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The Impact of the Financial Crisis on Corporate Capital Structure in the Nordic Countries

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Abstract

The aim of this study was to examine the impact of the financial crisis on corporate capital structure across the Nordic countries. The analysis was performed on a period extending from 2005 to 2017 on the basis of firm-level secondary data. The main objective was to determine whether the corporate capital structure had changed during the financial crisis and post-crisis when compared to the same in the pre-crisis sub-period.

Secondary numerical data was collected from the official databases and financial statements of the companies. The usage of the SPSS software enabled performing descriptive, correlational and multivariate ordinary and least square regression analyses. Descriptive statistics provided a factual overview of the dataset. A correlational study provided information regarding the level of association between two variables. The multivariate least square regression analysis demonstrated the extent of the impact of the list of independent variables on the dependent. Those methods served to test the asserted hypotheses and to answer the research questions.

The empirical findings suggested that the capital structure had changed throughout the period from 2005 to 2017. The corporate capital structure experienced changes from very high leverage ratios during the pre-crisis period to even higher ones during the crisis and, finally, to the least significant figure after the crisis. The results disclose that changes in the capital structure had not influenced risk and return of the companies except for return on equity ratio. Thereby, the outcomes indicate a positive association between the capital structure and return on equity.

Keywords/tags (subjects)
Financial crisis, capital structure, CAPM, Beta, Unsystematic risk, Systematic risk, WACC, Corporate financing, Debt, Equity, Nordic countries

Miscellaneous (Confidential information)

Contents

1 Introduction

1.1 Background

The financial crisis of 2007-2008 had an enormous impact on the global economy, and the Nordic countries were not an exception (Foster & Magdoff 2008, 11). Even though the economic crisis is currently believed to be over and the shaken economies of the world are recovering, the effects of the crisis on both the economy and companies are still quite evident. The primary goal of this study was to examine the effect of the financial crisis on the corporate capital structure. Since capital is a central component for conducting business and could be raised in so many different ways, capital structure is a topic of discussion. The financial crisis created a recession which, in turn, had a significant impact on firms' capital structure. Besides capital structure, company's risk and returns indicators are examined in this research. More precisely, the thesis aimed at finding whether the choice of capital structure impacted the risk and returns of the company. Risk and return relationship indicates the amount of return gained on an investment and the amount of risk undertaken in that investment (Campbell & Viceira). After an extensive literature review, the author realised that there existed a significant gap and inadequacy in examining the effects of the global financial crisis on the capital structure and its impact on firms' risk and returns. Accordingly, the main research objectives were derived. The first was to examine whether the financial collapse had influenced the capital structure in companies across the Nordic countries. Secondly, the thesis was targeted to determine if the changing corporate capital structure had an influence over the risk and returns of the company.

1.2 Motivation for the research

Having studied numerous recently published research articles and theses regarding this topic, the author realised that there was no extensive material although the topic is of significant amount of interest, especially in the context of the current times. The research topic was not only of academic medium-sized enterprises or big corporations.

The motivation to study the impact of financial crisis on Nordic countries is explained by the author's personal interest in particular countries even though she has interest in the given topic in general. Moreover, the interest is justified by the author's aspiration to study finance further as a specialization in her Master degree followed by a career in the field of finance.

1.3 Research questions

The study is built upon three research questions. The main research question is proposed as follows:

1. Has the corporate capital structure changed during the financial crisis and post-crisis when compared to the same in the pre-crisis sub-period?

2. What type of changes has the corporate capital structure experienced?

3. What were the effects of the changing corporate capital structure on the risk and return during three sub-periods?

In order to answer the aforementioned questions, 30 non-financial companies in Denmark, Finland, Iceland, Norway and Sweden which are publicly traded on Nasdaq OMX Nordic Stock Exchange (OMXN40), were considered and explored. The effects of the crisis were investigated by dividing the data period into three distinct time intervals called the pre-crisis (2005-2006), in-crisis (2007-2008) and the post-crisis (2009-2017) sub-periods. Furthermore, the study examined the possible relationships of the important determinants and the influences of the crisis on these determinants of the capital structure during the mentioned periods. In this respect, the relation of tangibility, profitability, size, growth, earning volatility, corporate tax and industry classification with the leverage of the firm were discussed. The secondary data regarding accounting and financial variables were collected from the corporate annual reports and other related documents; similarly, the market-related financial data was obtained from the Nasdaq OMX Nordic database. The key variables that were analysed in the current study were: risk and return and capital

structure. The data collected was categorised as variables which were then analysed by using multivariate least square analysis and correlation analysis. The analysis of the data was implemented with the assistance of SPSS analysis.

Regarding the outcomes of the thesis work, the following results were revealed as answers to the research questions. Firstly, it was detected that the capital structure had experienced significant alterations within the chosen period. Thereby, when the figures of the in-crisis and post-crisis were compared to the same in the pre-crisis period, solid changes could be distinguished. Generally, the debt proportion in the corporate capital structure had increased by 16.76% during the crisis and declined by 18.93% after the crisis in comparison to the pre-crisis sub-period (see Tables 2,6,10). The results disclosed that changes in the capital structure did not influence the risk and return of the companies except for the return on the equity ratio. In addition, the study revealed that the risks did not impact the capital structure, either. Thereby, the results represented only one positive association with the capital structure, which is the association with the return on equity. It was also discovered that systematic risk has a causal relationship with the return on equity.

1.4 Structure of the thesis

The study provides the readers with the theoretical background of the topic by acquainting them with the following topics: the history of the financial crisis and its impact, the concepts of risk and return in finance and capital structure. It forms a foundation for a subsequent study of the research questions. Further, the hypotheses based on the literature review are formed. In the next chapter, “Methodology”, the specific research approach is described as well as the methods of the data collection followed by the analysis methods used in the study. The chapter “Empirical findings” reveals the research results and demonstrates the analysis of the answers to the research questions. The last chapter, “Conclusion”, presents the practical and managerial implications of the results described in the “Results” chapter. In addition, it discusses the limitations of the research and the recommendations for future research.

2 Theoretical background of capital structure

Since the goal of this thesis is to analyse the capital structure of the companies across the Nordic countries, it is essential to characterise the complex concept of capital structure. Therefore, this chapter aims to introduce and summarize the most popular concepts in the field. Foremost, the distinctive features of the capital structure's constituents – debt and equity - are discussed in sub-chapter 2.1, 2.2. Capital structure as a concept is examined in sub-chapter 2.3, where capital structure's role in a company, its determinants are reviewed. Furthermore, the theories of the "weighted average cost of capital" and "capital asset pricing model" are covered in this sub-section. The existing theories relevant to the capital structure are discussed in section 2.5. The measuring instruments are reviewed in section 2.4. The author was primarily interested in the impact of the financial crisis on the capital structures of the companies. Therefore, the financial crisis and its impact is additionally reviewed in the theoretical background chapter. Acquaintance with the theoretical framework is of vital importance for the comprehensive understanding of the research process and methodology.

A firm requires capital in order to sustain and develop its business. In outline, there are two ways of fundraising: by issuing debt or equity capital. Debt financing fosters many benefits to a company in comparison to equity financing. However, debt additionally brings increased risks. Therefore, debt management has been a crucial task for every company aiming to optimize the benefits of debt capital and minimize the risk that it might bring. (Brigham & Houston 2007, 416-420.) This chapter addresses the primary characteristics of debt and equity financing. It provides the reader with the advantages and disadvantages of both options of financing a company's operations for further comparison of the financing options.

2.1 Debt

The borrowed capital represents the financial resources, or other property values, involved in a returnable basis for the financing of the company development. All

forms of borrowed capital represent the financial liabilities of the company, which are subject to repayment in a certain period. (Breadley 2011, 577.)

By issuing debt, the company receives many advantages, which under certain circumstances, however, may turn into disadvantages and entail deterioration of the financial condition of the company, bringing it closer to bankruptcy. Financing of assets from borrowed sources can be attractive since the creditor does not make any direct claims regarding the future incomes of the company. Regardless of the results, the creditor has the right to claim the agreed amount of the principal and interest on it. (ibid., 579.)

The fundamental difference between equity and debt financing is that the borrowed funds are irrelevant to the structure of equity capital. Debt obligations do not lead to a dilution of the share of the company's owners. In the majority of the cases, the value of the obligations and their maturity dates are known in advance, which facilitates the financial planning of cash flows. (Hamberg 2001, 107.)

Debt is acknowledged as the cheaper option of raising funds for the company because of the tax deductibility of the payment for the use of the borrowed funds. The tax expenses are, thus, reduced creating a "tax shield" for the company. At the same time, the presence of costs associated with the payment for the use of the borrowed funds shifts the break-even point of the enterprise. In other words, in order to achieve the break-even point, the company has to have more sales. In conditions of an unstable financial situation, this may become one of the reasons for the loss of solvency: the firm is not in a position to provide a higher inflow of funds necessary to cover the increased costs. (Grinblatt & Titman 2002, 70.)

Debt capital is characterized by the following positive properties (Efimova 2002, 294-295):

- sufficiently broad possibilities of attraction debt financing, especially with the high credit rating of the company;

- ensuring the financial growth of the firm if it is necessary to significantly expand its assets and increase the growth rate of its business;

- lower cost in comparison to the company's own capital due to the effect of a "tax shield";

- the ability to generate an increase in financial profitability (return on equity) due to the effect of financial leverage.

At the same time, the debt capital has the following downsides (Efimova 1994, 532):

- the use of this capital generates the most dangerous financial risks in the economic activity of the firm - the risk of reducing financial stability and loss of solvency;

- assets formed at the expense of borrowed capital generate a lower rate of profit, which is reduced by the amount of interest paid;

- a high dependence of the value of the borrowed capital on fluctuations in the financial market;

A further limitation of using debt is the lack of flexibility. A company with a significant share of borrowed capital has little room for manoeuvring in the event of unforeseen circumstances, such as a possible drop in demand for products, a significant change in interest rates, increased costs or seasonal fluctuations.

Thus, an enterprise that uses borrowed capital has a higher financial potential for its development due to the formation of an additional volume of assets and the possibility of an increase in financial profitability. However, this generates a higher financial risk and a threat of bankruptcy (Berg & DeMarzo 2017, 479). All these moments should be taken into account in the financial analysis when evaluating the rationality of the capital structure.

2.2 Equity

Equity capital in represented as finance earned either internally and retained within the firm or obtained externally by issuing new equity securities. There are three different types of equity that capital firms issue: (1) common stock, (2) preferred stock, and (3) warrants. (Grinblatt & Titman 2002, 70.)

Common shares are one of the options to finance a company's long-term assets. Common shareholders are the owners of the company, and, thus, raising funds by issuing more common shares has ownership and control implications for the firm. The individual shareholders possess power over the management of the company, and they can influence the decisions related to their shares. Consequently, they bear the risk associated with the operations of the company, and, in a bankruptcy scenario, the shareholders receive nothing or a very small amount of money. In the hierarchy of creditors, ordinary shareholders are placed at the bottom. Therefore, since they carry the greatest risks as lenders, the expected returns to them are higher in comparison to the repayments of debt. (ibid., 70.)

Dissimilar to common shares, the preferred shares give their holders a claim on a company's profits before the dividends to the common shareholders. Moreover, the holders of preferred shares are higher in the hierarchy of receiving money in case of the firm's liquidation. Nonetheless, their claims are always junior compared to the claims of the debtholders. The preferred shareholders' power on the firm's decisions is also limited, and it limits their rights to vote. Preferred stock is utilized less frequently than common stock as a source to finance a firm's operations. One of the biggest privileges of the preferred stock is that it allows companies to issue a debt-like security without lowering the ratings on their existing debt. However, in contrast to a debt security, the dividends on preferred stock are not tax-deductible. (Brealey et al. 2011, 350.)

Warrants are another option for firms, and they represent long-term call options on the issuing firm's stock. Call options give their holders the right to buy shares of the firm at a pre-specified price for a given period of time. These options are often

included as part of a unit offering, which includes various securities suggested as a package. (ibid., 351.)

Own capital is characterized by the following fundamental positive properties (Efimova 2002, 203):

- the simplicity of attraction, since decisions related to the increase of equity capital (especially at the expense of the internal source of their formation) are taken by the owners and managers of the organization without obtaining the consent of other economic entities;

- a higher ability to generate profits in all areas of activity, as when using it, no interest charge is required in all its forms;

- ensuring the financial sustainability of the company development;

- the company's solvency in the long run, and accordingly;

- risk of bankruptcy is reduced.

At the same time, the following barriers are inherent in own capital (ibid., 204):

- the limited scope of attracting opportunities for a significant expansion of the operational and investment activities of the organization at certain stages of its life cycle, especially during a period of favourable market conditions;

- higher costs in comparison to alternative sources of capital formation, more specifically, debt.

Thus, a company that uses only its own capital has the highest financial stability, but it may also restrict its limits to grow in the future (Berg & DeMarzo 2017, 479).

2.3 Capital structure

The acceleration of market changes, imposing entirely new, more stringent requirements on all subjects of market relations, is the most essential characteristic

of the current economy. Market changes increase in its number, and thereby multiply the uncertainty and the risks it entails. In these conditions, the efficiency of the company is largely determined by the ability of its owners and management team to accurately estimate market changes. Based on this estimation, it is crucial to elaborate an effective strategy for the company's development. Thus, the management teams of companies face a number of tasks that require practical solutions. (Madura 2006, 527.)

The development of modern companies cannot be imagined without introduction of sophisticated technology, the creation of competitive goods and services, without moving to new markets, which is associated with the implementation of major investment projects, the implementation of transactions on mergers and acquisitions. These operations directly determine the future competitive position of the company in the market and the implementation of its development strategy. (ibid., 527.)

In order to finance its activities, the company can use both its own and borrowed capital. Companies that are provided with inexpensive long-term capital have more opportunities to grow and gain market share than their competitors. At the same time, it is important not only to attract enough funds for the development of the company but also correctly determine the appropriate capital structure for it. So, the least expensive source is borrowed capital, however, by attracting loans, the company increases financial risks. Financing activities at the expense of own less risky, however, is more expensive. Therefore, only a balanced capital structure of the company can ensure the proper development. (Berg & DeMarzo 2017, 478.)

The establishment of an optimal capital structure have to meet the requirements imposed by both the economic situation in general and the company's management system, taking into account its characteristics at a particular stage of development. The requirements of the external economic situation are characterized by the uncertainty of external factors due to the influence of globalization, as well as the expansion of the range of possible options for investing available resources. The

requirements of the company's management imply effective functioning in a competitive environment and determination of the debt-equity ratio that would be optimal under the given conditions. This optimal structure of capital implies ensuring the financial stability of the firm, achieving the standards of its current liquidity and solvency, as well as the required return on invested capital. (Graham & Leary 2011, 5.) All of the above enumerates the relevance of the topic of this thesis work.

2.3.1 Role of capital structure in a firm

Determination of an optimal capital structure signifies a high impact on a firm's existence. Above all, capital structure decisions influence the formation of a sufficient amount of capital, ensuring the necessary pace of economic development of the company. The total capital requirements secure financing of assets necessary for the company. Moreover, an optimal for a firm capital structure guarantees a permanent financial equilibrium of the company in the process of its development. This equilibrium is characterized by a high level of financial stability and solvency of the firm at all stages of its development. (Madura 2006, 528.)

The right combination of capital structure provides superior conditions for achieving maximum return on capital at the envisaged level of financial risk. The maximum profitability of capital can be ensured at the stage of its planning by minimizing its weighted average cost and optimizing the ratio of its own and borrowed capital. It is significant to keep in mind that the maximization of the level of profitability of capital is achieved, as a rule, with a significant increase in the level of financial risks associated with its issuing, since there is a direct relationship between these two indicators. Therefore, the maximization of the return on capital must lay within an acceptable financial risk. The specific level of risk is determined by the owners or managers of the enterprise, taking into account their financial attitudes to the degree of acceptable risk in carrying out economic activities. (Milken 2009)

Decisions on capital structure also include company's aim to minimize financial risk associated with the use of capital. If the level of profitability of the capital is planned, it is an important task to reduce the level of financial risk of operations ensuring

achievement of this profitability. Such minimization of the level of risks can be ensured by diversification of the forms of attracted capital, optimization of the structure of its sources, avoidance of certain financial risks, useful forms of their internal and external insurance. (ibid.).

When planning capital structure, it is substantial to ensure a sufficient level of financial control over the company by its owners. Such financial control is provided by a controlling stake in the hands of the founders. At a stage of the subsequent development of the capital, it is of vital importance to evaluate the external resources of capital, their impact on the company and the possibility of absorption of the company by the foreign investors. (Hamberg 2001, 213.)

With to the right mix of the sources of finance, the company possesses financial flexibility. It characterizes the ability of a company to quickly generate the necessary amount of additional capital with an unexpected appearance of highly effective investment proposals or new opportunities for accelerating economic growth. The necessary financial flexibility is provided by optimizing the gearing ratio, long-term and short-term forms of capital raising, reducing the level of financial risks, favourable settlements with investors and creditors. (ibid.)

Due to the constant changes in the external economic environment or internal parameters of the economic activity of the company, a number of directions and forms of using capital may not provide the anticipated level of its profitability. This can be avoided by timely reinvestment of capital. (Kuznetsov 2005, 293.)

2.3.2 Determinants of capital structure

As Harris and Raviv state: “Several studies shed light on the specific characteristics of firms and industries that determine leverage ratios. [...] These studies generally agree that leverage increases with fixed assets, non-debt tax shields, growth opportunities, and firm size and decreases with volatility, advertising expenditures, research and development expenditures, bankruptcy probability, profitability and uniqueness of the product.” (1991, 334).

Size

From the theoretical point of view, the size of the company has an indefinite effect on its leverage. Rajan and Zingales state that a large-scale company tends to make more decisions in favour of debt due to the diversification and decreased risk of bankruptcy (1995, 1451). Moreover, empirical studies do not state clearly whether there is a positive or negative dependence between size and leverage. For instance, Huang and Song (2002), Rajan and Zingales (1995) and Friend and Lang (1988) show the evidence of positive relations between leverage and the size of the company in their works. On the other hand, some studies report a negative relation, for example, Kim & Sorensen (1986) and Titman & Wessels, (1988). The reasoning for the negative interdependency between these two factors is that the availability of information about the size of the company for the investors positively effects on their preference for equity relative to debt. De Jong and Verwijmeren (2010) also argue that bigger companies tend to follow a target debt ratio whereas smaller companies generally follow a preference order due to higher levels of information asymmetry. Their results, however, are very often weak as far as the level of statistical significance is concerned. The variable determining the size of the company in this work is a natural logarithm of the sales of a company.

Profitability

There is no clear evidence of a dependence between profitability and leverage. However, different authors present theories on this point. The trade-off theory (Kraus & Litzenberger 1976) implies that companies that earn more profit tend to have a higher portion of debt in their capital structure because of the possibility to shield more income from taxes. The agency theory (Jensen & Meckling 1976) delineates that more profitable companies should use more debt in order to discipline the managers, to induce them to pay out cash instead of spending money on inefficient projects. Nonetheless, according to the pecking-order theory (Myers & Majluf 1984), successful companies prefer internal financing to external. More profitable companies, thus, use external sources of finance infrequently in

comparison to internal ones. Most empirical studies, such as Rajan & Zingales (1995), Huang & Song (2002), Booth and collegues (2001), Friend & Lang (1988), Titman & Wessels (1988), and Kester (1986) demonstrate a negative relationship between leverage and profitability. Return on assets is used as a variable showing the profitability of the company.

Tangibility

The tangibility of the company impacts on the decisions regarding its capital structure to a great extent. In theory, it is believed that the more tangible assets the company possess, the higher the value of the company and the lower the risk of the company going bankrupt. The company, therefore, is able to issue more debt (Booth et al. 2001, 101). Friend & Lang (1988), Rajan & Zingales (1995) and Titman & Wessels (1988) agree upon this issue and observe a positive relation between tangibility and leverage. The ratio of tangible assets compared to the total assets was used as a variable for the analysis of tangibility in this work.

Growth opportunities

Future growth opportunities for companies play a significant role in planning the capital structure as well. However, there exist different opinions on this matter.

The agency theory (Jensen & Meckling 1976) documents the antagonistic relationship between the growth opportunities of a firm and its level of leverage demonstrating that firms that are growing rapidly, as a rule, utilise less borrowed capital (Frank & Goyal 2005). In essence, the agency theory reveals that managers behave rationally when trying to expand their own earning at the expense of the shareholders, and debt financing controls this behaviour. This leads to fewer investment opportunities for companies and a heightened cash flow as a result of a greater use of debt.

On the contrary, the pecking order theory (Myers & Majluf 1984) declares an affirmative relationship between growth opportunities and leverage. It argues that managers are rational, but not necessarily opportunistic. Thus, in the maturity phase,

debts exert no more the same disciplinary effect on managers as in the agency theory. For the calculation of growth opportunities, the growth in research and development expenses was employed in this study.

Corporate Tax

The trade-off theory (Kraus & Litzenberger 1976) argues that a company which has to pay higher taxes possesses a higher leverage ratio because of the tax shield advantage. However, for example, Fama and French (1998) declare that debt has no net tax benefits.

Modigliani and Miller advocate the tax advantage of the borrowing costs in their modified theory of capital structure (1963). The reasoning is that, since the interest expense is tax deductible, the government is subsidizing companies that issue debt securities for financing their operations and projects. Companies, thus, try to maximize their share of the government subsidy when planning their capital structure. Thus, when there exists an income-tax deductibility of interest payments at the firm level, the market value of the firm rises as a higher financial leverage is involved.

Another hypothesis proposed by DeAngelo and Masulis regards the non-debt tax shields, such as depreciation, provisions and tax carryovers, as providers of additional benefits. Firms strive to exploit the tax deductibility of interest to reduce the tax burden. If firms also have further tax-deductible items, other than their debts, then the leverage effect is low. (1980, 21.) Organizations that hold before-tax earning consistent primarily have a higher leverage ratio. They state that non-debt tax shields override the debt-related tax shield and, subsequently, there is a negative relationship between the non-debt tax shields and leverage.

Earning volatility

Volatility implies the risk of a financial distress in the company. The primary assumption is that volatility impacts on the decision on capital structure negatively and, thus, the company employs less debt as volatility increases (Kim & Sorensen

1986). There is, however, evidence of controversial relations between volatility and leverage aspects. For instance, Huang and Song declare that the higher the variance of the assets in the company, the smaller is market risk (2002, 9). This negative relation is also confirmed by Bradley (1984) and Titman & Wessels (1988). For the analysis of earnings volatility, the standard deviation in return on assets was employed in this study.

Industry classification

Capital structure is dependent on many aspects of the economy, and the classification of the industry in which the company operates stands for one of them. Harris and Raviv (1991, 333) argue that companies representing such products as pharmaceuticals, instruments, electronics and food, as a rule, possess less debt in their financial structure while the paper, textile, steel, airlines and cement companies more frequently have a higher leverage ratio. In order to measure this determinant, dummy variables were introduced in this work.

2.3.3 Systematic risk – Beta

The capital asset pricing model (hereafter, CAPM) is discussed in sub-chapter 2.3.4. Whereas this sub-chapter expounds the concept of Beta(ß) – the prime component of the CAPM theory. Foremost, beta is an indicator of systematic risk. In economic and financial theories, systematic risk constitutes the risk intrinsic to the entire market risk. This is frequently entitled as “undiversifiable risk”, “volatility” or “market risk”, which infers the risk impacting the whole market and not particular industry or company. (Luecke 2002, 114.) Beta shows the responsiveness of the moves in returns of the particular security relative to the moves in the stock exchange or market. Beta that equals 1 is a market beta which serves as a benchmark for the measurement of systematic risks. (Watson & Head, 2010, 239.)

The greater the beta of a particular security, the higher returns of the same security will be expected. The beta equals to 0.8 implies that if the market risk rises by 10 %, the security return will rise by 8% and, contrariwise, if the market risk lowers by 10%,

the security return will fall by 8%. Beta higher than 1.0 is considered as high and those below 1.0 as low. High-beta is also called aggressive, whilst low-beta is defensive. Higher-beta stocks are disposed to possess superior risk, thus, be more volatile, but grant higher returns. Lower-beta stocks create less risk but generally offer lower returns. (McLaney 2009, 199.) The idea has been disputable; some academics argue that the data show little dependence between beta and potential return, or even that lower-beta stocks can hold less risk and bring higher profits (McAlpine 2010).

The beta equals to the covariance of returns of the particular security and the market divided by the squared standard deviation of the market. The calculation of beta involves regression analysis - the collection of the data on the periodic returns of the market and the security under consideration (Watson & Head 2010, 240):

$$\beta = \frac{Cov_{i,m}}{{\sigma_m}^2}$$

where: $Cov_{i,m}$ = the covariance of returns of security i and the return of the market m;

σ_m = the standard deviation of the market returns.

2.3.4 The capital asset pricing theory

William Sharpe proposed “The capital asset pricing theory” in 1964 - the work that reveals the share valuation method. It demonstrates the linear relationship between risk and return of an investment. This work was based on Markowitz’s portfolio theory and acts as a logical continuation of it. The theory is used considering the following assumptions:

- all the investors behave rationally striving for maximisation of their profit;
- information is available to investors;
- it is possible to borrow and lend at risk-free rate;

- unsystematic risk is liquidated because of the investors' diversified portfolios;
- capital markets are perfectly competitive. (Watson & Head, 2010, 238.)

CAPM is the most commonly used method for computing the cost of equity (often expressed as "rate of return"), which is inferred by comparing the investment to other investments with similar risk profiles. The formula is represented below:

$$R_i = R_f + \beta_i(R_m - R_f)$$

where: R_i = the rate of return of security i predicted by the model;

R_f = the risk-free rate;

β_i= the beta coefficient of security i;

R_m= the return of the market. (ibid., 238.)

The rate of return predicted by the model (R_i), shown as a percentage, implies the expected income earned on investment (Medina 1988, 70).

Risk-free rate (R_f) is an investment with no potential risk, which provides with the original principal and additionally minimal return over a period of time. Nonetheless, investment cannot have absolutely zero-risk rate in real economy because of inflation. (Damodaran 2008, 12, 14.) The risk-free rate given by the government bonds is acknowledged as the nominal risk-free rate (Stowe 2007, 49).

As it was mentioned in the sub-chapter 2.3.3, Beta coefficient (β_i) indicates systematic risk and demonstrates the moves of the security return in relation to market return.

Whereas market return (R_m) denotes the return of the entire market. Different indexes, for instance FTSE 100, Dow Jones and Nasdaq, supply the market return rates. Those rates are constituted from the historical performance of the market. (Boyte-White 2015).

2.3.5 Weighted average cost of capital

The term "weighted average cost of capital" (hereafter, WACC) is used in financial analysis and business valuation. The WACC serves as a benchmark for company performance in corporate finance. The WACC demonstrates all the costs related to the proportion of debt and equity in the capital structure of a firm. In a rational financial world, every company's primary aim is to minimize the WACC and maximize shareholders' wealth. Hence, an optimal balance between various sources of raising funds are sought-for. (Watson & Head 2010, 259.)

The indicator WACC integrates information about the specific composition of the elements of the company's capital, their individual values and significance in the total amount of capital. It determines the relative level of expenses (in the form of interest payments, dividends and fees.) for the use of financial resources used in the activities of the organization. The total cost of capital, thereby, is the average value of the prices of each source in the total. (McLaney 2009, 282-283.)

Another application of the WACC is its usage as a discount rate in investment analysis. The cost of capital is compared with the internal rate of return. For the project to pay off, the rate of return yield should be greater than the cost of capital. The WACC shows the minimum return of the organization's funds to the capital invested in its activities, or its profitability. The economic meaning of this indicator is that the organization can make investment decisions if the level of their profitability is not lower than the current value of the WACC. The cost of capital characterizes the level of profitability of the invested capital necessary to ensure the high market value of the organization. (ibid., 283.)

The calculation takes into account the specific weight of each source of financing in the total cost. The indicator characterizes the relative level of total expenditure for each source of financing. The main difficulty in calculating this indicator is the calculation of the unit price of capital received from a particular source of funds, since this determines the accuracy of the WACC calculation. For some sources, it can be calculated quite easily and accurately (for example, the cost of a bank loan); for a

number of other sources it is rather difficult to do this, and exact calculation is impossible in principle. Nevertheless, even approximate WACC estimates are acceptable for analytical purposes (useful both for comparative analysis of the effectiveness of the organization, and for justifying the investment policy of the organization). Weighting can be initial or target. The initial weighting is based on the existing capital structure, which is recognized as an optimal and should be preserved in the future and can be carried out at the book value and market value of the sources. Target weighing is used if the organization wants to create an optimal capital structure for itself when the planned ratio of own and borrowed funds in the total volume of sources should be maintained for a long period of time. (Watson & Head 2010, 259.)

In the case where the company is financed with only equity and debt, the weighted average cost of capital is calculated as follows:

$$WACC = \frac{E}{E+D}K_e + \frac{D}{E+D}K_d(1-t)$$

where: E = the total shareholder's equity;

D = the total debt;

K_e = the cost of equity;

K_d = the cost of debt;

t = the effective corporate tax rate. (Fernandes 2014).

Cost of equity (K_e) is computed with the use of CAPM as it was defined in sub-section 2.2.4. In order to calculate cost of debt (K_d), the total amount of interest company pays on its debts for the year is divided by the total amount of debt. Effective corporate tax rate t is calculated by the income tax expenses divided by the income earned before taxes (Miles & Ezzell).

2.4 Measure of capital structure

The capital structure is defined as the relationship between debt and equity in the company, therefore, the level of gearing indicator is one of the methods of measuring it. The term gearing implies the relationship between debt and equity finance in a company. The higher proportion of debt relative to equity, the higher gearing level is. There are various methods of calculating the gearing ratio of the firm according to different theories (Rajan and Zingales 1995). These ratios include total liabilities-to-total assets and total debt-to-total assets. Total debt-to-net assets can further be a way to estimate capital structure (ibid.). All those ratios are used for more profound analysis of capital structure. Whereas this study examines only the phenomena of capital structure and the impact of external factors on capital structure changes. Hence, the ratio debt-to-equity is employed in this work. The ratio depicts the proportion of company capital financed through debt. Since the debt-to-equity ratio measures a company's debt relative to the total value of its stock, it is most often used to quantify the proportion of which a company is taking on borrowed capital as a means of leveraging in order to fund various projects. A high debt-to-equity ratio generally indicates company's aggressive manner in financing its growth with debt. Aggressive leveraging methods are often used when risk levels are high. This may result in volatile earnings as a result of the additional interest expenses.

With high gearing ratio, the company might potentially bring more profits compared to the lower gearing ratio. Nonetheless, high debt financing eventually leads to the increased risk and costs. Therefore, this is an issue of vital importance to estimate the optimal for the company capital structure and strive to reach this ratio.

2.5 Capital structure theories

Berk and DeMarzo explained a term "capital structure" as "the relative proportion of debt, equity, and other securities that a firm has outstanding constitute its capital structure." (2007, 428). Companies use two types of sources to raise fund for their

operations: equity and debt. In most cases, the combination of equity and debt is chosen as an option (ibid., 428).

Financial analysists, commentators or the CEOs of the companies strive to find out an optimal gearing level which would results in maximum profits for its shareholders. Capital structure is one the hottest topics and lays behind strategic and operational decisions of any company. Nonetheless, many argue if an optimal capital structure exists in practice. The equity–debt equation in a firm's capital structure has hitherto been disputable. However, the evidence of the tax shield benefit of debt financing is accepted by financial analysts and managers. (Bierman 2003, 5.)

2.5.1 Modigliani and Miller theory

Modigliani and Miller were the first financial economists who attempted to build a theory of an optimal capital structure. The Modigliani-Miller (hereafter, M&M) theory was originally proposed in a 1958 paper, then refined and modified. Their theory, based on the assumption of the perfect market with no corporate taxes and no bankruptcy, states that the financial performance of the company is irrelevant to the capital structure. In addition, they also assume that there is no inflation, transaction costs associated with raising money and all the information is credible. In accordance to their work, it is proved that the firm's total value does not depend on the amount of borrowed funds and can be calculated from the operating profit and the required return on equity with zero financial leverage. Thus, according to the model of M&M that was proposed in 1958, the price of a firm and the cost of capital are independent of the capital structure.

The Miller-Modigliani approach is built for a perfect market and can be seen as a paradox for a real economy. The model is only feasible if the possibility of bankruptcy is not taken into account. Notwithstanding, taking into account corporate taxes, a high leveraged firm pays less tax on its income compared to a low leveraged firm, because of the interest being tax-deductible, while the dividends to the shareholders not. Particularly, the debt interest can be offset against pre-tax profits before the calculation of the corporation tax bill, thus reducing the tax paid. Moreover, the costs

of issuing debts, which includes interests, transaction costs, all the fees, are generally less than issuing shares. (Arnold 2007, 391.) The criticism of the theory stimulated Modigliani and Miller to modify their theory. Thus, in 1963 they developed their initial model which took into account corporate profit taxes (Modigliani & Miller). In the new M&M model, it is asserted that a firm that uses a financial leverage is higher rated in the market, since paying interest on borrowed capital is an expense that involves tax benefits. Considering the tax benefits, the cost of borrowed capital is lower, and a higher share of borrowed capital in the total capital of the firm diminish the weighted average cost of capital. Thus, taking into account the profit tax, the financial leverage has a decreasing effect on the cost of the firm's capital and the increasing influence on the firm's value.

