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The Efficacy of Credit Insurance

A Study of the Quantitative Impact on Trade Receivables and

Receivables Turnover Ratio

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Abstract:

Export Trade Credit Insurance is a financial service product that intends to cater to the risk management needs of a company. Its primary purpose is protecting a policy holding company against payment defaults, insolvencies and bankruptcies that their business partners (buyers) can face. This helps the company keep their Accounts/Trades Receivable and bad debt under check.

The goal of this thesis is to study the impact of Credit Insurance coverage on a policy holding company's A/R levels, RT Ratio and overall financial health. The sample in the empirical section consists of 7 Finnish companies that were covered by EH Finland from 2012 till 2014, at least. Financial Statements of these 7 Finnish companies, covered by Euler Hermes, Finland have been analyzed. To understand the relative impact of Credit Insurance on these companies, they were compared with industry average values that correspond to a given company's industry type. To help the calculations reflect a fair assessment of this impact, RT ratio has been used to account for the changes in turnover relative to the change in A/R for a given period.

The average difference in RT Ratios for these 7 companies between 2 time periods – before insurance coverage and under insurance coverage was **4.25 %**. Without 2 outlier sample subjects, the effect increases to **6.41 %**. Notably, the average difference between the RT Ratio for the 7 companies was **0.24 %**, whereas the industries they belonged to saw a reduction in their average by **-4.38 %.**

Credit Insurance coverage could not make a quantifiable, and more importantly, significant difference on their policy holders' RT Ratio.

Keywords:	Credit Insurance, Risk Management, Accounts Receivables, Receivables Turnover Ratio, Trade Credit, Risk Management
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List of abbreviations

1. EH   Euler Hermes, Finland (or) EH Finland
2. A/R   Accounts Receivables or Trades Receivables
3. BS Total   Balance Sheet Total
4. A/R to BS Total Ratio   Accounts Receivables to Balance Sheet Total Ratio
5. RT Ratio   Receivables Turnover Ratio
6. WTO   World Trade Organization
7. ICISA   International Cr. Insurance & Surety Association

1) INTRODUCTION

Export Trade Credit Insurance (or Credit Insurance) is a unique financial service product that caters to the Risk Management needs of a company, by safeguarding its Accounts Receivables pertaining to the export trade activities. It is a service that is similar to health insurance, except it looks after the financial health of the company it provides coverage to. Credit Insurance is therefore a financial service that serves customers in a Business-to-Business (B2B) environment (Becue 2013).

According to International Credit Insurance & Surety Association (ICISA 2016), three major Credit Insurance providers – Euler Hermes, Atradius and Coface, worth well over €5.9 billion, dominate the Credit Insurance industry today. More importantly, the global exposure that Credit Insurance companies cover is over €2.21 trillion (ICISA 2015). This means that the Credit Insurance companies are insuring transactions worth €2.21 trillion out of the gross global export trade activities.
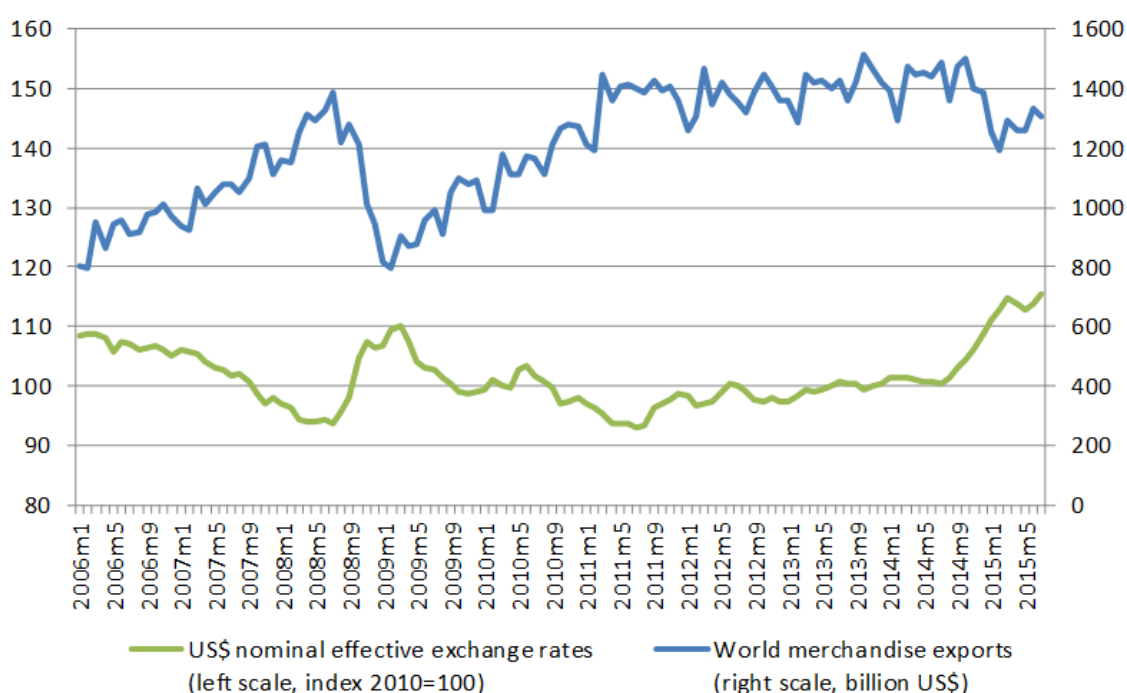
Figure 1. Effective Exchange Rates & World Merchandising Exports (WTO 2016)

To put it into a clearer perspective, that is almost equal to the United States' export activity level for the trade of goods and services (€2.3 trillion) in 2013, according to the United States Department of Commerce. Given the magnitude of the American economy, this

comparison demonstrates the relative influence that Credit Insurance has on global export trade activities. (WTO 2016)

In the UK, one of the world's biggest economies, approximately 80% of the trade activities took place on Credit terms. This accounted for 35% of an average company's total assets. (Summers & Wilson, 1997) With granting buyers trade credit frequently, the seller is exposing itself to Credit risk. As a result, as a contingency measure, the buyer must setup robust Credit Management and collections policies, which can safeguard their liquidity in times of defaults and/or bankruptcy on their buyer's part. In essence, a seller is providing their trade partners inventory financing in the form of Trade credit, which is interest free, in most cases. This cannot only add more accounting and collection related costs, but also costs related to monitoring. This monitoring applies to both the existing portfolio of buyers, as well as prospective ones. While adding no additional value to a seller's balance sheet, additional costs appear in the form of above mentioned costs. Asselbergh, 1999)

As global trade increases, global trade resulting from export activities increases too. Credit insurance claims to act as a liaison that can make these overseas export activities particularly fruitful for all parties involved. "The primary benefit of Export Trade Credit Insurance is that it enables one to use competitive Credit terms to increase both one's international sales and the profitability derived from these revenues." (Gary Mendell, 1997 p. 43) Anthony Barrett from Zurich Insurance claims that in some cases, companies trading overseas simply must purchase the trade Credit insurance coverage; their lending banks won't work with them otherwise. (Barrett, A., 2014)

Risk Management has been a hotly debated topic among corporate strategists, financial analysts and small business owners alike. Through careful risk management, a company can avoid the common pitfalls like dealing with a company in poor financial state, becoming increasingly insolvent, or on the verge of bankruptcy. While international trade has increased greatly in the last century, and the last decade in particular, unfair or fraudulent trade practices have been on the rise, consequently. Credit Insurance companies claim, that with the efficient use of Credit Insurance coverage, various types of risks that arise from growing global export trade levels can be monitored and proactively dealt with.

1.1 **Research aim**

As an International Business major specializing in Financial Management, the author holds a special interest in this research work. Apart from that, the author has worked in financial services industry, particularly Risk Management and Underwriting, which provides an added incentive in the form of self-learning based aptitude improvement. Investigating this area further allows the author to study the relationship between parameters in a company's balance sheet, which could indicate a potential relationship between Credit Insurance and a company's financial standing. The goal was to study whether Credit Insurance can act as more than a tool of Risk Management – a potential service that can improve a company's financial standing. In search for a possible link between Credit Insurance and Financial health of a company, the author has analyzed financial statements of 7 Finnish companies – which served as a key motivation behind this research study.

During this study, Euler Hermes S.A. Suomi (Euler Hermes's Business Unit based in Helsinki, Finland) was the focal point of the author's research study. A key factor behind getting their Export trade activities related accounts insured is that companies feel that a Credit Insurance policy helps keep its portfolio of export activities in good health, henceforth keeping its Accounts Receivables at levels that reflect growth but also vigilant prudence. From here onwards, Accounts Receivables shall be referred to as A/R in acronym form.

Through indemnification in cases of Credit risks like a supplier's insolvency or bankruptcy, policyholders can protect their accounts receivables. EH's proactive supervision of financial standings and activities of companies around the world provides their policyholders the market intelligence to trade with businesses that are less likely to fail in the first place. This is a claim that the author examines in this study. EH believes that this could have a potential impact on a policyholder's trade confidence, furthermore improving its revenues.

The aim of this research is to attempt to reveal and establish a link that reflects the impact of Credit Insurance on EH Finland's policyholders' financial standing. Through this

study, the author has attempted to establish a quantifiable link that shows a positive relationship, thus providing EH Finland, and Euler Hermes Group in general, a marketing tool that demonstrates the efficacy of Credit Insurance as both risk management as well as revenue enhancement financial service product. This relationship will be established through calculations in the form of (Accounts) Receivable Turnover ratio, which has been represented as both a ratio and the number of days. Receivables Turnover Ratio from here onwards will be referred to as RT Ratio.

1.2 Research Questions

While a company cannot have an influence on a country's economy where it conducts business, or even the financial standing of the overseas company they sell to on Credit terms, they presumably have much better control over their own Balance Sheet and their Accounts Receivable. Can a company keep its A/R's in check with the help of Credit Insurance? Can Credit Insurance help a company's revenue grow? Can RT ratio give a fair, quantifiable and accurate assessment of the relationship between a company's turnover growth/decline and the adjacent levels of A/R?

1.3 Demarcation

The study focuses on 7 Finnish companies and evaluates the impact of Credit Insurance on their financial health. A/R's, Turnover, Balance Sheet Total, RT in Days, RT Ratio and Working Capital ratio and other financial ratios that reflect that a company's revenue levels could potentially be directly proportional to the A/R have been analyzed. That the subject was covered by Euler Hermes Finland for at least 3 years, starting in 2012 was the criteria on which these companies were chosen. The EH Finland business unit is small and hence the list of companies – sample size, is rather small. This has been taken into account in the Research Method chosen for this study.

This study relates to private Credit Insurance, a service typically used for short-term trades, as opposed to public Credit Insurance, which protects policyholders against risks arising during medium to long-term projects. (Becue, 2013)

Owing to the empirical nature of this study, the companies studied have been examined initially based on their financial statements 3 years prior to undertaking Credit Insurance policy with Euler Hermes and 3 years under the coverage. This gave the author a historical trend of a company's financial health, which should help spot the potential impact of the policy coverage on its financial statements, especially the A/R's, RT Ratio and Working Capital ratio, since the focus is on finding the impact of Credit Insurance on a company's ability to recover enough cash from receivable accounts to continue to operate.

The financial crisis that commenced in 2008 could have a significant impact on a company's financials, and could therefore reflect negatively on Credit Insurance's impact on a company's financial standing. On the contrary, improving economic conditions could make this impact look better than it actually is. Although mainly empirical, the study has relied on secondary research, which encapsulates studies, articles from the past 30 years, which have attempted to examine the importance and relevance of Trade Credit Insurance on a company's financial standing.

Consumer data protection is one of the key aspects of customer service for Euler Hermes. As a result, EH Finland agreed to provide relevant and required financial data for this study, so long as client info is not revealed on pubic databases and web outlets. As a result, the author has written about and presented the companies under appropriate pseudo names. The validity of financial data and calculations based on it have been approved by the thesis supervisor.

2) METHODS

Listed below is a brief breakdown of the structure of the study. The structure of this study relies on quality data, a sound theoretical framework and appropriate data analysis structure. The author has listed below the design, material, approach and implementation under which the data acquired has been analyzed and interpreted.

2.1 Research Design

A research method implies a technique for data collection. Several different instruments, such as questionnaires, structured interview forms or participant observation can be used.

A research method is associated with a research design. This design is the structure that guides how to use a particular method. In addition, this design is a guide for the analysis of the data collected. (Bryman & Bell 2010 p. 47)

Many authors who write about methodological issues often differ between quantitative and qualitative research. This distinction has, however, been questioned. Some authors believe that there is a fundamental difference between the methods, while others feel that there is no useful distinction any longer. (Bryman & Bell 2010 p. 40-41)
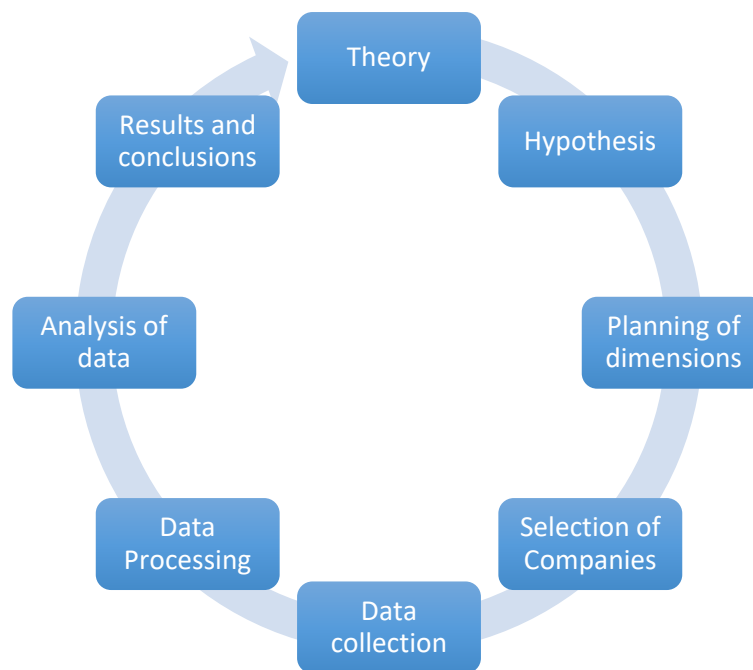
Figure 2. The quantitative research process (Bryman & Bell 2010 p. 86) Modified by the author.

Research is rarely such a linear and simple process, but this figure gives a picture of the main phases of a quantitative research. The fact that the first step is the "theory" suggests that this is an essentially deductive approach between theory and research. (Bryman & Bell 2010 p. 86)

Concepts are the building blocks of theory and are the basis for the implementation of Business Studies. In order to use a concept in a quantitative study it must be measurable or scalable. Once this requirement is fulfilled, the concepts can take the form of a dependent or an independent variable. It can in other words provide explanations for various aspects of the financial dynamics under this study. There are three main reasons why we should concern ourselves with measurement in quantitative surveys. The measurement is

done so that we can describe small and subtle differences between phenomenon in terms of the variables that are important. The measurement also gives us a coherent or a consistent tool with which we can measure differences. Measurement is also the basis for more accurate estimates or calculations of the relationship that exists between concepts. (Bryman & Bell 2010 p. 88-89)

Qualitative studies are used to get into the depth. The participants, or writers for the articles, perceptions are brought forward. When it comes to qualitative studies, the emphasis in the collection and analysis of data is on words, not numbers. The method is in other words more interpretive than the quantitative method. (Bryman & Bell 2010 p. 297) The qualitative method is, unlike quantitative data collection, less rule-governed. Upon obtaining results, they are linked to the theoretical framework. (Bryman & Bell 2010 p. 40-41)

Owing to a small sample size due the nature of the business, the author has chosen a case study approach, which uses deductive research method to analyze the collected data. While the case study method doesn't use statistical analyses with confidence intervals and probability ratios like paired sample T-tests, ANOVA tests or Chi-Squared tests, it uses Exponential Linear Regression to suggest the goodness of fit of the dataset being used. This helped the author make a more concrete statement on the data analyzed. This in turn gave the author the opportunity to dig deeper into various dimensions of a company's financial structure to get the overall picture of its health.

