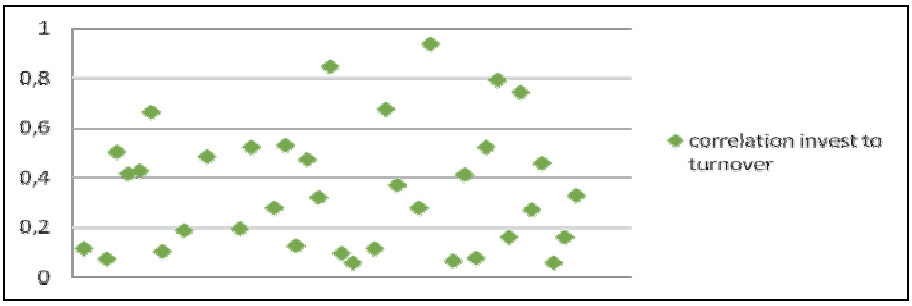

Figure no. 3: Correlation of Investments to turnover, 2008-2014
Source: according to the study conducted by the authors

It is easy to see in below figure no.4, that the correlations are mostly low. As a result we found out that there is no statistical significant correlation. We could not find an effect of investments on turnover. This result is completely different to the past approaches taken in

the US market. We have a correlation of the investment to Tobin`s Q but not in the absolute characteristic number of turnover. We focused our study on the companies with high correlation to find out if there are differences in the different industry areas. But there is significant difference. We found in all branches we analyzed (e.g. industry, trade, food, automotive) companies with low and high correlations. So the basic question is, why can we see an effect to rising market value if there is no significant rising turn over?
As another step we analyzed the effect of investments to the EBIT which is an additional signal for shareholders about the dividends.

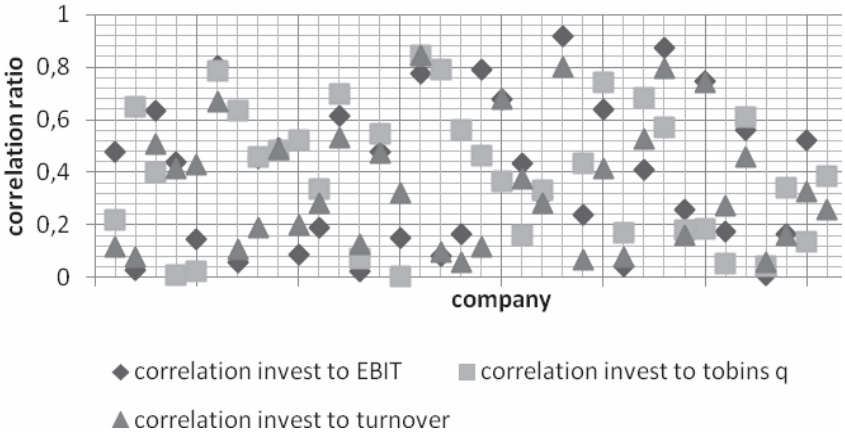

Figure no. 4: The correlation of investments to EBIT, turnover and Tobin`s Q during the years 2008-2014
Source: according to the study conducted by the authors

According to the above shown figure, we found out that the correlation of investment to EBIT is very different for each company. The statistical difference between the correlation of investment to Tobin`s Q is low. If we focus on each company we can clearly show a high correlation between the EBIT, turnover and Tobin`s Q. The EBIT is thus decoupled and behaves independently. The EBIT decreases due to the investment performance of a company, depending on the depreciation. Furthermore, the EBIT figure takes account of additional costs and expenses of the company, which are in sales and Tobin`s Q is not taken into account and thus independently affect EBIT.

3.2 Compound Annual Growth Rate Analysis

To create a clear view we analyzed and compared the average of all data in the years 2008 to 2014 in figure no.5.
On the Y-axis we show the growth rate and on the X-axis the data sample of the analyzed companies. In figure no.5 the Compound Annual Growth Rate (CAGR) shows the outliers which are mainly responsible for the low significance of our statistical results. If we are going to exclude the outliers it means that there is a basic correlation of investments to Tobin`s Q, to EBIT and to turnover. There is no given explanation why we found these heavy outliers so the reasons should be examined by each individual company.

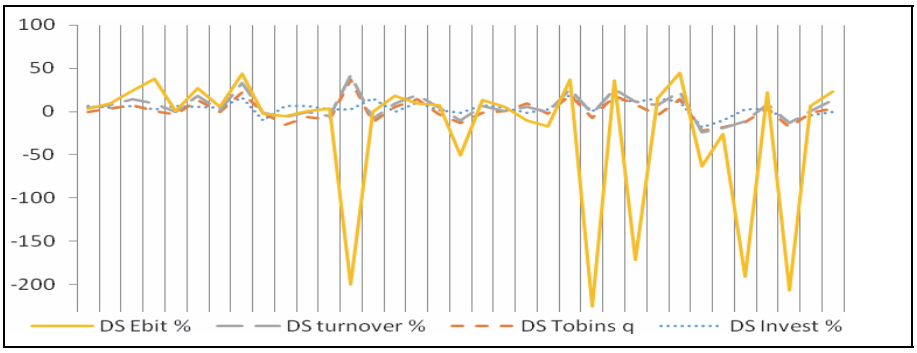

Figure no. 5: Compound Annual Growth Rate 2008 - 2014: The average of different characteristic numbers

Source: according to the study conducted by the authors

We refer to the Structure-Conduct-Performance Paradigma of Joe Bain (1959) which explains the structure of the market as an effect on the performance of the firm. The seven statistical outliers are showing in focus on the EBIT a huge difference to the average of all other companies in our study. We explain these outliers with their special market situation including the competitive situation.