Hence, the introduction of the tax model in the M&M model changes the investor's behaviour. The paradox is that in a perfect market when paying taxes on profits and developing a tax shield, the price of the firm is maximized at 100% borrowed capital. Therefore, if taxes were the only one ground that capital structure influences cash flow, the company would simply finance all the assets with 100% borrowed capital in order to generate tax deduction that is sufficient to eliminate its tax liability. Theoretically, it is impossible. And the reason for that is explained in the concept of financial distress costs, which M&M theory does not cover. (Brearly et al., 421.)

2.5.2 Trade-off theory

When the firm’s debt obligations exceed its ability to generate enough cash for repayments, the concept of financial distress costs emerges. Financial distress costs imply significant costs to the firm when it is not able to meet its own debt obligations. The costs of financial distress depend on the probability of the bankruptcy and the amount of costs associated with this process. With small loans, the probability of bankruptcy is low, and its costs are low as well. Advantages in taxation lead to an increase of debt share in the company's capital value. Albeit, with the high financial leverage, the probability of bankruptcy increases, and tax

advantages may not cover the growing financial distress costs. (Kraus & Litzenberger 1973.)

For that reason, the optimal structure of capital for a trade-off theory is defined by the balance determination between benefits from the tax shield and losses from a possible bankruptcy. Evidently, the benefits curve of the tax shield reaches a maximum point at a certain proportion of debt and with further increases in leverage starts declining. Therefore, the trade-off theory of capital structure states that companies can establish an optimal capital structure if the net tax advantage of debt financing compensates costs related to leverage, holding firm's assets and investment decisions constant. There is a maximum point where the marginal benefit of further increases in debt declines as debt increases, whereas the marginal cost increases. (ibid.)

Miller declares that higher leveraged firms enjoy more benefits because the costs associated with financial distress are not material (1977). Myers believes that all the companies implementing the trade-off theory strive to achieve the designated target debt-to-value ratio, which is considered to be the optimum balance. However, company's managers tend to opt for debt sources of finance if they believe that the company is underestimated in the market (1984). Atman reviewed the theory and concluded that companies, which issue additional equity, signals bad news since it is a sign of moving away from their optimum balance of finance (1984). Leary and Roberts (2005) claim that companies react to equity issuances and equity price drops by reconsidering actual leverage towards target leverage in two to four years. Additionally, they declare that persistent effects of shocks on leverage are due to optimizing strategies as opposed to indifference regarding their capital structure.

Ebaid argues that debt financing reduces agency costs because the company's image and the managers' wages are at stake. Nevertheless, higher leverage also implies that the company has higher commitment to comply its obligation payments. (2009.)

Furthermore, the trade-off theory denotes that the more profitable the company is, the lower the risks of financial distress. Consequently, those companies tend to employ a higher proportion of debt in their capital structure. (Myers 1984.)

2.5.3 Pecking order theory

Contrary to the trade-off theory, pecking order theory suggest not an optimal capital structure, but a hierarchy of financing sources. The theory considers the information asymmetry in the company which induces additional costs. Besides, transactional costs are also reckoned in this theory. These costs result in higher costs of external funds over internal ones. The ownership and management of the company being two separate units naturally lead to the information asymmetry. The pecking order theory thus documents that firms should follow a financing hierarchy in order to minimize information asymmetry between parties. The initial assumption is that companies prioritize their sources of financing, from internal financing to equity financing. Donaldson (1961) the first proposed that internally generated funds were preferred to external financing. His proposal was later developed by Myers (1984) who proposed a hierarchic preference order where the first resort of firms seeking capital is internal funds (retained earnings), followed by external funds where debt is preferred over equity. Retained earnings are uninfluenced by the problem of information. Furthermore, since companies pay interest and principal of debt, there is no significant impact of information asymmetry.

Thus, the pecking order theory suggests that internal funds are used primarily and only when all internal finances have been depleted, companies shift to debt financing. When it is not rational to issue any more debt, companies will ultimately turn to equity as a final financing resource. The theory demonstrates that companies with higher operating profit employ less debt finance when compared to the companies less profitable. (Myers & Majluf 1984.)

There is, however, empirical evidence that contradicts the theory. Thus, academics, implementing empirical research, illustrate firms that issue equity before they issue

debt, advocating a reversed order regarding to external funding (Helwege et al. 1996, Hogan 2005, Ni Yu, 2008).

2.5.4 Agency theory

Based on the work of Fama and Miller (1972) and Modigliani and Miller's theory (1958), Jensen and Meckling (1976) developed a theory focusing on agency costs. The authors assert that agency costs are the results of a conflict of interest between equity owners of the company and its managers and a conflict of interest between debt-holders and shareholders. If the proportion of debt and equity is not optimal, the conflict of interests of firm's management and its owners, or agent conflict, is aggravated. It can be manifested in the transformation of management motivation, the formation of an egoistic style of investment decisions, leading to the implementation of inefficient projects, as well as particularly risky projects. Finally, a too high share of borrowed capital cannot go unnoticed by its counterparties in business - customers and suppliers, belonging to the category of stakeholders of the company. The rational behaviour of such counterparties will lead them to search for other options, and this, in turn, will serve as an impetus to the deterioration of relationships, contract terms, the curtailment of volumes, the drop in revenues, and the reduction of cash flows. Agency theory proposes that managers prefer issuing debt to shares and bonds to spend future cash flows. With debt issuing, they are obliged to pay the principal and the interest on it. It is investigated, that debt reduces agency costs related to the cash flow by way of lessening the cash flow that have to be available for spending based upon decision of the managers. It serves as a control mechanism to discipline managers and limits the expropriation of private benefits. (ibid.)

The agency theory argues that the firms with more profitable assets use a bigger proportion of their earning for debt payments thus it positively affects their credit rating and the company can raise its debt capacity. Similarly, more profitable companies as compared to their investment can also get debt advantages and mitigate free cash flow issue. (Jensen, 1986.) Therefore, agency theory suggests a

positive relation between the profitability of the firm and its leverage. Furthermore, this theory proves that costs associated with debt are lesser for firms those having more tangible assets which demonstrate a positive relationship between asset's tangibility and leverage of firm. (ibid.)

2.6 The financial crisis and capital structure

The global financial crisis of 2008 is also known as the US Subprime Mortgage Crisis as well as the liquidity crisis. It was one of the worst financial crises during the past eight decades, i.e., after the great depression of the 1930s (Aubuchon & Wheelock 2009). It is known as a subprime mortgage because it has happened as a result of increasing numbers of loans to the people and companies with a higher probability of default due to lower interest rate (Goodhart, 2008).

According to Singh, the seed of 2008 financial crisis were sown during a short-lived recession that the US experienced at the beginning of 21th century. The surplus of savings generated in early 2000s in a part of the world economy were absorbed by deficits in the developed nations (Pol, 2009. 5). In order to stimulate the liquidity in the economy, Federal Reserve lowered the Federal Funds 11 times, thus giving a possibility for subprime borrowers to receive easy money in the form of subprime mortgages. For a more significant stimulus, in October 2004, the Securities Exchange Commission (SEC) relaxed the net capital requirement for five investment banks - Goldman Sachs, Merrill Lynch, Lehman Brothers, Bear Stearns and Morgan Stanley. It resulted in an increase in their leverage ratio by 30-40-times from their initial investment (Singh, n.d.a). It led to an increased use of the secondary mortgage market and subsequently to a higher number of sub-prime loans. Instead of holding the originated mortgages on their books, lenders were able to simply sell off the mortgages in the secondary market and collect the originating fees. (Petroff.)

In 2004, U.S. homeownership reached a maximum point of 70%. Immediately after, the Fed started raising rates so much that, most of the borrowers were not able to pay back the money to their lenders (Singh, n.d.a). Consequently, the banks faced with a liquidity problem. Therefore, a substantial number of the banks which

depended on the support of the central banks and third parties filed for bankruptcy or took over. This correspondingly, outspread to the other companies and finally appeared as a global crisis (Berg, and Kirschenmann, 2010).

Mathiason and Stewart described 2008 as “the year when the neo-liberal economic orthodoxy that ran the world for 30 years suffered a heart attack of epic proportions. Not since 1929 has the financial community witnessed 12 months like it. Lehman Brothers went bankrupt. Merrill Lynch, AIG, Freddie Mac, Fannie Mae, HBOS, Royal Bank of Scotland, Bradford & Bingley, Fortis, Hypo and Alliance & Leicester all came within a whisker of doing so and had to be rescued. Western leaders, who for years boasted about the self-evident benefits of light-touch regulation, had to sink trillions of dollars to prevent the world bank system collapsing.” (2008). The uncertainty in the financial markets and the unexpected bankruptcy of large companies made ambiguity in the credit quality of companies by the investors and less willingness of the investors to invest, which in its turn led to the credit tightening by the banks (Fosberg, 2012).

The Lehman Brothers collapse was one of the historical events that roiled the world’s financial system significantly. Many refer financial crisis to Lehman Brothers failure, the reason was that was the importance of the firm on the global arena and the extent of the collapse that spread far beyond U.S. borders. Larry McDonald, a former Lehman Brothers vice-president, distinguishes one factor above many others that played a substantial role in a Lehman Brothers failure. He recalls to the past with the following thoughts: “If only they - Dick Fuld and his president, Joe Gregory - had listened to the irredeemable logic of three of the cleverest financial brains on Wall Street – those of Mike Gelband, our global head of fixed income, Alex Kirk, global head of distressed trading research and sales, and Larry McCarthy, head of distressed bond trading. Each laid it out, from way back in 2005, that the real estate market was living on borrowed time and that Lehman Brothers was headed directly for the biggest subprime iceberg ever seen, […].” (Independent.co.uk 2009).

According to report by Supreme Audit Institutions (2010, 15), the development of the crisis in Europe became noticeable in mid-September 2008, when bank survival became doubtful, equity market plunged, export volume dropped by close to 15 per cent over the two following quarters, and limited access to capital became evident. The subprime crisis spread to the European Union due to a combination of: direct exposure to subprime assets, the gradual loss of confidence in a number of asset classes and the drying-up of wholesale financial markets. In this process, it came to expose 'home-grown' financial imbalances in, among other advanced economies, the European Union. These financial imbalances could be indicated with an overreliance on wholesale funding sources by the banking system and asset bubbles in residual property markets (Merrouche & Nier 2010).

There exist many studies concerning where the crisis takes its roots and what actually engendered the problem. Thus, Steve Denning regards as true the fact that the real problem was in an urge for quick money. "Many actors obviously played a role in this story. Some of the actors were in the public sector and some of them were in the private sector. But the public-sector agencies were acting at behest of the private sector. It is not as though Congress woke up one morning and thought to itself, "Let's abolish the Glass-Steagall Act!" Or the SEC spontaneously happened to have the bright idea of relaxing capital requirements on the investment banks. Or the Office of the Comptroller of the Currency of its own accord abruptly had the idea of pre-empting state laws protecting borrowers. These agencies of government were being strenuously lobbied to do the very things that would benefit the financial sector and their managers and traders. And behind it all, was the drive for short-term profits." (Denning 2011.)

With its tremendous impact on economies of countries across the whole world, it is hardly surprising when the global economic crisis of 2008 arises to have influenced the capital structure of companies, as Fosberg has ascertained in the case of companies in the US (2012). The effect of the financial crisis was to heavily disrupt the financial markets, diminish the amount of debt and equity capital financing available to businesses and to induce a severe recession in the U. S. and other

countries (Mizen 2008). The crisis stimulated a decline in the amount of finance other companies could obtain. In his work, Fosberg proves that companies have increased debt financing due to the crisis (2012).

2.7 Hypotheses development

Black & Champion describe hypothesis as conjectural explanation about a specific phenomenon the soundness of which is not proved (1976, 126). For a hypothesis to be a scientific hypothesis, the scientific method requires that one can test it. Hypotheses are generally derived from previous observations which cannot be sufficiently justified by the existing scientific theories. (Hilborn & Mangel 1997.) Grinnell (1988, 200) states that testing a hypothesis can only bring two types of results: either be proved or rejected by the authentic data. Hence, this study aims to provide credible data for the hypotheses testing. Hypothesis is formed with the purpose to create essence for the research to enhance research objectivity (Kumar 2011, 83).

This study comprises eight hypotheses investigated in total whereof the hypotheses are rejected or accepted due to the analysis that comes out from the descriptive and inferential statistics. The hypotheses are investigated through observing and comparing separately performed analysis for three sub-periods.

Based on the review of diverse literature the following hypotheses have been formed over three sub-periods, that is pre-crisis, during crisis and post-crisis:

H_1: The nature risk faced by the firm affects its capital structure;

H_2: Systematic risk of a firm is affected by its capital structure;

H_3: Unsystematic risk of a firm is affected by its capital structure;

H_4: Total risk of a firm is affected by its capital structure;

H_5: Cost of capital of a firm is affected by its capital structure;

H_6: Cost of capital of a firm is affected by its nature of risk;

H_7: Return on equity of a firm is affected by its capital structure;

H_8: Return on equity of a firm is affected by its nature of risk.

3 Methodology

Sunders and colleagues define methodology as a theory used for the implementation of the research, incorporating the theoretical and philosophical assumptions upon which the research is founded (2009, 595). This chapter aims to explain the steps taken and choices made along the process of implementing this study. By providing insight into the author's considerations and choices, the reader can better understand them and form a critical standpoint. The methodology is based on past empirical research and evidence with the purpose of engendering a trustworthy analysis as well as reliable results.

3.1 Research approach

Foremost, for a research paper it is crucial to define the philosophy that the author follows. Saunders and others define interpretivism, positivism, pragmatism and realism as the main philosophies that correspond to the research objectives (2009, 598). The philosophy of positivism was applied in this study, since this was considered to be the most appropriate in terms of analysis of the observable reality and generalization of the results that could be replicated in exactly the same circumstances at any other time (ibid., 598).

The initial purpose of this study was to determine whether the capital structure of the Nordic countries had changed after the financial crisis and whether it had affected the risks and returns of the companies. In order to conduct a study, an appropriate research approach has to be chosen. This study followed the descriptive and explanatory research approaches. Saunders and colleagues categorize research purposes into three categories - explanatory, exploratory, and descriptive. An

explanatory study is used when it is of vital importance to define and characterize the relationship between variables (Saunders et al. 2009, 139-140). Robson defines a descriptive study as a study that attempts to depict an accurate profile of events and situations (2002, 95).

Furthermore, a deductive approach was applied in this study as this approach is commonly used in combination with quantitative data for testing objective theories by exploring the relationship among variables (ibid., 124-125), upon which this study was solely based. These variables can be measured by way of analysing numerical data with statistical procedures (Creswell 2013, 4). The study covered the period from 2005 till 2017, which made this study a longitudinal study, which is commonly used to determine patterns within a certain period of time (Kumar 2014, 136-138).

There exist three kinds of research: quantitative, qualitative and mixed-method research. With the assistance of statistical analysis, this study examined the relationship between different variables which, in turn, produced numerical data. These characteristics are intrinsic to the quantitative research (Creswell 2013, 32).

3.2 Methods of data collection

In order to answer the research questions, secondary data was researched in this work. Secondary data is data which has been collected before for studies other than the one being implemented. Secondary data is employed with the purpose of engendering primary data (Saunders, Lewis & Thornhill 2009, 600). The data used in the present study was distinguished as panel data, which is a set of multi-dimensional data comprising measurements through time. Panel data includes observations of multiple phenomena acquired over multiple time periods from the same firms.

The financial information of the companies was drawn from secondary sources: stock market databases and the companies' annual reports. The database Nasdaq OMX Nordic was accessed with the purpose of retrieving information concerning the companies' stock prices. This web-site comprises the historical prices of the

companies' shares across all Nordic countries. The Nasdaq database and companies' financial statements are the official numerical corporate data. Therefore, the financial data was considered reliable and precise. A total sample of 30 companies was investigated. Banks and financial institutions were excluded from the research because the regulations for these firms regarding leverage are different (Alves & Francisco 2014). The time frame used for the research was from the 3rd Jan. 2005 to the 10th Nov. 2017. The sub-periods "pre-crisis", " in-crisis" and "post-crisis" were defined for the research. The retrieved stock prices of the companies were used for further calculation of the stocks' returns. The calculations were implemented for each year individually as well as for the sub-periods. The formula for the calculation of the stock's return was the following:

$$Stock\ return = \frac{Closing\ price\ _{current\ day} - Closing\ price\ _{previous\ day}}{Closing\ price_{previous\ day}}$$

The outcome of the calculations was used in further calculations of the firms and their average annual returns, systematic risks and the firms' beta and unsystematic risks (to be explained in 3.5).

Risk-free rate of return was retrieved from Investing.com website. Government bonds were acknowledged to serve as a risk-free rate of return. Therefore, the rate of the government bonds of the country in which the company operated were drawn on the yearly basis in this work.

Beta (described in sub-chapter 2.3.3) was calculated in the following way: the returns of a particular security, and the market return served as the base data for the regression analysis in Microsoft Excel (the function "SLOPE"). Beta was used for the further calculations of systematic risk (to be explained in 3.5).

Cost of equity was calculated with the help of the CAPM model (described in sub-chapter 2.3.4). In order to calculate cost of equity, the aforementioned "risk-free rate" was used. In addition, beta and average market return were calculated in advance.

WACC (described in sub-chapter 2.3.5) calculation required the numbers of total equity, total debt, calculated in advance cost of equity, cost of debt and the effective tax rate. The next sub-chapter provides the reader with more accurate information regarding the variables and their calculations.

3.3 Definition of key variables

The measurement, operationalization and source of the variables are listed below in Table 1.

Table 1. Definition of key variables

Variable's name	*Variable*	*Measurement and Operationalization*	*Source*
LnTE	Total equity	Natural logarithm of total equity	Annual report
LnTD	Total debt	Natural logarithm of total debt	Annual report
LnTA	Total assets	Natural logarithm of total assets.	Annual report
LnTS	Total sales	Natural logarithm of total sales. Depicts the size of a company as one of the determinant of capital structure.	Annual report
LnRD	R&D expenditure	Natural logarithm of R&D expenditure. Depicts the growth opportunities of a company as one of the determinant of capital structure.	Annual report
LnEBIT	Earnings Before Interest and Taxes	Natural log of operating profit.	Annual report
R_f	Risk free rate	Government bond rate	www.investing.com
FirmRet	Firm's Return	Firm's return is a standardized value and it reflects change in the market value of the index over two-time periods.	Annual report
MarkRet	Market return	Market return is a standardized value and it reflects change in the market value of the index over two-time periods.	Nasdaq
β_i	Equity beta	Measure of systematic risk is obtained by regressing the firm's stock return on the market stock return.	Nasdaq
σ_m	Market SD	Standard deviation of annual market's stock returns	Nasdaq
UnsystRisk	Unsystematic risk	Measure of unsystematic risk is obtained by regressing the firm's stock return. This measure reflects the Earning Volatility of company – one of the determinants of capital structure.	Nasdaq
SystematicRisk	Systematic risk	$\beta_i * \sigma_m$	Nasdaq
TotalRisk	Total risk	Unsystematic risk + systematic risk	Nasdaq
R_e	Cost of equity	$R_e = R_f + \beta_i(R_m - R_f)$	Annual report
R_d	Cost of debt	Financial costs/total debt	Annual report

FirmReturn/R_e	Total Firm's Return-to-equity cost	Firm's return/cost of equity	Nasdaq, annual report
ETR	Effective corporate tax rate	Total corporate tax paid/profit before taxes. Reflects corporate tax as one of the determinants of capital structure.	Annual report
ROE	Return on equity	Net operating profit/total equity.	Annual report
ROA	Return on assets	Net operating profit/total assets. Reflects profitability of the company – one of the determinant of capital structure.	Annual report
FirmReturn/TotalRisk	Total firm's return-to-risk ratio	Firm's return/total risk	Nasdaq, annual report
TangibleAssets/ TotalAssets	Tangibility ratio	Value of tangible assets/total assets. The ratio reflects the tangibility of the company – one of the determinants of capital structure.	Annual report
D/E	Debt-to-equity ratio	Total debt/total equity.	Annual report
WACC	Weighted average cost of capital	$WACC = \frac{E}{E+D}K_e + \frac{D}{E+D}K_d(1-t)$	Nasdaq, annual report
Industrials	Industry dummy variable: Industrial	= 1 if the firm belongs to Industrial; = 0 otherwise. Industry classification is one of the determinants of capital structure.	Nasdaq
HealthCare	Industry dummy variable: Health care	= 1 if the firm belongs to Health care; = 0 otherwise.	Nasdaq
RealEstate	Industry dummy variable: Real estate	= 1 if the firm belongs to Real estate; = 0 otherwise.	Nasdaq
Consumer Goods	Industry dummy variable: Consumer goods	= 1 if the firm belongs to Consumer goods; = 0 otherwise.	Nasdaq
Technology	Industry dummy variable: Technology	= 1 if the firm belongs to Technology; = 0 otherwise.	Nasdaq
ConsumerServices	Industry dummy variable: Consumer services	= 1 if the firm belongs to Consumer services; = 0 otherwise.	Nasdaq
BasicMaterial	Industry dummy variable: Basic material	= 1 if the firm belongs to Basic material; = 0 otherwise.	Nasdaq
Telecommunication	Industry dummy variable: Telecommunication	= 1 if the firm belongs to Telecommunication; = 0 otherwise.	Nasdaq
Utilities	Industry dummy variable: Utilities	= 1 if the firm belongs to Utilities; = 0 otherwise.	Nasdaq

Note: Natural log values have been taken to analyse several absolute value based variables in order to avoid linearity.

3.4 Methods of data analysis

This study paper encompasses several types of analysis. Foremost, the graphical interpretation is decomposed. The interpretation provides with the analysis of overall trends of risk variables, including systematic, unsystematic and total risk variables, across the sample companies within the timeframe from 2005 to 2017. The analysis also comprises the firm's return over the same time period. The graphical analysis facilitates more comprehensive understanding of the tendencies among the main variables of the research and enables to answer the research questions.

The analysis of the data was implemented with the help of SPSS analysis. Once the dependent and independent variables were assigned, the descriptive and inferential analysis was performed. The descriptive statistics table provides the researcher with factual overview of the dataset. Descriptive analysis is represented in the "Descriptive statistics" tables, which signify the information regarding the number of observations, maximum number, minimum number, mean and standard deviation of the examined variables. Maximum and minimum indexes show the extreme values of the variables among all the events. Mean value is the value indicating the arithmetic average, which is calculated by way of the total sum of values divided by the count. (William 1950, 221.) Standard deviation accounts for the average variation or dispersion from the mean of a set of data values (Bland & Altman 1996).

Further to descriptive analysis, inferential analysis is presented in this study. Inferential analysis comprises the correlation and regression analysis. The relationship between two variables can be estimated with a more intuitive measurement which is called correlation coefficient. There are many options to measure the correlation coefficient, but one of the most used is the Pearson's product-moment coefficient. This measure estimates the extent of a linear association between two variables. The coefficients vary from -1 to +1 describing how strong the linear relationship in this range. A value of -1 distinguish total negative linear correlation, 0 is no linear correlation, and +1 is total positive linear correlation. It is widely utilised in the empirical research. (Pearson 1895.) The analyse was performed using SPSS platform; the collected variables data was

inserted in SPSS and analysed with the help of “Bivariate analysis” function. The outcome comprised values of Person correlation and significance level. The last value shows the probability that the relationship between the independent variable and the dependent variable has occurred by chance. (Saunders et al. 2009, 463.)

Regression analysis of this work is represented in the multivariate ordinary least (hereafter, OLS) square estimation model. This model characterises and estimates the interrelation between one dependent and number of independent variables. The model is acknowledged as very practical for empirical studies similar to this sudy due to the possibility to include various independent variables and result in more flexible results. The multivariate OLS model enables the researcher to distinguish between effects of the specific independent variables. Thus, the variables adjust for each other’s effects and eliminate unappreciated variables apparent effects. (Dougherty 2011, 152-155.) The multiple OLS regression model for panel data employed in this work is based on the theory of Brooks (2008, 137):

$$y_{it} = a + \sum_{i=1}^{n}\sum_{t=1}^{k} x_{it} + \sum_{i=1}^{n}\sum_{j=1}^{m} Z_{ij} + u_{it}$$

Where:

y_{it} = dependent variable of firm i in the time period t;

a = intercept term;

x_{it} = independent variable including explanatory and control variables of firm i in the time period t;

Z_{it}= industry-fixed effect of firm i in the time period t;

j = Number of industry category;

k = number of classifications of time period;

m = number of industry classification;

$n =$ number of firm;

u = Disturbance Term.

The multivariate OLS regression technique is utilised to measure the following functional relationships of the models:

$$\frac{D}{E_{it}} = \alpha_{it} + \beta_1(LnTE)_{it} + \beta_2(LnTD)_{it} + \beta_3(LnTA)_{it} + \beta_4(LnTS)_{it} + \beta_5(LnRD)_{it} + \beta_6(LnEBIT)_{it} + \beta_7(FirmReturn)_{it} + \beta_8(\sigma_m)_{it} + \beta_9(UnsystematicRisk)_{it} + \beta_{10}(SystematicRisk)_{it} + \beta_{11}(TotalRisk)_{it} + \beta_{12}(R_e)_{it} + \beta_{13}(R_d)_{it} + \beta_{14}\left(\frac{FirmReturn}{R_e}\right)_{it} + \beta_{15}(ETR)_{it} + \beta_{16}(ROE)_{it} + \beta_{17}(ROA)_{it} + \beta_{18}\left(\frac{FirmReturn}{TotalRisk}\right)_{it} + \beta_{19}\left(\frac{TangibleAssets}{TotalAssets}\right)_{it} + \beta_{21}(WACC)_{it} + \sum_{i=1}^{n}\sum_{j=1}^{m} Z_{ij} + u_{it}$$

$$SysRisk_{it} = \alpha_{it} + \beta_1(LnTE)_{it} + \beta_2(LnTD)_{it} + \beta_3(LnTA)_{it} + \beta_4(LnTS)_{it} + \beta_5(LnRD)_{it} + \beta_6(LnEBIT)_{it} + \beta_7(FirmReturn)_{it} + \beta_8(\sigma_m)_{it} + \beta_9(UnsystematicRisk)_{it} + \beta_{10}(D/E)_{it} + \beta_{11}(TotalRisk)_{it} + \beta_{12}(R_e)_{it} + \beta_{13}(R_d)_{it} + \beta_{14}\left(\frac{FirmReturn}{R_e}\right)_{it} + \beta_{15}(ETR)_{it} + \beta_{16}(ROE)_{it} + \beta_{17}(ROA)_{it} + \beta_{18}\left(\frac{FirmReturn}{TotalRisk}\right)_{it} + \beta_{19}\left(\frac{TangibleAssets}{TotalAssets}\right)_{it} + \beta_{20}(WACC)_{it} + \sum_{i=1}^{n}\sum_{j=1}^{m} Z_{ij} + u_{it}$$

$$UnsysRisk_{it} = \alpha_{it} + \beta_1(LnTE)_{it} + \beta_2(LnTD)_{it} + \beta_3(LnTA)_{it} + \beta_4(LnTS)_{it} + \beta_5(LnRD)_{it} + \beta_6(LnEBIT)_{it} + \beta_7(FirmReturn)_{it} + \beta_8(\sigma_m)_{it} + \beta_9(SystematicRisk)_{it} + \beta_{10}(D/E)_{it} + \beta_{11}(TotalRisk)_{it} + \beta_{12}(R_e)_{it} + \beta_{13}(R_d)_{it} + \beta_{14}\left(\frac{FirmReturn}{R_e}\right)_{it} + \beta_{15}(ETR)_{it} + \beta_{16}(ROE)_{it} + \beta_{17}(ROA)_{it} + \beta_{18}\left(\frac{FirmReturn}{TotalRisk}\right)_{it} + \beta_{19}\left(\frac{TangibleAssets}{TotalAssets}\right)_{it} + \beta_{20}(WACC)_{it} + \sum_{i=1}^{n}\sum_{j=1}^{m} Z_{ij} + u_{it}$$

$$TotRisk_{it} = \alpha_{it} + \beta_1(LnTE)_{it} + \beta_2(LnTD)_{it} + \beta_3(LnTA)_{it} + \beta_4(LnTS)_{it} + \beta_5(LnRD)_{it} + \beta_6(LnEBIT)_{it} + \beta_7(FirmReturn)_{it} + \beta_8(\sigma_m)_{it} + \beta_9(D/E)_{it} + \beta_{11}(R_e)_{it} + \beta_{12}(R_d)_{it} + \beta_{13}\left(\frac{FirmReturn}{R_e}\right)_{it} + \beta_{14}(ETR)_{it} + \beta_{15}(ROE)_{it} + \beta_{16}(ROA)_{it} + \beta_{17}\left(\frac{FirmReturn}{TotalRisk}\right)_{it} + \beta_{18}\left(\frac{TotalSales}{TotalAssets}\right)_{it} + \beta_{19}\left(\frac{TangibleAssets}{TotalAssets}\right)_{it} + \beta_{20}(WACC)_{it} + \sum_{i=1}^{n}\sum_{j=1}^{m} Z_{ij} + u_{it}$$

$$WACC_{it} = \alpha_{it} + \beta_1(LnTA)_{it} + \beta_2(LnTS)_{it} + \beta_3(LnRD)_{it} + \beta_4(LnEBIT)_{it} + \beta_5(FirmReturn)_{it} + \beta_6(\sigma_m)_{it} + \beta_7(UnsystematicRisk)_{it} + \beta_8(D/E)_{it} + \beta_9(TotalRisk)_{it} + \beta_{10}(SystematicRisk)_{it} + \beta_{11}\left(\frac{FirmReturn}{R_e}\right)_{it} + \beta_{12}(ETR)_{it} + \beta_{13}(ROE)_{it} + \beta_{14}(ROA)_{it} + \beta_{15}\left(\frac{FirmReturn}{TotalRisk}\right)_{it} + \beta_{17}\left(\frac{TangibleAssets}{TotalAssets}\right)_{it} + \sum_{i=1}^{n}\sum_{j=1}^{m} Z_{ij} + u_{it}$$

$$ROE_{it} = \alpha_{it} + \beta_1(LnTD)_{it} + \beta_2(LnTA)_{it} + \beta_3(LnTS)_{it} + \beta_4(LnRD)_{it} + \beta_5(LnEBIT)_{it} + \beta_6(FirmReturn)_{it} + \beta_7(\sigma_m)_{it} + \beta_8(SystematicRisk)_{it} + \beta_9(UnsystematicRisk)_{it} + \beta_{10}(D/E)_{it} + \beta_{11}(TotalRisk)_{it} + \beta_{12}(R_e)_{it} + \beta_{13}(R_d)_{it} + \beta_{14}\left(\frac{FirmReturn}{R_e}\right)_{it} + \beta_{15}(ETR)_{it} + \beta_{16}(ROA)_{it} + \beta_{17}\left(\frac{FirmReturn}{TotalRisk}\right)_{it} + \beta_{18}\left(\frac{TangibleAssets}{TotalAssets}\right)_{it} + \beta_{19}(WACC)_{it} + \sum_{i=1}^{n}\sum_{j=1}^{m} Z_{ij} + u_{it}$$

The OLS regression equations are represented in the coefficient model. In this model, the unstandardized coefficient (Beta), t-test, and significance levels are examined. Unstandardized beta coefficient depicts the regression coefficient, which displays all variables' contributions to the model. Beta coefficient depicts the relative movements (both positive and negative) in dependent variable. If beta is represented by positive value, the relationship between dependent and independent variables is also positive. Whilst, the negative value highlights the negative relationship. The t-test value indicates

if any distinctions between means of two groups, which are statistically significant, can be determined. (Cohen, Manion, & Morrison 2007, 543.) The significance denotes the risk of being a type 1 error in the data when not rejecting the null hypothesis. For instance, a significance level of 1% means that all values that are extreme will appear with a probability of 1%. When implementing large financial data analysis, 5% of significance is commonly used, because standard errors, as a rule, decrease when using big data sets. In such works, it is recommended to set a 1% significance level. (Brooks 2008, 171.) In this study both 10%, 5% and 1% significance levels are shown in the results.

A primary assumption with the OLS model is the fact that the correlation between the residuals equals zero. If they aren't the data suffers from autocorrelation, also called serial correlation. Durbin-Watson test is used with the purpose to order autocorrelation. This test determines the relationship between errors of present and past values. Hence, when the Durbin-Watson test is close to 2 it implies the perfect positive autocorrelation. On the other hand, the value near 4 shows perfect negative autocorrelation. (Brooks 2008, 150.)

The OLS regression analysis, in addition, includes r-squared value which depicts how well the regression model fits. Higher values of r-squared indicates the better fit. Nonetheless, low r-squared values are also considered sufficient if the estimated coefficients are statistically significant. (Dougherty 2011, 514.)

3.5 Validity and reliability

Jonathan Wilson (2010, 308) defines validity as the degree of how well the test measures what it intends to measure. It demonstrates the credibility and trustworthiness of the study. The quantitative research requires external and internal validity. External validity is the degree to which the results of a study can be colligated to a wider population. Whereas internal validity implies the fulfilment of initially targeted study goals and collation of the input of each variable with a complete change in the model (Moskal & Leydens 2000).

This study work followed a list of strategies in order to ensure the validity. Foremost, the sample of the companies were carefully chosen in order to correspond to the research nature. The total of 30 chosen companies are from Finland, Sweden, Denmark and Ireland (see Figure 1). They represent various business fields facilitating the research to be consistent and resumptive and allowing the research to avoid the generalisation of the results to be restrained to a particular industry sector (see Figure 2).

