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The impact of credit risk reporting on the investor perception of firm-risk

Abstract

Purpose:
Providing evidence about the decision usefulness of credit risk disclosures,
more specific about the impact of credit risk reporting on investor perception of firm-risk.

Approach/design/methodology:
An association study forms the base for the falsification of four hypotheses deducted from the Positive Accounting Theory. The Efficiency Perspective suggests a negative association between credit risk disclosure level and investor risk.

Credit risk disclosure scores are determined with a disclosure index derived from the credit risk disclosure requirements as codified by IFRS 7 and Basel II-pillar 3.
The investor perception of risk is measured by the CAPM Beta factor, idiosyncratic risk, stock return volatility and the default probability assessed by Moody's.
The sample consists of 50 stock-listened European entities that perform banking as primary business activity.

Findings:
A negative association was found between credit risk disclosure level and the investor risk level, when risk level was operationalized with default probability. This result can be interpreted as evidence for a negative impact of credit risk disclosures on investor risk and confirms the Efficiency Perspective of the Positive Accounting Theory. Theoretically reasoned, credit risk disclosures reduce information asymmetry, estimation risk and thereby the investor perception of risk.

Research limitations/implications:
The scope of this research has been limited to a cross-sectional study with an one year period and investigates the effect of credit risk disclosures. A longitudual study that includes disclosures of other, normally less material risks (interest-rate risk, exchange rate risk, liquidity risk, etc) could provide a more comprehensive overview, especially under some circumstances, e.g. the liquidity crisis in 2008.

Originality/value:
Until so far, no other study has examined credit risk disclosure implications on diverse investor risk metrics for a bank sample.

Keywords:
risk reporting, credit risk disclosures, financial instruments, banks, investor risk, credit risk

Contents

Chapter 1: **Introduction**

§ 1.1.1 Introduction credit risk disclosure decision usefulness

"Today, basically, on Wall Street, the big money is made by taking risks" - Madoff (2007) *(former chairman NASDAQ)*

The above implied causal relation between risk and return denotes an old economic law. This concept of risk was first introduced by Markowitz's Portfolio Theory (1952). Markowitz distinguished stock returns from variance on stock returns. When investors maximize the stock returns and minimize the variance of stock returns by portfolio diversification, not all variances of stock returns are fully diversifiable. The willingness to accept a higher variance in order to not achieve a lower stock return represents a rational individual's risk aversion. Risk preferences are investor specific, but doing business without incurring risk is often impossible. Investors try to achieve a minimum risk point by controlling the mean-variance trade-off and therefore require perfect information to allocate their assets.

Risk disclosures communicated in financial reports can supply information that enables potential investors to become aware of certain company risks. Financial information should therefore be useful for basing decisions on. Financial reporting policy makers and financial reporting standard setters underline the importance of decision usefulness. The Conceptual Framework for financial reporting issued by the International Accounting Standard Board (IASB) defines the purpose of financial reporting as "*to provide information that is useful to present and potential investors and creditors and others in making investment, credit, and similar resource allocation decisions."* (Williams & Ravenscroft, 2011) Decision usefulness is a concept that is extensively studied in the field of accounting research. These studies often examine empirical relations between firm-specific values (e.g. stock prices or other values observable on a market) and accounting numbers that are expected to disclose useful information for assessing those firm-specific values. The studies are therefore categorized as value-relevance literature and have a descriptive nature that assist standard setters in analyzing the efficiacy of prescribed accounting standards (Holthausen & Watts, 2001). Evidence about the decision usefulness gives standard setters thus the capability to match accounting standards with the principle of the Conceptual Framework and can function as feedback for chosen accounting policies by reporting entities.

§ 1.1.2 Recent economic developments

The past shows several examples of poorly communicated financial risks. Vestia, a Dutch public housing corporation, declared in an annual report that a decrease of interest level to minus 3 percent wouldn't lead to liquidity risks. The opposite was true. Just a small decrease of the intrinsic interest level of outstanding plain vanilla swaps and other interest derivatives, required an acute transfer of 1,7 miljard Euro to rightfull counterparties.