2.2 Material

The study relies heavily on financial data from EH Finland, which is audited. These financial come from Credit Reports and/or Finnish Trade Register. Other data sources used by the company were utilized, wherever necessary.

Theoretical framework has been sourced from online database of articles and journals like Emerald, ABI/Inform, EBSCO, among others, which the author has partial access to through Arcada UAS.

Textbooks like 'Fundamentals of Corporate Finance' from Brealey, Myers, & Marcus as well as 'Introduction to Financial and Managerial Accounting' from Horngren, Harrison Jr., & Oliver have been used to go over the definitions and concepts pertaining to risk management, accounting principles and methods. A book on Credit Insurance by Paul Becue, the ex CEO of Euler Hermes UK has also been used to accurately reflect the field of Credit Insurance in general and how Euler Hermes plays a part in helping policyholders manage various types of risks. Theories in the field of finance like the Theory of Export Credit Insurance, and The Economic Theory of Insurance have been used, which have all been listed through in-text citations, as well as under the table of references and bibliography.

Euler Hermes has a comprehensive website that provides free access to statistical information, which the author has used when needed. Apart from that, specific literature pertaining to the field of Credit Insurance, Risk Management, Finance and Accounting has been used to add to the relevance and validity of the theoretical framework used to examine and assess the research data. Owing to the quantitative nature of this study, which leans on extensive numerical datasets, the author's personal bias has not had an effect on the material. Manual processing of large amounts of data may, although, expose the work to mistakes arising from human error. The author has spent a considerable amount of time in not only verifying the results to assure the readers of the accuracy of this work, but has also used expert help from Euler Hermes in using the best practices for data collection to ensure that the datasets were valid, relevant and accurate to begin with.

2.3 Approach

Several data sources that are available online have been used for the purpose of theoretical framework construction. These sources include peer-reviewed articles found in journals and independent papers and essays from respected authorities in the fields of Accounting and Finance. Documentation from the International Credit Insurance and Surety Association (ICISA) as well as the major Credit Insurance providers like Euler Hermes, Atradius, Coface, AIG, etc. have been used to familiarize the readers with some of the core terminologies used in the Credit Insurance industry.

Upon literature review, the author switched to a more empirical approach, which objectively evaluates the financial history of a company 3 years prior to and after undertaking Credit Insurance coverage from EH Finland.

2.3.1 Combining Quantitative and Qualitative Methods

Both quantitative and qualitative methods have been used for this research. There are arguments against the use of a multiple research strategy. There is a perception that quantitative and qualitative research methods represent different paradigms. Another view argues that the various research methods are based on theoretical propositions that differ too much. (Bryman & Bell 2010 p. 501) However, one can use qualitative methods in several ways to provide support for quantitative methods. Qualitative methods can provide help by being a source for the hypotheses or other ideas that later can be tested using quantitative methods. Qualitative methods can also assist in the measurement during the designing of survey questions on structured interviews and questionnaires. (Bryman & Bell 2010 p. 505)

The author has presented the results of data analysis upon comprehensive analysis of the numerical data within the established theoretical framework. This has ensured that the author's pre-existing view on Credit Insurance and Accounting has not affected the results. Credit Insurance remains as one of the more complex concepts in the financial services industry, owing to which generalized statements have been made about the results. The author has chosen to use the results to reflect the degree of the efficacy of Credit Insurance in terms of differences in means expressed in percentage, instead of using Boolean parameters of good/bad or efficient/inefficient.

2.4 Data Acquisition

Required financial data was collected by the author on the premises of EH Finland. Apart from publicly available financial data of the companies under study, the author has extracted financial data from Suomen Asiakastieto Oy – EH Finland's official Credit Ratings provider. Suomen Asiakastieto will from here onwards be referenced as simply Asiakastieto. The extracted data includes 7 documents related to the 7 companies under

study. These documents consist of balance sheets, cash flow statements and income statements. Through these documents, the author has taken out 6 data-points – Turnover, Balance Sheet Total, Accounts Receivables, A/R to Balance Sheet ratio (%), RT in days and RT Ratio. These documents were extracted with the permission of EH Finland on a confidentiality condition – that all company names be kept private and be instead represented through pseudo names. While the author has complied with EH Finland's condition, apart from the company's name, every parameter measured and analyzed comes from Asiakastieto and hence is of very high standard.

In addition to the company financials, the corresponding industry data also comes from Asiakastieto. This was crucial, since it only allowed the author to compare the companies' before and after insurance performances, but also compare them to their corresponding industry averages, giving a more specific picture of how well the subject company performed compared to the companies in the same industry.

2.5 Data Analysis

"Some customers do not pay, and that creates an expense called uncollectible account expense, doubtful account expense, or bad debt expense." (Horngren, Harrison Jr., & Oliver 2001: 407). This is a phenomenon that was particularly complicated to understand. Is Credit Insurance keeping a company's A/R levels under check, reducing them or increasing them? Increasing A/R levels are perfectly understandable if the policy holding company feels more confident in extending credit, or offering more competitive credit terms in foreign trade deals. This has been discussed in section 3.3. So, an increase in A/R levels is not a good indicator of the efficacy of Credit Insurance in helping a company's financial standing. The above-mentioned data was imported onto Excel files for further analysis. Averages of the above-mentioned data points were calculated to get an overall picture of the entire dataset. Financial ratios like 'Accounts RT', which represent the ratio of Credit Sales over Average Receivable Balance were investigated. (Investopedia a. 2016)

Since the author has analyzed the parameters to reflect a company's profitability and working capital, these parameters were aggregated into two groups – 1) The pre-insurance group, consisting of financial data from the 7 companies from 2009 till 2011 and 2) The

post insurance group, which consists of financial data from the same 7 companies. But, in this instance, from 2012 till 2014 – which also happened to be the length of their Credit Insurance policy coverage period.

Once organized into these groups, the mean values were taken into account, which produced six (7) data points for each of the 7 companies. 5 of these data points have been analyzed and discussed to make a conclusive statement.

2.5.1   Exponential Linear Regression & Coefficient of Determination (R^2)

Each company was treated as a case to be reviewed, listing its Turnover, Balance Sheet Total, Short term A/R's, A/R in terms of the % of the overall Balance Sheet, RT in Days, RT Ratio and Working Capital Ratio – 7 parameters. The rate of growth expressed in percentage has been take from the exponential trendline's equation. This textbox explains it.

> If $\quad y = 1E - 240e^{0.2779x}$ -- the growth rate is $0.2779 * 100 = 27.79\ \%$.

In addition, the Coefficient of Determination, also called as the R^2 value, of each of these 5 parameters has been listed under the Exponential Trendline for both before and after periods of Insurance. Using Exponential regression statistics was important in this case, since the increment and reduction in growth of these parameters were quite high and unpredictable, making it the most suitable choice of regression. The data set also contains points, which could have occurred purely out of chance, providing further incentive to use the R^2 value to comment on the quality of the data. The R^2 value fluctuates between 0 and 1. An R^2 value close to 0 represents poor fit of the trendline for the dataset, whereas a value nearing 1 represents a Regression trendline that fits the data it represents very accurately. The closer the fit of the trendline to the data points, the lesser the Standard Error in line. If a variable's growth declines at the rate of -27% per year with an R^2 value of 0.44, the decline can't be attributed to the effect of Credit Insurance. It could happen purely out of chance, recession or other unknown factors.

It must although be noted that low or high R^2 value does not necessarily always reflect an accurate goodness of fit of a data set or model, respectively. This is because an R^2 value does not reflect the relationship between the independent and dependent variable. Another

drawback to the validity of R^2 value is that it works best with a larger dataset. In this thesis's empirical section, the data sets range from 2009 till 2011 and 2012 till 2014 for the 5 different variables. This period of 3 years generates 3 data points each for their respective time periods for these variables.

3) WHY CREDIT INSURANCE: GENERAL OVERVIEW

The author has put together theoretical evidence to study the need for and importance of Risk management. In the process, light was shed on risk management alternatives that companies today use to practice sound Credit management. Credit Insurance could have the potential to be one of the key tools to practice risk management effectively, Credit Insurance providers claim. Although, no substantial empirical study exists to prove that. An attempt to show why it could also prove to be catalyst in a firm's improving financial standing has been made by analyzing historical financial data of these 7 companies.

Through this section, the author introduces the readers to Euler Hermes SA, the Credit Insurance provider that is the focal point of this research study and the data provider as well. Following the introduction is a brief discussion of the Credit Insurance industry and Credit Insurance, to familiarize the readers with relevant terminology, syntax, etc.

3.1 Euler Hermes

The history of Euler Hermes dates to 1917, when Hermes Kreditversicherungs-Bank AG was founded in Germany. In 1927, Société Française d'Assurance-Crédit was established in – a union of many insurance companies in France. After several mergers and takeovers, SFAC became Euler in 1997. The Euler Group took over Hermes from Allianz group, thus forth becoming Euler Hermes in 2003. Euler Hermes, which from here onwards, through an acronym, has been referred to as EH, is the world's largest provider of Credit Insurance. Allianz Group is the majority stockholder of the Euler Hermes Group, making EH a daughter company of Allianz. It provides insurance coverage in over 200 countries to its policyholders. With 54 subsidiaries spanning across Europe, Americas, Africa, Middle East and the Asia Pacific region, EH has an extensive database of proprietary financial information on more than 40 million companies worldwide, which allows them to help

its policyholders in choosing the right geographical regions and companies to conduct their export trade activities in. (Euler Hermes a., 2016)

3.2 A/R and Capital Tied – Credit Risk

One of the key motivations behind this study is to observe the difference Credit Insurance potentially makes a company's capital employed. Even though Working Capital is the difference between current assets and current liabilities, on an operational level, it is **Inventories + A/R – Accounts Payable**. (Marttonen, et al. 2013) This paper concerns operational working capital, which is closely tied to collection of A/R. Since A/R act as capital tied, or in other words, capital not involved in a company's daily operations, the higher the amount of A/R company has on its Balance Sheet at the end of the financial year, the lesser the company is able to invest into its operations and investments activities.

A positive working capital indicates good collection policies by a company and negative working capital implies the opposite. Although, in many cases, especially for growing companies, the amount of capital spent on investments is very high. This could mean purchase of new machinery, equipment, land, etc. Negative Working Capital, although, over an extended time frame could indicate financial problems for a company.

As a Credit Insurance policy holder, a reasonable expectation is to observe positive Working Capital Ratio growth. As a part of a company's operational core, Working Capital management could have an impact on how a company performs over a given time period. That said, Credit Insurance alone cannot guarantee a positive trend in Working Capital Ratio growth. This is where other variables like A/R to BS Total Ratio, as well as Receivable Turnover Ratio are key to understanding the true impact of Credit Insurance on a company's financial standing.

3.3 What makes Credit Insurance an attractive option?

An important component of Credit Management is management of Working Capital. Recession has forced many companies to extend Credit Terms to buyers that put them at a financial risk. Banks consider companies with Credit Insurance coverage a safer borrower

as opposed to those who do not. This is especially crucial for companies that trade over-seas or are expanding overseas. Companies insured by private or government provided Insurance policies can then in turn borrow from commercial banks against their insured receivables. Owing to insurance coverage, companies also enjoy better loan repayment and financing terms – typically better than their uninsured counterparts. (Jones, P. 2010 p 6)

For a company trading overseas as a supplier, the flexibility to engage in a trade agree-ment with a new buyer or on a temporarily increase the Credit limits for their existing buyers, Trade Credit Insurance is an attractive and safer option. This is a very worthy tradeoff on for a premium that companies pay for insurance coverage, since they can handle seasonal demand fluctuation and order requests during holiday season (retail), summer and spring time (construction, agricultural, clothing manufacturers, etc).

Other benefits of Credit Insurance are:
- Transferring of credit accounts' payments to the Credit Insurance company.
- Professional support from Risk Underwriters that specialize in risk management.
- Insurance of turnover volatility, since in most cases, all of the turnover is insured. (Jones, P. 2010 p 9)
- Competitive advantage over uninsured buyers who may expect advance pay-ments, or offer stricter credit terms to their buyers.
- Prevention against liquidity shortage or insolvency.
- Improved financing options, since lending institutions sometimes insist that a sup-plier is covered by a Trade Credit Insurance policy. (Jones, P. 2010 p 9)

Euler Hermes argues that Credit Insurance is a choice that should benefit the Credit Man-agement infrastructure for companies, especially those with a B2B sales of 4 million € or more. (Euler Hermes b., 2016)

3.4 Risk Management - The Alternatives

The studies in the fields of risk and Credit management have grown at a tremendous pace. Despite that, there are not many great options available to companies to choose from. Peter Jones, in his publication for the World Bank tabulated the alternatives to Credit

Insurance in his book 'Trade Credit Insurance'. These alternatives have been more common and are, therefore, considered the more traditional ways of managing a company's liquidity and working capital. We are not discussing and comparing the 'Letter of Credit' to Credit Insurance because it does not provide the seller with any coverage against commercial and/or political risks. It can therefore not be expected to act as an instrument of financing or monitoring, unlike Credit Insurance. Nonetheless, the most commonly used options for Credit management are listed below in the table provided by the World Bank.

Table 1. Trade Credit Insurance and its Substitutes (The World Bank 2010)

Feature	Credit Insurance	Letter of Credit	Factoring without Recourse
Risk Cover	Insolvency, protracted default and political risks.	Buyer Defaults	Insolvency and protracted default
Ancillary Services	Credit information, risk assessment, market intelligence, debt collection	None	Debt collection and credit information
Financing	None, but facilitates financing	None	Converts trade receivables into cash at a discount
Client Relations	Buyer is unaware of credit insurance contract	Buyer Initiates provision of credit	Collection by factor of trade receivables may affect client relations.

3.4.1 Non-recourse factoring

Non-recourse factoring is a financing service for suppliers, where their A/Rs are bought by a 'factor', in return for cash, minus interest and service fees. The seller in such a case generates liquidity, in order to improve and maintain capital for operational expenses. In non-recourse factoring, the buyer of A/Rs assume full responsibility for the credit risk. This method of financing is attractive for small to medium sized business, for whom financing is difficult, owing to the market norm of 30-90 days or even more of payment time that buyers usually demand. (Klapper, n.d.) Non-recourse factoring provides the company risk management, financing and ledger management services primarily. (Brandenburg 1987)

Non-recourse factoring, firstly, does not cover sellers against political risks, which can be a major setback for sellers who wish to sell aggressively in the so-called markets with sensitive economic outlook. Non-recourse factoring provider usually does not help the seller in a pro-active manner, unlike Credit Insurance. Last but not the least, engaging with customers who have factoring on their A/Rs can put some buyers off, stating lack of trust as a reason. The thought of going into administration and legal battle with the seller may not be a buyer's intention, but the idea of getting into one might not be very appealing. (Commercial Capital LLC a. 2016)

From a seller's perspective, factoring may not be an ideal choice, if they are providing a service that does not have a proven record, because a buyer could engage a seller in a payment dispute because of dissatisfaction on the delivered goods or service. Factoring does not cover such cases, and henceforth, the seller is solely liable for defaults arising from such disputes. (Commercial Capital LLC b. 2016)

Another disadvantage behind non-recourse factoring is the cost of factoring itself. For companies that enjoy healthy margins on their sales, factoring may be a better option, if they are deemed safe enough by the factor. However, for smaller companies that operate on little liquidity, factoring may prove to be expensive. (Commonwealth Capital LLC c. 2016)

3.5 Credit Insurance

Risk in international trade can occur in various forms such as "unforeseen defaults by foreign buyers and political risks as war, coup d'état, currency blockage and import restrictions in foreign countries" (Funatsu 1984 p. 679). Credit Insurance, which is also called 'Accounts Receivable Insurance', is a financial service product that protects a company against a buyer's (a company's customer, domestic or international) inability or deliberate choice in not paying its trade credit debt (Allianz 2016).