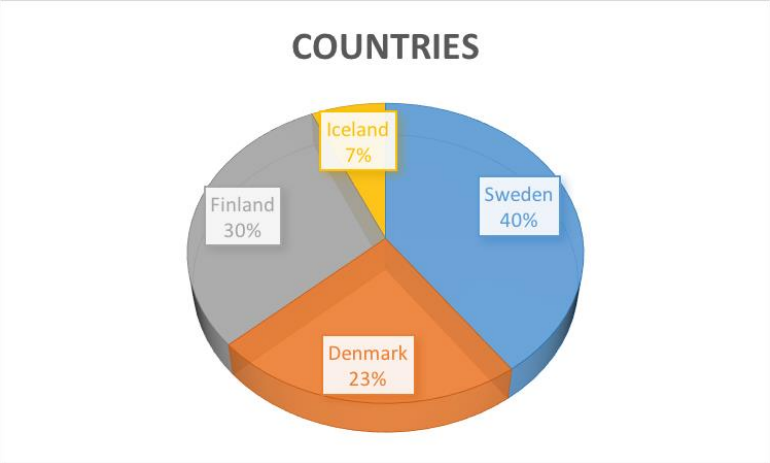

Figure 1. Countries of the sample companies

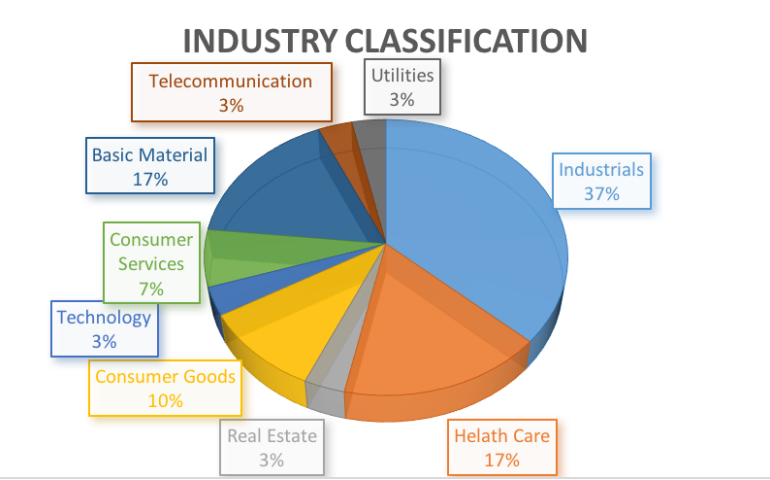

Figure 2. Industry classification of the sample companies

Furthermore, previous studies in the similar areas were considered with the purpose to ensure the external validity of the study and obviate ambiguous notation of variables.

In order to secure the internal validity and to avoid common statistical defects, the data sample was carefully selected in this study. The data was collected from the published annual reports, the Nasdaq database and Investing.com web-site, which are considered reliable sources. The hypotheses produced findings that were in line with the types of results expected. Hence, the validity of the research results is ensured.

Saunders and co-workers define reliability as the ability of the research to produce consistent results for the same data set. In other words, other researchers must be able to implement similar research comprising the same conditions and leading to the same results. (2009, 156.) The reliability of this study is justified by the fact that the methods utilised in this work have been also utilised by many researchers of the similar area. Moreover, the variables employed in this work can be replaced by another samples and lead to the corresponding outcomes. The data utilized as a part of the investigation were gathered from solid sources: the official sites of the sample organizations. A few information must be scaled by a typical measure so as to represent estimate impact that may have hampered the outcomes significantly. Moreover, the information accumulation strategies and the examination procedure utilized as a part of this exploration were clarified in reasonable detail in order to make it effectively justifiable for any reader. Hence, the research paper can be considered reliable.

4 Empirical findings

The following chapter presents the empirical findings of the study. The chapter is divided into descriptive statistics and regression results. These findings are the foundation upon which the analysis and conclusions were built. This chapter begins with the graphical analysis of the risk and return indicators across the sample companies over the whole research period. The descriptive and inferential analysis is categorised by the pre-crisis, during-crisis and the post-crisis sub-periods and the whole period.

4.1 Graphical analysis

Based on the secondary data, the following variables were calculated: company return, systematic risk, unsystematic risk and total risk for 30 companies in the Nasdaqnordic list for the period of 2005 - 2017. The graphical presentation of these variables was considered to be more clear and comprehensible by the author. Therefore, the thesis contains 30 visual graphs for each company individually indicating the company's risk and return during the researched period (see Appendices 1-30). These graphs were especially valuable for the determination of certain trends which might appear. Foremost, the first pattern observed by the author was an explicit leap in risk indicators during the crisis period of 2007 and 2008. Market and unsystematic risks increased dramatically which prompted the total risk to increase as well. Generally, the systematic and unsystematic risk followed the same pattern throughout the whole period. The peak of the total risk was in 2008 and varied on average from 3% to 6%. The highest index was 8.2% for the company BOLIDEN (see Appendix 15), whereas the total risk for the pre-crisis sub-period was only 0-3% with the highest index equal to 3.3% at BETSSON B in 2008 (see Appendix 13). The greatest figures for unsystematic and systematic risks were found for the BOLIDEN company (5.3% and 0.03% respectively). The peak accounted for the year 2008.

Contrary to risk, company returns tended to decrease during the crisis. Hence, a slight decline equal to 1-3% was observed in the years 2007-08. Company returns varied from -0.5% to 0% during this sub-period. Despite the distinct trend, the crisis benefited the ASTRAZENECA company (see Appendix 12), whose return climbed to 3.6% in 2008 from 2.5% in 2006. This contradicted the distinct tendency of companies' returns to decrease in an unstable economic environment.

The two subsequent years after the crisis could be characterized as a significant slip back in the risk indicators while the company return indexes had a modest rise. Afterwards, another soar of the risk indexes was observed among the sample companies. The peak of the second rise was distinctive for 2011, which was explained by the European debt crisis (Wearden & Garside 2012). The highest total risk index in 2011 was distinctive to

CARGOTEC (see Appendix 17), which equalled to 6%. The 2007-08 crisis had a more notable impact on the risks and returns of the company. BOLIDEN was once again the most susceptible to the risks. Hence, the systematic risk was 2.7% and unsystematic - 3% in 2011 (see Appendix 15).

In the majority of the companies, a fall in the 2014-2015 risk indicators could be noticed. This means that these years were the most stable in terms of the economic and financial environment. The ASTRAZENECA company (see Appendix 15) had the lowest figures of risks. Thus, the total risk was close to 0%, the systematic risk went slightly down to 0% and the unsystematic risk was also close to 0% in 2015 for ASTRAZENECA. During the whole post-crisis sub-period, there were fluctuations in the risk and return indexes. For some companies, an overall upward tendency of the risks indicators was observed (see Appendixes 3,5,13,25,27), whereas a downward trend was detected for a number of other companies (see Appendixes 1,2,7,14-17,28). All the other firms experienced slight risk movements, but the overall risk remained relatively constant. Furthermore, the firms' returns fluctuated gently, albeit, no significant movements could be detected.

4.2 Pre-crisis

4.2.1 Descriptive statistics analysis

The table 2 highlights the data set for pre-crisis period. The mean of the stock return was 1.4% and the mean of the total risk was 1.92% with the unsystematic risk constituting for 1.73% and systematic for 0.2%. Debt-to-equity ratio's mean was 148.93% implying that debt finance was prevailing over equity financing during the pre-crisis sub-period. The stable economic environment, thus, could be one of the urge for debt financing. In other words, when firms feel confident about market, they borrow more. The maximum percentage of debt financing over equity was 540% signifying that one company was able to borrow 5.4 Euro for every 1 Euro of equity. Mean index of the firm's return-to-total risk ratio was -24.5% for the pre-crisis period suggesting the that the higher the total risks, the less return for the company. Estimated cost of capital's mean was 2.59% which means that the investors of the company expected to receive 2.59%, whereas the

actual return on equity was 15.98%. The index is considered to be very positive, since it demonstrates that companies had outperformed significantly. In average, the cost of equity was higher for the pre-crisis sub-period (2.59%) when compared to cost of debt (0.1%). This explains debt finance dominance in the capital structure of the companies. The weighted average cost of capital was 3.93%, which depicts the percentage the company had to pay to finance its assets to all its security and debt holders.

Table 2. Descriptive statistics - Pre-crisis sub-period

	N	*Range*	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*	*Variance*
LnTE	60	6,11399	5,87914	11,99312	8,3388817	1,62304091	2,634
LnTD	60	8,42	4,60	13,02	8,5740	1,88889	3,568
LnTA	60	6,97	6,35	13,33	9,2015	1,71958	2,957
LnTS	60	7,16	5,31	12,47	8,9728	1,75971	3,097
LnRD	60	9,69	0,10	9,79	4,4099	2,46673	6,085
LnEBIT	60	10,45	0,10	10,55	6,3877	2,39282	5,726
FirmReturn	60	0,01	-0,01	0,00	0,0014	0,00149	0,000
MarketReturn	60	0,00	0,00	0,00	0,0008	0,00015	0,000
$\boldsymbol{\sigma_m}$	60	0,00	0,01	0,01	0,0089	0,00166	0,000
UnsystematicRisk	60	0,04	0,00	0,04	0,0173	0,00596	0,000
SytematicsRisk	60	0,02	-0,01	0,01	0,0020	0,00287	0,000
TotalRisk	60	0,05	0,00	0,05	0,0192	0,00770	0,000
$\boldsymbol{R_e}$	60	0,10	0,00	0,11	0,0259	0,02015	0,000
$\boldsymbol{R_d}$	60	2,12	-1,43	0,70	0,0010	0,20840	0,043
FirmReturn/ $\boldsymbol{R_e}$	60	0,94	-0,12	0,82	0,1137	0,16730	0,028
ETR	60	12,10	-6,03	6,08	0,2047	1,14263	1,306
ROE	60	0,54	-0,07	0,47	0,1598	0,11396	0,013
ROA	60	0,33	-0,02	0,31	0,0732	0,06652	0,004
FirmReturn/TotalRisk	60	44,44	-29,89	14,55	-0,2450	4,32169	18,677
TangibleAssetsRatio	60	0,80	0,00	0,80	0,2739	0,20974	0,044
D/E	60	5,19	0,21	5,40	1,4893	0,84351	0,712
WACC	60	2,02	-0,23	1,79	0,0393	0,23351	0,055
Industrial	60	1,00	0,00	1,00	0,4000	0,49403	0,244
HelathCare	60	1,00	0,00	1,00	0,1333	0,34280	0,118
RealEstate	60	1,00	0,00	1,00	0,0333	0,18102	0,033
ConsumerGoods	60	1,00	0,00	1,00	0,1000	0,30253	0,092
Technology	60	1,00	0,00	1,00	0,0333	0,18102	0,033
ConsumerServices	60	1,00	0,00	1,00	0,0667	0,25155	0,063
BasicMaterial	60	1,00	0,00	1,00	0,1667	0,37582	0,141
Telecommunication	60	1,00	0,00	1,00	0,0333	0,18102	0,033
Utilities	60	1,00	0,00	1,00	0,0333	0,18102	0,033
Valid N (listwise)	60						

Note: LnTE: Log of total equity, LnTD: log of total debt; LnTA: Log of total assets, LnTS: Log of total sales, LnRD: Log of research and development expenses, LnEBIT: Log of earnings before interest and taxes, FirmReturn: Firm's stock return, $\boldsymbol{\sigma_m}$: Market standard deviation, SysRisk: Systematic risk, UnsysRisk: Unsystematic risk, TotalRisk: Total risk, R_e: Cost of equity, R_d: Cost of debt, FirmReturn/R_e: Firm's return-to-cost of equity, ETR: Effective corporate tax rate, ROE: Return on equity, ROA: Return on assets, FirmReturn/TotalRisk: Firm's return-to-total risk, TangibleAssetsRatio: Tangibles assets-to-total assets, D/E: Debt-to-equity ratio, WACC: Weighted average cost of capital, Industrials: Industrials, HealthCare: Health care, RealEstate: Real Estate, ConsGoods: Consumer Goods, Technology: Technology, ConsServices: Consumer services, BasicMat: Basic material, Telecom: Telecommunication, Utilities: Utilities industry sector.

4.2.2 Correlation analysis

Table 3 demonstrates the pairwise correlation highlighting all the variables used in this work. The table comprises the list independent variables, including LnTE, LnTD, LnTA, LnR&D, LnEBIT, LnTS, R_f, R_e, R_d, Firm Return, Market Return, $\boldsymbol{\sigma_m}$, Firm Return/R_e, ETR, ROA, FirmReturn/TotalRisk, TangibleAssetsRatio; independent variables implying industry classifications (Z1-Z9) and dependent variables: D/E, SystematicRisk, UnsystematicRisk, TotalRisk, WACC and ROE (Y1-Y6). The correlations only with 0.01% and 0.05% significance levels were considered. The association between independent variables are explained below:

Total equity (LnTE) was strongly positively correlated with the following variables: total debt (LnTD), total assets (LnTA) and total sales (LnTS) (0,948, 0,984 and 0,882 respectively). The total amount of equity depended on the total debt, the total assets figures as well as the total sales index. Besides natural log of total equity, LnTD was also positively correlated with LnR&D, LnTS. The higher the total sales of the company or the research and development expenditures were, the higher amount of debt was utilised by firms. The correlation table also emphasises the linear association between LnTS and LnTA, LnTS and LnEBIT. Furthermore, there was an absolute negative correlation between market return and market standard deviation.

The results of correlation between dependent and independent variables are the following:

Debt-to-equity ratio was correlated with total debt, total assets, total sales of the company and effective corporate tax rate. With return on assets there was a negative correlation. The table also illustrates the correlation with industrial sector implying that companies from this industry had highly leveraged capital structure in the pre-crisis period. Systematic and unsystematic risk showed high correlations with relation to the total risk (0,724, 0,948). The reason for that is the fact that total risk constitutes for both of the risks. The correlation coefficients show that unsystematic risk was more significant for the total risk index. Besides, systematic risk had negative significant correlation, and therefore causal relationship, with risk-free rate, market return and

effective rate. Positive correlation with the systematic risk were found with firm's return, market standard deviation, firm's return-to-cost of equity ratio. Systematic risk and return on equity were also positively correlated with significance level of 0.01%. Unsystematic risk was found to be negatively correlated with total equity, total debt, total assets, EBIT and total sales of the company. The positive correlations were with cost of equity, firm's return-to-cost of equity, return on assets and technology and consumer services industries. Furthermore, the correlation matrix denotes that total risk was dependent on total debt, cost of equity, firm's return, market return, market standard deviation and return-to-cost of equity. Technology sector was found to suffer the most from total risk. Cost of capital was higher for companies with high cost of debt or technology companies. This could be explained in correlation between those variables. According to the table, company's EBIT, firm's return, return-to cost of equity ratio, tangible assets ratio (positively), risk-free rate, cost of equity, ETR (negatively) affected return on equity. Moreover, it could be concluded that industrials and consumer services companies has higher ROE ratio compared to basic material companies.

Table 3. Correlation - Pre-crisis sub-period. Part 1.

	X1	*X2*	*X3*	*X4*	*X5*	*X6*	*X7*	*X8*	*X9*	*X10*	*X11*	*X12*	*X13*	*X14*	*X15*	*X16*
X1	1	,948**	,984**	,376**	,689**	,882**	,377**	,320*	0,113	-0,005	-0,050	0,050	0,100	,343**	-0,139	-0,043
X2	,948**	1	,988**	,342**	,680**	,925**	,395**	,325*	0,191	0,032	-0,039	0,039	0,092	,389**	-,279*	-0,018
X3	,984**	,988**	1	,367**	,691**	,917**	,391**	,326*	0,142	0,012	-0,045	0,045	0,103	,380**	-0,217	-0,029
X4	,376**	,342**	,367**	1	,406**	,443**	,336**	,350**	0,080	0,086	-0,005	0,005	0,194	0,145	0,145	-0,089
X5	,689**	,680**	,691**	,406**	1	,728**	0,219	0,131	0,140	0,200	-0,065	0,065	,261*	0,180	0,239	-0,056
X6	,882**	,925**	,917**	,443**	,728**	1	,333**	0,230	0,212	0,025	-0,062	0,062	0,153	,311*	-0,143	-0,037
X7	,377**	,395**	,391**	,336**	0,219	,333**	1	,933**	0,094	-0,143	-,265*	,265*	-,391**	,372**	-,325*	0,080
X8	,320*	,325*	,326*	,350**	0,131	0,230	,933**	1	0,030	-,300*	-0,137	0,137	-,476**	,441**	-,363**	0,053
X9	0,113	0,191	0,142	0,080	0,140	0,212	0,094	0,030	1	0,040	-0,171	0,171	0,049	-,270*	-,310*	-0,002
X10	-0,005	0,032	0,012	0,086	0,200	0,025	-0,143	-,300*	0,040	1	-0,021	0,021	,697**	-0,148	,348**	-0,098
X11	-0,050	-0,039	-0,045	-0,005	-0,065	-0,062	-,265*	-0,137	-0,171	-0,021	1	-1,000**	0,067	0,031	-0,096	-0,175
X12	0,050	0,039	0,045	0,005	0,065	0,062	,265*	0,137	0,171	0,021	-1,000**	1	-0,067	-0,031	0,096	0,175
X13	0,100	0,092	0,103	0,194	,261*	0,153	-,391**	-,476**	0,049	,697**	0,067	-0,067	1	-0,119	,387**	-0,070
X14	,343**	,389**	,380**	0,145	0,180	,311*	,372**	,441**	-,270*	-0,148	0,031	-0,031	-0,119	1	-,355**	0,026
X15	-0,139	-,279*	-0,217	0,145	0,239	-0,143	-,325*	-,363**	-,310*	,348**	-0,096	0,096	,387**	-,355**	1	-0,096
X16	-0,043	-0,018	-0,029	-0,089	-0,056	-0,037	0,080	0,053	-0,002	-0,098	-0,175	0,175	-0,070	0,026	-0,096	1
X17	0,229	0,238	0,226	-,430**	-0,107	0,195	-0,028	-0,061	0,080	-0,114	0,044	-0,044	-0,084	0,051	-,329*	-0,010
Z1	0,254	,339**	,307*	0,180	,393**	,397**	0,034	-0,077	0,043	0,213	0,000	0,000	0,174	0,031	0,057	-0,075
Z2	0,003	-0,051	-0,024	0,232	-0,104	-0,087	,292*	,390**	0,038	-,257*	0,000	0,000	-0,208	0,254	-0,172	0,022
Z3	-0,001	0,005	-0,002	-,327*	0,059	-0,240	-0,133	-0,064	0,018	0,156	0,000	0,000	0,029	0,004	0,049	0,011
Z4	-0,075	-0,009	-0,042	0,060	0,004	0,011	-0,073	-0,071	0,011	-0,107	0,000	0,000	-0,134	-0,035	-0,138	0,019
Z5	-,257*	-,314*	-,292*	0,040	-0,098	-0,216	-0,133	-0,153	,314*	,273*	0,000	0,000	,280*	-,504**	,296*	0,011
Z6	-0,217	-,301*	-0,252	-0,063	-0,105	-0,157	-0,192	-0,169	-,453**	-0,158	0,000	0,000	-0,134	-0,016	,359**	0,015
Z7	0,023	0,027	0,017	-0,164	-,332**	-0,006	-0,048	-0,022	0,031	-0,039	0,000	0,000	0,088	0,005	-0,209	0,031
Z8	-0,133	-0,185	-0,167	-0,188	-0,075	-0,182	0,055	0,025	0,018	-0,015	0,000	0,000	-0,075	-0,001	0,016	0,011
Z9	0,072	0,043	0,052	-0,127	0,067	-0,068	0,055	0,062	0,006	-0,031	0,000	0,000	-0,089	0,005	-0,025	0,011
Y1	0,157	,427**	,324*	0,088	0,177	,395**	0,124	0,078	0,127	0,100	0,017	-0,017	0,157	,290*	-,405**	0,057
Y2	0,072	0,080	0,081	-0,021	0,185	0,202	-,304*	-,600**	0,151	,473**	-,271*	,271*	,543**	-,278*	,305*	0,040
Y3	-,306*	-,391**	-,348**	-0,242	-,272*	-,344**	-0,169	-,274*	-0,180	0,189	-0,220	0,220	,323*	-0,202	,312*	0,167
Y4	-0,210	-,273*	-0,239	-0,195	-0,142	-0,191	-0,244	-,435**	-0,083	,322*	-,271*	,271*	,452**	-,260*	,355**	0,145
Y5	-0,157	-0,178	-0,176	0,026	-0,041	-0,116	-0,069	-0,124	,554**	0,069	-0,134	0,134	0,102	-,759**	0,187	0,008
Y6	-0,104	-0,137	-0,123	0,208	,400**	0,006	-,315*	-,372**	-0,149	,420**	-0,136	0,136	,429**	-,302*	,896**	-0,074

Table 4. Correlation - Pre-crisis sub-period. Part 2.

	X17	*Z1*	*Z2*	*Z3*	*Z4*	*Z5*	*Z6*	*Z7*	*Z8*	*Z9*	*Y1*	*Y2*	*Y3*	*Y4*	*Y5*	*Y6*
X1	0,229	0,254	0,003	-0,001	-0,075	-,257*	-0,217	0,023	-0,133	0,072	0,157	0,072	-,306*	-0,210	-0,157	-0,104
X2	0,238	,339**	-0,051	0,005	-0,009	-,314*	-,301*	0,027	-0,185	0,043	,427**	0,080	-,391**	-,273*	-0,178	-0,137
X3	0,226	,307*	-0,024	-0,002	-0,042	-,292*	-0,252	0,017	-0,167	0,052	,324*	0,081	-,348**	-0,239	-0,176	-0,123
X4	-,430**	0,180	0,232	-,327*	0,060	0,040	-0,063	-0,164	-0,188	-0,127	0,088	-0,021	-0,242	-0,195	0,026	0,208
X5	-0,107	,393**	-0,104	0,059	0,004	-0,098	-0,105	-,332**	-0,075	0,067	0,177	0,185	-,272*	-0,142	-0,041	,400**
X6	0,195	,397**	-0,087	-0,240	0,011	-0,216	-0,157	-0,006	-0,182	-0,068	,395**	0,202	-,344**	-0,191	-0,116	0,006
X7	-0,028	0,034	,292*	-0,133	-0,073	-0,133	-0,192	-0,048	0,055	0,055	0,124	-,304*	-0,169	-0,244	-0,069	-,315*
X8	-0,061	-0,077	,390**	-0,064	-0,071	-0,153	-0,169	-0,022	0,025	0,062	0,078	-,600**	-,274*	-,435**	-0,124	-,372**
X9	0,080	0,043	0,038	0,018	0,011	,314*	-,453**	0,031	0,018	0,006	0,127	0,151	-0,180	-0,083	,554**	-0,149
X10	-0,114	0,213	-,257*	0,156	-0,107	,273*	-0,158	-0,039	-0,015	-0,031	0,100	,473**	0,189	,322*	0,069	,420**
X11	0,044	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,017	-,271*	-0,220	-,271*	-0,134	-0,136
X12	-0,044	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-0,017	,271*	0,220	,271*	0,134	0,136
X13	-0,084	0,174	-0,208	0,029	-0,134	,280*	-0,134	0,088	-0,075	-0,089	0,157	,543**	,323*	,452**	0,102	,429**
X14	0,051	0,031	0,254	0,004	-0,035	-,504**	-0,016	0,005	-0,001	0,005	,290*	-,278*	-0,202	-,260*	-,759**	-,302*
X15	-,329*	0,057	-0,172	0,049	-0,138	,296*	,359**	-0,209	0,016	-0,025	-,405**	,305*	,312*	,355**	0,187	,896**
X16	-0,010	-0,075	0,022	0,011	0,019	0,011	0,015	0,031	0,011	0,011	0,057	0,040	0,167	0,145	0,008	-0,074
X17	1	-0,106	-0,117	-0,244	-0,106	-0,228	-0,190	,500**	0,027	,360**	-0,017	0,004	-0,111	-0,084	-0,112	-,397**
Z1	-0,106	1	-,320*	-0,152	-,272*	-0,152	-0,218	-,365**	-0,152	-0,152	,355**	0,248	-0,250	-0,101	-0,087	,263*
Z2	-0,117	-,320*	1	-0,073	-0,131	-0,073	-0,105	-0,175	-0,073	-0,073	-0,115	-,345**	-0,002	-0,130	-0,053	-0,206
Z3	-0,244	-0,152	-0,073	1	-0,062	-0,034	-0,050	-0,083	-0,034	-0,034	-0,032	-0,146	-0,005	-0,058	-0,017	0,087
Z4	-0,106	-,272*	-0,131	-0,062	1	-0,062	-0,089	-0,149	-0,062	-0,062	0,118	0,001	-0,153	-0,119	-0,045	-0,117
Z5	-0,228	-0,152	-0,073	-0,034	-0,062	1	-0,050	-0,083	-0,034	-0,034	-0,220	0,167	,279*	,278*	,690**	0,179
Z6	-0,190	-0,218	-0,105	-0,050	-0,089	-0,050	1	-0,120	-0,050	-0,050	-0,197	0,060	,278*	0,238	-0,104	,265*
Z7	,500**	-,365**	-0,175	-0,083	-0,149	-0,083	-0,120	1	-0,083	-0,083	-0,065	-0,018	0,112	0,081	-0,043	-,322*
Z8	0,027	-0,152	-0,073	-0,034	-0,062	-0,034	-0,050	-0,083	1	-0,034	-0,193	-0,015	-0,025	-0,025	-0,012	-0,052
Z9	,360**	-0,152	-0,073	-0,034	-0,062	-0,034	-0,050	-0,083	-0,034	1	-0,097	-0,077	0,073	0,028	-0,017	-0,046
Y1	-0,017	,355**	-0,115	-0,032	0,118	-0,220	-0,197	-0,065	-0,193	-0,097	1	0,097	-0,251	-0,158	-0,139	-0,090
Y2	0,004	0,248	-,345**	-0,146	0,001	0,167	0,060	-0,018	-0,015	-0,077	0,097	1	,454**	,724**	0,218	,335**
Y3	-0,111	-0,250	-0,002	-0,005	-0,153	,279*	,278*	0,112	-0,025	0,073	-0,251	,454**	1	,943**	0,174	0,162
Y4	-0,084	-0,101	-0,130	-0,058	-0,119	,278*	0,238	0,081	-0,025	0,028	-0,158	,724**	,943**	1	0,216	0,250
Y5	-0,112	-0,087	-0,053	-0,017	-0,045	,690**	-0,104	-0,043	-0,012	-0,017	-0,139	0,218	0,174	0,216	1	0,144
Y6	-,397**	,263*	-0,206	0,087	-0,117	0,179	,265*	-,322*	-0,052	-0,046	-0,090	,335**	0,162	0,250	0,144	1

Note: ** p < 0.01; * p < 0.05

X1: LnTE, X2: LnTD, X3: LnTA, X4: LnRD, X5: LnEBIT, X6: LnTS, X7: $\boldsymbol{R_f}$, X8: $\boldsymbol{R_e}$, X9: $\boldsymbol{R_d}$, X10: FirmReturn, X11: MarketReturn, X12: $\boldsymbol{\sigma_m}$, X13: FirmReturn/ $\boldsymbol{R_e}$, X14: ETR, X15: ROA, X16: FirmReturn/TotalRisk, X17: TangibleAssetsRatio,

Z1: Industrials, Z2: HelathCare, Z3: RealEstate, Z4: ConsumerGoods, Z5: Technology, Z6: ConsumerServives, Z7: BasicMaterial, Z8: Telecommunication, Z9: Utilities,

Y1: D/E, Y2: SystematicRisk, Y3: UnsystematicRisk, Y4: TotalRisk, Y5: WACC, Y6: ROE.

Number of observations N = 60.

4.2.3 The multivariate OLS model analysis

In the following table, the multivariate OLS regression results are shown for the pre-crisis sub-period. The denotations of: *, ** or *** represents the 10%, 5% and 1% significance levels. The upper figures for variables are the estimated coefficients. If the figure is negative for a variable, the dependent and independent variables are negatively correlated. The same way positive value highlights the positive interrelation. Figures in parenthesis are the t-test values for each variable which compose the base for the significance level.

Table 5 show the effects of independent variables on corporate capital structure, represented in this study as D/E ratio. The table covers the per-crisis sub-period, or 2005-06 years. Similarly, this table indicates the influence of the same independent variables on Systematic risk, Unsystematic risk, Total risk, WACC and ROE.

Significant variables that strongly associated with Debt-to-equity ratio were: total debt, total equity and total assets. The positive association of LnTA with D/E highlighted that the more assets company possesses, the higher proportion of borrowed capital there is in the company. The other variables were insignificant in relation to debt-to-equity ratio. The determinant of capital structure (explained in 2.3.2), such as size of the company (LnTS), earning volatility ($\boldsymbol{\sigma_m}$), tangibility (tangible assets ratio), profitability (ROA), growth opportunities (LnRD) and industry classification did not show any significant interrelation with the capital structure. Neither the risk indexes showed the association with leverage (D/E) of the company.

Systematic risk had high negative association with unsystematic risk which shows that the higher the market risk, the lower the risk of the company. Unsystematic risk, in turn, had also positive association with the total risk indicating that the market risk has more significant impact on the total risk. The total risk was also dependent on research and development expenses. Moreover, the total risk was higher when the cost of equity is relatively low which is explained in negative figure between the total risk and R_e. This table represents the positive association of the Technology industry sector and weighted

average cost of capital. Thereby stating that technological companies had higher cost of capital when compared to other industries. Return on assets had very strong positive impact on return on equity.

The r-squared values lied in the range 0,6-1 and suggest that the regression model of stock return was explained by between 60 - 100%. These are very good indicators of model fit. The Durbin Watson-test was in the range 1,928-2,381, suggesting that the data did not suffer from much autocorrelation (Brooks 2008).

Table 5. OLS model - Pre-crisis sub-period

Dependent variables	***D/E***	***SysRisk***	***UnsysRisk***	***TotalRisk***	***WACC***	***ROE***
(Constant)	-2,821 (-8,201)	-1,382E-09 (-1,225)	-1,382E-09 (-1,206)	0,022 (2,795)	-0,064 (-0,198)	0,032 (0,540)
LnTE	-4,042*** (-22,315)	6,870E-11 (0,130)	6,870E-11 (0,127)	-0,002 (-0,445)		
LnTD	-1,411*** (-7,217)	4,295E-12 (0,007)	4,294E-12 (0,007)	0,003 (0,625)		0,070 (2,037)
LnTA	5,453*** (16,500)				0,030 (0,399)	-0,080* (-2,723)
LnTS	-0,004 (-0,060)	5,598E-11 (0,175)	5,598E-11 (0,172)	-0,001 (-0,277)	-0,059 (-0,731)	0,004 (0,255)
LnRD	-0,003 (-0,210)	1,261E-11 (0,150)	1,261E-11 (0,148)	0,001* (-2,700)	0,025 (0,981)	0,005 (1,319)
LnEBIT	0,004 (0,262)	-5,888E-11 (-0,753)	-5,888E-11 (-0,742)	-0,001 (-1,348)	0,004 (0,165)	0,006 (1,811)
FirmReturn	-20,665 (-0,978)	-5,032E-08 (-0,448)	-5,032E-08 (-0,441)	-1,313 (-1,530)	-50,334 (-1,648)	2,913 (0,588)
σ_m	14,038 (1,173)	7,117E-08 (1,125)	7,117E-08 (1,108)	0,522 (1,139)	0,517 (0,027)	6,133 (2,347)
UnsysRisk	-4,798 (-0,920)	-1,000*** (-5908818,907)			0,698 (0,083)	
SysRisk	-21,285 (-0,724)		-1,000*** (-5816212,033)		30,170 (1,919)	-17,268 (-2,474)
TotalRisk		1,000 (6506751,257)	1,000*** (35730146,190)			1,467 (1,206)
R_e	-2,428 (-0,242)	-4,554E-08 (-0,867)	-4,554E-08 (-0,854)	-0,605*** (-4,553)		-4,268 (-1,916)
R_d	0,197 (1,205)	-6,691E-10 (-0,802)	-6,691E-10 (-0,790)	-0,004 (-0,609)		0,074 (2,358)
FirmReturn/ R_e	0,691** (3,007)	8,416E-10 (0,646)	8,416E-10 (0,636)	0,033*** (3,732)	-0,270 (-0,714)	-0,004 (-0,069)
ETR	-0,030 (-0,948)	-3,147E-12 (-0,019)	-3,147E-12 (-0,019)	0,001 (0,830)		0,000 (-0,037)
ROE	-0,688 (-0,885)	1,429E-09 (0,354)	1,429E-09 (0,348)	-0,003 (-0,115)	1,230 (1,133)	
ROA	1,254 (0,905)	-2,141E-09 (-0,298)	-2,141E-09 (-0,294)	0,009 (0,163)	-1,575 (-0,896)	1,650*** (15,316)
FirmReturn/ TotalRisk	0,000 (-0,030)	-4,071E-12 (-0,228)	-4,071E-12 (-0,224)	8,517E-05 (0,596)	-0,003 (-0,469)	0,000 (0,450)
Tangible AssetsRatio	-0,157 (-0,923)	-2,609E-10 (-0,290)	-2,609E-10 (-0,285)	-0,019* (-2,909)	0,339 (1,136)	-0,036 (-0,903)

D/E		-1,898E-11 (-0,063)	-1,898E-11 (-0,062)	-0,003 (-1,312)	0,004 (0,070)	0,022 (2,319)
WACC	-0,079 (-0,461)	9,597E-11 (0,107)	9,597E-11 (0,105)	0,007 (0,972)		
Industrials						
HelathCare	0,070 (1,162)	4,630E-10 (1,471)	4,630E-10 (1,448)	0,004 (1,471)	-0,004 (-0,035)	-0,001 (-0,095)
RealEstate	-0,094 (-0,501)	3,339E-10 (0,340)	3,339E-10 (0,334)	-0,009 (-1,140)	0,192 (0,682)	-0,005 (-0,117)
ConsGoods	-0,054 (-0,929)	1,357E-10 (0,447)	1,357E-10 (0,440)	0,001 (0,232)	-0,002 (-0,024)	-0,030 (-2,453)
Technology	-0,052 (-0,332)	4,266E-10 (0,525)	4,266E-10 (0,516)	-9,970E-05 (-0,015)	1,080*** (5,743)	-0,079 (-2,602)
ConsService	-0,027 (-0,258)	-1,682E-10 (-0,314)	-1,682E-10 (-0,309)	0,007 (1,617)	-0,070 (-0,491)	0,009 (0,368)
BasicMat	0,019 (0,299)	8,040E-11 (0,241)	8,040E-11 (0,237)	0,003 (1,335)	0,024 (0,219)	-0,019 (-1,291)
Telecom	0,207 (2,227)	3,123E-10 (0,641)	3,123E-10 (0,631)	-0,004 (-0,911)	0,054 (0,339)	-0,005 (-0,222)
Utilities	0,190 (1,493)	-9,197E-11 (-0,139)	-9,197E-11 (-0,136)	0,009 (1,926)	-0,114 (-0,544)	0,006 (0,204)
R Square	0,992	1,000	1,000	0,813	0,604	0,973
Durbin-Watson	2,381	1,928	1,928	2,160	1,966	1,941
N	60	60	60	60	60	60

Note: OLS estimates are shown in above table (t-statistics appear in parentheses).