The start of the credit crisis in 2008 became with a rise in conscious that the creditworthiness of many American households within the subprime segment was heavily overrated. A period of an economic slowdown, increasing interest rates and decreasing house prices succeed a period of large capital inflows in the US economy, low interest rates and cheap lending. Financial intermediaries involved with the credit approval and loan origination process issued many new loans by expanding existing markets, but transferred the risks of their operations to less well informed counterparties with the trade in collateral debt obligations (often backed by real estate). These assets turn out to have unforeseen large risk exposures to the before mentioned economic effects. While the economic situation changed, these effects on the intrinsic value of the collateral debt obligations were devastating. The asset holders, mostly bank-owned hedge funds, were forced to make large impairments on these assets during 2008. By September 2008 were the equity levels of several American large banks exhausted.

§ 1.1.3 Introduction of risk reporting

Risk management starts with risk awareness. Both examples of recent developments show the importance of controlling risks, but controlling a risk as investor is impossible when there is no information of the presence of a risk. The function of financial reporting is to assist many parties external to an organization in making decisions by supplying information. (Deegan & Unerman, 2006) Risk reporting is seen as a way to communicate financial performance and governance. (Healy &Palepu, 2001) Salomon et al. (2000) notes that risk disclosures helps investors making investment portfolio. Given the fact that risk reporting affects investors, it would be interesting to investigate how disclosure practices affects investor's decisions.

§ 1.1.4 Relevance of new research on risk reporting

Different prior research studies investigated the risk disclosures practices of reporting entities. These studies empirically analyzed the association of different risk disclosure types quantities and qualities with variables as firm size (Linsley& Shrives, 2006), share prices and earnings (Chandiramani, 2009), firm risk (Sewdien, 2010) effect on investor's behavior. A difference between financial firms and non-

financial firms risk reporting practices requires that these reporting firms should be studied independently (Bessis, 2002, Linsley & Shrives, 2005). Van der Kruk (2009) and Van Oorschot (2009) developed a special disclosure index framework to recognize risk disclosures in the risk report of European banks. Linsley, Shrives & Crumpton (2006) were the first that conducted a comprehensive study about the risk reporting practices within banks. This study investigated positive associations between bank size, profitability, risk level and quantity of risk definitions in comparison with the levels of risk disclosures. The researchers however acknowledged that their risk level (book to market value of equity) measurement methodology was imperfect. It could be also possible that further subcategories of the risk disclosures show an association, but the total as whole not. There is until now no study published that focused on the association of credit risk disclosure level and risk levels as perceived by investors. The challenge and purpose of this study is to contribute with new results to the existing scientic accounting literature. The intention is to make the difference by solving limitations of prior studies and focusing on risk disclosures that haven't been investigated in association with other events. Evidence about credit risk disclosure practices and associations between the credit risk qualities and underlying risk levels can reveal new interesting insights in risk reporting. Banks are institution where risk management is a core business and highly sophisticated. With the focus on the most important intrinsic risk at banks, credit risk, it would be interesting how this expertise of the risk management divisions reflects in risk disclosure behavior. Insights of this risk reporting process can be interesting for those who are charged with risk reporting, regulators that consider more mandatory risk disclosures and potential investors that compare investments opportunities in risk disclosing companies.

§ 1.2 Research objectives

Banks form the centre of the credit intermediation process (SEB, 2011) and bear large credit risks. This thesis investigates if financial risk disclosures about credit risks in the annual reports of 50 European banks show an association with diverse risk-metrics, such as a company's Beta-factor, equity price volatility, unsystematic risk and credit rating. Associations between risk and credit risk will be compared with expectations that are deducted from accounting theories. In order to measure the disclosures, a disclosure index will developped to recognize credit risk disclosures qualities as accurate as possible. The ultimate goal of this research is to provide evidence about the usefulness of credit risk disclosures

§ 1.3 Research questions

The central problem statement of this research is formulated by the following question:

"Have reported levels of credit risk disclosures in the annual reports of 50 European banks impact on the investors' perception of firm-risk?"

A literature study examines the necessarily insight for the empirical study. The following set of sub-questions will form the foundation of the theoretical background:

- What is credit risk and how does credit risk emerge from banking operations?
- What are risk disclosures?
- What risk reporting practices do accounting theories predict and what risk reporting practices do accounting standards prescribe?
- What were the main findings of prior empirical research on risk reporting?