In his book published in 2013, Credit Insurance, Mr. Paul Becue, the then CEO of Euler Hermes UK, describes (private) Credit insurance, which under European legislation classified under class 14 of insurance sector. He defines Credit Insurance as a coverage that

indemnifies sellers (policyholders) when a buyer fails to pay the trade receivables because of insolvency or by simply defaulting on agreed terms of debt payment. This coverage comes at a cost, which the policyholder must pay in advance as a premium. The terms of conditions determine the premium rate for this insurance coverage. These premium rates reflect "the size and spread of the supplier's turnover, the trade sector and the historical experience of bad debts." (Becue 2013 p.19)

Here is a graphical representation of a simplified overview of Credit Insurance.

Figure 3. How Does Credit Insurance Work? (Euler Hermes 2016)

3.6 International Trade and Risk

As established earlier, a firm's primary objective is profit maximization. But, how aggressively does the company want to pursue its objectives lies beneath its ability or sensitivity to risk. "The most significant contribution by Sandmo (1971) is the introduction

of risk aversion. Using the expected utility maximization approach developed by von Neumann and Morgenstern, he showed, among other things, that in the presence of uncertainty, the optimal output of the risk-averse firm is less than that of the risk neutral firm." (Funatsu 1984 p. 8)

Boosting sales is obviously one of the core focuses for financial managers in order to increase turnover and revenue from sales. However, with increase in sales, especially with offshore trading, a company's market exposure increases too. As a substitute option for pre-payment or cash on delivery, policyholders provide buyers with trade credit. This trade credit goes into A/R, which is a risky asset owing to possible misconceptions or lack of knowledge of local customs, trade regulations, reputation of the buyer and regional corporate laws. If the supplier chooses to insure these A/R's, these assets become far more secure, which could potentially make a significantly positive difference to a supplier's bottom line at the close of accounting cycle. (Jones 2011)

Funatsu (1984) in his paper on the Theory of Export Credit Insurance concludes that the level of exports can be increased if government and insurance agencies can lower the premium rates for Credit Insurance coverage. He also claims that the larger a company's risk aversion, or appetite for growth, the greater an effect these lowered premium rates can reflect in its growth. "If the premium rate per dollar of coverage is set at a fair rare, a risk averse firm will export as much as a risk neutral firm does in the absence of insurance" (Funatsu 1984 p. 106)

4) RESULTS

The results section enlists the collected data, derived values from calculations and analysis on each of the six companies. Due to privacy concerns, the company names have been changed to pseudo names A1, A2, A3, A4, A5, A6 and A7. The rest of the financial information, including figures, tables and graphs are all taken from Asiakastieto, which at the time of writing this thesis was the official Credit service provider for EH Finland.

The trends of these parameters are presented in a table first, and then through graphs. A brief analysis follows them, interpreting the data. The graphs were split into 'before' and 'under' insurance coverage types, for the ease of understanding. The area of the table

highlighted in light blue shade represents the data gathered for the time period before insurance cover, while the area highlighted in light green represents the data gathered from the time frame when the company was under insurance coverage. Once each of these cases have been individually described, they will be discussed further in the discussion section.

4.1 **Company A1**

A1 is a manufacturer of machinery for paper and paperboard production. Founded in 2002, the company engages in both import and export trade activities. (Asiakastieto, 2016)

Table 2: Company A1 - Historical Financial Data from 2009 till 2014

Parameter	2009	2010	2011	2012	2013	2014
Turnover (t €)	19637.9	29052.5	34370.8	34068.6	29220.5	33043
BS Total (t €)	14958.6	18076.9	20806.6	19083.1	17506.7	20044
A/R (t €)	3707.7	6266.3	5240.8	5741.6	5700.5	6342
(AR/BS Total) %	24.79%	34.66%	25.19%	30.09%	32.56%	31.64%
RT (days)	64	69	52	52	62	63
RT Ratio	5.70	5.29	7.02	7.02	5.89	5.79
Working Capital Ratio (%)	31.6	27.2	25.8	21.2	25.2	23.7

Of the above mentioned 7 parameters, 4 of them are detailed further in the upcoming subsections.

4.1.1 Turnover

A1's turnover showed positive growth rate from 2009 till 2011 – **27.9 %**. Whereas, for the period of 2012 till 2014, the turnover growth slowed down a little, shrinking at the rate of -**1.5 %**. Although, given the sharp growth in the pre-insurance period, this small decline doesn't make a significant negative impact on the company's turnover.
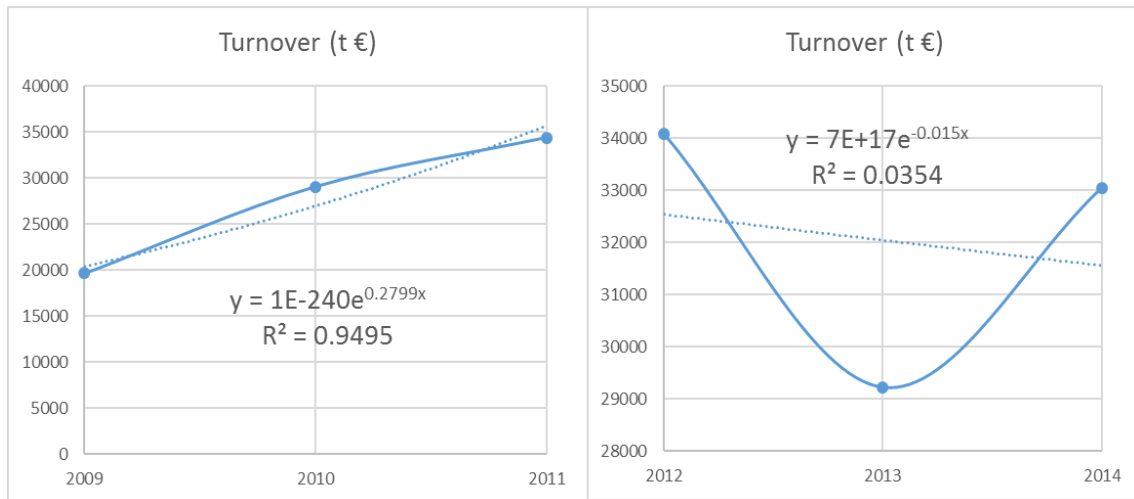
Figure 4: Turnover Growth Rates from 2009 till 2011 and 2012 till 2014

4.1.2 A/R to BS Total in Percentage

A/R to Balance Sheet Ratio expressed in percentage reflects the part of the Balance Sheet total that the company holds as an asset, although a part that is not available for investment purposes.

In A1's case, the growth of the A/R to BS Total ratio increased from **0.8 %** from 2009 till 2011 to **2.52 %** from 2012 till 2014.
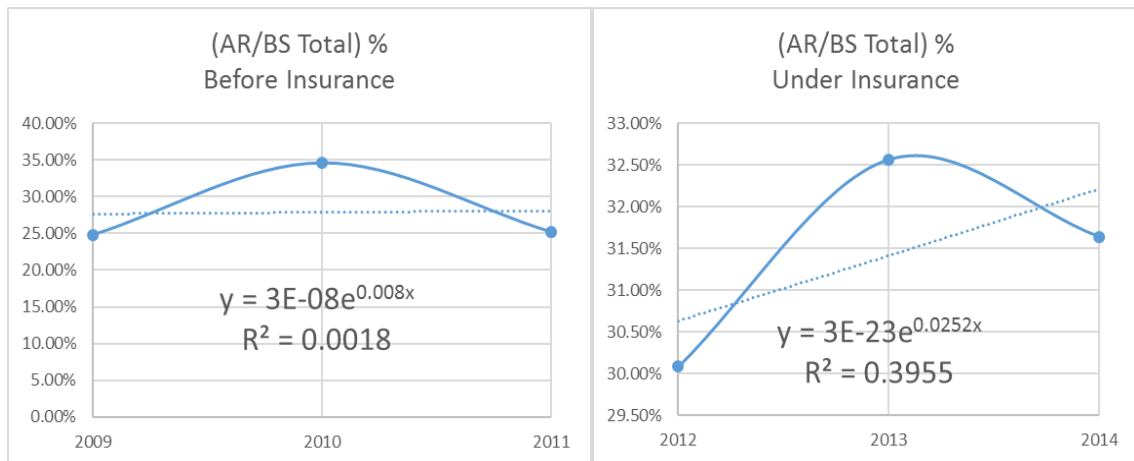
Figure 5: A/R to BS Total Growth Rates from 2009 till 2011 and 2012 till 2014

4.1.3 RT Ratio

The RT Ratio for A1 from 2009 to 2011 reflected a healthy growth rate of **10.3 %**, indicating good collection and credit terms. Although from 2012 till 2014, under the policy

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coverage, the growth turned negative, with a **-9.6 %** decline – either indicating improved confidence in offering competitive credit terms or poor collection practices.
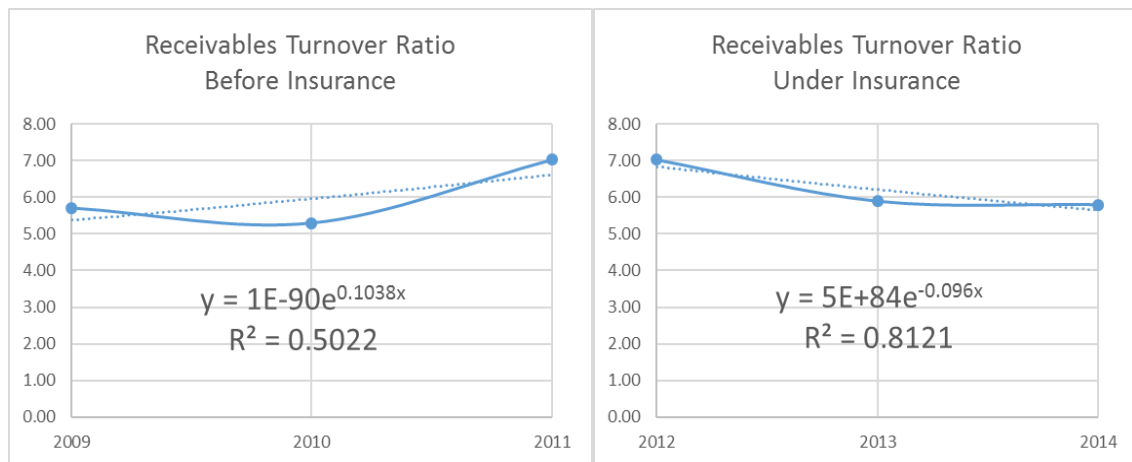
Figure 6: RT Ratio Growth Rates from 2009 till 2011 and 2012 till 2014

4.1.4 Working Capital Ratio

Working Capital Ratio was an obvious choice to examine, since it's a ratio that indirectly reflects a company's ability to manage and recover Accounts Receivables, apart from factors like Inventory management. These assets have an impact on their working capital and hence worth analyzing.

For A1, the Working Capital Ratio declined at the rate of **-10.1 %** from 2009 till 2011, whereas, it improved to **5.57 %** from 2012 till 2014.
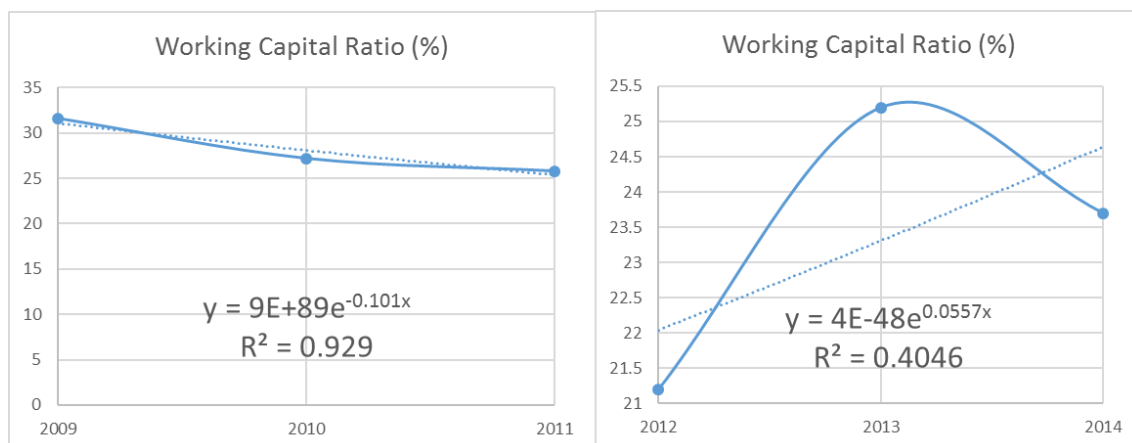
Figure 7: Working Capital Ratio Growths from 2009 till 2011 and 2012 till 2014

4.2 **Company A2**

A2 is a manufacturer of other general purpose machinery. It is a privately-owned Finnish company founded in 1991. (Asiakastieto, 2016)

Table 3: Company A2 - Historical Financial Data from 2009 till 2014

Parameter	2009	2010	2011	2012	2013	2014
Turnover (t €)	38054	48272.7	65606.4	74833.5	77300.3	81810.5
BS Total (t €)	29239.6	34285.4	40666.1	43104.8	47037.6	51228
A/R (t €)	10285.3	11183.5	11492.3	13022.8	16241.0	18705.3
(AR/BS Total) %	35.18%	32.62%	28.26%	30.21%	34.53%	36.51%
RT (days)	65	64	51	49	57	50
RT Ratio	5.62	5.70	7.16	7.45	6.40	7.30
Working Capital Ratio	35	26.9	23.6	23.4	26.7	25.1

4.2.1 Turnover

A2's turnover showed positive growth rate from 2009 till 2011 – **27.23 %**. Whereas, for the period of 2012 till 2014, the turnover continued to grow at the rate of **4.46 %**, indicating faster and sustained growth.

Figure 8: Turnover Growth Rates from 2009 till 2011 and 2012 till 2014

4.2.2 A/R to BS Total in Percentage

For A2, the Accounts Receivables to Balance Sheet total expressed in percentage, showed decline at the rate of **-10.9 %** between 2009 till 2011. But, it started growing between 2012 to 2014 at the rate of **9.47 %**.

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Figure 9: A/R to BS Total Growth Rates from 2009 till 2011 and 2012 till 2014

4.2.3 RT Ratio

A2's RT Ratio grew at the rate of **12.13%** during 2009 till 2011, whereas between the period of 2012 till 2014, it slowed down to **-1.0%**, which is in line with the rise in the A/R to BS Total Ratio growth rates from 2012 till 2014.