*** p < 0.001; ** p < 0.005; * p < 0.01

D/E: Debt-to-equity ratio, SysRisk: Systematic risk, UnsysRisk: Unsystematic risk, TotalRisk: Total risk, WACC: Weighted average cost of capital, ROE: Return on equity, LnTE: Log of total equity, LnTD: log of total debt; LnTA: Log of total assets, LnTS: Log of total sales, LnRD: Log of research and development expenses, LnEBIT: Log of earnings before interest and taxes, FirmReturn: Firm's stock return, σ_m: Market standard deviation, R_e: Cost of equity, R_d: Cost of debt, FirmReturn/R_e: Firm's return-to-cost of equity, ETR: Effective corporate tax rate, ROA: Return on assets, FirmReturn/TotalRisk: Firm's return-to-total risk, TangibleAssetsRatio: Tangibles assets-to-total assets, Industrials: Industrials, HealthCare: Health care, RealEstate: Real Estate, ConsGoods: Consumer Goods, Technology: Technology, ConsServices: Consumer services, BasicMat: Basic material, Telecom: Telecommunication, Utilities: Utilities industry sector.

4.3 During crisis

4.3.1 Descriptive statistics analysis

Table 6 depicts the descriptive statistics of 30 companies during crisis period, or 2007-08 years. At this sub-period, the stock return's mean was 0.07% which is extremely low when compared to the same figure in the pre-crisis sub-period (1.4%). The total risk index increased sharply to 3.4% in relation to 1.92% in 2005-06. Market risk equalled 0.91% and company-specific risk – 2.52%. Debt-to-equity grew even higher (165.69%) during the crisis sub-period. This demonstrates that crisis prompted companies to borrow even more than before. Firm's return-to-total risk was -19.30% indicating negative relation between risk and return among sample companies. The figure increased by 5.2% since the pre-crisis sub-period. This might be explained in overall increase of total risks and decrease in firm's return indicators. Cost of equity mean, R_e, is 2.74%, the actual return on equity's mean is 18.70%. The cost of equity did not rise

dramatically compared to pre-crisis, whilst the increase total of 2.72% can be noticed in return on equity mean index. The cost of debt was 1.86% which is considerably higher than before (0.1%). However, it was still lower than cost of equity resulting in greater proportion of debt over equity in capital structure of sample companies. The weighted average cost of capital is 1.92% for during the crisis sub-period. The figure has decreased from pre-crisis figure (3.93%).

Table 6. Descriptive statistics - During crisis sub-period

	N	*Range*	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*	*Variance*
LnTE	60	6,53577	6,03591	12,57168	8,4896357	1,75055183	3,064
LnTD	60	7,96235	5,39426	13,35661	8,8691866	1,90194150	3,617
LnTA	60	7,20918	6,52323	13,73241	9,4237358	1,80100799	3,244
LnTS	60	6,72424	6,47536	13,19960	9,2765839	1,74926251	3,060
LnRD	60	10,11600	0,10000	10,21600	4,6995121	2,57931369	6,653
LnEBIT	60	7,83444	3,17805	11,01250	6,9420984	1,90454810	3,627
FirmReturn	60	0,01083	-0,00470	0,00613	-0,0006860	0,00195649	0,000
MarketReturn	60	0,00254	-0,00222	0,00032	-0,0009511	0,00128149	0,000
$\boldsymbol{\sigma_m}$	60	0,01315	0,01273	0,02588	0,0193050	0,00662884	0,000
UnsysRisk	60	0,05335	0,00031	0,05365	0,0252309	0,01060595	0,000
SysRisk	60	0,03215	-0,00220	0,02995	0,0091658	0,00838352	0,000
TotRisk	60	0,08330	0,00030	0,08360	0,0343967	0,01817831	0,000
$\boldsymbol{R_e}$	60	0,11445	-0,00891	0,10554	0,0274101	0,02380798	0,001
$\boldsymbol{R_d}$	60	0,23924	-0,10191	0,13733	0,0186360	0,03360462	0,001
***FirmReturn/*$\boldsymbol{R_e}$	60	5,98126	-4,03233	1,94892	-0,1099896	0,67306249	0,453
ETR	60	14,99970	-3,48485	11,51485	0,3282472	1,56353523	2,445
ROE	60	0,69161	-0,11941	0,57221	0,1870553	0,15622874	0,024
ROA	60	0,34885	-0,05512	0,29373	0,0732012	0,06827905	0,005
FirmReturn/TotalRisk	60	14,31569	-12,93036	1,38533	-0,1930412	1,68184266	2,829
TangibleAssetsRatio	60	0,81070	0,00047	0,81117	0,2515135	0,20017511	0,040
D/E	60	4,89460	0,33570	5,23030	1,6568752	0,82440875	0,680
WACC	60	0,17630	-0,08326	0,09304	0,0192109	0,02589336	0,001
Industrial	60	1,00000	0,00000	1,00000	0,4000000	0,49403218	0,244
HelathCare	60	1,00000	0,00000	1,00000	0,1333333	0,34280333	0,118
RealEstate	60	1,00000	0,00000	1,00000	0,0333333	0,18102033	0,033
ConsumerGoods	60	1,00000	0,00000	1,00000	0,1000000	0,30253169	0,092
Technology	60	1,00000	0,00000	1,00000	0,0333333	0,18102033	0,033
ConsumerServices	60	1,00000	0,00000	1,00000	0,0666667	0,25154887	0,063
BasicMaterial	60	1,00000	0,00000	1,00000	0,1666667	0,37582301	0,141
Telecommunication	60	1,00000	0,00000	1,00000	0,0333333	0,18102033	0,033
Utilities	60	1,00000	0,00000	1,00000	0,0333333	0,18102033	0,033
Valid N (listwise)	60						

Note: LnTE: Log of total equity, LnTD: log of total debt; LnTA: Log of total assets, LnTS: Log of total sales, LnRD: Log of research and development expenses, LnEBIT: Log of earnings before interest and taxes, FirmReturn: Firm's stock return, $\boldsymbol{\sigma_m}$: Market standard deviation, SysRisk: Systematic risk, UnsysRisk: Unsystematic risk, TotalRisk: Total risk, R_e: Cost of equity, R_d: Cost of debt, FirmReturn/R_e: Firm's return-to-cost of equity, ETR: Effective corporate tax rate, ROE: Return on equity, ROA: Return on assets, FirmReturn/TotalRisk: Firm's return-to-total risk, TangibleAssetsRatio: Tangibles assets-to-total assets, D/E: Debt-to-equity ratio, WACC: Weighted average cost of capital, Industrials: Industrials, HealthCare: Health care, RealEstate: Real Estate, ConsGoods: Consumer Goods, Technology: Technology, ConsServices: Consumer services, BasicMat: Basic material, Telecom: Telecommunication, Utilities: Utilities industry sector.

4.3.2 Correlation analysis

Correlations were computed for 30 companies during 2007-08 constituting total of 60 observations. Table 7 demonstrates these correlations. Similar to pre-crisis, log of total equity was strongly associated with total debt, total assets, total EBIT and total sales. LnTD was correlated significantly with LnTA, LnEBIT and LnTS. Natural log of total assets was correlated with natural logs of EBIT and of total sales. There was also a strong correlation between LnEBIT and LnTS. Cost of equity was heavily correlated with all risk indicators: systematic, unsystematic and total risk (0,746, 0,610 and 0,700 respectively). The correlation matrix states that the WACC and cost of debt showed significant correlation. The relation was positive implying that when the cost of debt increases, the cost of capital significantly rises as well. Market return was heavily correlated with all risk indicators. The correlation was negative indicating reverse relationship between market return and risks. Unsystematic and total risks as well as the total debt were positively correlated with market standard deviation ($\boldsymbol{\sigma_m}$) signifying that market volatility react upon movements of those variables. Furthermore, return on assets and return on equity were associated positively, which demonstrated that the return on company's assets are high when the return on equity to company's shareholders are high too.

The risk indicators were heavily correlated between each other; thus, systematic and unsystematic risks showed high association. Besides, there was high correlation between systematic and total risk as well as unsystematic and total risk.

Table 7. Pairwise correlation - During crisis sub-period. Part 1.

	X1	*X2*	*X3*	*X4*	*X5*	*X6*	*X7*	*X8*	*X9*	*X10*	*X11*	*X12*	*X13*	*X14*	*X15*	*X16*
X1	1	,961**	,987**	,381**	,865**	,905**	,488**	,305*	,268*	0,078	-0,019	0,019	-0,016	0,075	-,292*	-0,072
X2	,961**	1	,992**	,388**	,873**	,940**	,468**	,269*	,292*	0,025	-0,040	0,040	-0,096	0,040	-,328*	-0,093
X3	,987**	,992**	1	,395**	,880**	,935**	,482**	,283*	,279*	0,051	-0,032	0,032	-0,060	0,055	-,313*	-0,086
X4	,381**	,388**	,395**	1	,438**	,484**	,408**	,299*	0,023	0,197	-0,021	0,021	-0,025	0,053	0,139	-0,173
X5	,865**	,873**	,880**	,438**	1	,871**	,296*	0,094	0,215	0,180	0,010	-0,010	-0,035	-0,039	0,078	-0,124
X6	,905**	,940**	,935**	,484**	,871**	1	,434**	0,207	,282*	0,007	-0,043	0,043	-0,086	0,053	-0,207	-0,066
X7	,488**	,468**	,482**	,408**	,296*	,434**	1	,770**	,286*	-0,043	-0,139	0,139	-0,034	0,023	-,374**	0,108
X8	,305*	,269*	,283*	,299*	0,094	0,207	,770**	1	0,134	0,254	0,243	-0,243	0,148	0,125	-,315*	-0,019
X9	,268*	,292*	,279*	0,023	0,215	,282*	,286*	0,134	1	-0,096	-0,126	0,126	-0,037	0,012	-,307*	0,071
X10	0,078	0,025	0,051	0,197	0,180	0,007	-0,043	0,254	-0,096	1	,463**	-,463**	,457**	-0,018	,341**	-0,205
X11	-0,019	-0,040	-0,032	-0,021	0,010	-0,043	-0,139	0,243	-0,126	,463**	1	-1,000**	,256*	0,092	0,084	-0,143
X12	0,019	0,040	0,032	0,021	-0,010	0,043	0,139	-0,243	0,126	-,463**	-1,000**	1	-,256*	-0,092	-0,084	0,143
X13	-0,016	-0,096	-0,060	-0,025	-0,035	-0,086	-0,034	0,148	-0,037	,457**	,256*	-,256*	1	0,003	0,124	-0,034
X14	0,075	0,040	0,055	0,053	-0,039	0,053	0,023	0,125	0,012	-0,018	0,092	-0,092	0,003	1	-0,129	0,047
X15	-,292*	-,328*	-,313*	0,139	0,078	-0,207	-,374**	-,315*	-,307*	,341**	0,084	-0,084	0,124	-0,129	1	-0,073
X16	-0,072	-0,093	-0,086	-0,173	-0,124	-0,066	0,108	-0,019	0,071	-0,205	-0,143	0,143	-0,034	0,047	-0,073	1
X17	0,068	0,045	0,052	-,430**	-0,126	0,039	-0,079	-0,055	0,123	-0,246	0,038	-0,038	0,038	-0,020	-,387**	0,043
Z1	,280*	,384**	,347**	0,191	,421**	,397**	0,027	-0,109	-0,044	0,173	0,000	0,000	-0,201	-0,116	0,060	-0,141
Z2	-0,006	-0,099	-0,051	0,234	-0,030	-0,072	,340**	,325*	0,211	0,002	0,000	0,000	0,050	-0,042	-0,071	0,045
Z3	0,064	0,046	0,051	-,334**	-0,015	-0,188	-0,116	-0,004	-0,005	0,043	0,000	0,000	0,030	-0,002	-0,118	0,023
Z4	-0,068	-0,034	-0,053	0,028	-0,114	-0,034	-0,063	-0,047	-0,039	-0,145	0,000	0,000	-0,004	-0,059	-0,210	0,038
Z5	-0,245	-,286*	-,274*	0,052	-0,105	-0,190	-0,116	-0,094	-0,093	0,033	0,000	0,000	0,031	-0,006	,590**	0,021
Z6	-0,214	-0,251	-0,232	-0,052	-0,102	-0,117	-0,166	-0,085	-0,153	0,246	0,000	0,000	0,233	-0,030	,380**	0,031
Z7	-0,023	-0,036	-0,036	-0,176	-,275*	-0,030	-0,088	-0,054	0,085	-,328*	0,000	0,000	0,024	,278*	-,370**	0,052
Z8	-0,175	-0,180	-0,184	-0,181	-0,128	-0,208	0,016	0,071	0,026	-0,003	0,000	0,000	0,019	-0,012	0,058	0,021
Z9	0,060	0,037	0,044	-0,111	0,060	-0,081	0,016	0,017	-0,104	0,031	0,000	0,000	0,006	-0,021	0,032	0,020
Y1	0,027	,282*	0,185	0,157	0,188	,287*	0,027	-0,129	0,071	-0,135	-0,087	0,087	-0,233	-0,101	-0,134	-0,085
Y2	0,000	0,035	0,025	-0,042	0,115	0,080	-0,191	-,746**	0,061	-,499**	-,637**	,637**	-,303*	-0,134	0,095	0,126
Y3	-0,240	-,261*	-0,251	-0,230	-0,199	-0,224	-0,190	-,610**	0,021	-,538**	-,610**	,610**	-0,153	-0,056	0,069	,273*
Y4	-0,140	-0,136	-0,135	-0,153	-0,063	-0,093	-0,199	-,700**	0,040	-,544**	-,650**	,650**	-0,229	-0,094	0,084	0,217
Y5	0,189	0,188	0,188	0,057	0,137	0,167	,421**	,340**	,635**	0,033	0,012	-0,012	0,025	-,596**	-0,190	0,051
Y6	-0,202	-0,131	-0,159	0,247	0,230	-0,015	-,387**	-,372**	-,256*	,277*	0,062	-0,062	-0,002	-0,138	,883**	-0,142

Table 8. Pairwise correlation - During-crisis sub-period. Part 2.

	X17	*Z1*	*Z2*	*Z3*	*Z4*	*Z5*	*Z6*	*Z7*	*Z8*	*Z9*	*Y1*	*Y2*	*Y3*	*Y4*	*Y5*	*Y6*
X1	0,068	,280*	-0,006	0,064	-0,068	-0,245	-0,214	-0,023	-0,175	0,060	0,027	0,000	-0,240	-0,140	0,189	-0,202
X2	0,045	,384**	-0,099	0,046	-0,034	-,286*	-0,251	-0,036	-0,180	0,037	,282*	0,035	-,261*	-0,136	0,188	-0,131
X3	0,052	,347**	-0,051	0,051	-0,053	-,274*	-0,232	-0,036	-0,184	0,044	0,185	0,025	-0,251	-0,135	0,188	-0,159
X4	-,430**	0,191	0,234	-,334**	0,028	0,052	-0,052	-0,176	-0,181	-0,111	0,157	-0,042	-0,230	-0,153	0,057	0,247
X5	-0,126	,421**	-0,030	-0,015	-0,114	-0,105	-0,102	-,275*	-0,128	0,060	0,188	0,115	-0,199	-0,063	0,137	0,230
X6	0,039	,397**	-0,072	-0,188	-0,034	-0,190	-0,117	-0,030	-0,208	-0,081	,287*	0,080	-0,224	-0,093	0,167	-0,015
X7	-0,079	0,027	,340**	-0,116	-0,063	-0,116	-0,166	-0,088	0,016	0,016	0,027	-0,191	-0,190	-0,199	,421**	-,387**
X8	-0,055	-0,109	,325*	-0,004	-0,047	-0,094	-0,085	-0,054	0,071	0,017	-0,129	-,746**	-,610**	-,700**	,340**	-,372**
X9	0,123	-0,044	0,211	-0,005	-0,039	-0,093	-0,153	0,085	0,026	-0,104	0,071	0,061	0,021	0,040	,635**	-,256*
X10	-0,246	0,173	0,002	0,043	-0,145	0,033	0,246	-,328*	-0,003	0,031	-0,135	-,499**	-,538**	-,544**	0,033	,277*
X11	0,038	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-0,087	-,637**	-,610**	-,650**	0,012	0,062
X12	-0,038	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,087	,637**	,610**	,650**	-0,012	-0,062
X13	0,038	-0,201	0,050	0,030	-0,004	0,031	0,233	0,024	0,019	0,006	-0,233	-,303*	-0,153	-0,229	0,025	-0,002
X14	-0,020	-0,116	-0,042	-0,002	-0,059	-0,006	-0,030	,278*	-0,012	-0,021	-0,101	-0,134	-0,056	-0,094	-,596**	-0,138
X15	-,387**	0,060	-0,071	-0,118	-0,210	,590**	,380**	-,370**	0,058	0,032	-0,134	0,095	0,069	0,084	-0,190	,883**
X16	0,043	-0,141	0,045	0,023	0,038	0,021	0,031	0,052	0,021	0,020	-0,085	0,126	,273*	0,217	0,051	-0,142
X17	1	-0,187	-0,027	-0,235	-0,080	-0,202	-0,186	,481**	0,047	,345**	-0,105	-0,030	-0,037	-0,036	0,179	-,392**
Z1	-0,187	1	-,320*	-0,152	-,272*	-0,152	-0,218	-,365**	-0,152	-0,152	,438**	0,161	-0,072	0,032	-0,042	,294*
Z2	-0,027	-,320*	1	-0,073	-0,131	-0,073	-0,105	-0,175	-0,073	-0,073	-0,218	-0,197	-0,096	-0,147	,410**	-0,109
Z3	-0,235	-0,152	-0,073	1	-0,062	-0,034	-0,050	-0,083	-0,034	-0,034	-0,084	-0,072	0,032	-0,015	-0,053	-0,147
Z4	-0,080	-,272*	-0,131	-0,062	1	-0,062	-0,089	-0,149	-0,062	-0,062	0,044	0,007	0,003	0,005	-0,078	-0,227
Z5	-0,202	-0,152	-0,073	-0,034	-0,062	1	-0,050	-0,083	-0,034	-0,034	-0,194	0,036	0,127	0,091	-0,073	,400**
Z6	-0,186	-0,218	-0,105	-0,050	-0,089	-0,050	1	-0,120	-0,050	-0,050	-0,111	-0,038	0,047	0,010	-0,104	,267*
Z7	,481**	-,365**	-0,175	-0,083	-0,149	-0,083	-0,120	1	-0,083	-0,083	-0,109	0,031	0,098	0,072	-0,137	-,418**
Z8	0,047	-0,152	-0,073	-0,034	-0,062	-0,034	-0,050	-0,083	1	-0,034	-0,101	-0,059	-0,014	-0,035	0,056	0,025
Z9	,345**	-0,152	-0,073	-0,034	-0,062	-0,034	-0,050	-0,083	-0,034	1	-0,098	0,004	-0,039	-0,021	-0,034	0,001
Y1	-0,105	,438**	-0,218	-0,084	0,044	-0,194	-0,111	-0,109	-0,101	-0,098	1	0,190	-0,043	0,063	-0,004	,266*
Y2	-0,030	0,161	-0,197	-0,072	0,007	0,036	-0,038	0,031	-0,059	0,004	0,190	1	,830**	,946**	-0,147	0,162
Y3	-0,037	-0,072	-0,096	0,032	0,003	0,127	0,047	0,098	-0,014	-0,039	-0,043	,830**	1	,966**	-0,169	-0,003
Y4	-0,036	0,032	-0,147	-0,015	0,005	0,091	0,010	0,072	-0,035	-0,021	0,063	,946**	,966**	1	-0,166	0,073
Y5	0,179	-0,042	,410**	-0,053	-0,078	-0,073	-0,104	-0,137	0,056	-0,034	-0,004	-0,147	-0,169	-0,166	1	-0,186
Y6	-,392**	,294*	-0,109	-0,147	-0,227	,400**	,267*	-,418**	0,025	0,001	,266*	0,162	-0,003	0,073	-0,186	1

Note: ** p < 0.01; * p < 0.05

X1: LnTE, X2: LnTD, X3: LnTA, X4: LnRD, X5: LnEBIT, X6: LnTS, X7: $\boldsymbol{R_f}$, X8: $\boldsymbol{R_e}$, X9: $\boldsymbol{R_d}$, X10: FirmReturn, X11: MarketReturn, X12: $\boldsymbol{\sigma_m}$, X13: FirmReturn/ $\boldsymbol{R_e}$, X14: ETR, X15: ROA, X16: FirmReturn/TotalRisk, X17: TangibleAssetsRatio,

Z1: Industrials, Z2: HelathCare, Z3: RealEstate, Z4: ConsumerGoods, Z5: Technology, Z6: ConsumerServives, Z7: BasicMaterial, Z8: Telecommunication, Z9: Utilities,

Y1: D/E, Y2: SystematicRisk, Y3: UnsystematicRisk, Y4: TotalRisk, Y5: WACC, Y6: ROE.

Number of observations N = 60.

4.3.3 The multivariate OLS model analysis

Table 9 depicts the OLS regression model for the during crisis sub-period. Similar to the pre-crisis sub-period, strong association was determined between debt-to-equity ratio and total debt, total equity and total assets logs. All the other variables were insignificant to the capital structure. Size of the company (LnTS), earning volatility ($\boldsymbol{\sigma_m}$), tangibility (tangible assets ratio), profitability (ROA), growth opportunities (LnRD) and industry classification are the determinants of capital structure according to the previous existing theories, however, they did not affect the leverage (D/E) in both sub-periods of the research. The risk indicators had no significant effect on capital structure of the company. The predictions, therefore, are not met in the work. Hypothesis 1 is not supported by the findings. The table depicts that systematic risk was not affected by capital structure of the company, nonetheless, total risk had positive impact and unsystematic risk had negative impact on systematic risk.

During the crisis unsystematic risk, or risk specific to certain company was positively affected by total debt, total sales, market standard deviation, total risk, effective corporate tax rate, return on assets and WACC. The following variables showed negative impact on unsystematic risk: total equity, firm's return, systematic risk, cost of equity, cost of debt, firm's return-to-cost of equity and return on equity. However, debt-to-equity ratio was affected unsystematic risk which contradicts the hypothesis 3. Unsystematic risk had strong negative association with health care, technology and telecommunication industry sectors, whereas real estate and utilities industries had positive coefficients. The interpretation is that companies from health care, technology and telecommunication are less vulnerable to firm-specific risk than real estate and utilities companies.

Total risk was negatively associated with cost of equity implying that when the cost of equity is low, the total risk tends to increase. Other association with total risk was not determined during the crisis. The hypothesis 4 stating that total risk is affected by capital structure cannot be accepted. All the independent variables had insignificant association

with cost of capital (WACC). Hence, the WACC was not affected by capital structure either, the hypothesis 5 is rejected.

Return on equity (ROE) was significantly positively affected by total debt and negatively affected by total assets and consumer goods industry. Moreover, debt-to-equity impacted significantly the return on equity which supports H5. The adjusted R-square value was very close to 1,000 with the exception of the WACC variable (R squared = 0,395). The higher values indicate the better fir for the research, however, low figures are still considered sufficient if the estimated coefficients are statistically significant. Durbin-Watson index lays from 1,731 to 2,399 which is appropriate.

Table 9. OLS model - During crisis sub-period

	D/E	*SysRisk*	*UnsysRisk*	*Total Risk*	*WACC*	*ROE*
(Constant)	-4,116 (-10,371)	3,09171E-10 (0,355394884)	-5,069E-10 (-2,656)	0,031 (2,425)	-0,017 (-0,394)	0,057 (0,834)
LnTE	-4,581*** (-20,586)		-5,976E-10*** (-5,545)	0,004 (0,550)		
LnTD	-2,408*** (-9084)	7,615E-10 (1,232)	4,212E-10*** (3,954)	-0,006 (-0,753)		0,125* (2,772)
LnTA	6,876*** (15,409)	-8,057E-10 (-1,263)			0,000 (0,015)	-0,150** (-3,456)
LnTS	0,119	6,038E-11 (0,270)	1,163E-10 (1,996)	-0,002 (-0,369)	-0,005 (-0,328)	0,032 (1,905)
LnRD	-0,003 (-0,233)	6,788E-11 (1,707)	6,871E-11*** (6,759)	6,602E-05 (0,085)	-2,519E-05 (-0,010)	0,006 (1,885)
LnEBIT	0,006 (0,155)	-2,609E-11 (-0,218)	5,825E-11 (1,822)	0,002 (0,825)	0,004 (0,593)	-0,002 (-0,229)
FirmRet	-5,682 (-0,403)	-6,162E-08 (-1,334)	-5,683E-08*** (-4,828)	-1,992 (-2,350)	1,254 (0,469)	-0,957 (-0,261)
σ_m	1,512 (0,363)		3,099E-08*** (8,855)	0,672 (3,114)	-0,077 (-0,130)	
UnsystRisk	-1,287 (-0,306)	-1,000*** (30894090,876)				-0,387 (-0,357)
SysRisk	6,967 (0,582)		-1,000*** (-80640841)			0,620 0,205
Total Risk		1,000*** (46402645,433)	1,000*** (284927974,953)			
R_e	3,873 (0,772)	-4,773E-09 (-0,671)	-3,147E-08*** (-7,647)	-0,808*** (-7,328)		-0,079 (-0,064)
R_d	0,319 (0,246)	3,224E-10 (0,082)	-3,272E-09** (-3,007)	-0,021 (-0,255)		-0,166 (-1,107)
FirmReturn/R_e	0,019 (0,663)	-2,361E-10 (-2,537)	-2,397E-10*** (-10,006)	0,002 (1,077)	-0,001 (-0,252)	0,004 (0,523)
ETR	0,017 (0,579)	7,313E-11 (0,845)	1,556E-10*** (6,429)	0,001 (0,537)		0,004 (1,262)
ROE	-0,270 (-0,388)	-3,494E-09 (-1,592)	-3,520E-09*** (-6,029)	-0,014 (-0,313)	-0,006 (-0,045)	2,131 (12,976)
ROA	0,909 (0,567)	7,450E-09 (1,467)	7,120E-09*** (5,324)	-0,005 (-0,046)	-0,031 (-0,100)	

FirmReturn/ TotalRisk	0,000 (0,037)	1,758E-11 (0,529)	2,943E-12 (0,339)	0,000 (0,638)	0,000 (0,173)	-0,001 (-0,328)
Tangible Assets/ TotalAssets	0,032 (0,188)	-3,660E-11 (-0,067)	-3,259E-10 (-2,271)	-0,013 (-1,160)	0,064 (1,930)	0,018 (0,448)
D/E		7,475E-11 (0,532)	-6,942E-11 (-1,352)	0,001 (0,326)	0,004 (0,467)	0,032** (3,027)
WACC	1,067 (0,419)	5,427E-09 (0,721)	1,300E-08*** (6,084)	0,074 (0,458)		
Industrials						
HelathCare	-0,112 (-1,291)	-5,288E-10 (-1,927)	-7,350E-10*** (-10,285)	-0,006 (-1,185)	0,021 (1,458)	0,041 (2,084)
RealEstate	0,339 (1,861)	4,285E-10 (0,728)	5,618E-10*** (3,678)	-0,002 (-0,166)	0,007 (0,179)	0,064 (1,430)
ConsGoods	0,005 (0,078)	2,233E-11 (0,097)	7,138E-11 (1,212)	-0,004 (-0,805)	0,001 (0,057)	-0,045* (-2,718)
Technology	-0,053 (-0,303)	-6,213E-10 (-1,099)	-7,783E-10*** (-5,338)	0,002 (0,135)	0,020 (0,530)	-0,100 (-2,466)
ConsServ	-0,199 (-1,732)	4,998E-11 0,140	-1,276E-10 (-1,348)	0,000 (0,018)	0,010 (0,417)	-0,047 (-1,720)
BasicMat	0,025 (0,346)	-2,954E-10 (-1,278)	-1,352E-10 (-2,215)	0,001 (0,143)	-0,014 (-0,945)	-0,034 (-1,927)
Telecom	0,071 (0,712)	-3,405E-10 (-1,033)	-3,202E-10*** (-3,797)	-0,001 (-0,219)	0,004 (0,201)	0,021 (0,806)
Utilities	0,187 (1,357)	2,880E-10 (0,650)	4,816E-10*** (4,175)	0,001 (0,103)	-0,033 (-1,143)	0,026 (0,749)
R Square	0,990	1,000[a]	1,000	0,907	0,395	,990[a]
Durbin-Watson	2,399	1,731	2,072	1,778	2,272	2,318
N	60	60	60	60	60	60

Note: OLS estimates are shown in above table (t-statistics appear in parentheses).

*** p < 0.001; ** p < 0.005; * p < 0.01

D/E: Debt-to-equity ratio, SysRisk: Systematic risk, UnsysRisk: Unsystematic risk, TotalRisk: Total risk, WACC: Weighted average cost of capital, ROE: Return on equity, LnTE: Log of total equity, LnTD: log of total debt; LnTA: Log of total assets, LnTS: Log of total sales, LnRD: Log of research and development expenses, LnEBIT: Log of earnings before interest and taxes, FirmReturn: Firm's stock return, σ_m: Market standard deviation, R_e: Cost of equity, R_d: Cost of debt, FirmReturn/R_e: Firm's return-to-cost of equity, ETR: Effective corporate tax rate, ROA: Return on assets, FirmReturn/TotalRisk: Firm's return-to-total risk, TangibleAssetsRatio: Tangibles assets-to-total assets, Industrials: Industrials, HealthCare: Health care, RealEstate: Real Estate, ConsGoods: Consumer Goods, Technology: Technology, ConsServices: Consumer services, BasicMat: Basic material, Telecom: Telecommunication, Utilities: Utilities industry sector.

4.4 Post-crisis

4.4.1 Descriptive statistics

The table 10 emphasises the descriptive statistics for the post-crisis sub-period. The mean firm's stock return was 0.09%, the index fell significantly when compared to the pre-crisis sub-period. Total risk's mean is 2.04%. The index was less than during crisis, however more superior than in pre-crisis. This signifies that the crisis prompted unstable economic environment in which organisations experience turbulence even after the crisis. Market risk constituted for 0.28%, which is lower compared to during crisis, and unsystematic risk constitutes for 1.76%. The is explained that despite of the crisis consequences, the firm-specific risk is still higher than market risk. The D/E ratio

amounted for 130% which was slightly lower than in 2005-06 years (148.93%) and in 2007-08 (165.69%). This emphasised the fact that debt finance constituted less significant proportion in corporate capital structures of the sample companies after the crisis. The firm's return-to-total risk ratio amounted for 7.96%, the same ratio was negative in 2006-08 years. This ratio suggests that for the same amount of risk the company received higher rate than in the pre-crisis and during the crisis sub-periods. Cost of equity, equivalent to 1.13%, was still greater rate than cost of debt 0.89%. Return on equity dropped to 16.56% in the post-crisis sub-period in comparison to during the crisis (18.7%). This is an evidence that return on equity to company's shareholders was notably higher despite market instability. The WACC, amounting for 1.11%, had had a downward trend over all the three sub-periods.