The second part comprises an empirical study. To support the practical elaboration of the research design, the following set of sub-questions will be answered:

- How is the disclosure level of credit risk reports measurable?
- How can the investor's perception of risk be measured?
- What association is observable between disclosure level and risk perception?

§ 1.4 Demarcation

The scope of this research will be limited by some necessarily demarcation lines. Necessarily to keep this research processeable and executable, but these incorporated limitations and their implications require further explanation.

Content analysis studies are known as very labour-intensive. It is therefore practically impossible to conduct a longitudinal study. The time horizon of this disclosure index study will be limited to one year. Linsley & Shrives (2005) also used a cross-sectional study with a time period of one year. The nature of banking activities is very location-specific. Despite ongoing world-wide convergence projects, the same holds true for legislation and accounting standards. The focus of this study will therefore be set on banks headquartered in modern European countries. Market-based research requires also the availability of stock listened companies. Further sample specific issues will be discussed in chapter five. As implication of these choices are the conclusions of this study are in first instance only applicable for similar banks, but may be also applicable for non-stock listened banks

and/or non modern European banks. As second, this study does not take into accountant changing patterns of risk reporting over time.

For the analysis of risk disclosures are some demarcations important to mention. First, other forms of risk disclosures than that can be find in the risk paragraph of annual reports are excluded. Risk disclosures published in other media such as press releases, interim reports and presentations are assumed to be also included in the annual reports. Second, the choice to investigate exclusively credit risk disclosures is defended by the fact that investors view this as the most important risk of banking activities. (Papa & Peters, 2011) More detailed demarcations will be made along with the description of definitions in chapter two and three.

§ 1.6 Structure

This thesis comprises seven chapters. The literature study is worked out in chapter two and three. Chapters two examines the economic background of credit risk and banks. Chapter three on the other hand addresses attention to accounting theories, risk reporting and relevant empirical research. After a description of what accounting theories predict, evidence of risk reporting practices is summarized in this chapter. Chapter four contains the development of the hypotheses. In chapter five is a research design presented that will be used for the empirical study together with the sample design. The research design describes the two research approaches with corresponding methodologies; the content analysis to measure credit risk disclosure level and market-based research to measure investor's risk perception. The underlying technique to recognize risk disclosures is what accounting standard setters prescribe. During the development of the research design are these requirements summarized. The outcomes of the empirical study will be discussed in chapter six. Conclusions to sub-questions are given at the end of each chapter. Chapter seven summarizes all findings and gives a final conclusion on the central problem statement.

Chapter 2: Background banking industry and credit risk

§ 2.1 Introduction

The purpose of this chapter is to examine concepts of credit risk and describe processes within banking operations that generate credit risk. The second paragraph therefore starts with a summary of the banking industry and banking processes. The third paragraph points out in detail what credit risk is, how it is related to other risks and how risks are identified. In the last paragraph is described which specific assets and liabilities are involved in banking operations and how credit risk arise from these banking operations.

§ 2.2.1 Banking industry

Businesses, households and governments carry out investment plans and therefore require funding. These funding flows can go directly from investor to lender, but for reasons that later will be explained, often go via credit intermediators that facilitate transactions on the financial markets. Beck & Kunt (2009) split the financial system up in bank institutions with bank-like financial institution and equity/private bond markets. The continental European financial system depends heavily on a bank-based system. The Anglo-Saxon economies tend to use a market-based system. Beck & Kunt (2009) found that developed, high-income countries have larger market-based financial systems in relation to GDP than low income countries. Andries (2008) explains that banks have a role in contributing to a durable economic growth. The structure of the financial system with banks and capital markets influence economic conditions. The past showed that some economic crises were preceded by a banking crisis. Kaminsky & Reinhart (1999) proved that many banking crises were triggered by market crises, for example the real-estate market crisis in the US. An effective legal environment helps preventing a banking crisis. (Kunt & Detragiache, 1998)