Figure 10: RT Ratio Growth Rates from 2009 till 2011 and 2012 till 2014

4.2.4 Working Capital Ratio

A2's Working Capital Ratio declined at the rate of **-19.70%** between 2009 and 2011, whereas it started growing in the positive direction, at **3.51%** from 2012 till 2014.

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	Working Capital Ratio		Working Capital Ratio	

$y = 3E{+}173e^{-0.197x}$
$R^2 = 0.9638$

$y = 6E{-}30e^{0.0351x}$
$R^2 = 0.2822$

Figure 11: Working Capital Ratio Growths from 2009 till 2011 and 2012 till 2014

4.3 **Company A3**

Founded in 1966, A3 is a private Finnish company involved in the wholesale of chemical products. (Asiakastieto, 2016)

Table 4: Company A3 - Historical Financial Data from 2009 till 2014

Parameter	2009	2010	2011	2012	2013	2014
Turnover (t €)	33425.9	42328.4	35663.5	48245	52829.6	51531.7
BS Total (t €)	11497.4	14577.2	12645.8	15904.0	15379.5	15135.9
A/R (t €)	877.4	3972.8	8288.6	9913.8	10106.5	6598
(AR/BS Total) %	7.63%	27.25%	65.54%	62.34%	65.71%	43.59%
RT (days)	24	24	18	22	20	19
RT Ratio	15.21	15.21	20.28	16.59	18.25	19.21
Working Capital Ratio (%)	1.3	1.3	1.2	2.2	1.4	-0.2

4.3.1 Turnover

A3's turnover showed positive growth at the rate of **3.24%** from 2009 till 2011. Whereas, for the period of 2012 till 2014, the turnover continued to grow at a marginally faster rate of **3.30 %**, showing consistent growth.
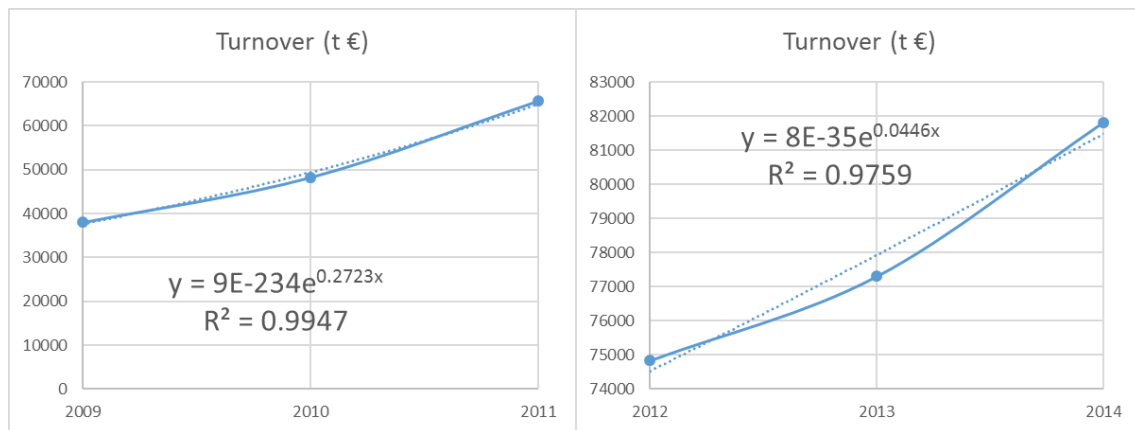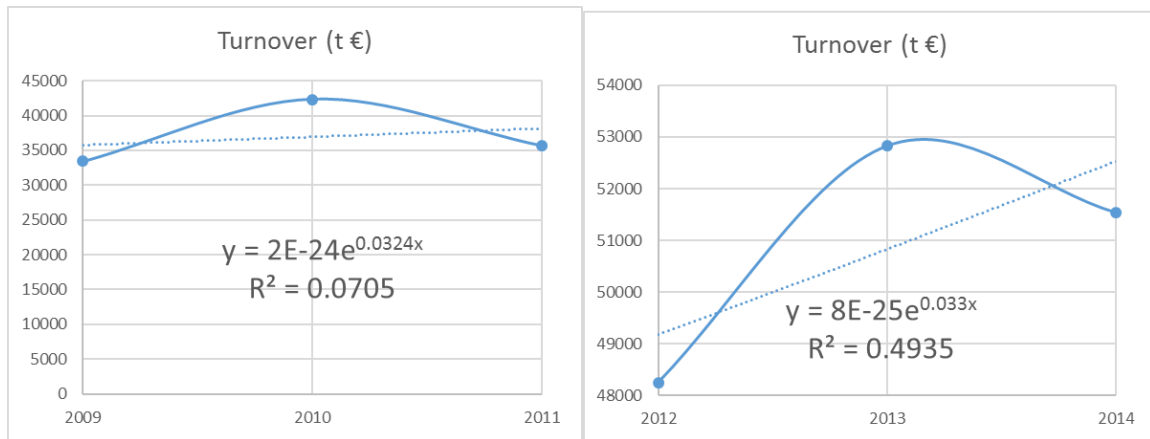
Figure 12: Turnover Growth Rates from 2009 till 2011 and 2012 till 2014

4.3.2 A/R to BS Total in Percentage

For A3, the Accounts Receivables to Balance Sheet total expressed in percentage, grew at an alarmingly fast rate of **107.52 %** between 2009 till 2011. But, it managed to reduce the high growth rate of the past 3 years with a declining growth rate of -**17.90%** from 2012 till 2014.
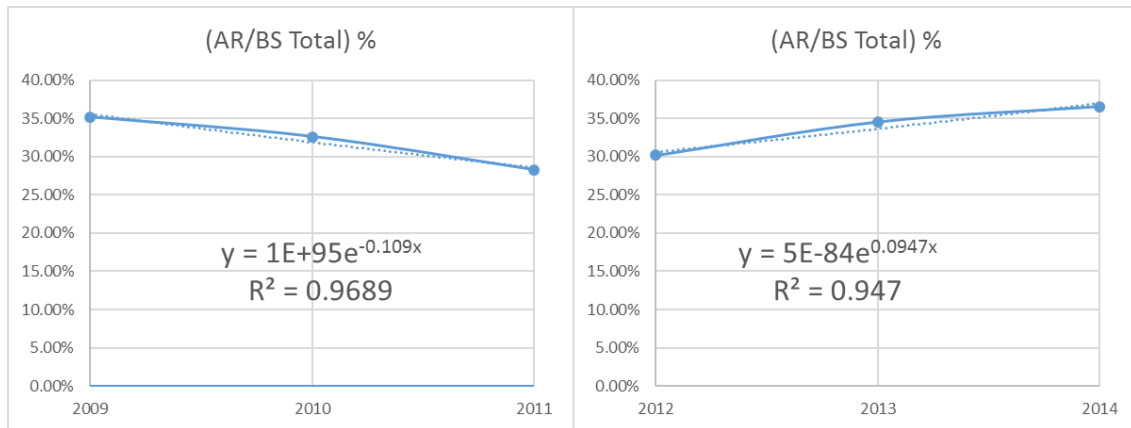

Figure 13: A/R to BS Total Growth Rates from 2009 till 2011 and 2012 till 2014

4.3.3 RT Ratio

A3's RT Ratio grew at the rate of **14.38%** during 2009 till 2011, whereas between the period of 2012 till 2014, it continued growing at the rate of **7.33%.**
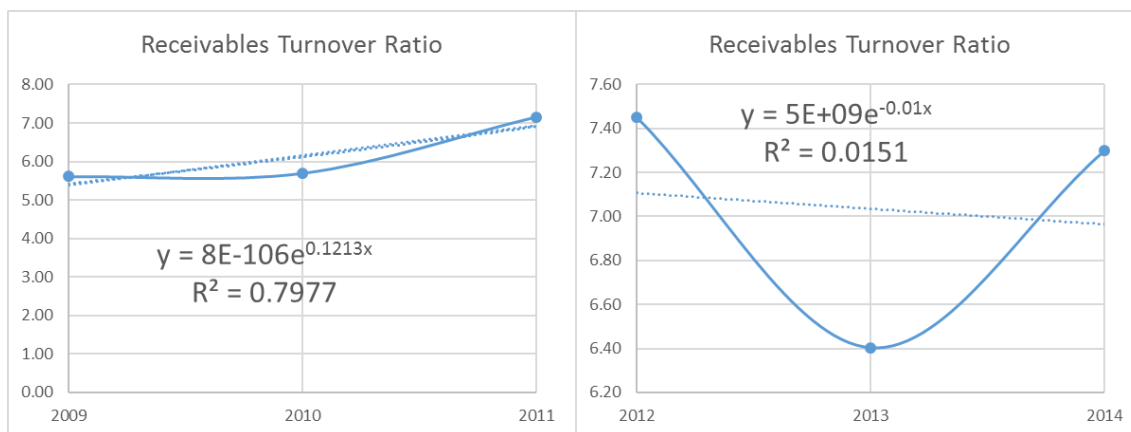
Figure 14: RT Ratio Growth Rates from 2009 till 2011 and 2012 till 2014

4.3.4 Working Capital Ratio

A3's Working Capital Ratio declined at the rate of **-4%** between 2009 and 2011, whereas between 2012 to 2014, it declined at an even faster rate of **-120%** from 2012 till 2014 indicating massive expansion or increased liabilities.

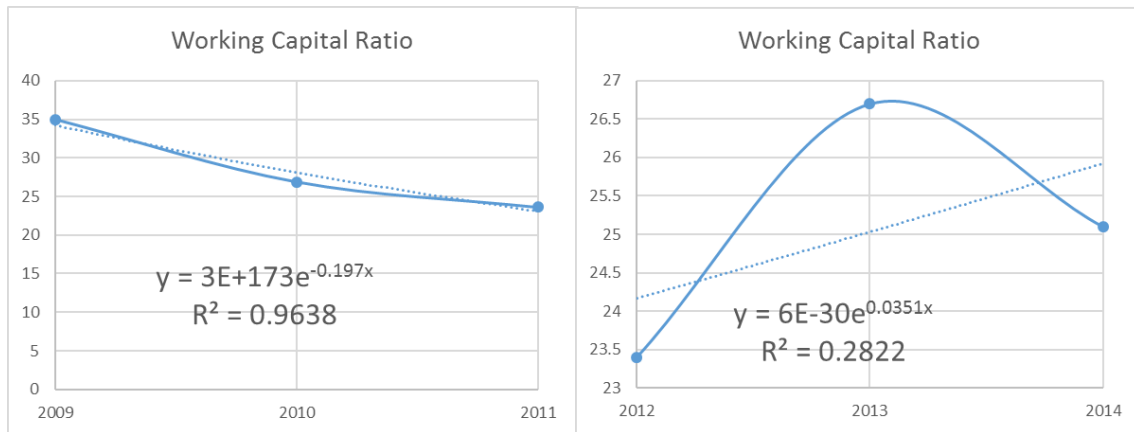*Figure 15: Working Capital Ratio Growths from 2009 till 2011 and 2012 till 2014*

4.4 Company A4

A4 is a private Finnish company, that started its operations in 2003. It specializes in large scale retail in supermarkets. (Asiakastieto, 2016)

Table 5: Company A4 - Historical Financial Data from 2009 till 2014

Parameter	2009	2010	2011	2012	2013	2014
Turnover (t €)	1587155	1653998	1763401.6	1857854	1878606	1853458
BS Total (t €)	213985.4	259504.0	258391.5	283662	227638	229475
A/R (t €)	90692.8	90972.1	31479.7	69277.0	51308.1	77878.0
(AR/BS Total) %	42.38%	35.06%	12.18%	24.42%	22.54%	33.94%

RT (days)	5	4	4	3	2	4
RT Ratio	73.00	91.25	91.25	121.67	182.50	91.25
Working Capital Ratio (%)	5.6	5.6	5.7	4.8	4.4	4.5

4.4.1 Turnover

A4's turnover showed positive growth at the rate of **5.27%** from 2009 till 2011. Whereas, for the period of 2012 till 2014, the turnover showed a very small decline at the rate of **0.1 %,** reflecting no significant negative signs.

Figure 16 : Turnover Growth Rates from 2009 till 2011 and 2012 till 2014

4.4.2 A/R to BS Total in Percentage

For A4, the Accounts Receivables to Balance Sheet total ratio declined at the rate of **-62.3 %** between 2009 till 2011. But, it could not continue the favorable trend and started showing increment in the growth at rate of **16.45%** from 2012 till 2014.
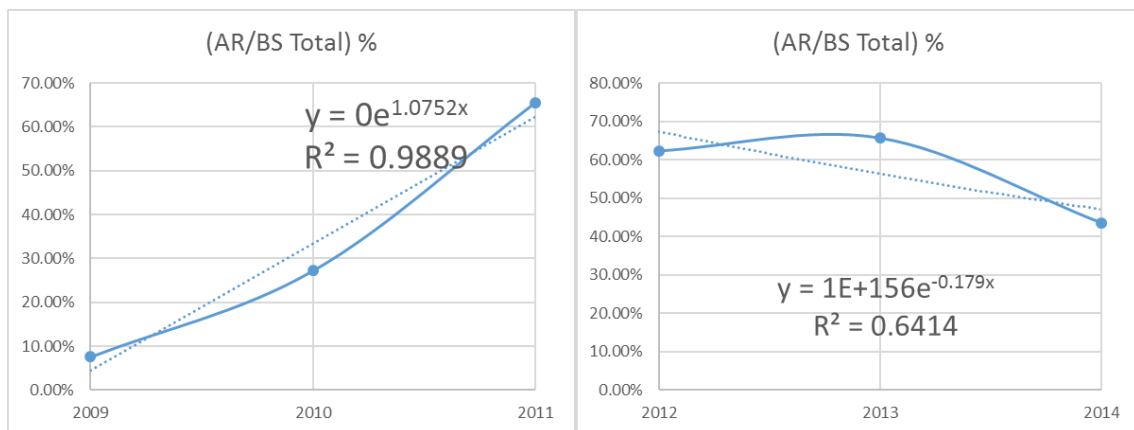

Figure 17 : A/R to BS Total Growth Rates from 2009 till 2011 and 2012 till 2014

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4.4.3 RT Ratio

A4's RT Ratio grew at a healthy rate of **11.16%** from 2009 till 2011, whereas between the period of 2012 till 2014, its positive trend slowed down a little, at the rate of **-1.44%** Despite the increase in A/R to BS Total Ratio growth rate, a decreasing RT ratio indicates slower collection rate and hence lesser liquidity.