Table 10. Descriptive statistics - Post-crisis sub-period

	N	*Range*	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*	*Variance*
LnTE	270	7,02052	6,17300	13,19352	8,9445656	1,69007840	2,856
LnTD	270	7,97450	5,71057	13,68506	9,1128528	1,69059815	2,858
LnTA	270	7,50092	6,66142	14,16234	9,7468596	1,67658548	2,811
LnRD	270	10,85088	0,10000	10,95088	4,8346199	2,71256189	7,358
LnEBIT	268	12,68090	-1,20397	11,47693	7,1629790	1,97915260	3,917
LnTS	270	7,43575	6,17960	13,61535	9,4642422	1,69698987	2,880
Rf	270	0,09465	-0,00960	0,08505	0,0138830	0,01888210	0,000
Re	270	0,10210	-0,01612	0,08599	0,0112999	0,01781237	0,000
Rd	270	1,93270	-1,39433	0,53837	0,0088759	0,09684307	0,009
FirmRet	270	0,00924	-0,00177	0,00748	0,0008928	0,00116117	0,000
MarkRet	270	0,00187	-0,00056	0,00131	0,0004945	0,00051754	0,000
UnsysRisk	270	0,04341	0,00009	0,04350	0,0176329	0,00658849	0,000
MarkSD	270	0,01391	0,00625	0,02017	0,0125332	0,00417522	0,000
SysRisk	270	0,02851	-0,00223	0,02628	0,0027643	0,00457874	0,000
TotRisk	270	0,05982	0,00010	0,05992	0,0203972	0,00940828	0,000
RetTOCost	270	6,71623	-3,91455	2,80168	0,0801855	0,50196986	0,252
ETR	270	20,48179	-9,12179	11,36000	0,1825870	0,94527908	0,894
ROE	270	1,05900	-0,16945	0,88954	0,1656521	0,13575326	0,018
ROA	270	0,39086	-0,07575	0,31510	0,0737566	0,06039740	0,004
RetTORisk	270	20,15413	-9,68440	10,46973	0,0786099	1,09731970	1,204
TangibleAssetsRatio	270	0,76812	0,00036	0,76847	0,2417963	0,20582663	0,042
DtoE	270	5,51089	0,37604	5,88693	1,3003154	0,59763603	0,357
WACC	270	0,40420	-0,17858	0,22561	0,0110779	0,02812179	0,001
Industrial	270	1,00000	0,00000	1,00000	0,4000000	0,49080769	0,241
HelathCare	270	1,00000	0,00000	1,00000	0,1333333	0,34056590	0,116
RealEstate	270	1,00000	0,00000	1,00000	0,0333333	0,17983884	0,032
ConsGoods	270	1,00000	0,00000	1,00000	0,1000000	0,30055710	0,090
Technology	270	1,00000	0,00000	1,00000	0,0333333	0,17983884	0,032
ConsServ	270	1,00000	0,00000	1,00000	0,0666667	0,24990705	0,062
BasicMat	270	1,00000	0,00000	1,00000	0,1666667	0,37337006	0,139
Telecom	270	1,00000	0,00000	1,00000	0,0333333	0,17983884	0,032
Utilities	270	1,00000	0,00000	1,00000	0,0333333	0,17983884	0,032

Note: LnTE: Log of total equity, LnTD: log of total debt; LnTA: Log of total assets, LnTS: Log of total sales, LnRD: Log of research and development expenses, LnEBIT: Log of earnings before interest and taxes, FirmReturn: Firm's stock return, σ_m: Market standard deviation, SysRisk: Systematic risk, UnsysRisk: Unsystematic risk, TotalRisk: Total risk, R_e: Cost of equity, R_d: Cost of debt, FirmReturn/R_e: Firm's return-to-cost of equity, ETR: Effective corporate

tax rate, ROE: Return on equity, ROA: Return on assets, FirmReturn/TotalRisk: Firm's return-to-total risk, TangibleAssetsRatio: Tangibles assets-to-total assets, D/E: Debt-to-equity ratio, WACC: Weighted average cost of capital, Industrials: Industrials, HealthCare: Health care, RealEstate: Real Estate, ConsGoods: Consumer Goods, Technology: Technology, ConsServices: Consumer services, BasicMat: Basic material, Telecom: Telecommunication, Utilities: Utilities industry sector.

4.4.2 Correlation

The results of the correlational analysis for the post-crisis sub-period indicated a highly significant correlation between log of total equity and log of total debt, log of total assets, log of total sales and log of EBIT. Debt was strongly correlated with assets, EBIT and sales. Log of EBIT was correlated with log of total sales. Regarding dependent variables, debt-to-equity ratio was highly correlated with log of total debt. Also, it was negatively correlated with tangible assets ratios which supports the theory of tangibility acting as a one of the capital structure determinants. The negative correlation means that the more tangible assets, the less leveraged firms are. Debt-to-equity ratio also correlated with the following industries: Industrials and health care (positive), technology and basic material (negative). The reviewed previous empirical findings argue that industry classification play significant role in capital structures, thus the research supports this argument. Debt-to-equity showed high positive correlation with and return on equity. This correlation supports hypothesis 7 predetermined in this work.

Systematic risk had negative correlation with cost of equity, firm's return and market return. This implies that systematic risk increases when mentioned variables decrease and conversely. Market standard deviation, unsystematic and total risk, in turn, had positive correlation with systematic risk.

Unsystematic risk was significantly negatively correlated with log of total equity, log of total debt, log of total assets, log of R&D expenses, log of EBIT and risk-free rate of return. When the values of those variables were low, the firm-specific risk was superior. Firm and market return as well as market standard deviation was positively correlated with unsystematic risk. The table also illustrated negative correlation with industrials sector and positive with consumer services and technology.

Total risk had reverse dependence on total equity total debt, total assets, R&D expenses, EBIT and Risk-free rate. Whereas positive dependence showed market standard deviation, systematic and unsystematic risk.

WACC was significantly correlated with firm's equity, debt, assets, EBIT, sales, risk-free rate, cost of equity and cost of debt. Furthermore, the table suggested that health care companies had higher cost of capital, whereas consumer services companies had lower.

Return on equity was higher when total equity total debt and total assets were not significant. Whilst, total sales, risk-free rate and return on assets showed direct dependency with return on equity. Return on equity was higher for consumer services and technology companies, but lower for consumer goods and basic material.

Table 11. Correlation - Post-crisis sub-period. Part 1.

	X1	*X2*	*X3*	*X4*	*X5*	*X6*	*X7*	*X8*	*X9*	*X10*	*X11*	*X12*	*X13*	*X14*	*X15*	*X16*
X1	1	,969**	,991**	,402**	,817**	,893**	,309**	,353**	0,049	-0,051	-0,052	-0,056	0,050	-0,059	-,211**	0,030
X2	,969**	1	,993**	,402**	,812**	,899**	,304**	,342**	0,052	-0,029	-0,040	-0,053	0,043	-0,064	-,241**	0,047
X3	,991**	,993**	1	,409**	,821**	,905**	,310**	,351**	0,051	-0,040	-0,045	-0,055	0,045	-0,061	-,228**	0,040
X4	,402**	,402**	,409**	1	,472**	,509**	,323**	,338**	,129*	0,077	-0,016	0,011	0,025	0,081	,198**	0,067
X5	,817**	,812**	,821**	,472**	1	,838**	,234**	,260**	0,079	-0,020	-0,064	-0,017	0,075	-0,002	,183**	0,107
X6	,893**	,899**	,905**	,509**	,838**	1	,317**	,346**	0,068	-0,023	-0,035	0,007	0,084	0,005	-0,042	0,028
X7	,309**	,304**	,310**	,323**	,234**	,317**	1	,929**	,126*	-0,011	0,053	,319**	0,002	0,066	-,126*	-0,024
X8	,353**	,342**	,351**	,338**	,260**	,346**	,929**	1	0,114	0,073	,211**	,193**	-0,001	0,058	-,146*	-0,016
X9	0,049	0,052	0,051	,129*	0,079	0,068	,126*	0,114	1	0,058	0,061	-0,013	0,023	-0,038	0,000	-0,024
X10	-0,051	-0,029	-0,040	0,077	-0,020	-0,023	-0,011	0,073	0,058	1	,505**	,120*	,169**	-0,007	0,070	0,112
X11	-0,052	-0,040	-0,045	-0,016	-0,064	-0,035	0,053	,211**	0,061	,505**	1	0,091	,197**	0,040	-0,061	0,088
X12	-0,056	-0,053	-0,055	0,011	-0,017	0,007	,319**	,193**	-0,013	,120*	0,091	1	,156*	-0,008	0,074	0,073
X13	0,050	0,043	0,045	0,025	0,075	0,084	0,002	-0,001	0,023	,169**	,197**	,156*	1	-0,031	0,081	0,062
X14	-0,059	-0,064	-0,061	0,081	-0,002	0,005	0,066	0,058	-0,038	-0,007	0,040	-0,008	-0,031	1	0,025	-0,024
X15	-,211**	-,241**	-,228**	,198**	,183**	-0,042	-,126*	-,146*	0,000	0,070	-0,061	0,074	0,081	0,025	1	0,053
X16	0,030	0,047	0,040	0,067	0,107	0,028	-0,024	-0,016	-0,024	0,112	0,088	0,073	0,062	-0,024	0,053	1
X17	0,018	-0,061	-0,025	-,391**	-0,097	0,000	-0,083	-0,079	-0,009	-0,042	0,006	0,022	0,011	-0,013	-0,116	-0,030
Z1	,284**	,388**	,343**	,217**	,281**	,384**	0,050	0,029	0,028	0,053	0,000	0,000	0,050	-0,046	-0,079	0,075
Z2	0,025	-0,080	-0,024	,241**	0,064	-0,011	,181**	,213**	,129*	0,040	0,000	0,000	-,204**	0,035	,161**	-0,025
Z3	0,046	0,063	0,054	-,325**	-0,004	-,203**	-0,095	-0,081	-0,034	-0,066	0,000	0,000	-0,008	-0,102	-0,088	-0,013
Z4	-0,063	-0,057	-0,063	-0,052	-,129*	-0,117	-0,096	-0,099	0,020	0,001	0,000	0,000	0,063	-0,057	-,208**	-0,022
Z5	-,211**	-,242**	-,230**	0,115	-0,069	-0,114	-0,095	-0,100	-0,012	0,027	0,000	0,000	0,043	0,016	,443**	-0,011
Z6	-,179**	-,179**	-,179**	-0,039	-0,063	-0,028	-,137*	-0,119	-0,048	-0,050	0,000	0,000	0,007	-0,010	,310**	-0,008
Z7	-0,051	-0,092	-0,077	-,216**	-,137*	-0,064	-0,019	-0,038	-0,109	0,024	0,000	0,000	0,067	,120*	-,249**	-0,032
Z8	-,237**	-,213**	-,228**	-,172**	-,140*	-,235**	0,050	0,058	0,005	-0,054	0,000	0,000	-0,025	0,011	0,070	-0,005
Z9	0,040	0,021	0,030	-0,077	-0,090	-0,107	0,050	0,049	-0,021	-0,111	0,000	0,000	-0,015	-0,003	-0,080	-0,013
Y1	-0,107	,122*	0,022	0,067	0,006	0,061	-0,023	-0,042	0,015	0,074	0,052	0,009	-0,048	-0,012	-0,088	0,077
Y2	-0,021	-0,023	-0,024	-0,023	0,017	0,028	0,059	-,254**	-0,095	-,207**	-,426**	,438**	0,041	0,002	0,108	-0,041
Y3	-,168**	-,201**	-,189**	-,174**	-,203**	-0,118	,159**	0,042	0,031	,141*	,161**	,533**	0,115	0,020	-0,065	-0,105
Y4	-,128*	-,152*	-,144*	-,133*	-,133*	-0,069	,140*	-0,094	-0,025	-0,002	-0,095	,586**	0,101	0,015	0,007	-0,094
Y5	,249**	,243**	,248**	0,118	,249**	,234**	,354**	,380**	,474**	0,032	0,063	0,089	0,016	-,481**	-0,082	-0,075
Y6	-,234**	-,187**	-,208**	,197**	,181**	-0,007	-,134*	-,158**	-0,008	0,065	-0,048	0,074	0,056	0,022	,915**	0,074

Table 12. Correlation - Post-crisis sub-period. Part 2.

	X17	*Z1*	*Z2*	*Z3*	*Z4*	*Z5*	*Z6*	*Z7*	*Z8*	*Z9*	*Y1*	*Y2*	*Y3*	*Y4*	*Y5*	*Y6*
X1	0,018	,284**	0,025	0,046	-0,063	-,211**	-,179**	-0,051	-,237**	0,040	-0,107	-0,021	-,168**	-,128*	,249**	-,234**
X2	-0,061	,388**	-0,080	0,063	-0,057	-,242**	-,179**	-0,092	-,213**	0,021	,122*	-0,023	-,201**	-,152*	,243**	-,187**
X3	-0,025	,343**	-0,024	0,054	-0,063	-,230**	-,179**	-0,077	-,228**	0,030	0,022	-0,024	-,189**	-,144*	,248**	-,208**
X4	-,391**	,217**	,241**	-,325**	-0,052	0,115	-0,039	-,216**	-,172**	-0,077	0,067	-0,023	-,174**	-,133*	0,118	,197**
X5	-0,097	,281**	0,064	-0,004	-,129*	-0,069	-0,063	-,137*	-,140*	-0,090	0,006	0,017	-,203**	-,133*	,249**	,181**
X6	0,000	,384**	-0,011	-,203**	-0,117	-0,114	-0,028	-0,064	-,235**	-0,107	0,061	0,028	-0,118	-0,069	,234**	-0,007
X7	-0,083	0,050	,181**	-0,095	-0,096	-0,095	-,137*	-0,019	0,050	0,050	-0,023	0,059	,159**	,140*	,354**	-,134*
X8	-0,079	0,029	,213**	-0,081	-0,099	-0,100	-0,119	-0,038	0,058	0,049	-0,042	-,254**	0,042	-0,094	,380**	-,158**
X9	-0,009	0,028	,129*	-0,034	0,020	-0,012	-0,048	-0,109	0,005	-0,021	0,015	-0,095	0,031	-0,025	,474**	-0,008
X10	-0,042	0,053	0,040	-0,066	0,001	0,027	-0,050	0,024	-0,054	-0,111	0,074	-,207**	,141*	-0,002	0,032	0,065
X11	0,006	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,052	-,426**	,161**	-0,095	0,063	-0,048
X12	0,022	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,009	,438**	,533**	,586**	0,089	0,074
X13	0,011	0,050	-,204**	-0,008	0,063	0,043	0,007	0,067	-0,025	-0,015	-0,048	0,041	0,115	0,101	0,016	0,056
X14	-0,013	-0,046	0,035	-0,102	-0,057	0,016	-0,010	,120*	0,011	-0,003	-0,012	0,002	0,020	0,015	-,481**	0,022
X15	-0,116	-0,079	,161**	-0,088	-,208**	,443**	,310**	-,249**	0,070	-0,080	-0,088	0,108	-0,065	0,007	-0,082	,915**
X16	-0,030	0,075	-0,025	-0,013	-0,022	-0,011	-0,008	-0,032	-0,005	-0,013	0,077	-0,041	-0,105	-0,094	-0,075	0,074
X17	1	-,222**	0,060	-,218**	-,127*	-0,111	-,178**	,470**	0,056	,249**	-,293**	0,023	0,112	0,090	0,052	-,187**
Z1	-,222**	1	-,320**	-,152*	-,272**	-,152*	-,218**	-,365**	-,152*	-,152*	,384**	0,076	-,174**	-0,085	-0,017	0,038
Z2	0,060	-,320**	1	-0,073	-,131*	-0,073	-0,105	-,175**	-0,073	-0,073	-,291**	-0,113	0,006	-0,051	,227**	0,064
Z3	-,218**	-,152*	-0,073	1	-0,062	-0,034	-0,050	-0,083	-0,034	-0,034	0,027	-0,037	-0,038	-0,044	0,051	-0,081
Z4	-,127*	-,272**	-,131*	-0,062	1	-0,062	-0,089	-,149*	-0,062	-0,062	-0,025	0,022	0,047	0,043	-0,001	-,221**
Z5	-0,111	-,152*	-0,073	-0,034	-0,062	1	-0,050	-0,083	-0,034	-0,034	-,121*	0,028	,147*	0,117	-0,063	,354**
Z6	-,178**	-,218**	-0,105	-0,050	-0,089	-0,050	1	-,120*	-0,050	-0,050	0,048	-0,049	-0,042	-0,053	-,125*	,326**
Z7	,470**	-,365**	-,175**	-0,083	-,149*	-0,083	-,120*	1	-0,083	-0,083	-,195**	0,065	,230**	,193**	-0,082	-,289**
Z8	0,056	-,152*	-0,073	-0,034	-0,062	-0,034	-0,050	-0,083	1	-0,034	0,054	-0,057	-0,094	-0,094	0,010	0,100
Z9	,249**	-,152*	-0,073	-0,034	-0,062	-0,034	-0,050	-0,083	-0,034	1	-0,074	-0,031	-0,049	-0,049	-0,037	-0,083
Y1	-,293**	,384**	-,291**	0,027	-0,025	-,121*	0,048	-,195**	0,054	-0,074	1	-0,041	-,140	-0,118	-0,026	,257**
Y2	0,023	0,076	-0,113	-0,037	0,022	0,028	-0,049	0,065	-0,057	-0,031	-0,041	1	,400**	,767**	-0,103	0,092
Y3	0,112	-,174**	0,006	-0,038	0,047	,147*	-0,042	,230**	-0,094	-0,049	-,140	,400**	1	,895**	0,098	-0,119
Y4	0,090	-0,085	-0,051	-0,044	0,043	0,117	-0,053	,193**	-0,094	-0,049	-0,118	,767**	,895**	1	0,019	-0,039
Y5	0,052	-0,017	,227**	0,051	-0,001	-0,063	-,125*	-0,082	0,010	-0,037	-0,026	-0,103	0,098	0,019	1	-0,105
Y6	-,187**	0,038	0,064	-0,081	-,221**	,354**	,326**	-,289**	0,100	-0,083	,257**	0,092	-0,119	-0,039	-0,105	1

Note: ** p < 0.01; * p < 0.05

X1: LnTE, X2: LnTD, X3: LnTA, X4: LnRD, X5: LnEBIT, X6: LnTS, X7: $\boldsymbol{R_f}$, X8: $\boldsymbol{R_e}$, X9: $\boldsymbol{R_d}$, X10: FirmReturn, X11: MarketReturn, X12: $\boldsymbol{\sigma_m}$, X13: FirmReturn/ $\boldsymbol{R_e}$, X14: ETR, X15: ROA, X16: FirmReturn/TotalRisk, X17: TangibleAssetsRatio,

Z1: Industrials, Z2: HelathCare, Z3: RealEstate, Z4: ConsumerGoods, Z5: Technology, Z6: ConsumerServives, Z7: BasicMaterial, Z8: Telecommunication, Z9: Utilities,

Y1: D/E, Y2: SystematicRisk, Y3: UnsystematicRisk, Y4: TotalRisk, Y5: WACC, Y6: ROE.

Number of observations N = 270.

4.4.3 The multivariate OLS model analysis

Table 13 reveals the outcomes of the regression analysis for the last sub-period – post-crisis. The association between dependent and independent variables are displayed.

Identical to the previous sub-periods, debt-to-equity was strongly impacted by the amount of total equity, total debt and total assets in the company. Moreover, the relationship was negative for equity and debt and positive for assets, which coincided with the previous sub-periods. However, in this sub-period, the positive relationship between debt-to-equity and return on equity was determined. This indicated that during the post-crisis sub-period, companies tended to have more leveraged capital structure in cases when the return on equity was high. The negative association with return on assets, in turn, implied that debt was least favoured when the return on assets was high. Health care industry represented negative influence on capital structure. In other words, companies from health care sector had less borrowed capital in their corporate structures. This supported the existing theories covered in this work that industry classification has an impact on leverage of the company.

Systematic risk showed high dependency on cost of equity, unsystematic risk (negative) and total risk (positive). From the table 13, it can also be concluded that technological firms as well as consumer services organisations were exposed to higher systematic risk. Unsystematic risk, consecutively, had greater impact on technological and consumer service companies. Besides, total risk, cost of equity and firm's return-to-cost of equity showed significant positive association with unsystematic risk.

According to the tables, total risk, in turn, was dependent on how much revenues (LnTS) the company performed or how much was spent on research and development (LnRD). Cost of equity was one of the determinants of total risk, similar as of the systematic and unsystematic risks. This highlighted that the higher the cost of equity, the more company was exposed to risks. From the table, it can be concluded that health care industry possessed higher weighted average cost of capital. Similar as in during the crisis, return on equity was dependent on the capital structure of the firm which supported H5. Besides leverage, log of total sales, ratio "firm's return-to-total risk" and utilities industry

showed significant association with return on equity. The adjusted R-square value were 0,255 to 1,000. The higher values indicated the better fir for the research work, however, low figures were still considered sufficient if the estimated coefficients were statistically significant. Durbin-Watson index laid from 1,936 to 2,222 which supported the validity of the study.

Table 13. OLS model - Post-crisis sub-period

	D/E	*SysRisk*	*UnsysRisk*	*Tot Risk*	*WACC*	*ROE*
(Constant)	-3,059 (-16,257)	-3,222E-10 (-1,356)	-3,222E-10 (-1,286)	0,006 (1,471)	-0,024 (-1,314)	-0,115 (-4,239)
LnTE	-3,741*** (-30,615)	2,173E-10 (1,523)	2,173E-10 (1,444)	0,001 (0,338)		
LnTD	-1,808*** (-14,526)	-1,636E-10 (-1,130)	-1,636E-10 (-1,072)	-0,002 (-0,933)		-0,026 (-1,269)
LnTA	5,586*** (23,242)				-0,005 (-1,128)	0,008 (0,370)
LnTS	-0,023 (-1,299)	-6,538E-11 (-1,189)	-6,538E-11 (-1,127)	0,003* (2,708)	0,003 (0,700)	0,019*** (3,881)
LnRD	0,003 (0,670)	-2,169E-11 (-1,716)	-2,169E-11 (-1,627)	-0,001** (-2,938)	0,000 (-0,176)	-0,001 (-1,215)
LnEBIT	-0,003 (-0,383)	4,939E-11 (1,852)	4,939E-11 (1,757)	-0,001 (-1,317)	0,005 (2,335)	0,002 (0,747)
FirmRet	2,026 (0,300)	2,454E-08 (1,170)	2,454E-08 (1,110)	0,627 (1,845)	1,163 (0,882)	-1,675 (0,957)
σ_m				0,966*** (9,583)	-0,096 (-0,227)	0,204 (0,340)
UnsystRisk		-1,000*** (-82881813,299)				-0,335 (-0,848)
SysRisk	-8,023 (-2,079)		-1,000*** (-78599638,977)			0,400 (0,453)
Total Risk	3,049 (2,225)	1,000*** 103804298,765	1,000*** (222110472,231)			
R_e	-2,086 (-1,044)	-2,024E-08*** (-3,253)	-2,024E-08** (-3,085)	-0,719*** (-11,613)		0,348 (0,622)
R_d	-0,024 (-0,300)	-1,340E-10 (-0,529)	-1,340E-10 (-0,502)	-0,005 (-1,062)		0,014 (0,605)
$FirmReturn/R_e$	-0,016 (-1,174)	1,261E-10 (2,945)	1,261E-10* (2,793)	4,273E-05 (0,056)	0,003 (0,836)	0,000 (-0,126)
ETR	0,011 (1,223)	6,723E-11 (2,391)	6,723E-11 (2,268)	0,000 (0,727)		-0,005 (-1,840)
ROE	1,428*** (6,690)	-2,693E-10 (-0,375)	-2,693E-10 (-0,355)	-0,007 (-0,555)	-0,095 (-1,712)	
ROA	-2,565*** (-5,224)	-1,718E-10 (-0,107)	-1,718E-10 (-0,101)	0,005 (0,173)	0,106 (0,845)	2,070*** (37,383)
FirmReturn/ TotalRisk	5,117E-05 (0,009)	-1,597E-11 (-0,856)	-1,597E-11 (-0,812)	-0,001 (-1,947)	-0,002 (-1,501)	0,000 (-0,099)
Tangible Assets/ TotalAssets	0,034 (0,633)	1,400E-10 (0,851)	1,400E-10 (0,807)	-0,007 (-2,336)	0,027 (2,125)	-0,014 (-0,972)
D/E		1,924E-10 (1,729)	1,924E-10 (1,640)	-0,001 (-0,331)	0,010 (1,935)	0,084*** (13,848)
WACC	0,502 (1,309)	5,494E-10 (0,461)	5,494E-10 (0,437)	0,035 (1,649)		-0,232 (-2,181)
Industrials						

HelathCare	-0,078* (-2,648)	1,337E-10 (1,494)	1,337E-10 (1,417)	0,001 (0,828)	0,018** (2,857)	0,014 (1,680)
RealEstate	-0,042 (-0,734)	-4,007E-10 (-2,264)	-4,007E-10 (-2,147)	0,000 (0,046)	0,026 (1,860)	0,033 (2,094)
ConsGoods	0,018 (0,720)	-1,402E-10 (-1,848)	-1,402E-10 (-1,752)	0,001 (0,917)	0,007 (1,151)	0,003 (0,499)
Technology	0,008 (0,169)	4,561E-10** (3,048)	4,561E-10** (2,891)	0,006 (2,259)	0,011 (0,957)	-0,020 (-1,450)
ConsServ	0,032 (0,950)	3,426E-10*** (3,238)	3,426E-10** (3,071)	-0,002 (-1,008)	0,003 (0,327)	-0,005 (-0,504)
BasicMat	0,011 (0,437)	-3,381E-12 (-0,044)	-3,381E-12 (-0,042)	0,004 (2,966)	-0,008 (-1,344)	0,012 (1,790)
Telecom	-0,024 (-0,580)	1,002E-10 (0,784)	1,002E-10 (0,744)	-0,001 (-0,635)	0,007 (0,726)	0,023 (2,047)
Utilities	-0,045 (-0,940)	1,881E-10 (1,277)	1,881E-10 (1,211)	0,002 (0,826)	-0,003 (-0,281)	0,043*** (3,298)
R Square	0,973	1,000	1,000	0,660	0,255	0,958
Durbin-Watson	2,041	2,222	2,222	1,936	2,168	2,026
N	270	270	270	270	270	270

Note: OLS estimates are shown in above table (t-statistics appear in parentheses).

*** p < 0.001; ** p < 0.005; * p < 0.01

D/E: Debt-to-equity ratio, SysRisk: Systematic risk, UnsysRisk: Unsystematic risk, TotalRisk: Total risk, WACC: Weighted average cost of capital, ROE: Return on equity, LnTE: Log of total equity, LnTD: log of total debt; LnTA: Log of total assets, LnTS: Log of total sales, LnRD: Log of research and development expenses, LnEBIT: Log of earnings before interest and taxes, FirmReturn: Firm's stock return, σ_m: Market standard deviation, R_e: Cost of equity, R_d: Cost of debt, FirmReturn/R_e: Firm's return-to-cost of equity, ETR: Effective corporate tax rate, ROA: Return on assets, FirmReturn/TotalRisk: Firm's return-to-total risk, TangibleAssetsRatio: Tangibles assets-to-total assets, Industrials: Industrials, HealthCare: Health care, RealEstate: Real Estate, ConsGoods: Consumer Goods, Technology: Technology, ConsServices: Consumer services, BasicMat: Basic material, Telecom: Telecommunication, Utilities: Utilities industry sector.

4.5 Full period

4.5.1 Descriptive statistics

The following table depicts the descriptive statistics regarding the whole period of the research covering 2005 – 2017 years. The company stock's return varied from -0.1% to 0.1% with the mean value equal to 0.07%. The total risk's mean was 2.24%, whilst unsystematic risk was 1.87% and systematic – 0.36%. Debt-to-equity ratio's mean was 138.42 implying that debt finance have been predominating over equity finance within the whole period. The reason for that might be explained in higher costs for equity compared to debt (1.6% and 0.92% respectively). Mean index of the firm's return-to-total risk ratio was -1.3% suggesting the that the higher the total risk was, the less return the company received. The estimated cost of equity capital's mean was 1.6% - the percentage investors expected to receive in average. The real return on equity was 16.8% for the full period. Weighted average cost of capital was 1.67%.

Table 14. Descriptive statistics - Full period

	N	*Range*	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*	*Variance*
LnTE	390	7,31	5,88	13,19	8,7814	1,70334	2,901
LnTD	390	9,09	4,60	13,69	8,9925	1,76229	3,106
LnTA	390	7,81	6,35	14,16	9,6132	1,71124	2,928
LnTS	390	8,30	5,31	13,62	9,3598	1,71957	2,957
LnRD	390	10,85	0,10	10,95	4,7485	2,65392	7,043
LnEBIT	387	12,68	-1,20	11,48	7,0104	2,05313	4,215
FirmRet	390	0,01	-0,01	0,01	0,0007	0,00150	0,000
MarkRet	390	0,00	0,00	0,00	0,0003	0,00086	0,000
σ_m	390	0,02	0,01	0,03	0,0130	0,00529	0,000
UnsysRisk	390	0,05	0,00	0,05	0,0187	0,00776	0,000
SysRisk	390	0,04	-0,01	0,03	0,0036	0,00566	0,000
TotRisk	390	0,08	0,00	0,08	0,0224	0,01212	0,000
R_e	390	0,12	-0,02	0,11	0,0160	0,02043	0,000
R_d	390	2,12	-1,43	0,70	0,0092	0,11519	0,013
FirmReturn/ R_e	390	6,83	-4,03	2,80	0,0561	0,50236	0,252
ETR	390	20,64	-9,12	11,51	0,2084	1,09059	1,189
ROE	390	1,06	-0,17	0,89	0,1680	0,13596	0,018
ROA	390	0,39	-0,08	0,32	0,0736	0,06246	0,004
FirmReturn/TotRisk	390	44,44	-29,89	14,55	-0,0130	2,02819	4,114
TangibleAssetsRatio	390	0,81	0,00	0,81	0,2482	0,20537	0,042
D/E	390	5,68	0,21	5,89	1,3842	0,68996	0,476
WACC	390	2,02	-0,23	1,79	0,0167	0,09498	0,009
Industrial	390	1,00	0,00	1,00	0,4000	0,49053	0,241
HelathCare	390	1,00	0,00	1,00	0,1333	0,34037	0,116
RealEstate	390	1,00	0,00	1,00	0,0333	0,17974	0,032
ConsumerGoods	390	1,00	0,00	1,00	0,1000	0,30039	0,090
Technology	390	1,00	0,00	1,00	0,0333	0,17974	0,032
ConsumerServices	390	1,00	0,00	1,00	0,0667	0,24976	0,062
BasicMaterial	390	1,00	0,00	1,00	0,1667	0,37316	0,139
Telecommunication	390	1,00	0,00	1,00	0,0333	0,17974	0,032
Utilities	390	1,00	0,00	1,00	0,0333	0,17974	0,032
Valid N (listwise)	387						

Note: LnTE: Log of total equity, LnTD: log of total debt; LnTA: Log of total assets, LnTS: Log of total sales, LnRD: Log of research and development expenses, LnEBIT: Log of earnings before interest and taxes, FirmReturn: Firm's stock return, σ_m: Market standard deviation, SysRisk: Systematic risk, UnsysRisk: Unsystematic risk, TotalRisk: Total risk, R_e: Cost of equity, R_d: Cost of debt, FirmReturn/R_e: Firm's return-to-cost of equity, ETR: Effective corporate tax rate, ROE: Return on equity, ROA: Return on assets, FirmReturn/TotalRisk: Firm's return-to-total risk, TangibleAssetsRatio: Tangibles assets-to-total assets, D/E: Debt-to-equity ratio, WACC: Weighted average cost of capital, Industrials: Industrials, HealthCare: Health care, RealEstate: Real Estate, ConsGoods: Consumer Goods, Technology: Technology, ConsServices: Consumer services, BasicMat: Basic material, Telecom: Telecommunication, Utilities: Utilities industry sector.

4.5.2 Correlation

Table 16 highlights the correlation analysis covering the whole period of the research. In terms of dependent variables, the following correlations were identified:

Debt-to-equity ratio was highly positively correlated with total debt, total sales and risk-free rate. Return on assets showed the negative correlation with the ratio. Firms' leverage was also dependent on industrials, health care, technology and basic material industry. This supported the idea of industry classification playing major role in capital structure. Tangible assets ratio was negatively correlated with the ratio which

demonstrated reverse relationship between capital structure and tangibility. This contradicted many previous empirical research, for instance works of Friend – Lang (1988), Rajan – Zingales (1995) and Titman – Wessels (1988). Systematic risk and return on equity also demonstrated positive correlation with debt-to-equity ratio. These correlations assisted in acceptance of hypotheses 1 and 7.

Systematic risk had positive correlation with risk-free rate, market standard deviation, unsystematic risk, total risk, return on assets and return on equity. Negative relationship was found for cost of equity, cost of debt, firm's return, market return and health care industry.

Unsystematic risk was strongly positively correlated with risk-free rate, market standard deviation, systematic, total risks, technology and basic material sectors. negatively correlated with total equity, total debt, total assets, R&D expenses, EBIT, total sales, firm's return and market return. The table illustrated that technology and basic material companies were more susceptible to the unsystematic risk when compared to industrials. Total risk was negatively associated with equity, debt, assets and R&D expenses of the company as well as with cost of equity, firm's return, market return. The returns both company and market were in reverse relation with risk which illustrated that the increased total risk reduced the returns. Positive correlation included risk-free rate, market standard deviation, technology and basic material sector. The latter one demonstrated that companies from mentioned industries were more vulnerable to the total risk influence.

The weighted average cost of capital had positive correlation with cost of debt and negative with effective corporate tax rate. The results also suggested that for the technology sector, the cost of capital was significantly higher.