The allocation of resources in an economy is canalized by banks. Banks are thus special organizations with a different place in the economy than conventional organizations. There are a number of theories that describe the need for credit intermediation and the existence of banks. (Andries,2008) Monitoring theories suggest that information asymmetry between lenders and borrowers about planned investment projects, related risks and actions of the borrower increase transaction and information costs. Banks reduce this inefficiency of direct funding by utilizing their expertise, economies of scale and long-term relationships. Economies of scale makes it not only possible to decrease transaction costs, but also to have an diversified investment portfolio. With closely monitoring, the bank follows and verifies the borrowers. Trusted banks can obtain private

information that is not shared with capital markets. The commitment theory explains that banks are stimulated to avoid risky investments. Banks have usually illiquid assets and very liquid liabilities in the form of short-sight deposits. Banks should prove prudent-behaviour in their actions to keep their own lenders attracted. This puts pressure on the bank to invest carefully in long term projects. Andries (2008) The existence of banks is also explained by income smoothing theories. Individuals with an excess of capital are willing to smooth consumption to later periods in exchange of a compensation. Banks then assist in the linearization of consumption.

Banks interact with the capital market to gain legal required capital levels as safe-haven for risky investments. The problem that banking regulators notice and try to avoid is that banks want to maximalize returns on this capital and thereby engage in behavior that can be considered as moral conflicting. Banking regulators therefore obliges banks to release specified information that allows the market (consisting of other banks and other stake-holders) to create incentives for the bank to avoid investments exceeding the bank's risk appetite. (more on this topic in paragraph 5.2.6.3) This market-discipline theory expects that investors in bank liabilities punish when incurred risk are outbalance with yields on these liabilities. The market discipline theory suggest that incentives are forced with adverse market-price reactions on bad news. (Nier & Baumann, 2002)

§ 2.2.2 Banking operations

Campbell (1986) identified the following different service-concepts that a bank can provide: risk reduction by diversification, maturity intermediation, information processing, reduction of information costs, payment systems and insurance. Not all banks provide these services. Matthews & Thompson (2006) describe the services provided by different bank types and explains related banking processes. Retail banks are most visible within society and focus on taking deposits and making loans to households and small businesses. With this intermediation, the bank transforms incoming cash in outgoing cash by a size transformation, a maturity transformation and a risk transformation. Small amounts of cash from deposit-holders are bundled to a size requested by a borrower during a loan origination. The borrower usually invests this loan in assets with a long lifetime, e.g. machines and requires funding during this period. A deposit-holder has the right to cash his deposit on demand. Because the borrower doesn't want to refinance its loan continuously and not all deposit-holders want to cash their deposits at the same time, the bank is able to transform the maturity of part of the incoming cash from deposits into assets with a high maturity. Daily withdraws by deposit-holders are covered by liquidity reserves. The bank determines an optimal cash reserves based on the interest on loans, costs of deficiencies and probability distribution of withdraw behavior as part of the asset and liability management. Chang & Velasco (2000) showed that banks also structure assets

and liabilities based on bank-run expectations and invest more illiquid assets when this risk is small. As third, the bank transforms risk-free deposits with a low interest compensation into risky loans with a high interest premiums and achieves with this a risk-transformation. The interest rate spread, also indicated as the margin of intermediation is the difference between these interest-rates. The interest rates that banks price for loans depends on volatility of assets returns and competitive conditions.

These transformation concepts are also in more or less degree present in other types of banks. Wholesale banks however have a small portion of deposits (fewer deposit holders, but higher deposits per deposit-holder) and borrow mainly part from other banks via the interbank market. Attracting additional funds for short term is easier via the interbank market, since with deposits holders require first a higher interest-rate compensation. The transformations, e.g. maturity and size transformations from customer deposits are less important in wholesale banking. Retail banks have in contrast with wholesale banks payment systems and automatic cash withdraw facilities. This business model with short distance to the customer is therefore better suited for a retail bank. Wholesale banks serve often larger customers, e.g. governments with debt financing and have large trading portfolios with stocks in other companies and derivatives. Universal banks deliver all kinds of services including insurance services and are a combination of wholesale and retail banks. The next paragraph first describes risk. In the fourth paragraph is discussed which assets and liabilities are used in these banking processes and how risk exactly emerges these sources.

§ 2.3.1 Risk

Ale (2009) describes why humans are motivated to take risks. People perform activities to satisfy the needs of Maslow's hierarchy of human needs pyramid and use technology and systems to reach determined goals. However, as side-effect, human inability to master technology and systems causes failures. The previous paragraph explained that risk-taking and risk-management is part of the core business of a bank. The next paragraphs will concentrate more on the concept of risk itself.