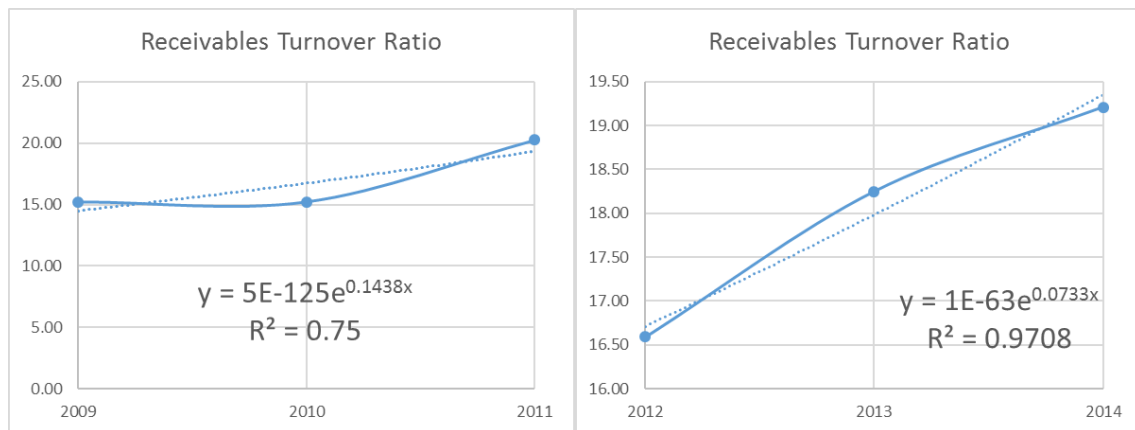*Figure 18 : RT Ratio Growth Rates from 2009 till 2011 and 2012 till 2014*

4.4.4 Working Capital Ratio

A4's Working Capital Ratio grew at a modest but positive rate of **0.88%** between 2009 and 2011, whereas between 2012 to 2014, it started declining at the rate of **-3.2%** from 2012 till 2014.
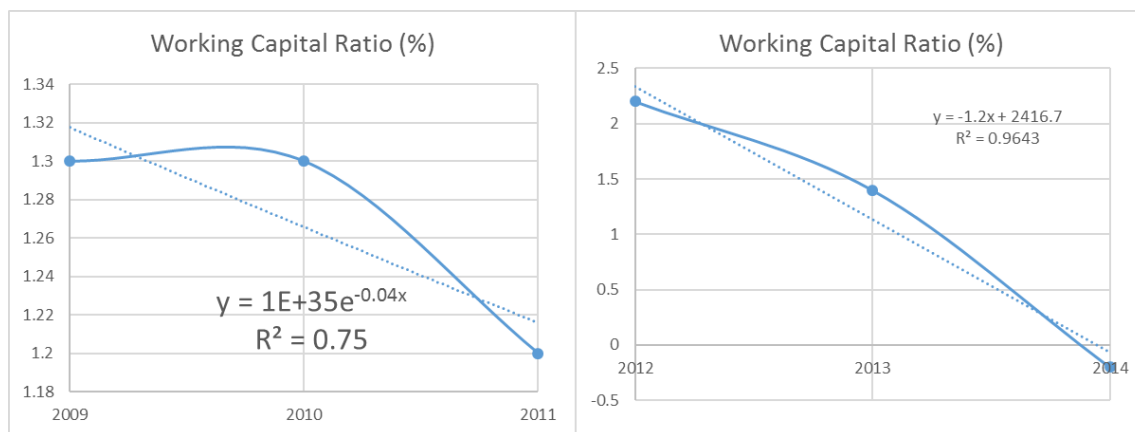

Figure 19 : Working Capital Ratio Growths from 2009 till 2011 and 2012 till 2014

4.5 Company A5

A5 is a privately held Finnish company that started its operation 1999. It's a small company that specializes in sawmilling and planing of wood. 70% of its production is exported to overseas markets. (Asiakastieto, 2016)

Table 6: Company A5 - Historical Financial Data from 2009 till 2014

Parameter	2009	2010	2011	2012	2013	2014
Turnover (t €)	10504	15047	16337	14785.2	16980	17683
BS Total (t €)	5878.3	5519.0	5317.0	5493.5	5978.8	6226.0
A/R (t €)	1312.2	1194	1693	1674.6	1836.8	2111
(AR/BS Total) %	22.32%	21.63%	31.84%	30.48%	30.72%	33.91%
RT (days)	46	28	34	40	37	42
RT Ratio	7.93	13.04	10.74	9.13	9.86	8.69
Working Capital Ratio (%)	5.7	5.1	5.9	7.3	8.2	7.7

4.5.1 Turnover

A5's turnover showed a positive growth at the rate of **22.08%** from 2009 till 2011. Whereas, for the period of 2012 till 2014, the turnover continued to grow at the rate of **8.95 %,** reflecting continued good performance.
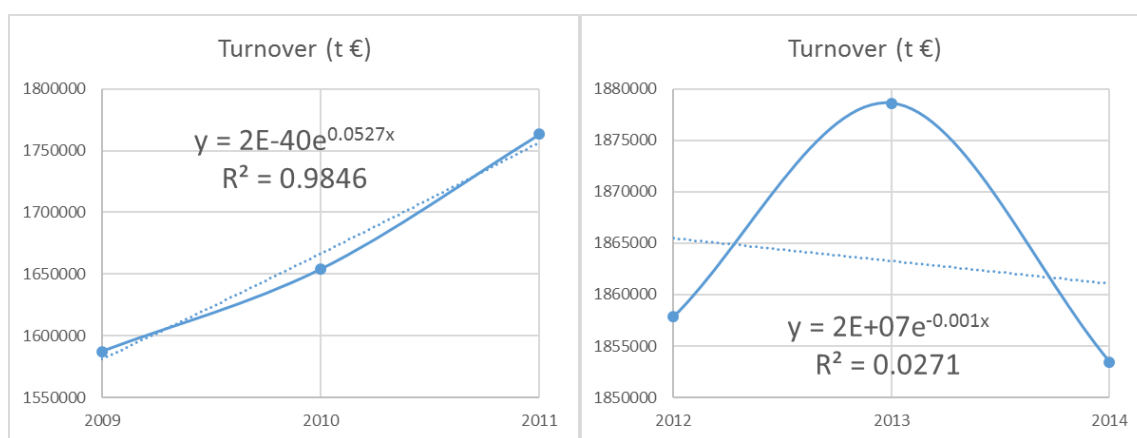

Figure 20 : Turnover Growth Rates from 2009 till 2011 and 2012 till 2014

4.5.2 A/R to BS Total in Percentage

For A5, the Accounts Receivables to Balance Sheet total ratio increased at the rate of -**17.76 %** between 2009 till 2011. But, it managed to break the unfavorable trend and

started showing slower increment in the growth at rate of **5.32%** from 2012 till 2014. This reflects positively on the company since the turnover grew during the same period.
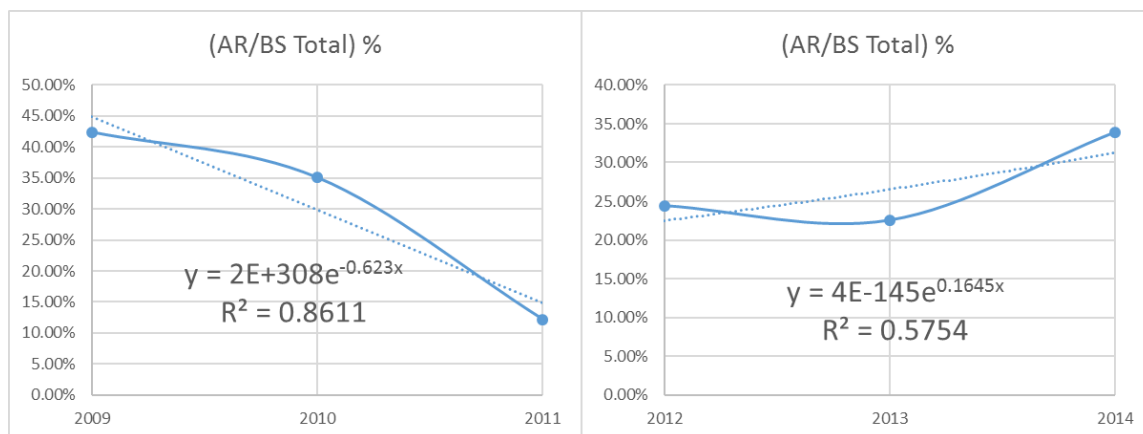

Figure 21 : A/R to BS Total Growth Rates from 2009 till 2011 and 2012 till 2014

4.5.3 RT Ratio

A5's RT Ratio grew at a healthy rate of **15.11%** from 2009 till 2011, whereas between the period of 2012 till 2014, it showed signs of decline at the rate of **-2.4%**. Despite the increase in A/R to BS Total Ratio growth rate, this decline reflects the need for better credit terms.
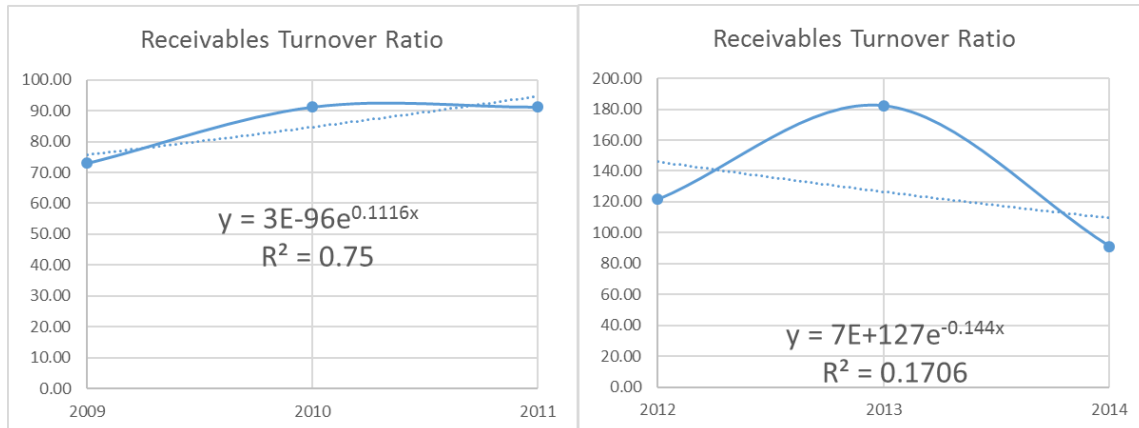

Figure 22 : RT Ratio Growth Rates from 2009 till 2011 and 2012 till 2014

4.5.4 Working Capital Ratio

A5's Working Capital Ratio grew at a modest but positive rate of **1.72%** between 2009 and 2011, whereas between 2012 to 2014, it gained a slight momentum with an increased rate of **2.67%**.
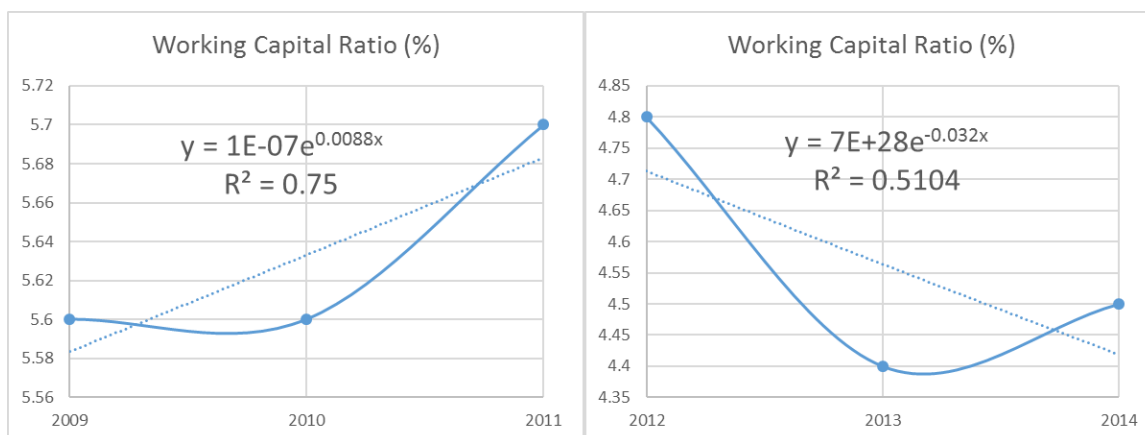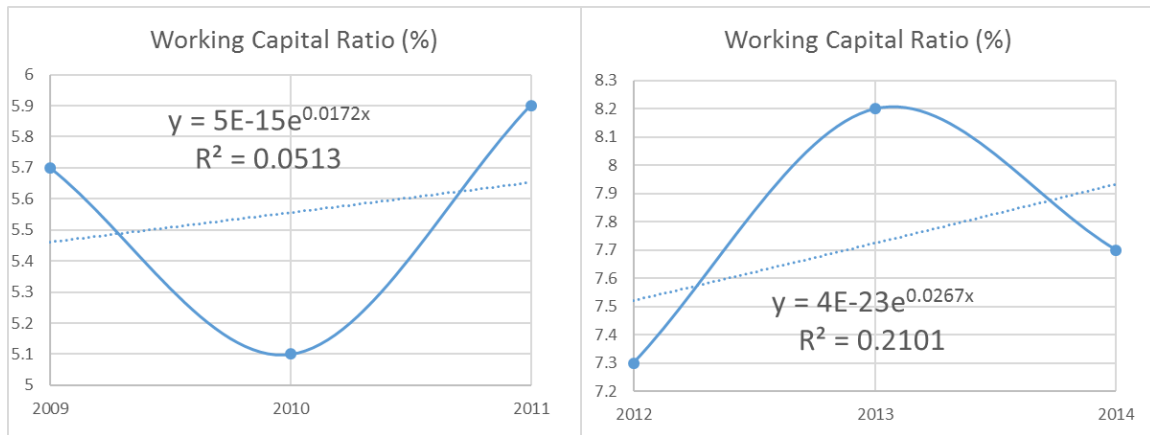
Figure 23 : Working Capital Ratio Growths from 2009 till 2011 and 2012 till 2014

4.6 **Company A6**

A6 is also a privately held Finnish company that started its operation 1999. It's a small company that engages sawmilling and manufacturing specialized wooden products that are sold to overseas markets mostly. As a matter of fact, 90% of its production is exported to overseas markets. (Asiakastieto, 2016)

Table 7: Company A6 - Historical Financial Data from 2009 till 2014

Parameter	2009	2010	2011	2012	2013	2014
Turnover (t €)	2628	2679	3739	3497	4942	5880
BS Total (t €)	1695.0	1698.0	2011.0	2102.0	2309.0	3137.0
A/R (t €)	282.0	384.0	360.0	454	512	771
(AR/BS Total) %	16.64%	22.61%	17.90%	21.60%	22.17%	24.58%
Receivables Turnover (days)	34	29	39	24	35	27
Receivables Turnover Ratio	10.74	12.59	9.36	15.21	10.43	13.52
Working Capital Ratio (%)	12.8	16.9	19	21.8	17.7	24.4