Return on equity had negative correlation with equity, debt, assets of the company., risk-free rate, cost of equity and tangibility ratio. The latter case proposed that companies with more tangible assets had higher return on equity. Negative correlations with ROE comprised R&D expenses and EBIT of the company. Besides, industrials, technology, consumer services industries had superior ROE comparing to consumer

goods and basic material companies. was is positive significant correlation between debt-to-equity ratio and systematic risk with return on equity which supported the hypotheses 7 and 8.

Table 15. Correlation - Full period. Part 1.

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16
X1	1	,962**	,989**	,398**	,800**	,893**	,212**	,263**	0,070	0,003	0,002	-0,031	0,043	0,030	-,210**	-0,001
X2	,962**	1	,992**	,392**	,797**	,911**	,237**	,267**	,101*	-0,005	-0,022	-0,006	0,014	0,037	-,261**	0,005
X3	,989**	,992**	1	,403**	,806**	,912**	,230**	,269**	0,082	-0,002	-0,012	-0,018	0,027	0,034	-,239**	0,002
X4	,398**	,392**	,403**	1	,456**	,497**	,259**	,292**	,099*	0,089	-0,014	0,020	0,021	0,081	,179**	-0,018
X5	,800**	,797**	,806**	,456**	1	,823**	,154**	,151**	,101*	0,048	-0,037	0,020	0,057	0,023	,176**	0,011
X6	,893**	,911**	,912**	,497**	,823**	1	,239**	,248**	,113*	-0,010	-0,026	0,029	0,048	0,064	-0,086	-0,004
X7	,212**	,237**	,230**	,259**	,154**	,239**	1	,877**	,103*	-,192**	-,279**	,361**	-0,082	,108*	-,161**	-0,012
X8	,263**	,267**	,269**	,292**	,151**	,248**	,877**	1	0,075	-0,019	0,020	,104*	-0,017	,144**	-,205**	-0,014
X9	0,070	,101*	0,082	,099*	,101*	,113*	,103*	0,075	1	0,015	-0,021	0,039	0,010	-0,095	-,105*	-0,006
X10	0,003	-0,005	-0,002	0,089	0,048	-0,010	-,192**	-0,019	0,015	1	,565**	-,294**	,306**	-0,050	,167**	-0,024
X11	0,002	-0,022	-0,012	-0,014	-0,037	-0,026	-,279**	0,020	-0,021	,565**	1	-,611**	,251**	0,016	-0,005	-0,001
X12	-0,031	-0,006	-0,018	0,020	0,020	0,029	,361**	,104*	0,039	-,294**	-,611**	1	-0,059	-0,008	0,026	0,056
X13	0,043	0,014	0,027	0,021	0,057	0,048	-0,082	-0,017	0,010	,306**	,251**	-0,059	1	-0,030	,103*	0,014
X14	0,030	0,037	0,034	0,081	0,023	0,064	,108*	,144**	-0,095	-0,050	0,016	-0,008	-0,030	1	-0,077	0,008
X15	-,210**	-,261**	-,239**	,179**	,176**	-0,086	-,161**	-,205**	-,105*	,167**	-0,005	0,026	,103*	-0,077	1	-0,023
X16	-0,001	0,005	0,002	-0,018	0,011	-0,004	-0,012	-0,014	-0,006	-0,024	-0,001	0,056	0,014	0,008	-0,023	1
X17	0,049	0,000	0,020	-,404**	-,109*	0,031	-0,044	-0,051	0,021	-0,084	0,015	-0,007	0,011	-0,003	-,195**	-0,013
Z1	,276**	,376**	,335**	,208**	,318**	,386**	0,037	-0,013	0,026	0,095	0,000	0,000	0,003	-0,048	-0,033	-0,014
Z2	0,017	-0,078	-0,028	,238**	0,020	-0,032	,181**	,245**	0,095	-0,017	0,000	0,000	-,142**	0,052	0,068	0,004
Z3	0,041	0,050	0,044	-,326**	0,006	-,205**	-0,086	-0,059	-0,015	-0,003	0,000	0,000	0,002	-0,061	-0,071	0,002
Z4	-0,064	-0,045	-0,057	-0,024	-,102*	-0,084	-0,073	-0,079	0,013	-0,045	0,000	0,000	0,036	-0,053	-,196**	0,003
Z5	-,221**	-,259**	-,245**	0,094	-0,079	-,141**	-0,086	-,100*	0,075	0,063	0,000	0,000	0,050	-0,072	,443**	0,002
Z6	-,188**	-,210**	-,198**	-0,044	-0,075	-0,062	-,124*	-,112*	-,160**	-0,002	0,000	0,000	0,046	-0,015	,329**	0,006
Z7	-0,035	-0,063	-0,055	-,202**	-,192**	-0,049	-0,027	-0,036	-0,051	-0,059	0,000	0,000	0,056	,134**	-,263**	0,005
Z8	-,209**	-,202**	-,210**	-,175**	-,125*	-,222**	0,039	0,051	0,009	-0,032	0,000	0,000	-0,017	0,004	0,059	0,004
Z9	0,047	0,027	0,035	-0,089	-0,040	-0,096	0,039	0,042	-0,015	-0,058	0,000	0,000	-0,014	-0,005	-0,052	0,001
Y1	-0,056	,195**	0,090	0,077	0,058	,150**	,118*	0,030	0,058	-0,036	-0,097	0,085	-0,097	0,032	-,158**	0,023
Y2	-0,030	-0,004	-0,015	-0,024	0,053	0,046	,169**	-,278**	-0,004	-,374**	-,628**	,603**	-,115*	-0,045	,106*	0,005
Y3	-,207**	-,230**	-,219**	-,179**	-,193**	-,162**	,206**	-0,076	-0,009	-,205**	-,362**	,599**	-0,013	-0,015	0,017	0,042
Y4	-,147**	-,149**	-,147**	-,126*	-0,099	-0,082	,211**	-,179**	-0,007	-,306**	-,525**	,665**	-0,062	-0,030	0,060	0,029
Y5	-0,011	-0,027	-0,021	0,030	0,022	-0,001	0,090	0,068	,461**	0,040	0,006	0,010	0,018	-,416**	0,049	-0,007
Y6	-,212**	-,168**	-,187**	,206**	,220**	-0,006	-,135**	-,207**	-0,049	,125*	-0,047	0,066	0,048	-0,059	,900**	-0,014

Table 16. Correlation - Full period. Part 2.

	X17	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Y1	Y2	Y3	Y4	Y5	Y6
X1	0,049	,276**	0,017	0,041	-0,064	-,221**	-,188**	-0,035	-,209**	0,047	-0,056	-0,030	-,207**	-,147**	-0,011	-,212**
X2	0,000	,376**	-0,078	0,050	-0,045	-,259**	-,210**	-0,063	-,202**	0,027	,195**	-0,004	-,230**	-,149**	-0,027	-,168**
X3	0,020	,335**	-0,028	0,044	-0,057	-,245**	-,198**	-0,055	-,210**	0,035	0,090	-0,015	-,219**	-,147**	-0,021	-,187**
X4	-,404**	,208**	,238**	-,326**	-0,024	0,094	-0,044	-,202**	-,175**	-0,089	0,077	-0,024	-,179**	-,126*	0,030	,206**
X5	-,109*	,318**	0,020	0,006	-,102*	-0,079	-0,075	-,192**	-,125*	-0,040	0,058	0,053	-,193**	-0,099	0,022	,220**
X6	0,031	,386**	-0,032	-,205**	-0,084	-,141**	-0,062	-0,049	-,222**	-0,096	,150**	0,046	-,162**	-0,082	-0,001	-0,006
X7	-0,044	0,037	,181**	-0,086	-0,073	-0,086	-,124*	-0,027	0,039	0,039	,118*	,169**	,206**	,211**	0,090	-,135**
X8	-0,051	-0,013	,245**	-0,059	-0,079	-,100*	-,112*	-0,036	0,051	0,042	0,030	-,278**	-0,076	-,179**	0,068	-,207**
X9	0,021	0,026	0,095	-0,015	0,013	0,075	-,160**	-0,051	0,009	-0,015	0,058	-0,004	-0,009	-0,007	,461**	-0,049
X10	-0,084	0,095	-0,017	-0,003	-0,045	0,063	-0,002	-0,059	-0,032	-0,058	-0,036	-,374**	-,205**	-,306**	0,040	,125*
X11	0,015	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	-0,097	-,628**	-,362**	-,525**	0,006	-0,047
X12	-0,007	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,085	,603**	,599**	,665**	0,010	0,066
X13	0,011	0,003	-,142**	0,002	0,036	0,050	0,046	0,056	-0,017	-0,014	-0,097	-,115*	-0,013	-0,062	0,018	0,048
X14	-0,003	-0,048	0,052	-0,061	-0,053	-0,072	-0,015	,134**	0,004	-0,005	0,032	-0,045	-0,015	-0,030	-,416**	-0,059
X15	-,195**	-0,033	0,068	-0,071	-,196**	,443**	,329**	-,263**	0,059	-0,052	-,158**	,106*	0,017	0,060	0,049	,900**
X16	-0,013	-0,014	0,004	0,002	0,003	0,002	0,006	0,005	0,004	0,001	0,023	0,005	0,042	0,029	-0,007	-0,014
X17	1	-,198**	0,019	-,224**	-,116*	-,143**	-,181**	,476**	0,050	,280**	-,191**	0,007	0,047	0,033	-0,019	-,248**
Z1	-,198**	1	-,320**	-,152**	-,272**	-,152**	-,218**	-,365**	-,152**	-,152**	,376**	0,098	-,146**	-0,048	-0,038	,112*
Z2	0,019	-,320**	1	-0,073	-,131**	-0,073	-,105*	-,175**	-0,073	-0,073	-,236**	-,134**	-0,017	-0,074	0,044	-0,001
Z3	-,224**	-,152**	-0,073	1	-0,062	-0,034	-0,050	-0,083	-0,034	-0,034	-0,005	-0,048	-0,016	-0,033	0,002	-0,070
Z4	-,116*	-,272**	-,131**	-0,062	1	-0,062	-0,089	-,149**	-0,062	-0,062	0,015	0,014	0,010	0,013	-0,020	-,208**
Z5	-,143**	-,152**	-0,073	-0,034	-0,062	1	-0,050	-0,083	-0,034	-0,034	-,149**	0,037	,146**	,110*	,243**	,337**
Z6	-,181**	-,218**	-,105*	-0,050	-0,089	-0,050	1	-,120*	-0,050	-0,050	-0,028	-0,031	0,018	-0,003	-0,069	,306**
Z7	,476**	-,365**	-,175**	-0,083	-,149**	-0,083	-,120*	1	-0,083	-0,083	-,149**	0,042	,169**	,128*	-0,038	-,314**
Z8	0,050	-,152**	-0,073	-0,034	-0,062	-0,034	-0,050	-0,083	1	-0,034	-0,022	-0,046	-0,061	-0,061	0,000	0,067
Z9	,280**	-,152**	-0,073	-0,034	-0,062	-0,034	-0,050	-0,083	-0,034	1	-0,081	-0,023	-0,028	-0,029	-0,015	-0,063
Y1	-,191**	,376**	-,236**	-0,005	0,015	-,149**	-0,028	-,149**	-0,022	-0,081	1	,106*	-0,059	0,012	-0,056	,204**
Y2	0,007	0,098	-,134**	-0,048	0,014	0,037	-0,031	0,042	-0,046	-0,023	,106*	1	,622**	,865**	0,014	,140**
Y3	0,047	-,146**	-0,017	-0,016	0,010	,146**	0,018	,169**	-0,061	-0,028	-0,059	,622**	1	,931**	0,060	-0,033
Y4	0,033	-0,048	-0,074	-0,033	0,013	,110*	-0,003	,128*	-0,061	-0,029	0,012	,865**	,931**	1	0,045	0,044
Y5	-0,019	-0,038	0,044	0,002	-0,020	,243**	-0,069	-0,038	0,000	-0,015	-0,056	0,014	0,060	0,045	1	0,014
Y6	-,248**	,112*	-0,001	-0,070	-,208**	,337**	,306**	-,314**	0,067	-0,063	,204**	,140**	-0,033	0,044	0,014	1

Note: ** p < 0.01; * p < 0.05

X1: LnTE, X2: LnTD, X3: LnTA, X4: LnRD, X5: LnEBIT, X6: LnTS, X7: $\boldsymbol{R_f}$, X8: $\boldsymbol{R_e}$, X9: $\boldsymbol{R_d}$, X10: FirmReturn, X11: MarketReturn, X12: $\boldsymbol{\sigma_m}$, X13: FirmReturn/ $\boldsymbol{R_e}$, X14: ETR, X15: ROA, X16: FirmReturn/TotalRisk, X17: TangibleAssetsRatio,

Z1: Industrials, Z2: HelathCare, Z3: RealEstate, Z4: ConsumerGoods, Z5: Technology, Z6: ConsumerServives, Z7: BasicMaterial, Z8: Telecommunication, Z9: Utilities,

Y1: D/E, Y2: SystematicRisk, Y3: UnsystematicRisk, Y4: TotalRisk, Y5: WACC, Y6: ROE.

Number of observations N = 390.

4.5.3 The multivariate OLS model analysis

The multivariate OLS analysis provided analysis of dependent variables and their regression with independent variables. The table 18 denotes the regression matrix for the full period. From the table, it can be concluded that debt-to-equity ratio or company's leverage was highly dependent on total equity, total debt and total assets of the company. The former two had negative association and latter one – positive. It was also visible that return on equity had causal relationship with debt-to-equity. The negative association with capital structure showed return on assets ratio and health care industry. Regarding systematic risk, there was negative association with unsystematic risk and cost of equity. Whereas the total risk had positive causal relationship with systematic risk. Total risk had high dependence on company's total debt, total sales, R&D expenses and tangibility. Hence, total risk was increased when total debt, R&D and the number of tangible assets were low, but conversely when total sales were raised. The table revealed strong causal relationship between return on equity and return on assets showing that the higher return on assets, the higher return on equity of the company. The adjusted R-square value varied from 0,766 to 1,000 which was reasonable and denoted to the fit of the study. Durbin-Watson index varied from 1,814 to 2,196 which made research paper valid.

Table 17. OLS model - Full period

	D/E	*SysRisk*	*UnsysRIsk*	*TotalRisk*	*WACC*	*ROE*
(Constant)	-3,120 (-24,305)	-4,401E-10 (-2,359)	-4,401E-10 (-1,968)	0,008 (2,528)	0,041 (0,780)	0,044 (0,731)
LnTE	-3,886*** (-48,740)	-5,826E-12 (-0,055)	-5,826E-12 (-0,046)	0,003 (1,783)	-0,009 (-0,718)	0,076 (1,197)
LnTD	-1,730*** (-21,340)	3,037E-11 (0,283)	3,037E-11 (0,236)	-0,005* (-2,761)		0,069 (1,977)
LnTA	5,623*** (36,606)					-0,167 (-1,736)
LnTS	0,006 (0,380)	8,790E-12 (0,182)	8,790E-12 (0,152)	0,003** (3,072)	0,003 (0,198)	0,000 (0,137)
LnRD	0,001 (0,199)	-8,985E-12 (-0,781)	-8,985E-12 (-0,652)	-0,001*** (-3,536)	-0,001 (-0,231)	0,003 (1,486)
LnEBIT	0,002 (0,274)	9,215E-12 (0,447)	9,215E-12 (0,373)	0,000 (-1,300)	0,007 (1,237)	0,019 (4,219)
FirmRet	1,868 (0,406)	9,810E-09 (0,713)	9,810E-09 (0,595)	0,173 (0,722)		-1,461 (-1,102)

σ_m	0,485 (0,300)	5,497E-09 (1,139)	5,497E-09 (0,950)	0,864 (12,004)	-0,876 (-0,670)	0,835 (1,796)
UnsystRisk	1,332 (1,107)	-1,000*** (-99244879,576)				-0,691 (-1,996)
SysRisk	-0,652 (-0,228)		-1,000*** (-82783076,698)		0,176 (0,092)	-0,130 (-0,157)
Total Risk		1,000*** (116924260,722)	1,000 (231474013,790)		0,209 (0,214)	
R_e	0,392 (0,265)	-1,157E-08* (-2,627)	-1,157E-08 (-2,191)	-0,735 (-18,318)		-0,211 (-0,494)
R_d	0,139 (2,202)	-5,536E-11 (-0,300)	-5,536E-11 (-0,250)	-0,004 (-1,281)		0,023 (1,281)
FirmReturn/ R_e	-0,002 (-0,169)	-2,114E-12 (-0,057)	-2,114E-12 (-0,047)	0,000 (0,502)	0,005 (0,473)	-0,002 (-0,604)
ETR	0,004 (0,628)	4,098E-11 (2,236)	4,098E-11 (1,865)	0,000 (0,517)	-0,054 (-0,361)	-0,002 (-0,911)
ROE	0,885*** (5,000)	-4,597E-10 (-0,844)	-4,597E-10 (-0,704)	-0,019 (-2,009)	-0,095 (-0,291)	
ROA	-1,672*** (-4,257)	7,870E-10 (0,655)	7,870E-10 (0,546)	0,031 (1,461)	0,013 (0,337)	1,998*** (41,236)
FirmReturn/ TotalRisk	0,000 (-0,140)	-8,060E-13 (-0,095)	-8,060E-13 (-0,079)	2,413E-05 (0,160)	0,000 (-0,155)	-5,448E-05 (-0,066)
Tangible Assets/ TotalAssets	0,033 (0,679)	3,853E-11 (0,265)	3,853E-11 (0,221)	-0,009*** (-3,567)		-0,018 (-1,290)
D/E		7,851E-11 (1,083)	7,851E-11 (0,903)	0,002 (1,359)	-0,001 (-0,090)	0,074*** (5,000)
WACC	0,000 (0,006)	1,362E-10 (0,576)	1,362E-10 (0,481)	0,002 (0,538)		-0,028 (-1,238)
Industrials						
HealthCare	-0,011* (-0,465)	1,027E-10 (1,449)	1,027E-10 (1,208)	0,002 (1,383)	0,011 (0,615)	0,014 (2,064)
RealEstate	0,023 (0,449)	-1,366E-10 (-0,881)	-1,366E-10 (-0,735)	0,001 (0,473)	0,013 (0,311)	0,035 (2,343)
ConsGoods	0,024 (1,110)	-1,123E-11 (-0,172)	-1,123E-11 (-0,144)	0,001 (0,546)	-0,004 (-0,248)	-0,012 (-1,894)
Technology	0,060 (1,384)	2,716E-10 (2,085)	2,716E-10 (1,739)	0,004 (1,879)	0,149*** (4,260)	-0,032 (-2,544)
ConsServ	-0,001 (-0,041)	1,662E-10 (1,799)	1,662E-10 (1,501)	-0,002 (-1,335)	-0,005 (-0,220)	-0,009 (-1,046)
BasicMat	0,040 (1,794)	4,134E-11 (0,624)	4,134E-11 (0,521)	0,004 (3,658)	-0,012 (-0,665)	0,002 (0,285)
Telecom	0,026 (0,703)	8,930E-11 (0,822)	8,930E-11 (0,686)	-0,001 (-0,623)	0,002 (0,071)	0,018 (1,706)
Utilities	0,033 (0,771)	1,653E-10 (1,287)	1,653E-10 (1,074)	0,004 (1,704)	-0,007 (-0,190)	0,041*** (3,319)
R Square	0,975	1,000	1,000	0,766	0,087	0,945
Durbin-Watson	2,108	2,196	2,196	1,814	1,977	2,004
N	390	390	390	390	390	390

Note: OLS estimates are shown in above table (t-statistics appear in parentheses).

*** p < 0.001; ** p < 0.005; * p < 0.01

D/E: Debt-to-equity ratio, SysRisk: Systematic risk, UnsysRisk: Unsystematic risk, TotalRisk: Total risk, WACC: Weighted average cost of capital, ROE: Return on equity, LnTE: Log of total equity, LnTD: log of total debt; LnTA: Log of total assets, LnTS: Log of total sales, LnRD: Log of research and development expenses, LnEBIT: Log of earnings before interest and taxes, FirmReturn: Firm's stock return, σ_m: Market standard deviation, R_e: Cost of equity, R_d: Cost of debt, FirmReturn/R_e: Firm's return-to-cost of equity, ETR: Effective corporate tax rate, ROA: Return on assets, FirmReturn/TotalRisk: Firm's return-to-total risk, TangibleAssetsRatio: Tangibles assets-to-total assets, Industrials: Industrials, HealthCare: Health care, RealEstate: Real Estate, ConsGoods: Consumer Goods, Technology: Technology, ConsServices: Consumer services, BasicMat: Basic material, Telecom: Telecommunication, Utilities: Utilities industry sector.

5 Conclusions

This section intends to clarify the summary of the examination performed so as to answer the research questions and test predetermined hypotheses. Besides, the section explains the practical implications of this study along with its limitations. Towards the finish of the section, a few suggestions have been accommodated for the future research.

5.1 Summary of key findings

The primary goal of the thesis was to determine the effects of the financial crisis on corporate capital structures. The theoretical and empirical analysis assisted the author in achieving the main targets of the work. To sum up the key findings of the research work, the research questions are individually answered in this sub-section.

1. Has the corporate capital structure changes during the financial crisis and post crisis when compared to the same in pre-crisis sub-period?

In order to answer this question, the author resorted to the descriptive statistics of three sub-periods. Since the capital structure of the firm is represented in the debt-to-equity ratio, this ratio was used for the thorough analysis. The statistics suggested that debt-to-equity ratio has been fluctuating throughout the whole period. Hence, when figures of during crisis and post-crisis were compared to the same in pre-crisis period, solid changes could be distinguished.

2. What type of changes corporate capital structure has experienced?

Answering this question, it is crucial to show the numeric outcomes of the descriptive statistics. Thus, debt-to-equity ratio's mean had the following values in pre-crisis, during and post-crisis sub-periods respectively: 148.93%, 165.69% and 130.00%. The figure for the full period was 138.42%. The numbers signified the sharp increase in proportion of debt financing during the financial crisis – the change was in 16.76%. This suggests that there was a trend of borrowing more money from lending institutions during the

financial instability. After the crisis, however, there was a substantial drop in the debt-to-equity ratio even when compared to the pre-crisis period (decrease by 18.93%). This illustrates that from 2009 to 2017, in average, debt financing was less significant than before the crisis. Hereby, the corporate capital structure has increased by 16.76% during the crisis and declined by 18.93% after the crisis in comparison to the pre-crisis sub-period.

3. What are the effects of changing corporate capital structure on the risk and return during three sub-periods.

With the respect to the latter research question, it is worth to test the hypotheses of the study beforehand relying on the results of the inferential analysis during three sub-periods.

The first hypothesis states that: “The nature risk faced by the firm affects its capital structure”. The hypothesis must be rejected because the correlation and multivariate OLS analysis did not show any significant interdependencies between debt-to-equity ratio and risks variables, including systematic, unsystematic and total risks.

The second hypothesis suggests that: “Systematic risk of a firm is affected by its capital structure.” In order to test this hypothesis, the inferential statistics, particularly systematic risk correlation and regression with debt-to-equity ratio was evaluated. Nonetheless, no significant correlation or association was found. The hypothesis, therefore, is rejected.

Hypotheses three and four are the following:

H_3: Unsystematic risk of a firm is affected by its capital structure.

H_4: Total risk of a firm is affected by its capital structure.

Similarly to the systematic risk, the analysis was implemented with the regard to the unsystematic and the total risks. However, no significant correlation or association was detected. Hence, these hypotheses are rejected.

Hypotheses five and six are concerning the weighted average cost of capital and the relationship with the capital structure and its nature of risk:

H_5: Cost of capital of a firm is affected by its capital structure;

H_6: Cost of capital of a firm is affected by its nature of risk.

Thereby, the relationship between the WACC figure and debt-to-equity ratio as well as the WACC and risk values were researched. However, the correlation matrix and OLS regression models did not denote any significant relationships regarding the WACC indicators. The hypotheses five and six, hence, are rejected.

Last two hypotheses were aimed at testing the relationship of return on equity with the capital structure and the risks values:

H_7: Return on equity of a firm is affected by its capital structure;

H_8: Return on equity of a firm is affected by its nature of risk;

The outcomes (see tables 4, 5, 6, 9, 10, 12, 16 and 17) showed that there was significant correlation between return on equity and debt-to-equity ratio during crisis (0,266 with 1% significance level), post-crisis (0,257 with 5% significance level) and during full period (0,204 with 5% significance level). Besides, OLS models also signified strong association between the two variables. Thus, the estimated coefficient for during crisis was 0,032 with 5% significance level, in the post crisis sub-period – 0,084 with 1% significance level and during the full period – 0,074 with 1% significance level (see tables 6,10,14 and 18). Moreover, the relation between return on equity and systematic risk was identified. In the pre-crisis, correlation coefficient was 0,335 and during full periods – 0,140 both with 1%significance level. Consequently, the hypotheses seven and eight are accepted.

To conclude, the corporate capital structure experienced changes from very high leverage ratios in pre-crisis to further higher during crisis to the least significant figure after the crisis. The results disclosed that changes in the capital structure has not influenced the risk and returns of the companies except for the return on equity ratio. Besides, the work revealed that the risks did not impact the capital structure either. Thereby, the results represented only one positive association with capital structure

which is the association with return on equity. It was also explored that systematic risk has causal relationship with return on equity.

5.2 Practical implications

Financial crisis and its impact, in general, has been one of the major research topics once the global economic shakedown took place. Besides, the capital structure and the decision of the company affecting its capital structure has always been a subject of interest for many researches and organisations. There have been mixed results on the evidence of factors that impact the capital structure of a company. Furthermore, the effect of financial crisis of 2007-08 has not been explored thoroughly before. This particular study can be an advantage to the already extensive literature regarding the capital structure theories. However, the results are particularly concerned with the Nordic countries, namely Finland, Denmark, Sweden and Ireland.

Foremost, the finding of the research may be of interest to financial and business researchers. Since the results of the thesis introduced some concrete aspects regarding capital structure to take into consideration.

Furthermore, these results of this thesis are particularly useful for corporations. By acknowledgement of the finding of this study might allow the firms to consider the trends of other companies during crisis and afterwards. The work illustrates how the crisis affected companies' capital structure, risks and returns. By thoroughly studying the tremendous effects of the crisis, the companies might be able to be prepared whenever any new financial instability hits the economy.

Besides researches and companies, the research might be useful for the investors and financial analysts. The work is beneficial since it provides with the companies' behaviour which reflects in the returns for the investors. Thereby, the investors who familiarise themselves with the research might obtain some advantages of predicting the future company's or market moves.

5.3 Limitations and recommendations

The list of limitations and recommendation based on them are represented in this chapter. The thesis is limited to using only 30 sample companies in Nordic countries. Overall, the research doesn't cover all existing companies and it could not represent the full market picture. It could also be difficult to apply research results to another countries or companies. However, for companies across Nordic, or any other companies with similar business culture the results could be applicable. The fact that financing decisions are grounded primarily on international terms enhances the argument. Besides, there are risks such as the relationship between variables could suffer from a reversed association problem. The reversed association problem is present if one variable affects another one at the same time the second one affects the first one. The existence of reversed association might obstruct the validity of the results, as it makes the outcome less reliable.

The limitations of the research broaden the opportunities for the future research. In this work, debt-to-equity ratio was used as the measure of capital structure. A way to dig deeper into the subject is to do similar research with other variables, for instance, with debt-to-total assets. It could be interesting to implement research with other explanatory variables. Since there is a large amount of existing studies on the topic there is also a large amount of control variables that could have been investigated on other data or in other combinations. Besides, the research is limited regarding distinguishing between shot-term and long-term debt. Therefore, this could be considered in the future. Since one of the limitation mentioned is sampling, the recommendation for future research could be to perform similar analysis for all Nordic countries to see the full market conditions. It could also be interesting and valuable to see similar research for other parts of the world.

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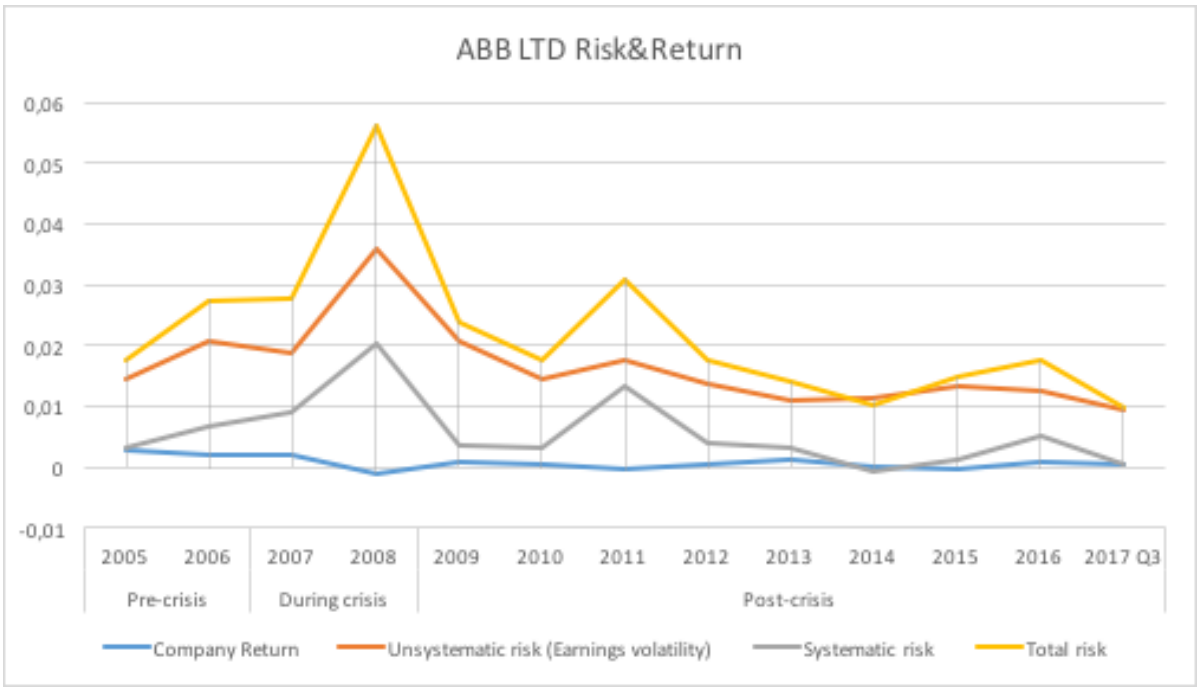
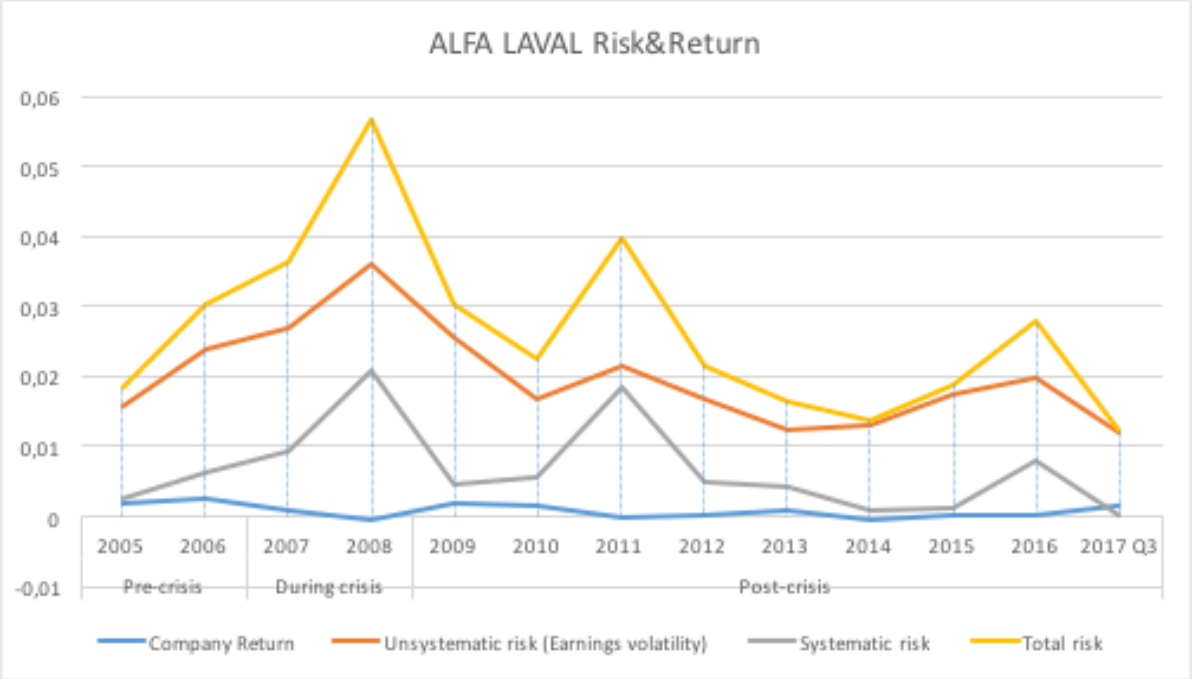
Appendices

Appendix 1. ABB LTD Risk & Return



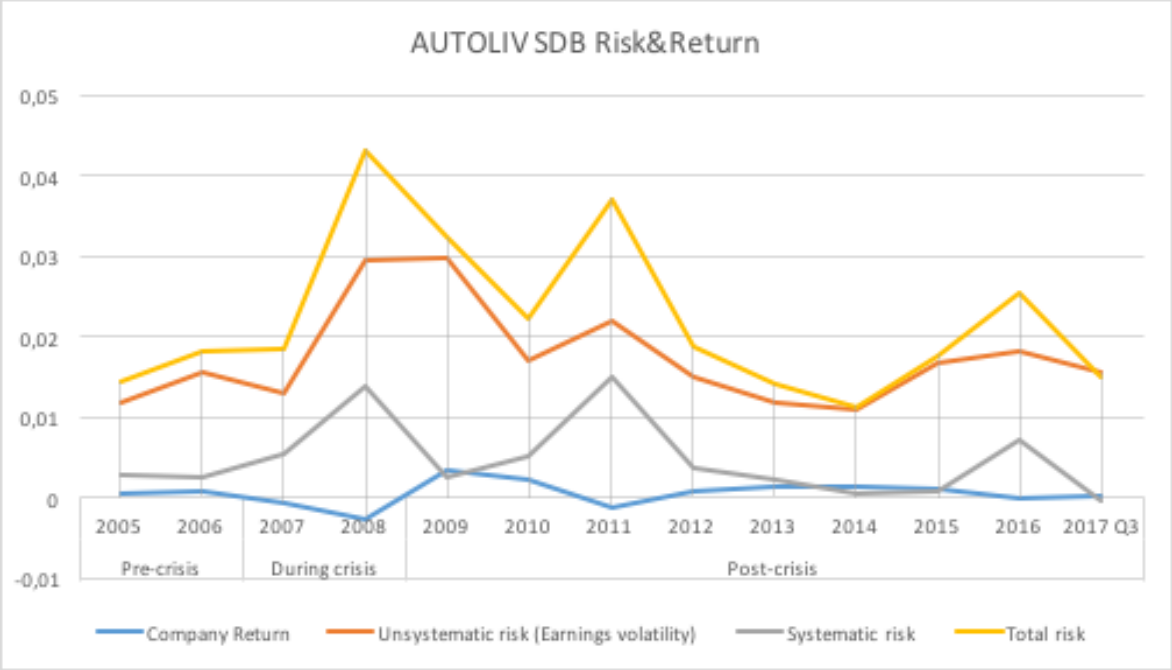
Note: Calculations are made by the author. The data is retrieved from the ABB LTD company's annual report.