In most contexts, risks has a negative connotation. Damodaran calls this the traditional perspective on risk. As opposed to this one-side view, other perspectives consider two dimensions, a positive and a negative. In the Chinese language is the word fēng xiǎn (risk) written by a combination of two characters, 风 and 险, what means danger and opportunity. Linsley and Shrives (2005) indicate with risk any opportunity or prospect, or hazard, danger, harm, threat or exposure, that impacts or already impacted a company. Raval and Fichadia (2007) defines risk as the difference between business objectives and actual business performance.

With the development and application of new statistical techniques and availability of data, a mathematical and more rationalized and standardized approach of risk replaced pre-modern views on risk as a natural phenomenon. (Linsley And Shrives, 2005, Lupton, 1999) Dobler (2008) describes risk as a distribution of future outcomes and points out two risk-approaches. The vision of Borch (1963) is called a target-based view and specifies an optimal target based on expected utility functions. Deviations from the optimized equilibrium point represent risk. Knight's (1921) uncertainty-based view doesn't mention a fixed point, but views risk as a numerical expressible distribution of future outcomes. Van der Sar et al (2004) distinguishes uncertainty from risk. Something is uncertain when factors and probabilities of that factors influencing future outcomes are unknown. Certainty requires perfect information. With risk has a decision maker no certainty and thus no perfect information, but still knows the factors that influence future value and is able to assign probabilities to these factors. The traditional statistical approach measures risk as the variance of expected future outcomes. (Box, 2009) Paragraph 2.3.4 goes in further detail about risk metrics and the quantification of risk.

Botsosan (1997) and Abraham and Cox (2007) equated risk in a list of keywords. By using the wide two dimensional definition of risk, Abraham and Cox (2007) decomposed risk in risk as variation (variation, fluctuation, volatility, oscillation and amplitude), risk as uncertainty (uncertainty, unexpected, contingency, surprise and shock) and risk as opportunity (opportunity, prospect, potential, upside and advantage).

§ 2.3.2 Risk categories

The Institute of Chartered Accountants in England and Wales (ICAEW) developed a risk model to categorize risks in 6 classes, financial risk, operations risks, empowerment risk, information processing/technology risk, integrity and strategic risk. (Linsley and Shrives, 2005) Cabedo and Tidado (2004) separate financial risks from non financial risk by the criterion that financial risks have an immediate monetary effect on assets and liabilities. Non-financial or indirect financial risks, however have still impact on a business and it's competive position. These risks influence cash flows and profits level in the long run and are also called business risks. Vasal and Fichadia (2007), opposed to Cabedo and Tidado (2004) describe all risks that are uncontrollable as business risks. Cabedo and Tidado (2004) describe a third, external risk class, besides two internal risks, business/indirect financial risks and financial risks. The emphasis in financial report is mainly placed on a presentation of financial risks. Financial risks are further divided into liquidity risk, market risk and credit risk. Market risk or price risk comprises risks emerging from foreign exchanges rates, commodities, equity positions and interest rate. (Basel Committee on Supervision, 2001)

§ 2.3.3 Credit risk and other financial risks

Credit risk can arise from a transaction in which two counterparties engage in borrowing and lending. Borrowing can also include shorting with the involvement of a transfer of an asset that is not owned by a counterparty and borrowed from a third party to accomplish obligations from a transaction. (Jarrow, 2009) When it becomes less likely that a counterparty is able or has no intension to fulfill its obligations before an agreed upon date, the other counterparty incurs a credit risk. Credit risk doesn't mean necessarily the risk that a counterparty complete defaults. (Christofferson, 2003) Hull (2000) views risk as the probability of a default by borrowers, counterparties in derivative transactions and bond issuers. BIS (2010) describe that a broad definition of credit risk also takes into account changes of in default risk of stochastic nature, changes in credit quality and changes in the exposure at default. Investors view credit risk as the most important risk of banking activities and more important than market risk. (Papa & Peters, 2011)