These outliers are strong samples that especially the EBIT can differ very heavily from all other characteristic numbers of economic value. In total the investments grow with 3,75% during the years 2008 to 2014 while the EBITS decreases at the same time with -27,48% and the turnover increases with 4,56%. If we exclude the outliers the EBIT increases with 4,88%. That means, the turnover, EBIT and Tobin`s Q will increase higher the than investments.

Conclusions and future directions

Entrepreneurs raised their investments in the analyzed timeframe between 2008 and 2014. The turnover, EBIT and Tobin`s Q raised too. But there is no statistical significant correlation. This means that the investment is not the major factor for the increased economic value. Additionally the authors concluded that there is a very strong variation of the EBIT for some companies, which has a statistical influence on the overall results. In order to increase the economic value of a company is not only a question of high investments. There are external factors that also have an influence on the economic value of a company. Further it could be clearly demonstrated by the Compound Annual Growth Rate that there are virtually no significant time lags between the time of investment and the effect on the results. A "time lag" could not be detected and possible downstream effects on the economic value could not be observed. The Compound Annual Growth Rate moves significantlly statistical and is highly correlated with the other analyzed data across time.

As companies are complex systems the authors will have to pursue an additional approach to analyze the specific market situation of the selected companies.

References

Akpoyomare, O. b., Adeosun, L. P. K. & Ganiyu, R. A., 2012. Differentiation And Positioning Strategy: A Toss Of The Same Coin. *International Journal of Management and Sustainability*, 1(2), pp. 53-65.

Bain, J. S., 1959. *Industrial Organization: A Treatise.* s.l.:John Wiley.

Bain, J. S., 1986. *Structure versus Conduct as Indicators of Market Performance.* s.l.:Antitrust Law and Economics Review.

Barney, J., 1991. Firm Resources and Sustained Competitive Advantage. *Journal of Management*, pp. 99-120.

Barney, J. B. & Hesterly, W., 1969. Organizational Economics: Understanding the Relationship between Organizations and Economic Analysis.

Brealey, R. & Myers, S., 1988. *Principles of Corporate Finance.* s.l.:Mc Graw Hill.

Dobbs, R. & Koller, T., 2015. *The new global competition for corporate profits,* s.l.: McKinsey.

Drucker, P., 1999. *Management Challenges for 21st Century.* New York: Harper Business.

Gerke, N., 1994. *Tobins q.* Wiesbaden: Gabler Verlag.

Kim, W. & Lyn, E., 1986. Excess Market Value. *Journal of International Business Studies*, pp. 119-125.

Kisfalvi, V., 2002. The entrepreneur`s character, life issues, and strategy making. *Journal of Business Venturing*, Issue 189-518.

Phillip Phan, J. B., 2003. Entrepreneur`s Attitudes, Strategy Choices, And Firm. *Journal of Business & Entrepreneurship*, 01(15).

Porter, M., 1985. Competitive Advantage: Creating and Sustaining Superior Performance. *Free Press*.

Porter, M. E., 1980. *Competetive Strategy: Techniques for Analyzing Industries and Competitors.* New York: Free Press.

Porter, M. E., 1999. *Wettbewerbsstrategie: Methoden zur Analyse von Branchen und Konkurrenten.* Frankfurt/ Main: Campus.

Porter, M. E., 2008. *The Five Competitive Forces That Shape Strategy.* s.l.:Harvard Business Review.

Porter, M. E., 2013. *Wettbewerbsstrategien.* 13 ed. Frankfurt am Main: Campus Verlag.

Robert Huggins, H. I., 2011. *Competition, Competitive Advantage, and Clusters: The Ideas of Michael Porter.* Oxford: Oxford Scholarship Online.

Sato, K. & Sawaki, K., 2013. A continious-time dynamic pricing model knowing the competitor`s pricing strategy. *European Journal of Operational Research*, pp. 223-229.

Stevens, J., 1986. Tobins q Ratio: Monopoly Earnings, Risk, and Dividend. *Journal of Business Research,* Issue 14, pp. 213-223.

Verjel, A.-M., Hohan, A. & Schmid, J., 2015. Requirements for improving the performance and ensuring the sustainability of small and medium enterprises (SMEs) in relation with social responsibility (CSR). *Quality - Access to Success*.

Violeta, A. M., Ramona, M. E. & Nicolae, B. S., 2011. The "New Economy" And The Entrepreneur: Reassessment And Perspectives In The Context Of XXI Century. *The Journal of the Faculty of Economics - Economic*, July, pp. 324-329.