Appendix 2. ALFA LAVAL Risk & Return



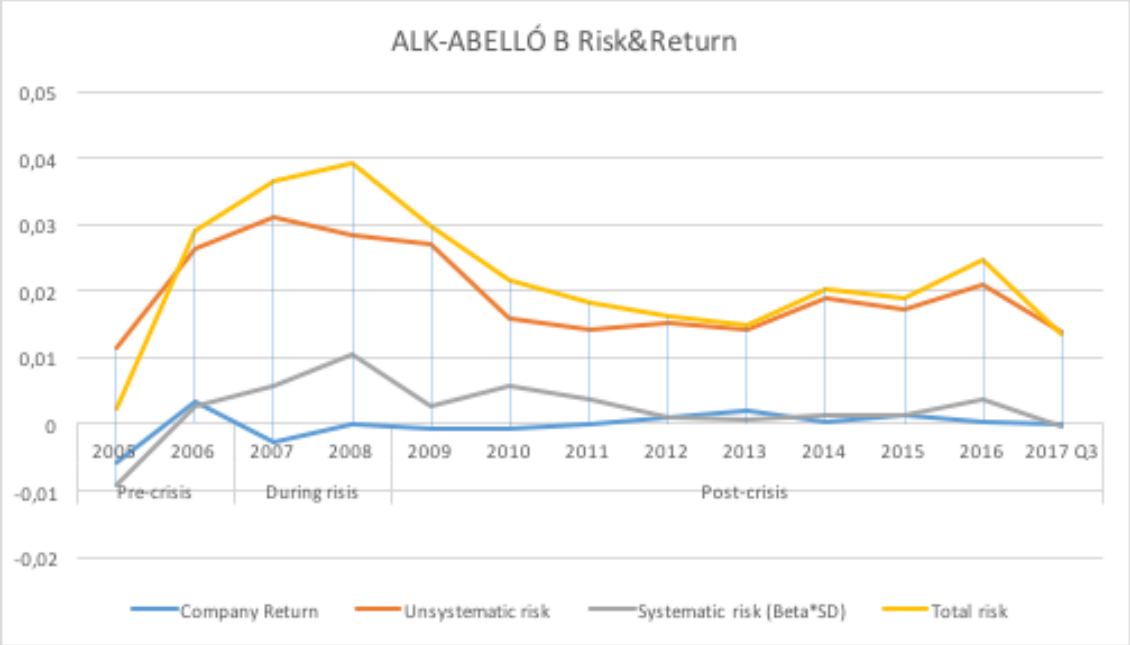
Note: Calculations are made by the author. The data is retrieved from the ALFA LAVAL company's annual report.

Appendix 3. AUTOLIV SDV Risk & Return



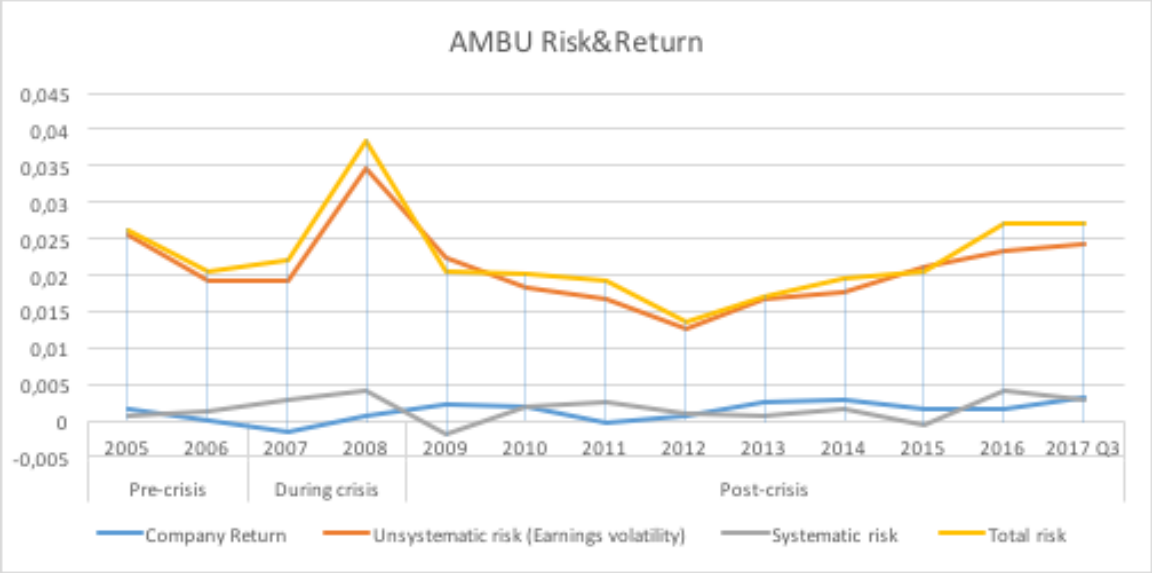
Note: Calculations are made by the author. The data is retrieved from the AUTOLIV SDV company's annual report.

Appendix 4. ALK-ABELLO B Risk & Return



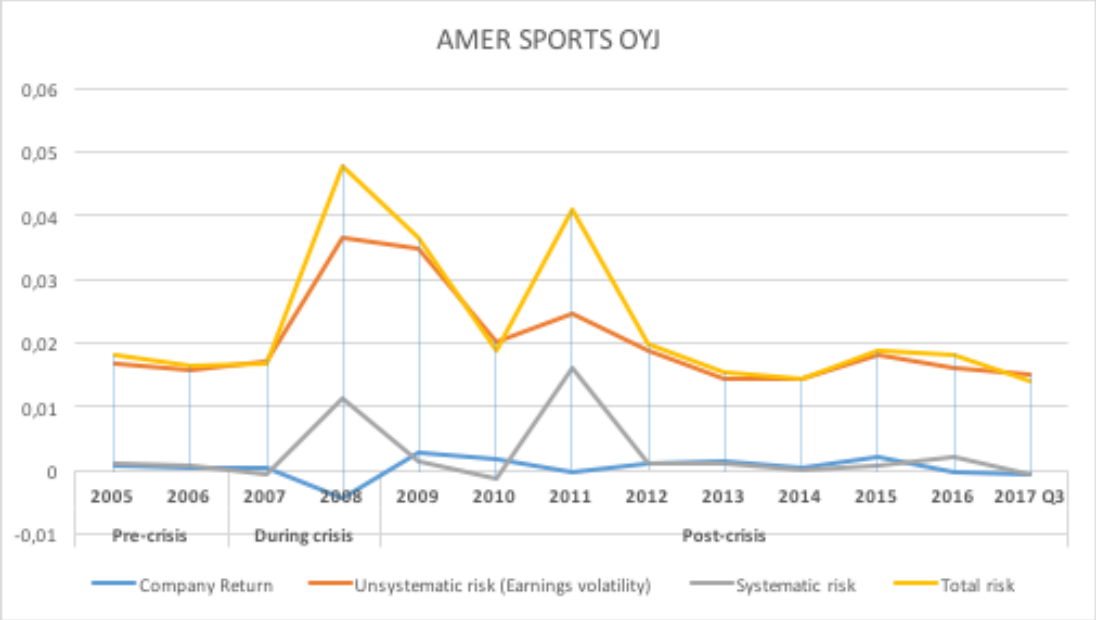
Note: Calculations are made by the author. The data is retrieved from the ALK-ABELLO B company's annual report.

Appendix 5. AMBU Risk & Return



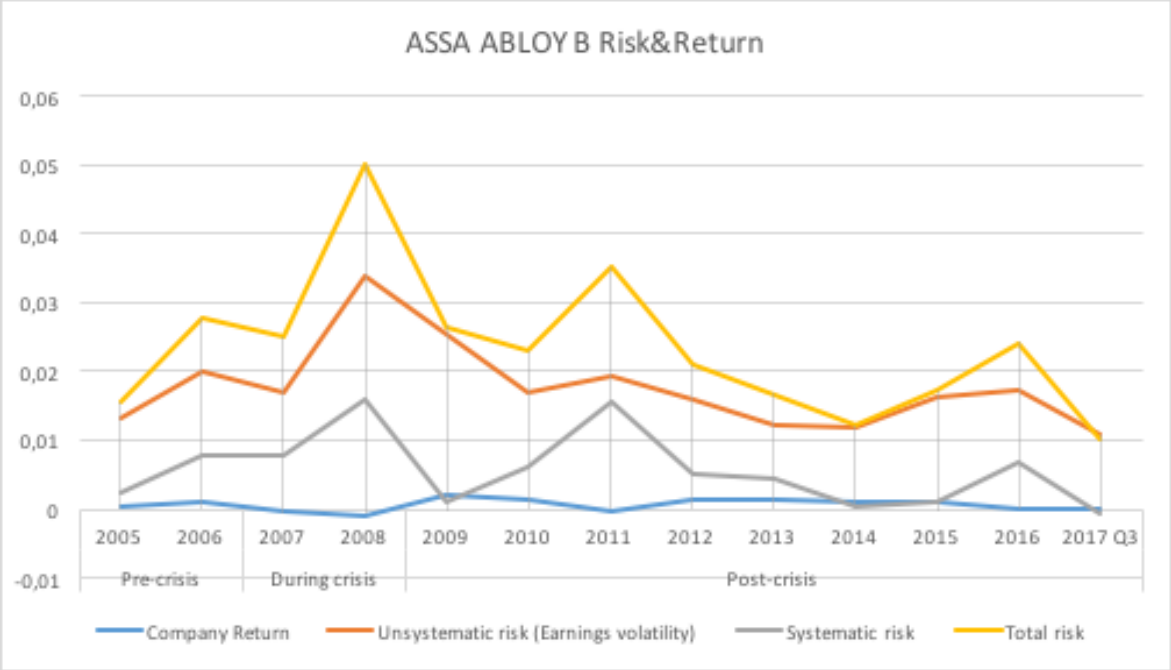
Note: Calculations are made by the author. The data is retrieved from the AMBU company's annual report.

Appendix 6. AMER SPORTS Risk & Return



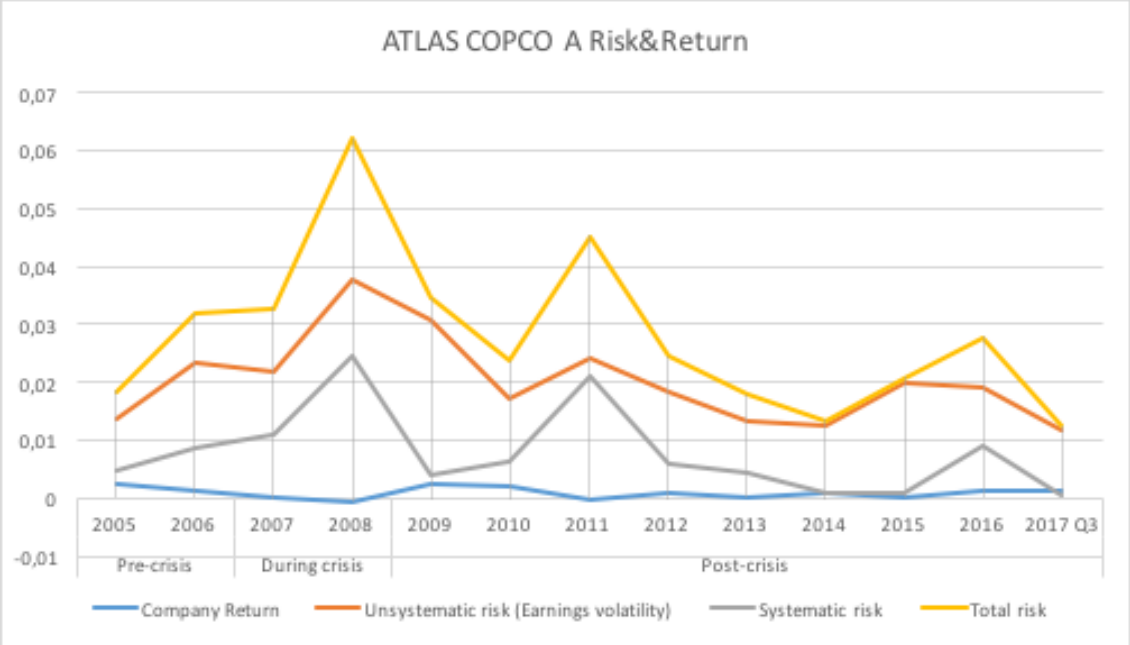
Note: Calculations are made by the author. The data is retrieved from the MAER SPORTS company's annual report.

Appendix 7. ASSA ABLOY B Risk & Return



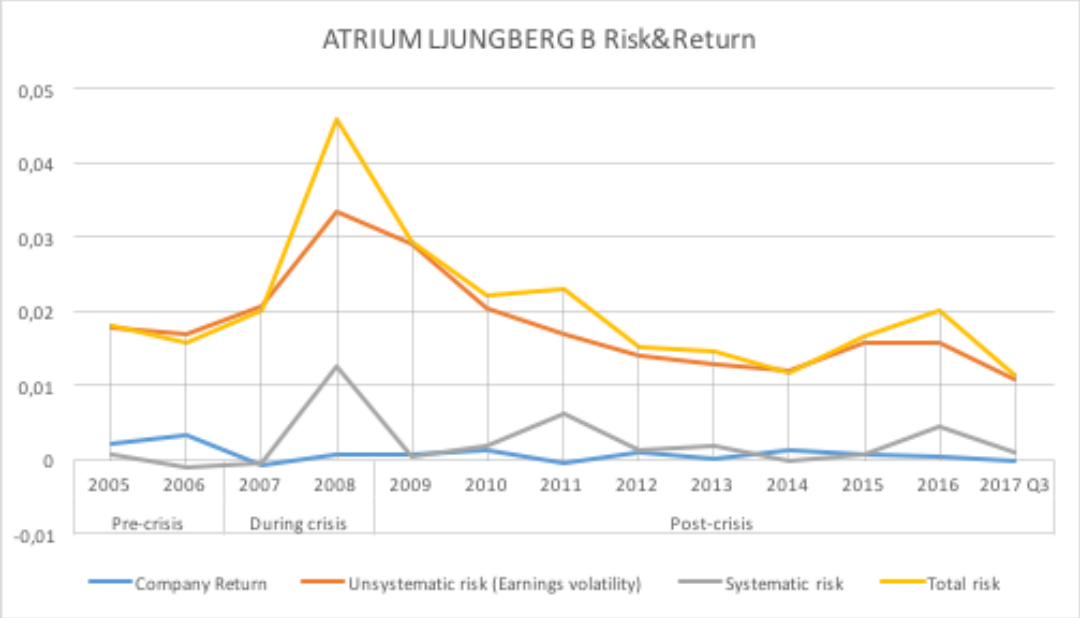
Note: Calculations are made by the author. The data is retrieved from the ASSA ABLOY B company's annual report.

Appendix 8. ATLAS COPCO A Risk & Return



Note: Calculations are made by the author. The data is retrieved from the ATLAS COPCO A company's annual report.

Appendix 9. ATRIUM LJUNGBERG B Risk & Return

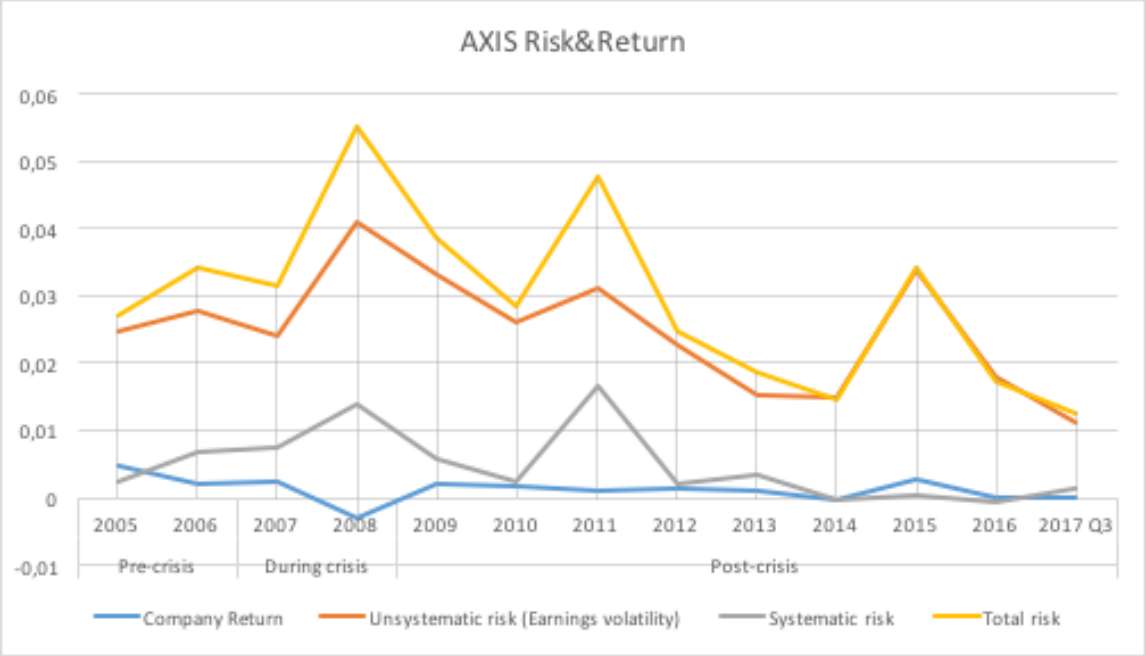


Note: Calculations are made by the author. The data is retrieved from the ATRIUM LJUNGBERG B company's annual report.

Appendix 10. AXFOOD Risk & Return

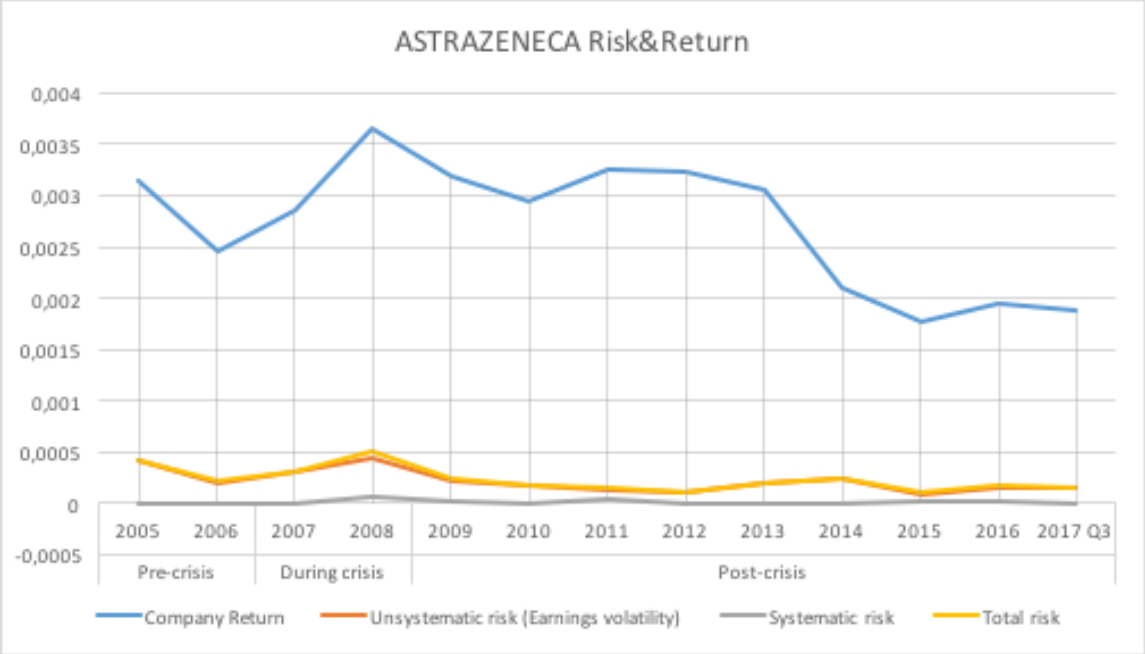
Note: Calculations are made by the author. The data is retrieved from the AXFOOD company's annual report.

Appendix 11. AXIS Risk & Return



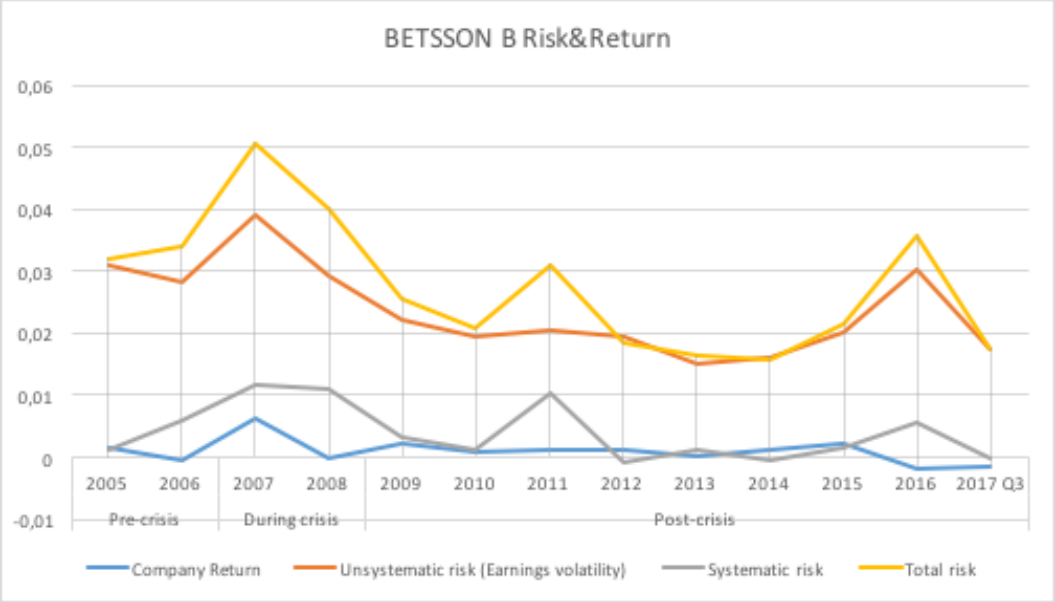
Note: Calculations are made by the author. The data is retrieved from the AXIS company's annual report.

Appendix 12. ASTRAZENECA Risk & Return



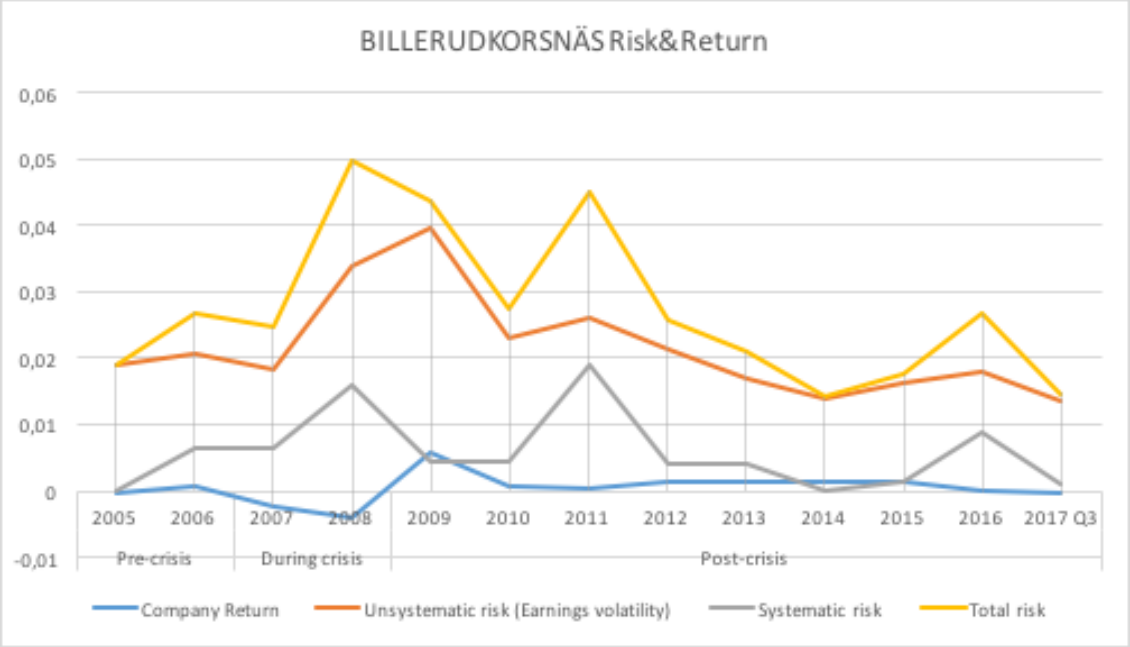
Note: Calculations are made by the author. The data is retrieved from the ASTRAZENECA company's annual report.

Appendix 13. BETSSON B Risk & Return



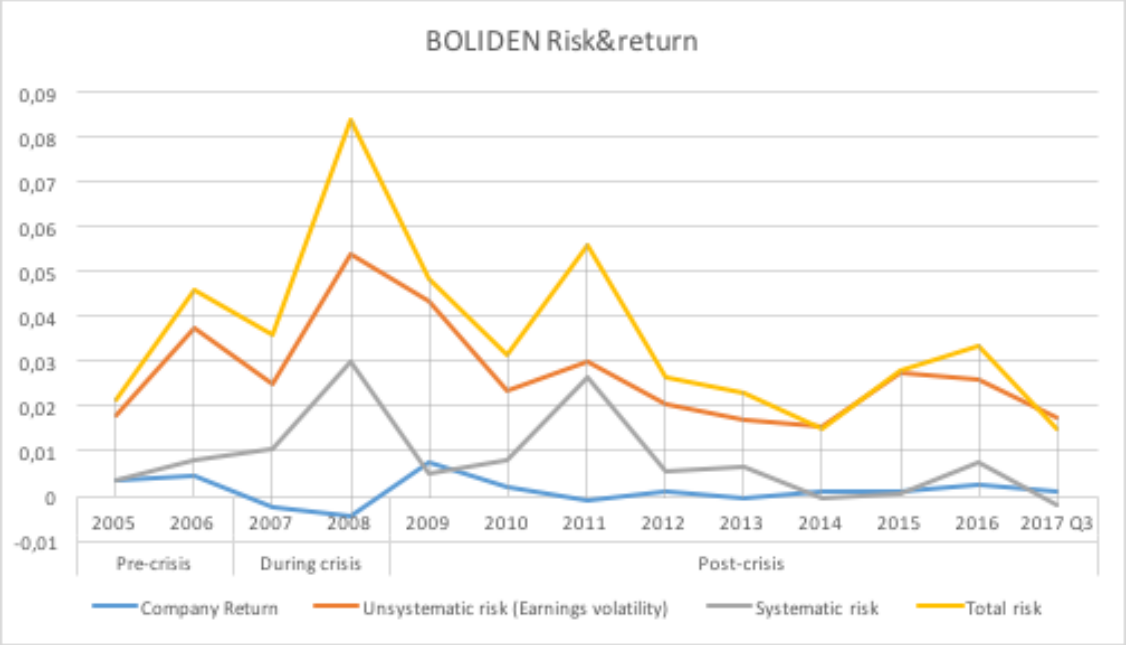
Note: Calculations are made by the author. The data is retrieved from the BETSSON B company's annual report.

Appendix 14. BILLERUDKORNAS Risk & Return



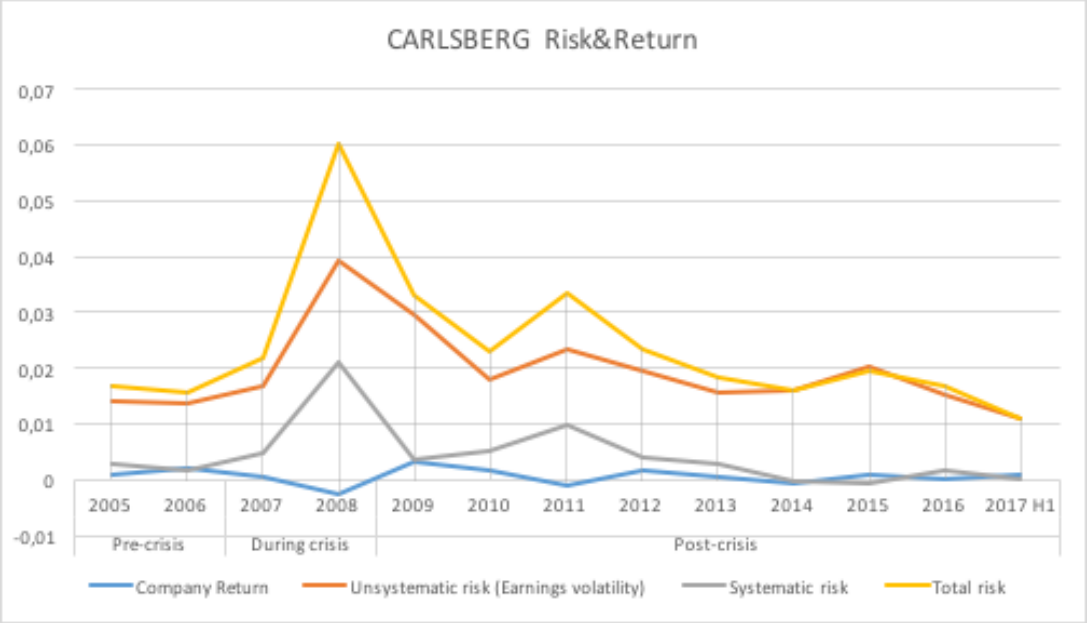
Note: Calculations are made by the author. The data is retrieved from the BILLERUDKORNAS company's annual report.

Appendix 15. BOLIDEN Risk & Return



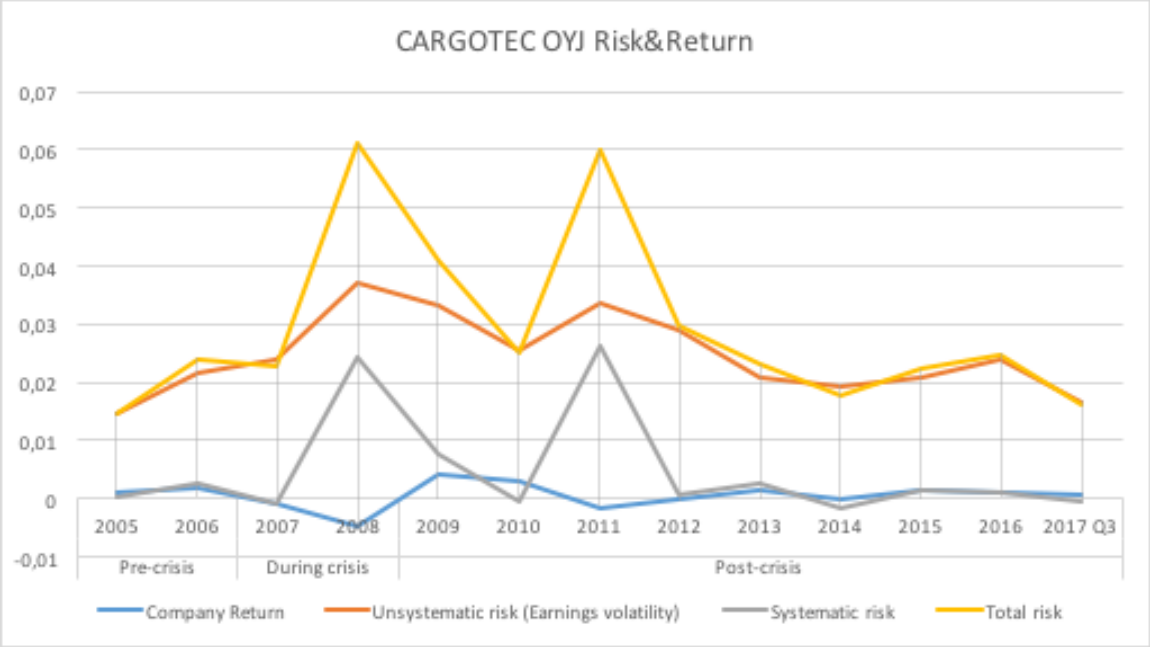
Note: Calculations are made by the author. The data is retrieved from the BOLIDEN company's annual report.