4.6.1 Turnover

A6's turnover grew at the rate of **17.63%** from 2009 till 2011. Whereas, for the period of 2012 till 2014, the turnover continued to grow even faster at the rate of **25.98 %**, reflecting solid growth.
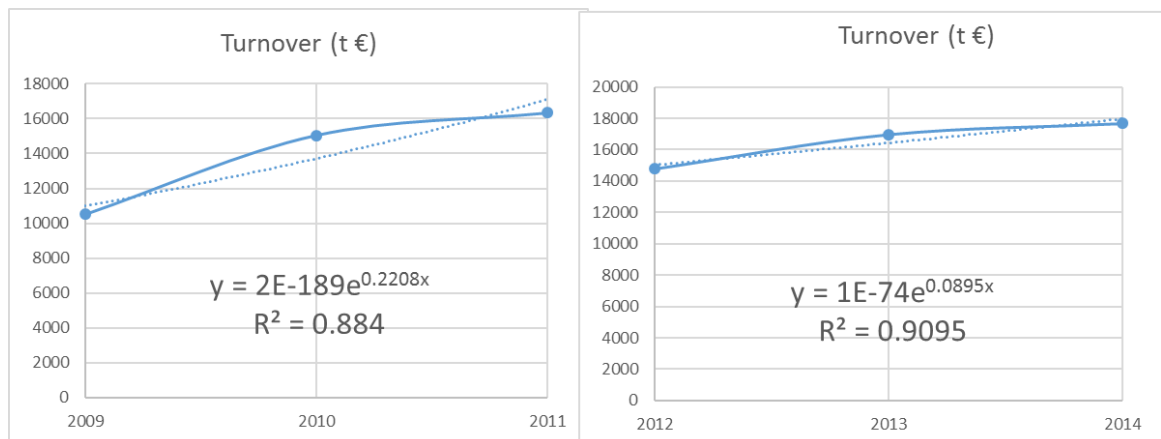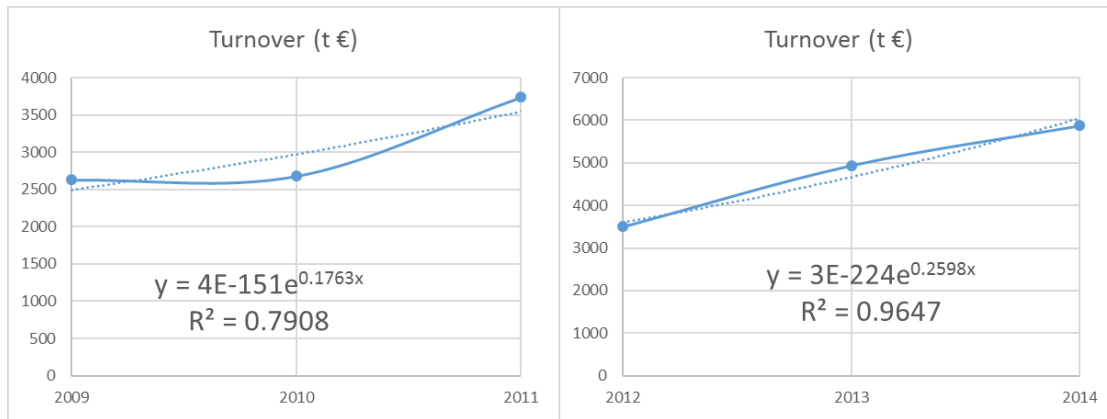
Figure 24 : Turnover Growth Rates from 2009 till 2011 and 2012 till 2014

4.6.2 A/R to BS Total in Percentage

For A6, the Accounts Receivables to Balance Sheet total ratio increased at the rate of -**3.66 %** between 2009 till 2011. It could not continue the positive trend and continued growing at a faster rate of **6.46%** from 2012 till 2014. Nonetheless, this reflects positively on the company since the turnover grew during the same period.
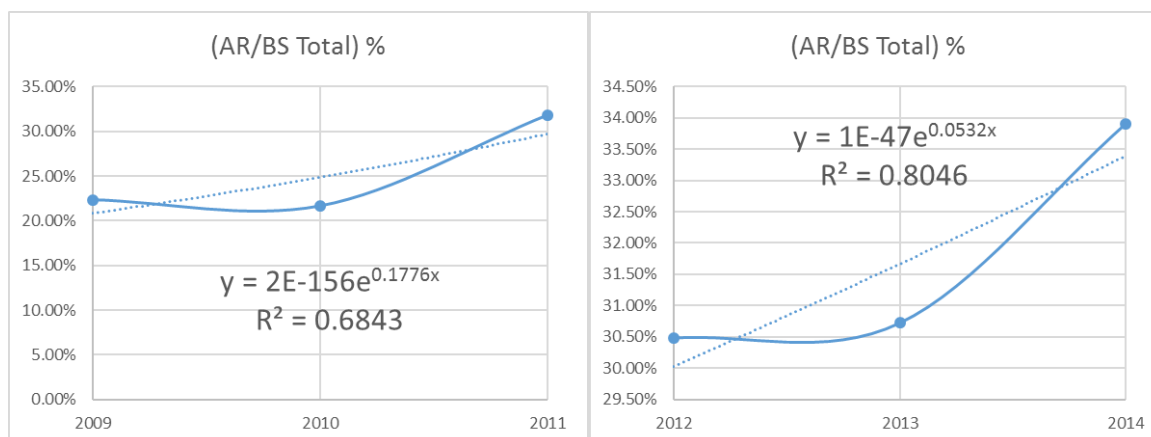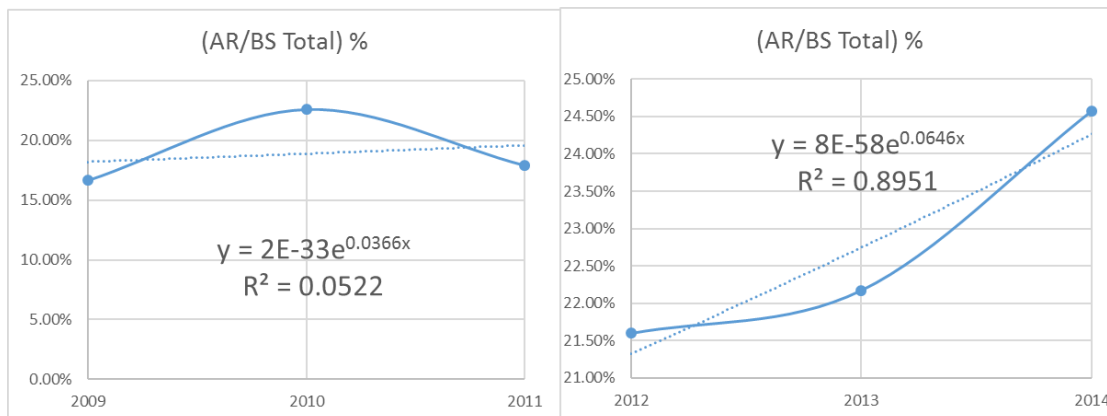

Figure 25 : A/R to BS Total Growth Rates from 2009 till 2011 and 2012 till 2014

4.6.3 RT Ratio

A6's RT Ratio declined at the rate of **-6.9%** from 2009 till 2011, whereas between the period of 2012 till 2014, it showed signs of improvement at the rate of **-5.9%.** Combined with an increase in turnover, this indicates better liquidity for the company.
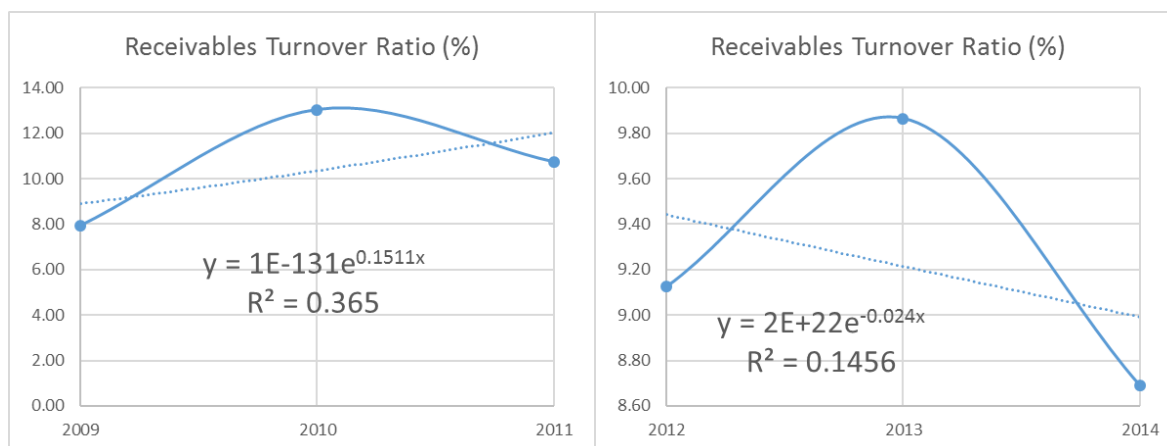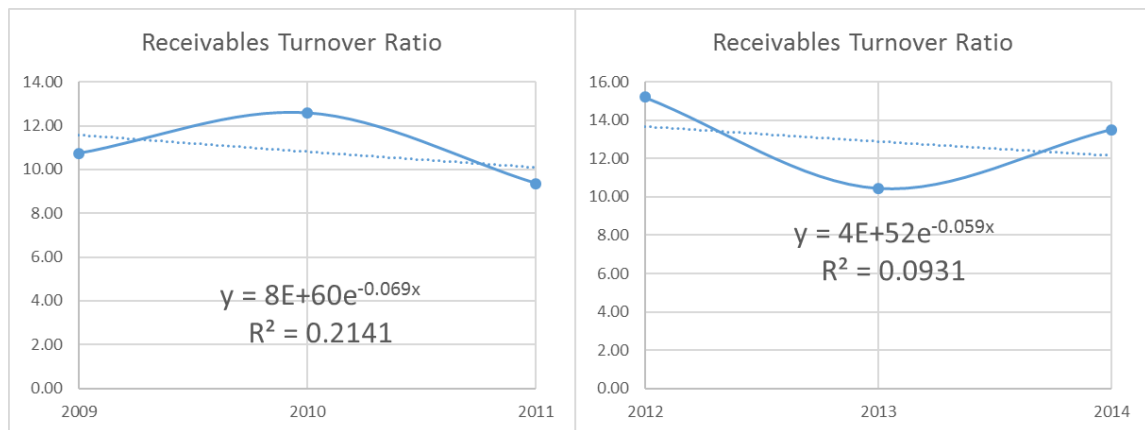
Figure 26 : RT Ratio Growth Rates from 2009 till 2011 and 2012 till 2014

4.6.4 Working Capital Ratio

A6's Working Capital Ratio grew at a solid rate of **19.75%** between 2009 and 2011, whereas between 2012 to 2014, it continued the growth in the positive direction, with a growth rate of **5.63%.**
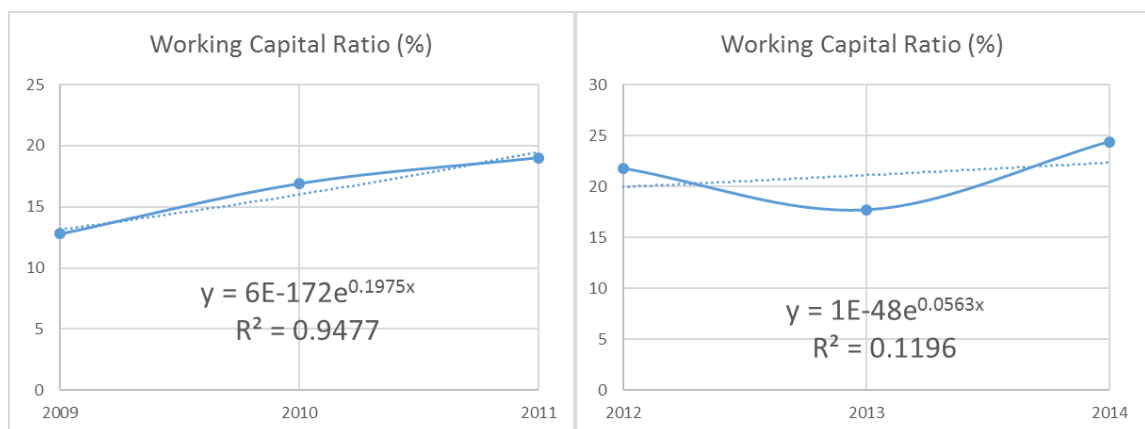
Figure 27 : Working Capital Ratio Growths from 2009 till 2011 and 2012 till 2014

4.7 Company A7

A7 is small private Finnish company that started operations in 2005. Currently, it employs 40 staff members. They specialize in making aluminum metal structures and part of structures. (Asiakastieto, 2016)

Table 8: Company A7 - Historical Financial Data from 2009 till 2014

Parameter	2009	2010	2011	2012	2013	2014
Turnover (t €)	2762.6	2495.1	4086.8	2857.7	6413.5	8292
BS Total (t €)	2957.8	2707.9	3125.5	2920.4	4575.0	3691.8
A/R (t €)	226.2	270.8	656.4	560.6	1201	902.9

(AR/BS Total) %	7.65%	10.00%	21.00%	19.20%	26.25%	24.46%
RT (days)	19	39	45	35	69	40
RT Ratio	19.21	9.36	8.11	10.43	5.29	9.13
Working Capital Ratio (%)	14.9	20.3	15.3	19.8	30.7	20.2

4.7.1 Turnover

A7's turnover grew at a healthy rate of **19.58%** from 2009 till 2011. Whereas, for the period of 2012 till 2014, the turnover continued to grow even faster at the rate of **53.26%**, reflecting solid growth and expansion.
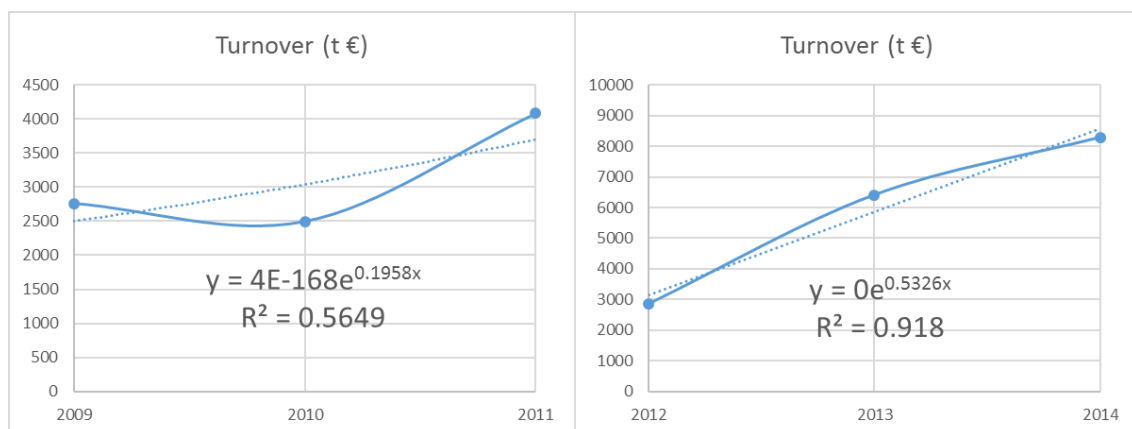
Figure 28 : Turnover Growth Rates from 2009 till 2011 and 2012 till 2014

4.7.2 A/R to BS Total in Percentage

For A7, the Accounts Receivables to Balance Sheet total ratio increased at the rate of **50.51%** between 2009 till 2011. But, during the period of 2012 till 2014, it was able to slow down this rate of growth, bringing it down to **12.11%.** This improvement is significant, given the increase in turnover, signaling excellent liquidity.
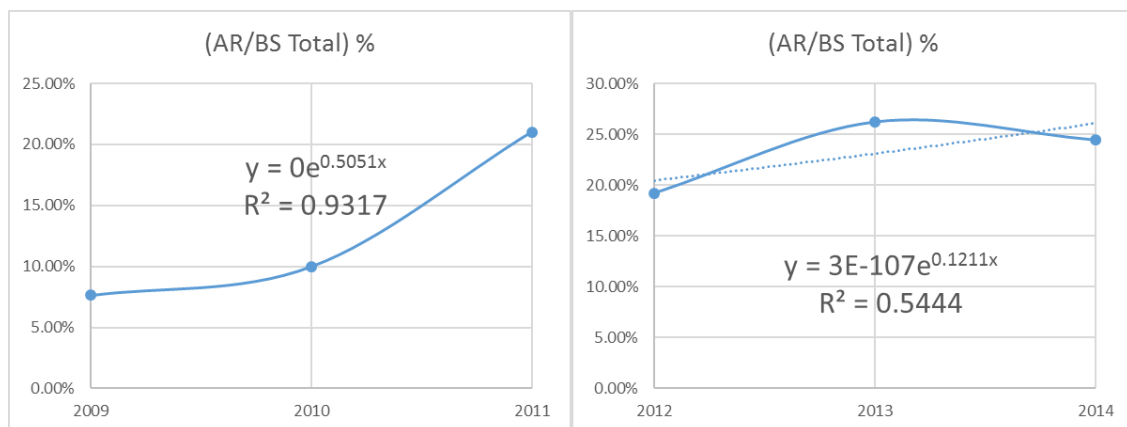
Figure 29 : A/R to BS Total Growth Rates from 2009 till 2011 and 2012 till 2014