The Basel Committee on Supervision (2009) explains that risk can be driven by risk drivers and that different risks can be driven by the same risk driver. During the financial crisis, it became clear that market risks, such as short-term interest rates reinforced credit risk and thus that market and credit risk were in fact joint risks. The traditional demarcation between market risk and credit risk was made by the nature of financial instruments and covering assets, liabilities and equity instruments. BIS (2009) sums up three reasons why this demarcation line is distorted. First, some assets bear a combination of both types of risk. Second, illiquidity of a trading market can press normally tradable assets (which are often only subjected to market risk) into a held-to-maturity position with as main risk credit risk. As third, the accounting treatment of financial instruments is not a solid base to make a distinction between credit and market risk. For example tradable credit instruments or loan portfolios valuated against fair value may have also exposures to market risks

The EU's Solvency II directive (2009) for insurance regulation classify three risk drivers for credit risk, counterparty default risk, spread risk and market concentrations. Market concentration risk are the result from risk exposures that have the potential to threaten the financial position and business activities (in this case insurance activities). Spread risk is defined as the sensitivity of value of financial instruments to changes in level and volatility of interest premiums over the risk-free interest rate. (in other words as change in the spread structure) Banks make do not always use treasury rates as risk-free interest (Hull, 2000), e.g. UBS (2010) use the London Interbank Offered Rate (LIBOR) interest rate as risk-free interest rate. Spread risk shall not be confused with interest rate risk, which is a market risk. E.g. , a risk-free LIBOR interest rate can change without a change in spread structure (e.g. LIBID minus LIBOR rate).

When joint risks exists, credit risk can be reinforced by another risk. BIS (2009) mentions cases in which credit risk was actually increased by foreign exchange rate risk, interest rate risk and equity positions. In the case of a foreign bank with loan portfolio outstanding in a domestic currency, the bank bears a credit risk over the loan portfolio and a foreign exchange rate risk. The ability of the domestic counterparty to fulfill the repayment of the loan will then also depend on fluctuations in exchange rate and hence the credit risk is influenced by the exchange rate risk. The same analogy holds for debt instruments that experience both the effects of changes in interest rates and exchange rate, such as carry trades. During the recent financial crisis were credit risks underestimated by banks. Errors in aggregation of credit risk with other risks based on wrong assumptions, like fixed market risks, biased credit risk estimations. This resulted in the need for large impairments on for example traded bond portfolios. Overestimation of credit risk can also occur if a bank assumes perfect correlation of credit risk and other market risks when compounding multiple risks and the bank manages to achieve diversification advantages lowering the total risk.

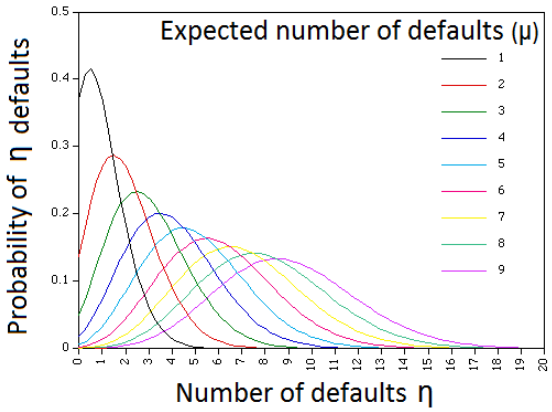
Market risk and credit risk exposures are determined by a bank's specific business model and risk management. BIS (2009) Van Lanschot (2009) explains that it tries to eliminate market risk in order to avoid capital requirements. Market and credit risk however require an active market and vary with the liquidity of a market. The liquidity of markets change in an unpredictable way. When market conditions deteriorate, trading volumes decrease (Christofferson, 2003) and the time gap before an bank can execute it's risk management strategy becomes longer. The longer it takes to execute a risk management strategy, the so called liquidity horizon, the higher the market and credit risks are for the financial instruments involved in that risk management strategy. Perceptions of credit and market risks, for example caused by a change of investor's faith, other hand determine the liquidity of a market. When investors risk appetite declines and a higher risk premium is requested, large bid ask spreads result in price drops of financial instruments below fundamental value. (Christofferson, 2003) Such a downward spiral is correlated with default risk and thus credit risk. BIS (2009) As last, BIS (2008) separates the above mentioned market liquidity risk from funding liquidity risk. The latter is a risk of an institution specific nature and indicates a risk in the ability of a bank to fund investments in assets and fulfill obligations when they come due against reasonable costs. Unlike, market risks and market liquidity risk, funding liquidity risk doesn't directly affect credit risk. However market prices and thus market risks determined for financial instruments prices in both funding liquidity risk and counterparty credit risk. (BIS, 2010) (He and Xiong, 2012)