Appendix 16. CARLSBERG Risk & Return



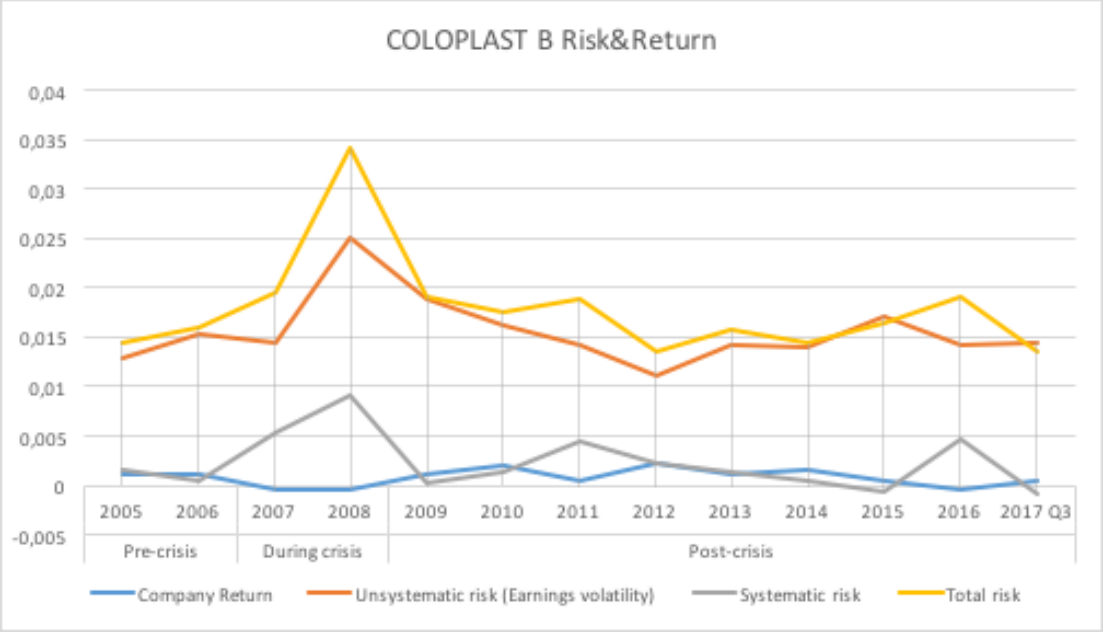
Note: Calculations are made by the author. The data is retrieved from the CARLSBERG company's annual report.

Appendix 17. CARGOTEC Risk & Return



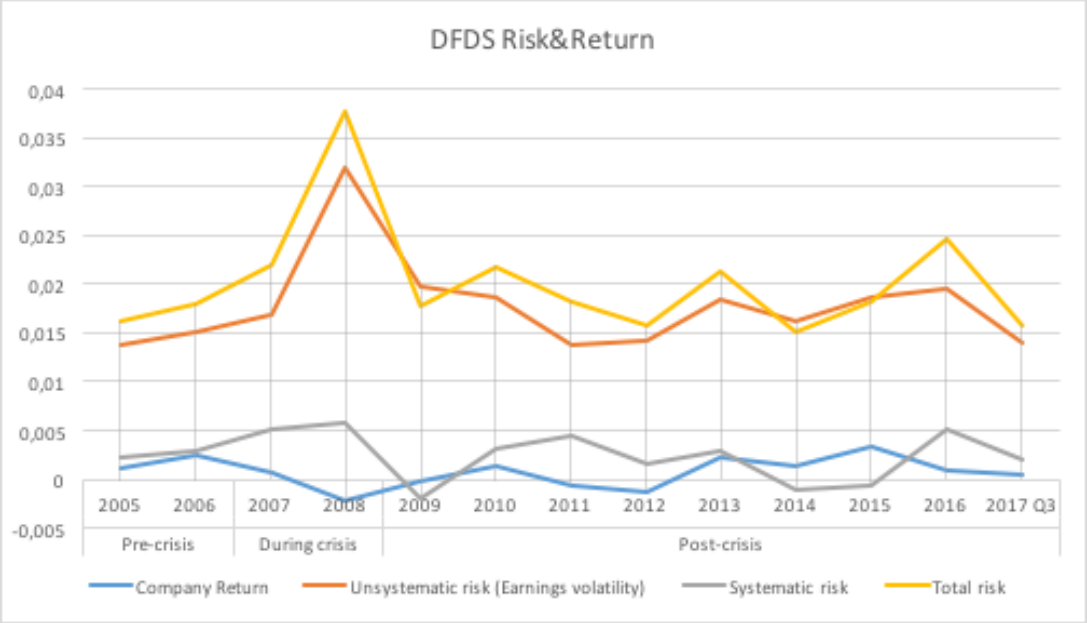
Note: Calculations are made by the author. The data is retrieved from the CARGOTEC company's annual report.

Appendix 18. COLOPLAST Risk & Return



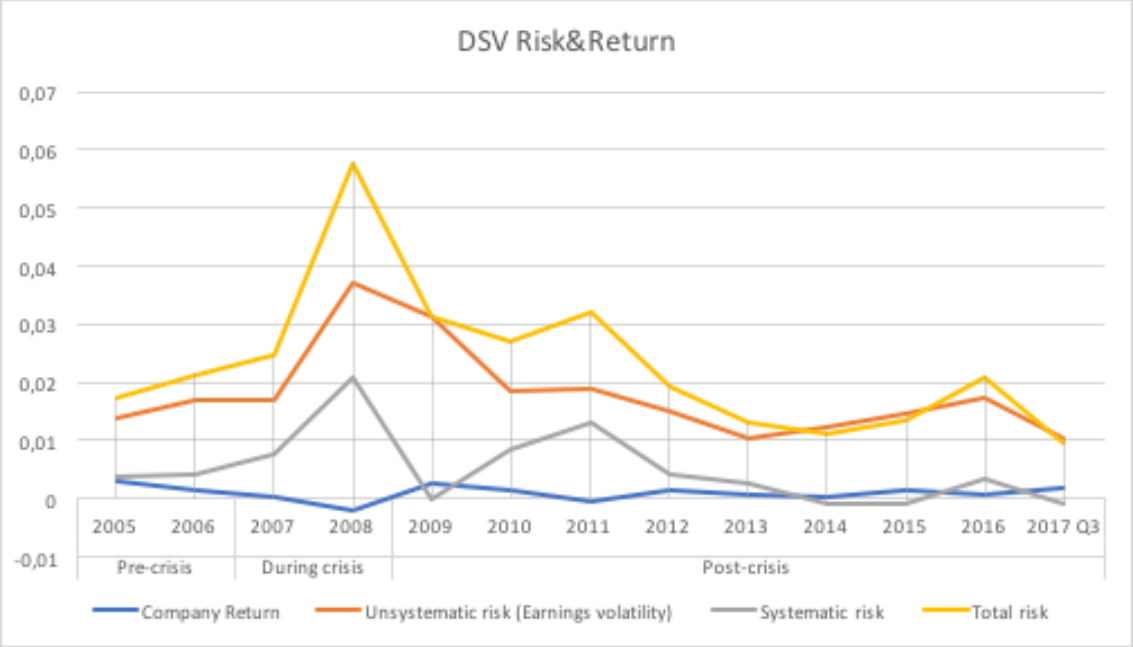
Note: Calculations are made by the author. The data is retrieved from the COLOPLAST company's annual report.

Appendix 19. DFDS Risk & Return



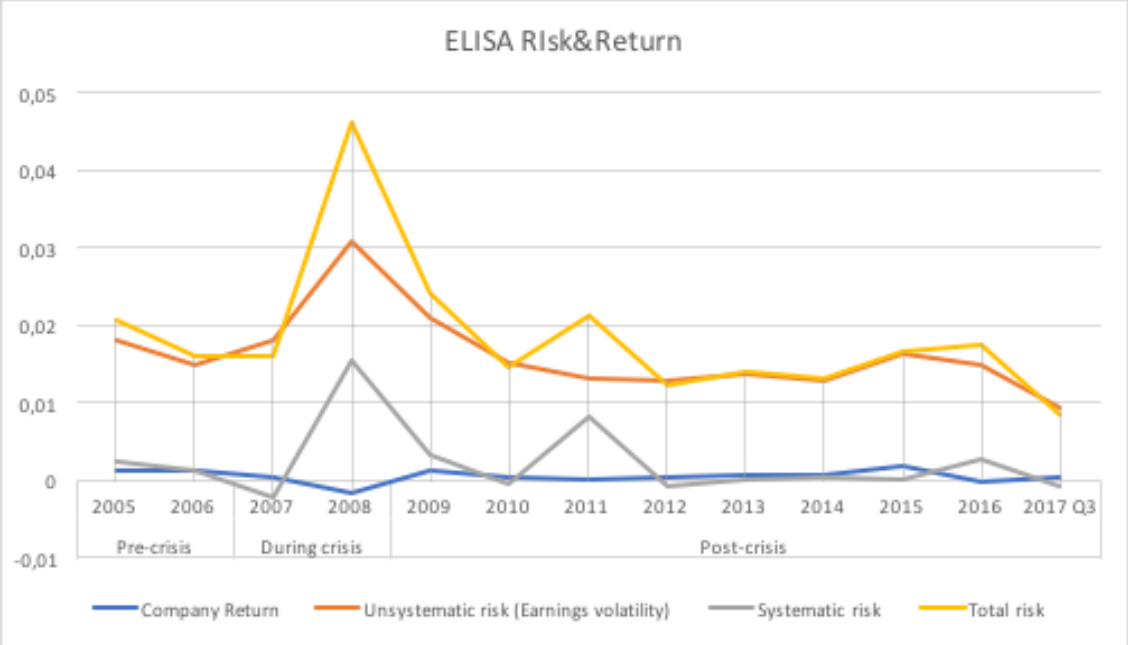
Note: Calculations are made by the author. The data is retrieved from the DFDS company's annual report.

Appendix 20. DSV Risk & Return



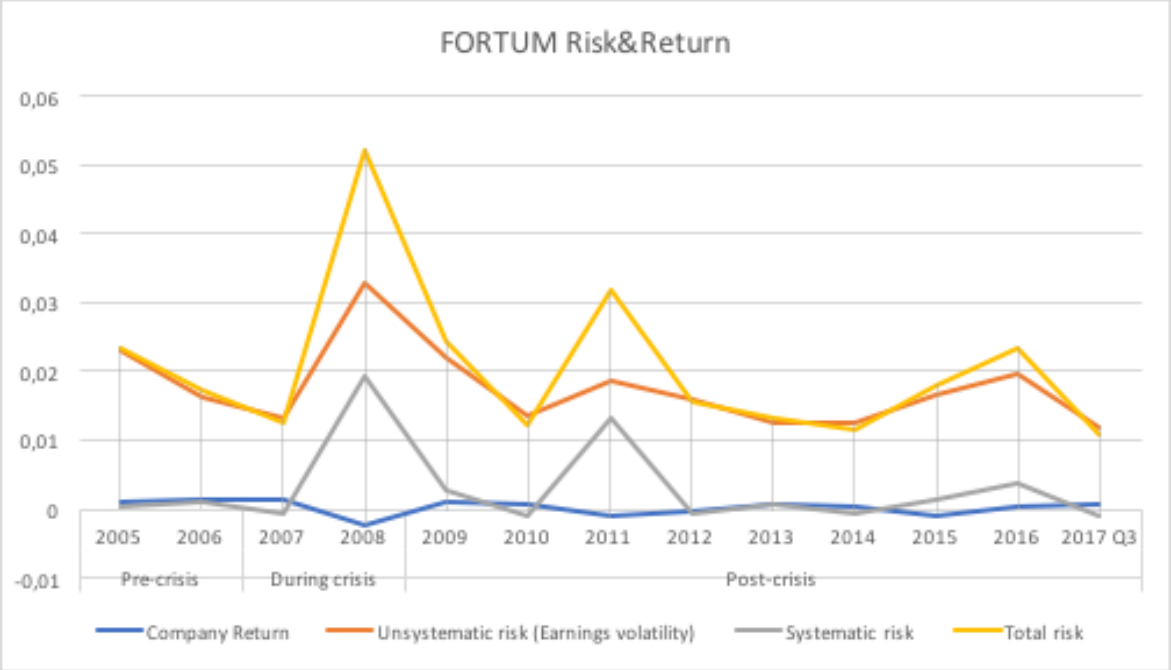
Note: Calculations are made by the author. The data is retrieved from the DSV company's annual report.

Appendix 21. ELISA Risk & Return



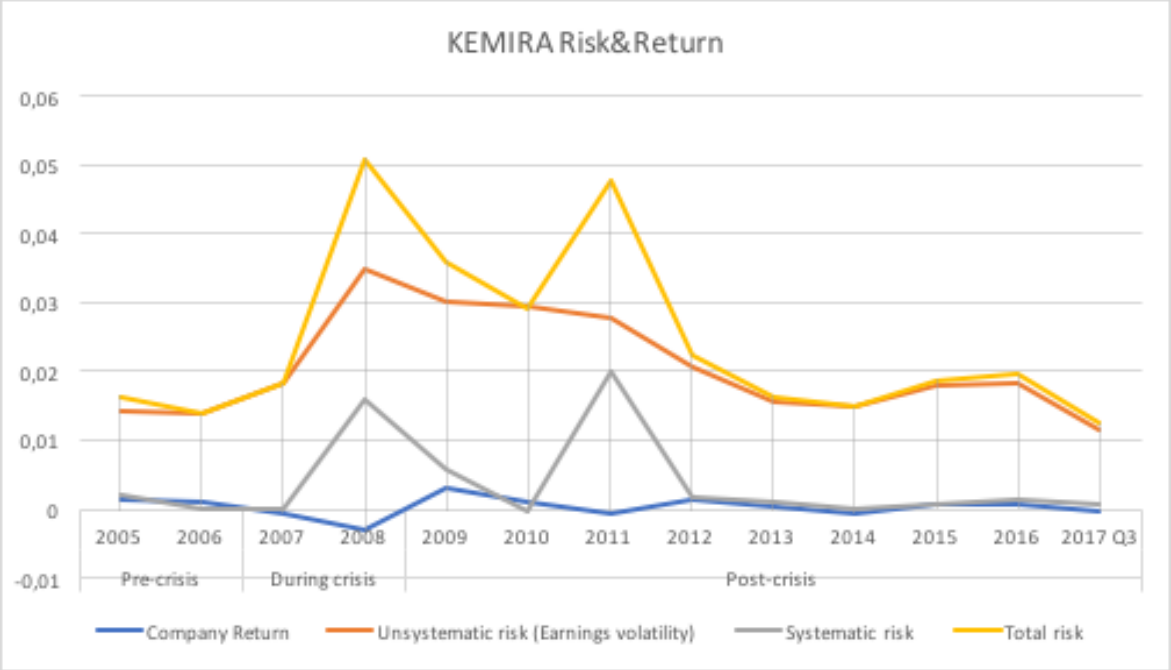
Note: Calculations are made by the author. The data is retrieved from the ELISA company's annual report.

Appendix 22. FORTUM Risk & Return



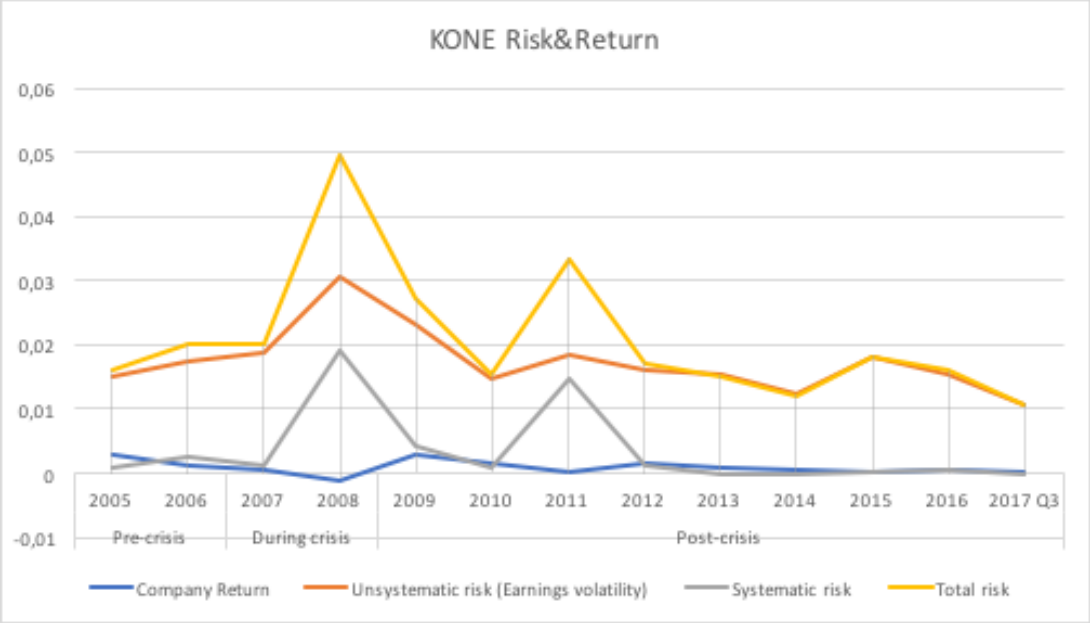
Note: Calculations are made by the author. The data is retrieved from the FORTUM company's annual report.

Appendix 23. KEMIRA Risk & Return



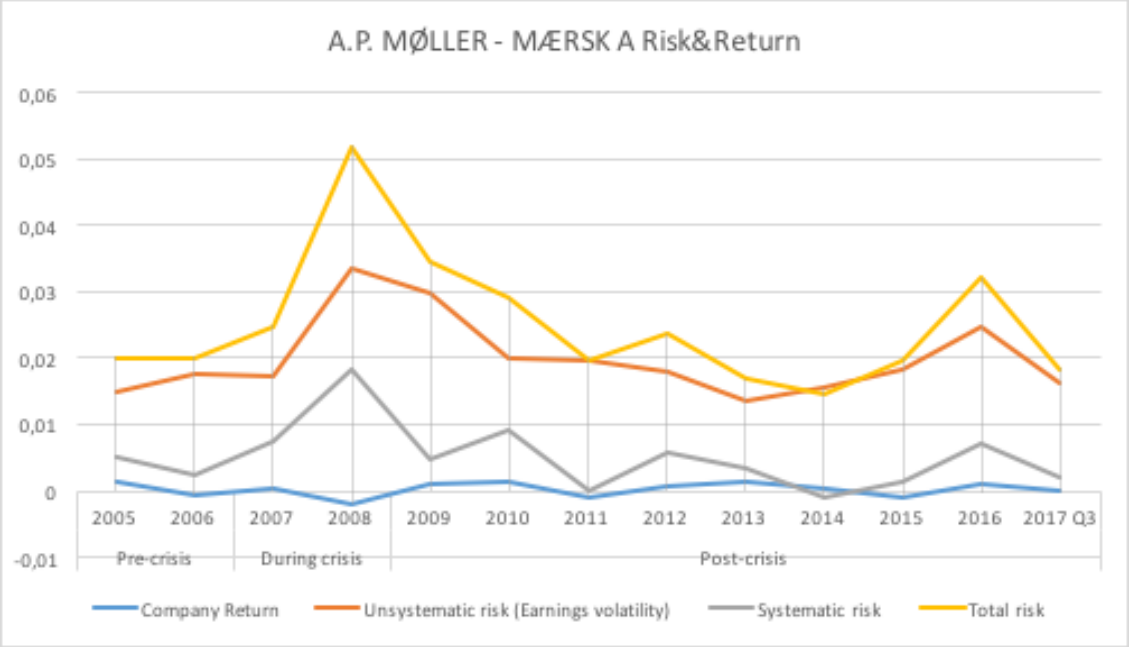
Note: Calculations are made by the author. The data is retrieved from the KEMIRA company's annual report.

Appendix 24. KONE Risk & Return



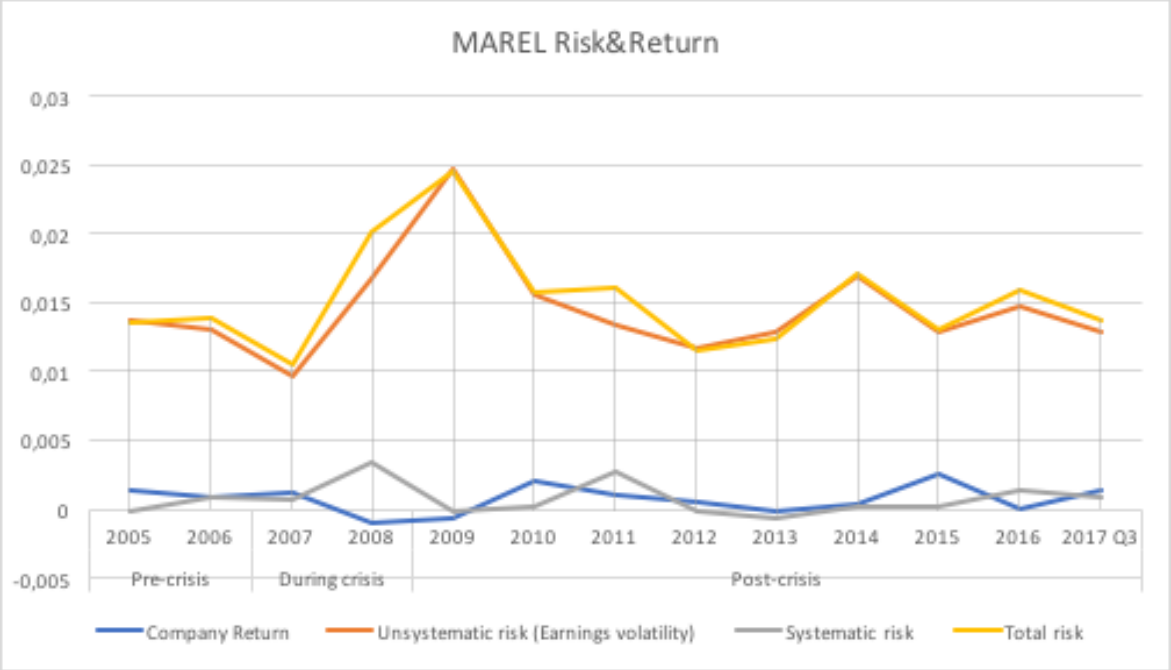
Note: Calculations are made by the author. The data is retrieved from the KONE company's annual report.

Appendix 25. A.P.MOLLER-MAERSK Risk & Return



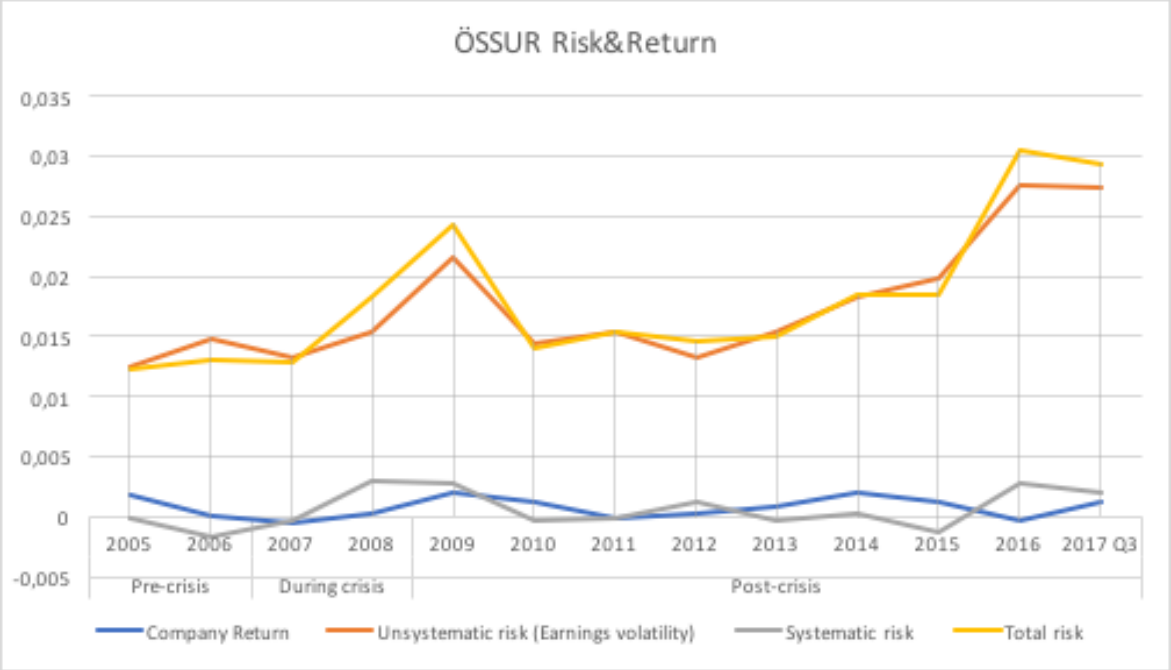
Note: Calculations are made by the author. The data is retrieved from the A.P.MOLLER-MAERSK company's annual report.

Appendix 26. MAREL Risk & Return



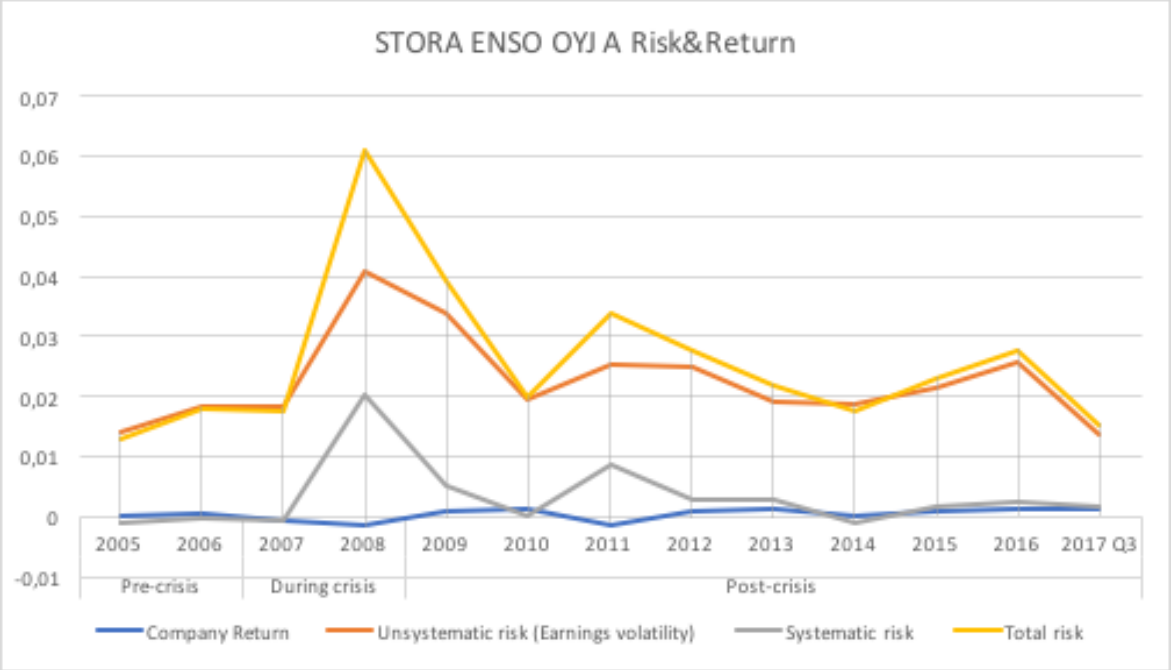
Note: Calculations are made by the author. The data is retrieved from the MAREL company's annual report.

Appendix 27. OSSUR Risk & Return



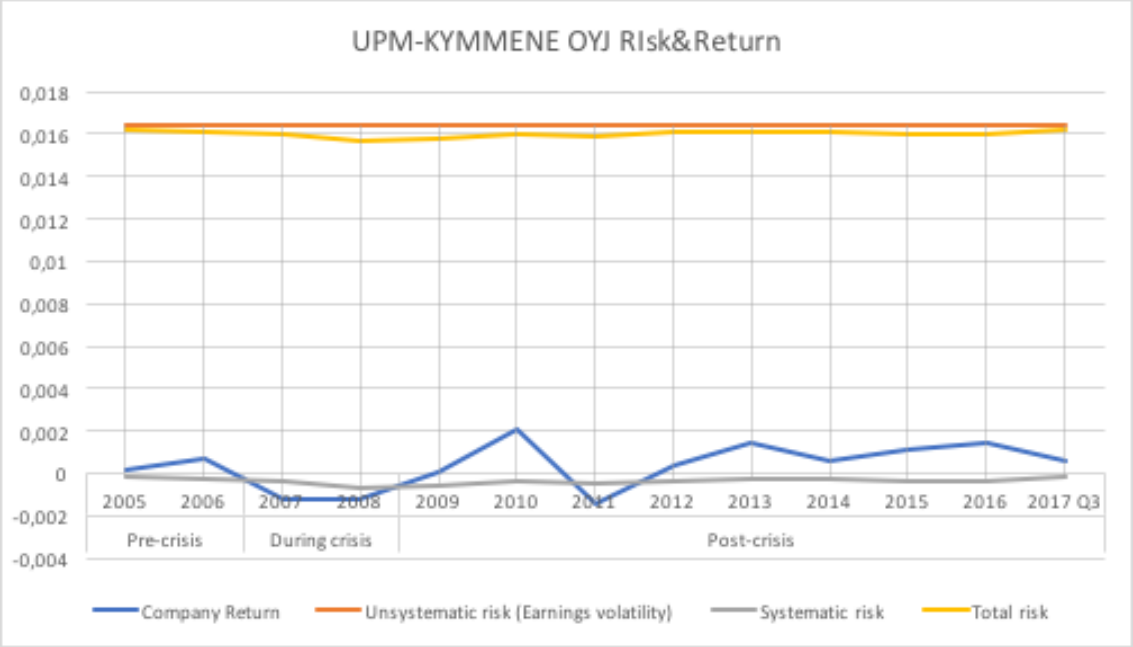
Note: Calculations are made by the author. The data is retrieved from the OSSUR company's annual report.

Appendix 28. STORA ENSO OYJ Risk & Return



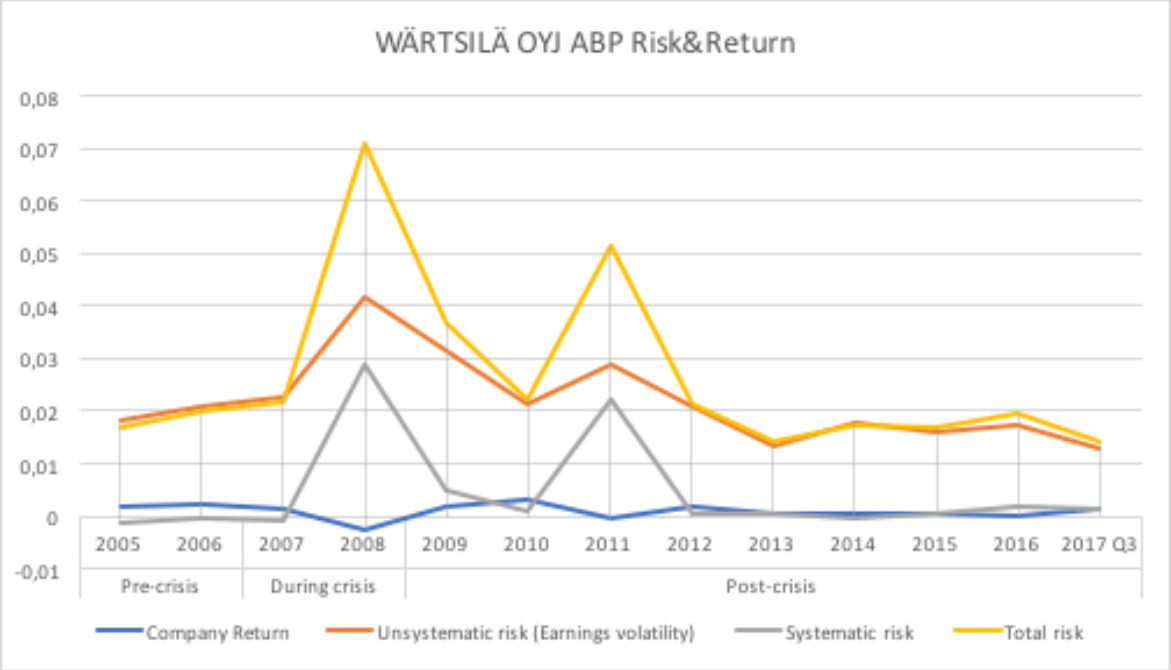
Note: Calculations are made by the author. The data is retrieved from the STORA ENSO OYJ company's annual report.

Appendix 29. UPM-KYMMENE OYJ Risk & Return



Note: Calculations are made by the author. The data is retrieved from the UPM-KYMMENE OYJ company's annual report.

Appendix 30. WARTSILA OYJ Risk & Return



Note: Calculations are made by the author. The data is retrieved from the WARTSILA company's annual report.