4.7.3 RT Ratio

A7's RT Ratio declined at the rate of **-4.31%** from 2009 till 2011, whereas between the period of 2012 till 2014, it continued the negative trend at the rate of **-6.7%**. Combined with a positive A/R to BS Total ratio, this indicated that the company has managed to improve liquidity despite a decline in the RT Ratio.
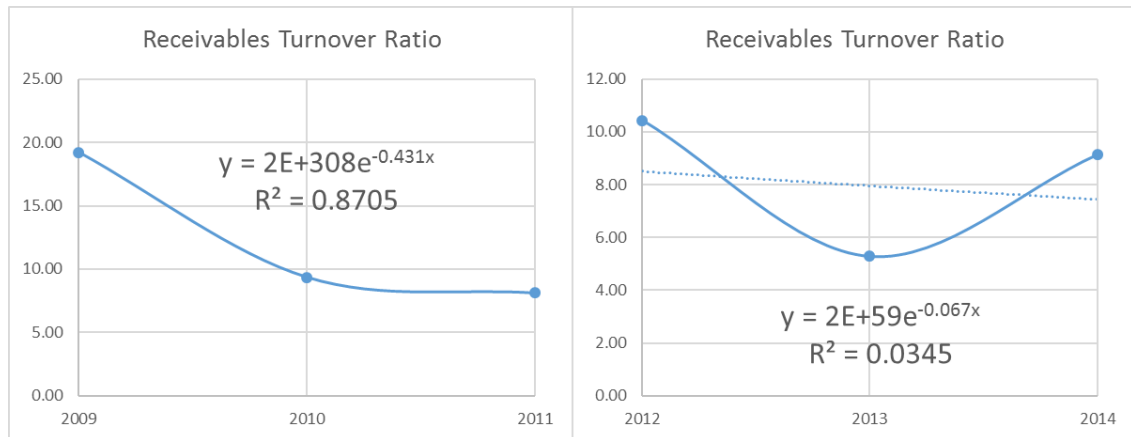
Figure 30 : RT Ratio Growth Rates from 2009 till 2011 and 2012 till 2014

4.7.4 Working Capital Ratio

A7's Working Capital Ratio grew at a modest rate of **1.32%** between 2009 and 2011, whereas between 2012 to 2014, it continued the growth in the positive direction, with a marginal decline in growth rate at **1.0%.**
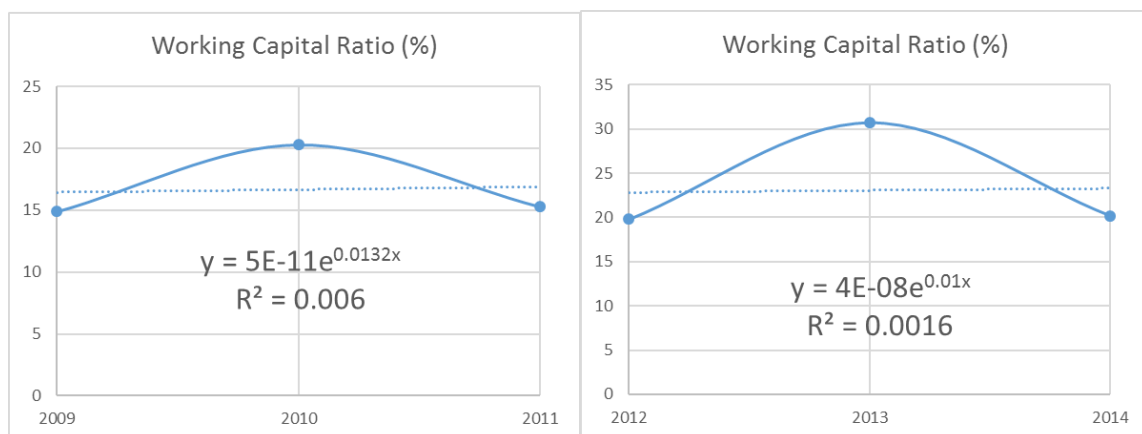
Figure 31 : Working Capital Ratio Growths from 2009 till 2011 and 2012 till 2014

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5) DISCUSSION

Following are case by case analyses of the 7 companies under study. Differences measured were plotted against each other to get a sense of the overall relevance of the increasing or decreasing averages in the two periods of pre-and post-insurance.

Using the before and after means of Turnover, A/R in €, A/R over BS Total, RT Ratio and Working Capital Ratio, the following values were calculated for analysis through the difference of means.

These 5 parameters gave 2 sample means, which have been tabulated below.

Table 9: Turnover, Accounts Receivables and A/R over BS Total compared between 2009-2011 and 2012-2014: Difference (Δ) in means expressed in %

	Turnover in t €			A/R in t €			A/R over BS Total		
	Before	**Under**	**Δ in %**	**Before**	**Under**	**Δ in %**	**Before**	**Under**	**Δ in %**
A1	27687.1	32110.7	15.98%	5071.6	5928.0	5.19%	28.21%	31.43%	11.40%
A2	50644.4	77981.4	53.98%	10987.0	15989.7	35.68%	32.02%	33.75%	5.41%
A3	37139.3	50868.8	36.97%	4379.6	8872.8	19.88%	33.48%	57.21%	70.91%
A4	1668184.8	1863306.0	11.70%	71048.2	66154.4	1.22%	29.87%	26.97%	-9.73%
A5	13962.6	16482.6	18.05%	1399.7	1874.1	5.89%	25.27%	31.70%	25.48%
A6	3015.3	4773	58.29%	342.0	579	39.67%	19.05%	22.78%	19.59%
A7	3114.8	5854.4	87.95%	384.5	888.2	27.25%	12.88%	23.30%	80.87%

Table 10: A/R Turnover Ratio and Working Capital Ratios compared between 2009-2011 and 2012-2014: Difference (Δ) in means expressed in %

	A/R Turnover Ratio			Working Cap Ratio (%)		
	Before	**Under**	**Δ in %**	**Before**	**Under**	**Δ in %**
A1	6.00	6.23	3.82%	6.00	6.23	-17.14%
A2	6.16	7.05	14.49%	6.16	7.05	-12.05%
A3	16.90	18.02	6.62%	28.50	1.13	-96.02%
A4	101.39	131.81	30.00%	5.60	162.22	-18.45%
A5	10.57	9.23	-12.70%	5.57	7.73	38.92%
A6	12.38	11.36	19.81%	19.27	19.50	1.21%
A7	12.23	8.28	-32.27%	16.83	23.57	40.00%

The tables above tabulate the 5 data points that the author has thrown light on, in order analyze, critique and make conclusions on the basis of. Each company has been shortly discussed through the analysis of the differences in means from the period of 2009 till 2011 (without Credit Insurance coverage) and from 2012 till 2014 (under Credit Insurance coverage) using the 5 chosen parameters. This was the only available option and hence the chosen way, since the sample size is too small for T-tests, Chi-squared test and ANOVA test.

5.1 **Special mention to A4 – High RT Ratio**

A4 must be discussed separately because of the magnitude of its parameters. In terms of Accounts Receivables, A4 was the largest in the sample (33 times bigger in terms of
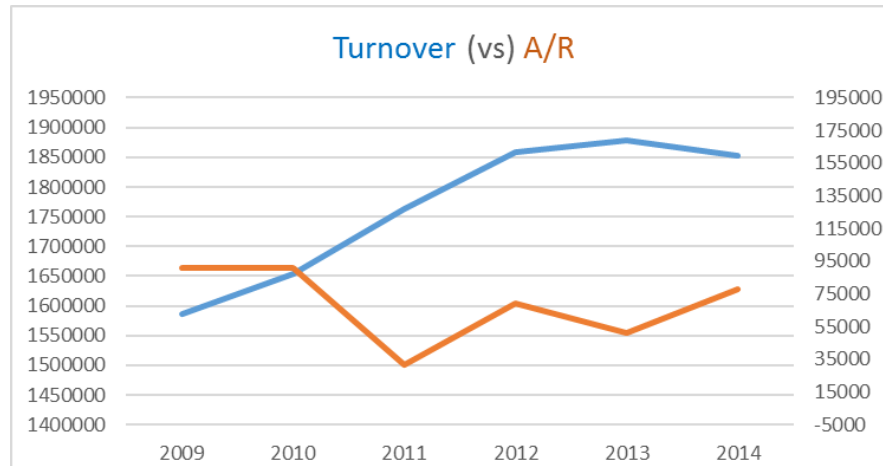
Figure 32: A4's Turnover and A/R compared

Turnover than A2 – the second largest subject in the sample), and hence the overall change between the before insurance periods was only 1.22 % – something the author

thor expected, owing to the large scale on which the company operates, that too in retail industry, which does not react to external financial anomalies like other industries. The retail market in Finland follows an Oligopoly, due to the strong dominance of a few players in the market. A4 succeeded in bringing its A/R to BS Total Ratio figures down in the under-insurance period by 9.73%, which is a sign of solid progress, combined with the 11.70% difference between the turnover figures in the same period. This is confirmed by a sharp increase in the A/R turnover ratio. Although, it must be noted that A/R is calculated by dividing the RT in days by 365. And, since big companies like A4 collect receivables much more often than smaller businesses, a difference of 1 day makes a huge difference to the RT Ratio. Additionally, this figure is rounded off in Credit Reports. So, an average of 3.5 days is reported as 4.

The figure above shows why A4's RT Ratio increased. Despite a steady growth, with a slight decline in the 3rd year of the insurance coverage, the growth rate of A4's Turnover was much sharper than its A/R growth rate. Although, from A4's point of view, a slightly higher A/R could also indicate more trade deals on credit terms that are insured, giving them the confidence to offer competitive credit terms to their buyers. As can be seen from the figure below, the A/R to BS Total Ration increased from around 25% in 2012 to near 35 % in 2015.
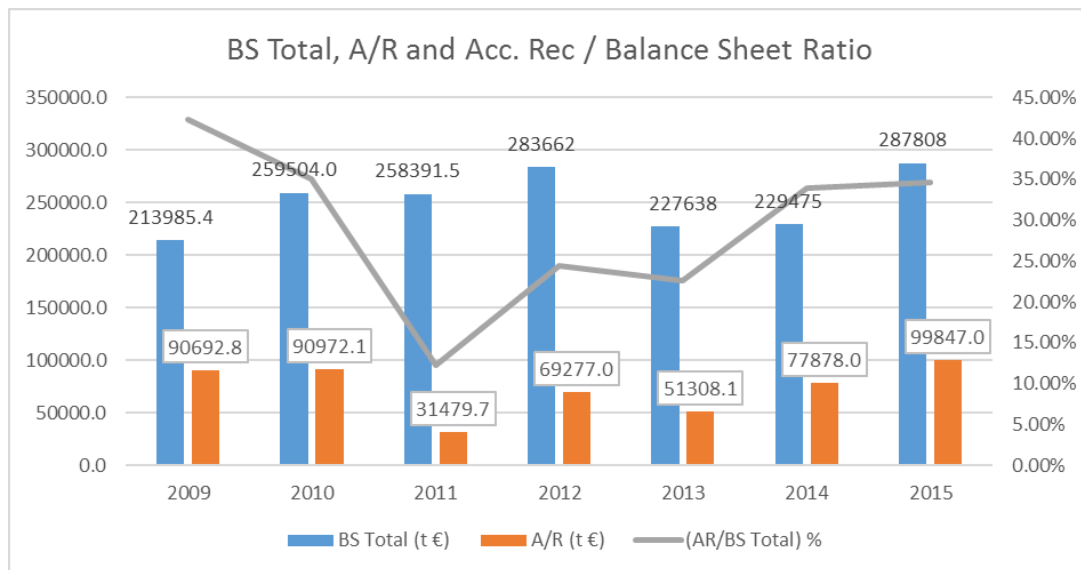
Figure 33: Comparison -- A4's Balance Sheet Total, Accounts Receivables and A/R to Balance Sheet Total Ratio

For instance, A4's RT in 2012 was 3 days in the insurance period, whereas it was 2 in 2013. This means the RT ratio for these periods were 365 / 4 = 121.67 and 365 / 2 = 182.50 respectively, which show a massive difference relative to other companies, which have a higher RT in days on average, and therefore much smaller corresponding Receivable Turnover ratios.

Interestingly, A4's working capital ratio decreased in the two studied periods by -18.45%. This is misleading at first, but upon taking into consideration the high inventory levels in retail industry, it is justified to an extent.

5.2 Notable Effects on Financial Performance

Table 11: Heatmap: Based on total change between two periods.

Rec. Turnover Ratio		Turnover		A/R in t €		A/R over BS Total		Working Cap Ratio	
Companies	Δ in %	Companies	Δ in %	Companies	Δ in %	Companies	Δ in %	Companies	Δ in %
A7	-32.27%	A4	11.70%	A4	1.22%	A4	-9.73%	A3	-96.02%
A5	-12.70%	A1	15.98%	A1	5.19%	A2	5.41%	A4	-18.45%
A1	3.82%	A5	18.05%	A5	5.89%	A1	11.40%	A1	-17.14%
A3	6.62%	A3	36.97%	A3	19.88%	A6	19.59%	A2	-12.05%
A2	14.49%	A2	53.98%	A7	27.25%	A5	25.48%	A6	1.21%
A6	19.81%	A6	58.29%	A2	35.68%	A3	70.91%	A5	38.92%
A4	30.00%	A7	87.95%	A6	39.67%	A7	80.87%	A7	40.00%
Average	4.25%	Average	40.42%	Average	19.25%	Average	29.13%	Average	-9.08%

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5.2.1 Company A7 – Fast Growing Small Company

A7 shows great progress by scoring the highest in turnover change and Working Capital Ratio, but also showed a significant change in A/R to BS Ratio of 80 %, indicating aggressive credit provision to customers in order to gain market share, heavy investment within the company and/or loans. With a 3rd lowest increase in A/R (the lower the better, if profitability remains positive), A7 still did better than 4 other companies. Unsurprisingly, A7 has the sharpest decline in RT Ratio, which could possibly indicate their willingness to take greater risks in foreign markets with better Credit Terms.

5.2.2 Company A4 – Big Player, Steady Performance

A4 scored highest in changes in Turnover Ratio, lowest change in A/R combined with a highest change in their A/R to BS Total Ratio between two periods.

5.2.3 Company A2 – Controlled Growth

A2 showed impressive changes in Turnover, with the under-insurance average nearing 78 m€, from 51 m€ in the pre-insurance period. A2 was able to achieve with smaller increase in A/R with the A/R increasing by 35.68 % -- much smaller than the change in Turnover. This was accompanied by a decent increase in RT Ratio of 14.49 %. A2 has definitely expanded, but through careful selection of trading partners, which has helped them keep their A/R's growth lower than its turnover.

5.2.4 Company A3 – Big Group, unpredictable trends

A3 turned out to be the most unpredictable of all the sample subjects, by scoring 2nd highest in A/R to BS Total, showing highest decline in Working Capital Ratio, and yet ending with a 36.97 % better Turnover between the two periods. Sanctions imposed on Russia has had a serious impact on A3, increasing its Receivables.