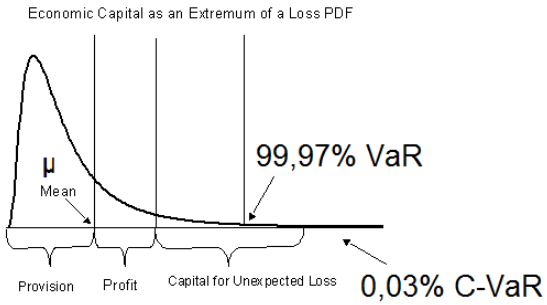
§ 2.3.4 Risk metrics and quantification of risk

Each business has its own risk tolerance and understanding. (Poslinsky, 2008) When Enron collapsed in 2001, counterparties had a total of $6.3 billion receivables outstanding at Enron with concentrations over $100 million for some main trading partners. (Rich and Curtis, 2002) Where non-financials often choose to focus only on core activities with related business risks and don't manage financial risks (Christofferson, 2003), banks are required to have a sound and adequate risk management system to limit potential damage to the financial system. A bank must design a strategy, policies and practices to cope stated risk tolerance objectives and implement processes to identify, measure, monitor and control financial risks. (BIS, 2010) This paragraph will elaborate measurement concepts for the estimation of credit risk.

For financial risk management, it is necessarily to know the exact magnitude of risk. The industry standard to quantify risk is the Value-at-Risk (VaR) model. (Matthews and Thompson, 2006) The VaR model makes it possible to summarize with a single number the risk of a portfolio of multiple assets. VaR measures how bad things can get, whereas C-VaR measures the losses if things go bad (Hull, 2000). Both measure thus the downside part of risk. Often denoted by N-day x% VaR, states the expected amount of monetary units which in 100-x% of the cases not will be lost during N days. (Hull, 2000) For this, the calculation of VaR requires an estimation of the statistical distribution of the underlying event as source for expected losses. (Matthews and Thompson, 2006) Examples are stock-returns, other changes in prices or numbers of defaults. The estimated statistical distribution is derived from a dataset of the underlying event over series of time.

Credit Suisse developed the Credit Risk Plus approach to estimate a statistical distribution of defaults. In the case of a group of assets with one counterparty, the expected number of defaults (μ) depends on the probability of default (p) and the number of assets (Z), $\mu = p\,Z$. The statistical distribution of the probability of η defaults is calculated with a Poisson distribution by the formula $\frac{e^{\mu}\mu^{\eta}}{\eta!}$ and is graphically depicted in the left distribution plot below. J.P. Morgan's CreditMetrics doesn't assume fixed default probabilities (in the form of credit ratings) over time, but incorporates the effect of credit-rating migrations probabilities. An Aaa-rated loan has besides a certain default probability, a chance to become a lower-rated loan. CreditMetrics captures thus also changes in creditworthiness. (Hull, 2000)





A simulation technique, such as the Monte Carlo simulation, with a specified stochastic process shows how these statistics behave in a real experiment for a portfolio of a number of different assets with different expected default assumptions. (Brooks, 2008) Paths of defaults rates are simulated. (Jorion, 2001) By gathering and sampling historical data observations, average default rates for a similar group of assets are used to calculate the probability of default. When knowing these default probabilities, sampling the number of defaults and losses for each default show the variances and probability distribution of defaults and corresponding losses. Total losses given a specifiable confidence interval of that distribution respresent the VaR point. (Hull, 2000) The right figure graphically depicts the 99,97%-VaR point (given this error margin not to lose more than this amount) and the remaining 0,03%- C-VaR area cumulatively represents the loses for the condition that things go bad.