5.2.5 Company A5, A1 – Solid Growth, Lower RT Ratio

A5 showed an improvement in Turnover by 18.05 % with a respectable increase of only 5.89 % in their A/R levels. Although, they did so by extending their Credit terms, which

increased their share of A/R in the Balance Sheet Total by 25.48 %. Predictably, this reflects in the 2nd lowest Turnover Ratio in the group. At the same time, given their small size, with an average Turnover of around € 16.5 million, it is normal for a company to offer aggressive credit terms to increase their market share. Whether this aggressive move is a result of Credit Insurance is not easy to predict.

A1 on the other hand comes right below A5 in terms increase in turnover of 15.98 %, with the A/R and A/R over BS Total Ratio remaining lower than their Turnover Change. Their Working Capital Ratio, although decreased significantly by -17.14 %. Despite a positive RT Ratio, A6 shows worse liquidity.

5.2.6 Company A6 – Besides high A/R, one of the best

A6 exports 90% of its products, which partially explains higher A/R figures. Due to difference in trade regulations between Finland and other Easter European countries, the Credit Terms offered are more flexible than they would be, were they to only sell in the Finnish market. With an industry average of RT in days of 27, A6 is collecting its receivables much slower than their competitors. But, they have managed to increase their turnover – clearly suggesting that A6 is doing business with the right buyers.

5.3 Comparing company and corresponding industry Turnover Ratios

A more concrete indicator of how these companies performed with and without insurance can be seen by comparing their corresponding industry averages in Turnover Ratio. Average of industry performance from 2009 till 2011 and 2012 till 2014 can be tabulated and plotted against all the 7 corresponding companies. Following are the industry types that these 7 companies belong to.

Table 12: Company and Corresponding Industries

Company	Industry Type
A1	Machinery Manufacturing
A2	Manufacturing - General Purpose
A3	Wholesale Chemical Products

A4	Retail - Large Supermarkets
A5	Sawmilling / Planing of Wood
A6	Sawmilling / Planing of Wood
A7	Metal Industry

Table 13: RT Ratio Before Insurance – How the Companies performed compared to their Corresponding Insurtries

Receivables Turnover Ratio Before Insurance						
Industry Type	**2009**	**2010**	**2010**	**Industry Average**	**Company Average**	
Machinery Manufacturing	12.59	8.49	8.69	9.61	A1 Average	6.00
Manufacturing - General Purpose	13.04	9.86	10.14	10.84	A2 Average	6.16
Wholesale Chemical Products	11.77	13.04	11.41	12.03	A3 Average	16.90
Retail - Large Supermarkets	121.67	91.25	91.25	99.55	A4 Average	101.39
Sawmilling / Planing of Wood	13.04	13.52	13.52	13.35	A5 Average	10.57
Sawmiling / Planing of Wood	13.04	13.52	13.52	13.35	A6 Average	12.38
Metal Industries	19.21	9.36	8.11	10.63	A7 Average	12.23

The table above shows that 4 out of 7 industries performed better than their corresponding companies. This shows the development of RT Ratios before Insurance coverage was undertaken by the 7 Finnish companies starting in 2012.

The table below, on the other hand, shows that 5 out of 7 industries performed better than their corresponding 7 Finnish companies between the period of 2012 and 2014 – when these companies were covered by Credit Insurance.

Table 14: RT Ratio After Insurance – How the Companies performed compared to their Corresponding Industries

Receivables Turnover Ratio Under Insurance						
Industry Type	**2009**	**2010**	**2010**	**Industry Average**	**Company Average**	
Machinery Manufacturing	8.30	7.45	7.77	7.82	A1 Average	6.23
Manufacturing - General Purpose	12.17	11.06	11.06	11.41	A2 Average	7.05
Wholesale Chemical Products	10.74	11.06	10.43	10.74	A3 Average	18.02
Retail - Large Supermarkets	73.00	91.25	91.25	84.23	A4 Average	131.81
Sawmilling / Planing of Wood	13.52	15.87	13.04	14.04	A5 Average	9.23
Sawmilling / Planing of Wood	12.17	13.04	13.04	12.73	A6 Average	11.36
Metal Industries	11.77	11.41	11.41	11.53	A7 Average	8.28

But, if the before and after performances of these 7 companies and 7 industry types were to be compared, the picture looks different.

Table 15: The % change seen by the 7 industries and companies from 2009 till 2011 and 2012 till 2014

% Change in Turnover Ratio before and After Credit Insurance			
Industry Type	**Δ**	**Δ**	**Companies**
Machinery Manufacturing	-19%	3.82%	A1
Manufacturing - General Purpose	5%	14.49%	A2
Wholesale Chemical Products	-11%	6.61%	A3
Retail - Large Supermarkets	-15%	30.00%	A4
Sawmiling / Planing of Wood	5%	-12.70%	A5
Sawmiling / Planing of Wood	-5%	-8.26%	A6
Metal Industries	8%	-32.27%	A7
Average Effect	-4.38%	0.24%	

The table above shows that in 4 out of 7 industry types, the corresponding companies performed better than the industry average. For these 7 industries combines, the RT Ratio declined by **-4.38 %** on average, whereas these 7 companies managed to increase their RT Ratios by **0.24 %**.

6) CONCLUSION

It could be argued that if it were not for taxation, Credit Insurance would not be as important a product for companies, since equity financing would be more prevalent in that case. One could also argue that debt financing in the end is a form of hedging that allows the firm to utilize cash reserves or equity financing in other operations, giving the company a chance to focus on overall development. Trade Credit Insurance could in that case also be seen as an instrument of hedging for a company, especially if it chooses to insure its entire turnover against political and default risks.

In order to make conclusive remarks, the author has compared the before and after effects of Credit Insurance, by first comparing the numerical difference in growth of Turnover, A/R and RT Ratio. Then, a similar comparison is performed, using the growth rates calculated from trendline equations for Turnover Growth Rates, A/R to BS Total Ratio Growth Rates, as well as RT Ratio Growth Rates, which reflect a clearer difference in effects in the before and after insurance time periods.

A/R to BS Total Ratio Growth Rates are more descriptive of the change in the companies' Balance Sheet Totals and their corresponding shares of A/R expressed in percentage. So, if a company's Turnover grew at the rate of 10% but the A/R to BS Total Ratio grew at

8.5%, it could be seen as a positive sign for the company, since it manages to increase its turnover, and yet keep the share of A/R represented in the Balance Sheet relatively lower, increasing a company's liquidity and working capital. From this study's perspective, this is one of the key indicator of the efficacy of Credit Insurance.

This is further consolidated, if the company also manages to increase its RT Ratio growth rates.

Can a company keep its A/R's in check with the help of Credit Insurance? Can Credit Insurance help a company's revenue grow?

	Turnover in t €			A/R in t€		
	Before	Under	Δ in %	Before	Under	Δ in %
A1	27687.1	32110.7	15.98%	5071.6	5928.0	5.19%
A2	50644.4	77981.4	53.98%	10987.0	15989.7	35.68%
A3	37139.3	50868.8	36.97%	4379.6	8872.8	19.88%
A4	1668184.8	1863306.0	11.70%	71048.2	66154.4	1.22%
A5	13962.6	16482.6	18.05%	1399.7	1874.1	5.89%
A6	3015.3	4773	58.29%	342.0	579	39.67%
A7	3114.8	5854.4	87.95%	384.5	888.2	27.25%

In all 7 cases shown above, the difference in turnovers was not only positive, but also greater than the increase in the Δ of A/R for the 7 companies. This hints at the strong potential effect of Credit Insurance on companies' improving Turnover figures and reducing (in relevance to Turnover) A/R figures.

	A/R Turnover Ratio		
	Before	Under	Δ in %
A1	6.00	6.23	3.82%
A2	6.16	7.05	14.49%
A3	16.90	18.02	6.62%
A4	101.39	131.81	30.00%
A5	10.57	9.23	-12.70%
A6	12.38	11.36	19.81%
A7	12.23	8.28	-32.27%

This continues to look good, as, in 5 out of 7 cases, the RT Ratios grew, while for A5 and A7 they decreased significantly. But, given A5 (**18.05%**) and A7 (**87.95%**) sharp growth in Turnover, the decline in RT ratio is justified, as it signals towards aggressive expansion in trading frequency and magnitudes. Based on these 3 tables, it could be argued that Credit Insurance could help the companies become more liquid and helped their revenue growths.

Although, given the economic growth or recession and market share expansion or shrinking, these figures do not give the full picture of the changes in Turnover and Accounts Receivables. Percentage differences (Δ) in growth rates, on the other hand, disregard the numerical difference, as shown above, and instead compare the difference between Turnover Growth Rates and A/R to BS Total Ratio Growth Rates, as shown below.

Conclusive statements about the efficacy of Credit Insurance as a Credit Management tool, which could also potentially help a business grow, can only be made if the companies under policy coverage show positive growth in the policy coverage period, even if fractionally greater than the growth rate before.

Table 16: Comparing the relative Growth Rates of Turnover and A/R to BS Total

Turnover Growth Rates				A/R to BS Total Growth Rates			
#	2009 - 11	2012 - 14	Δ	#	2009 - 11	2012 - 14	Δ
A1	27.90%	-1.50%	-29.40%	A1	0.80%	2.52%	1.72%
A2	27.20%	4.46%	-22.74%	A2	-10.90%	9.47%	20.37%
A3	3.24%	3.30%	0.06%	A3	107.52%	-17.90%	-125.42%
A4	5.27%	-0.10%	-5.37%	A4	-62.30%	16.45%	78.75%
A5	22.08%	8.90%	-13.18%	A5	17.76%	5.32%	-12.44%
A6	17.63%	25.98%	8.35%	A6	3.66%	6.46%	2.80%
A7	19.58%	53.20%	33.62%	A7	50.51%	12.11%	-38.40%
Avg Δ in Turnover Growth			-4.09%	Avg Δ in A/R to BS Growth			-10.37%
Postive Δ is good. Negative is bad.				Postive Δ is good. Negative is bad.			

While it is unreasonable to maintain a sharp increase in Turnover Rates for a company that is out of the Startup or initial settling phase, it is normal to expect sustained positive growth. It was found that for A1, not only did the turnover declined at the rate of **-29.40%**, but the A/R to BS Total Ratio grew by **1.72%** also. This double negative effect shows that Credit Insurance was not able to help A1 improve its liquidity. A similar effect is seen on A2, A4. 3 out of 7 companies ended up losing liquidity during the policy coverage.

Can RT ratio give a fair, quantifiable and accurate assessment of the relationship between a company's turnover growth/decline and the adjacent levels of A/R?

Despite all the calculations and analysis, this question is very hard to answer. This hinges on factors like industry type, competitiveness of the market, product or service provided, state of the economy, among many others. That said, A/R Turnover Ratio is a fairer indicator of the effect of Credit Insurance on a company's liquidity than just Turnover or A/R difference values, since all the 7 companies listed above use Accrual-based accounting. Companies above include their A/R in their yearly revenues. They are, as a result, claiming revenue that they are yet to realize – as this "revenue", is in fact, sitting in their Balance Sheet as a numerical figure, adding no tangibility to their liquidity and operations.

In fact, in cases of payment defaults, this ends up being recorded as a revenue anyway, even though they will never be realized. To circumvent this, the author used various parameters and chose to analyze the historical data with the data from their policy coverage period. In addition, in case of payment defaults, bankruptcies (buyers), EH Finland indemnifies the policy holder with 80% of the A/R value that the buyers owe the policyholder.

Table 17: Comparing the Turnover Growth Rate and RT Ratio Growth Rate Differences from before and after insurance coverage.

Turnover Growth Rates				RT Ratio Growth Rates			
#	2009 - 11	2012 - 14	Δ	#	2009 - 11	2012 - 14	Δ
A1	27.90%	-1.50%	-29.40%	A1	10.38%	-9.60%	-19.98%
A2	27.20%	4.46%	-22.74%	A2	12.13%	-1.00%	-13.13%
A3	3.24%	3.30%	0.06%	A3	14.38%	7.33%	-7.05%
A4	5.27%	-0.10%	-5.37%	A4	11.36%	20.27%	8.91%
A5	22.08%	8.90%	-13.18%	A5	15.11%	2.40%	-12.71%
A6	17.63%	25.98%	8.35%	A6	-6.90%	-5.90%	1.00%
A7	19.58%	53.20%	33.62%	A7	-43.00%	-6.70%	36.30%
Avg Δ in Turnover Growth			-4.09%	Avg Δ in RT Ratio Growth			-0.95%
Postive Δ is good. Negative is bad.				Postive Δ is good. Negative is bad.			

The figure above, which compares turnover growth rate differences to RT Ratio from before and after insurance coverage, gives a more solid answer to the research question asked above.

A1 noticed a strong decline in Turnover of **-29.40%**, but it's RT Ratio worsened by **-19.98 %**. A2 showed a steep decline in Turnover Growth Rate, but it's RT Ratio was relatively better, although still negative. A3 and A4 were the standout data points. A3's Turnover Growth Rate remained positive (**0.06%**), but still showed a decline in RT Ratio (**-7.05%**). A4, on the other hand, saw a decline in Turnover rate (-**5.27%**) and still managed to show a much-improved collection cycle by showing a RT Growth difference of (**8.91%**). For A5, the rate of decline in RT Ratio was not as bad as its decline in Turnover rate. For A6 and A7, the relative comparison between Turnover Growth Rates and RT Growth Rates reflects well on Credit Insurance's effect on their liquidity and growth. Although, A6 and A7 are younger companies in comparison, and their growth could not be attributed to the policy coverage entirely.

The quantitative impact of Credit Insurance on these 7 Finnish companies' financial standing is hard to predict for two big reasons – small sample size and 2 big outliers in

A3 and A7, which skew the averages. The combined average difference that these 7 companies showed during the coverage period was **4.25%**, which includes **-32%** reduction from A7 and a 30% increment for A4. If these two values are to be excludes, on account of removing outliers and getting more accurate averages, the average difference seen in RT Ratio is **6.41%**. That is a **2.16 %** increase by reducing the sample size to 5, which do not include outlying values. If the author had the choice, the sample would have included companies from across Scandinavia, allowing a better statistical model's use to conduct this research study.

Average difference in Turnover Growth Rates: -4.09%
Average difference in RT Ratio Growth Rate: -0.95%

It must, although, be noted that it was easier for companies to show faster growth between 2009 and 2011 after the financial crisis of 2008, which could point towards why the period of 2012 till 2014 wasn't as good for these companies. But, due to lack of information on the effect of recovery from recession on the financial standing of these companies, the author cannot make a conclusive remark on it.

Keeping these objective, numerical observations into account, the author concludes that Credit Insurance coverage could not make a quantifiable, and more importantly, significant difference on their policy holders' RT Ratio. Taking the average effect of Credit Insurance on these 7 companies Turnover and RT Ratio into account, this conclusion certainly holds more logic and reasoning.

7) SUGGESTIONS

The author hopes that this study will inspire future students and researches to conduct empirical studies that can study the relationship between Credit Insurance and Financial Performance indicators. This study could have benefitted from larger sample size, which would have allowed the author to use paired sample T-tests to test the hypothesis and answers the research questions with a 95% confidence interval, instead of relying of comparing means of before and after sample groups.

Another important suggestion would be to use companies that belong to one industry, or industries that are closer in to each other. This could help narrow down the research study and produce more reliable results.

Conducting this research study has allowed the author to understand the Credit Insurance industry, Accounting and Financial Analysis better.

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