The VaR model approach, sometimes indicated as variance-covariance approach, calculates the VaR by modeling aggregated variances of the assets within a portfolio with the asset correlations. (Christofferson, 2003) Different statistical models can be chosen for the calculation of VaR. Important is to mention that VaR is not a historical number, but a forecast of how much losses would not happen given a confidence interval during a future period. Whereas the typical time horizon for market risks usually 10 days is, has credit risk often a time horizon of 1 year. (Hull, 2000) Both future variances and correlations of assets must be extrapolated from distributions based on historical data. The Basel II rules require for the calculation of market risk with VaR estimation at least an observation period of 1 year with 250 observations. (Matthews and Thompson, 2006) Instead of assuming that variances constant(historical volatility method) and correlations are constant over time, other approaches as the ARCH and GARCH volatility models specify conditional variances and correlations depending on lags of previous period variances/correlations and errors terms. A complex VaR model incorporates a covariance matrix with a lot of correlated assets, liabilities and macro-economic variables capturing all kinds of economic factors.

As last part of the financial risk management process, the estimated risks with the used models must be compared with actual risks. A so called reality-check of used parameters, assumptions and techniques, that help risk managers to calibrate the risk estimation process. (Jorion, 2001) Stress tests are a diagnostic method to evaluate how a model works under the most extreme events observed in the past. These events happen from time to time, but are considered as impossible in the used probability distribution. (Hull, 2000) Backtesting is a diagnostic technique that is more suited as reality check (Hull, 2000) and even required by the Basel Committee if internal VaR-models are used for the determination of capital requirements. (Jorion, 2001) For example, a banks test can test how many days an estimated 1-day 99% VaR loss amount is exceeded during a period of 1000 days. The Basel Committee framework determines that a VaR-model is in that case inadequate when the failure rate is higher than 17 days. (Jorion, 2001) As consequence of more violations than allowed applies the Basel Committee the so-called hysteria factor to the calculation of required capital based on the VaR value. A high confidence level however increases also the chance on bad luck. (Martens, 2010)

Lim & Tan (2007) suggest that subjective assumptions about future events allows companies to misstate risk exposures expressed in VaR estimates. They also explain that the predictive power of VaR estimates depend on the bank's technical sophistication and that investors may not understand VaR estimation methods and the quantitative and probabilistic nature of VaR values.

§ 2.4.1 Credit risk emerging from banking operations

With the insights of previous paragraphs about the processes a bank performs and definition and insights of different financial risks that have an immediate monetary effect on assets and liabilities, this last paragraph will answer how credit risk emerge from banking operations.

§ 2.4.2 Credit risk emerging from duration mismatches

In the most simplified form, a bank holds a loan portfolio until maturity financed with direct claimable deposits and optimized cash and equity levels as buffer-zone for risks. If the banks has after a maturity transformation loans with a different time to maturity than deposits (e.g. five years and three months), the bank is subjected to interest rate risk. Risk exposures from interest rate risk are managed by controlling the duration of assets and liabilities. (Landkroner & Ruthenberg, 1989) The duration is the time to maturity of a series of cash-flows arising from assets or liabilities and a duration mismatch results directly in an interest-rate risk. (Matthews & Thompson, 2006) The following balance-sheet shows durations of a portfolio with five year fixed interest loan assets and variable interest deposit with a maturity of three months. The duration gap of this portfolio is about

four years, 4,22-0,22*(90.000/103.063) and an increase of the all interest rates with 1% results in an equity drop of $-4 * \left(\frac{0,01}{1.05}\right)$= 3.8 % of its value, because outgoing cash-flows from deposits increase relatively harder in value than incoming cash-flows from loans.

Asset	*Value*	*Rate %*	*Duration*	*Liability*	*Value*	*Rate %*	*Duration*
Cash	*3.063*	*0*		*Deposits(3m)*	*90.000*	*4*	*0,26*
Loans (5y)	*100.000*	*5*	*4,35*	*Equity*	*13.063*		
Total	*103.063*		*4,22*	*Total*	*103.063*		*0,22*

The bank can eliminate these duration mismatches and thereby the sensitivity to interest rate (triggered by exposures to interest resets and liquidity flows, (Bessis, 2002)) with duration matching. Duration matching is an internal hedging operation that the bank in this case can perform self by shortening asset durations or extending liability durations. (Matthews & Thompson, 2006) This is sometimes refered as Asset-Liability Management (ALM) and is effectively managing the volume of assets and liabilities portfolios and their reference interest rates. (Bessis, 2002) More sophisticated methods for duration estimation are however required to avoid misguided strategic planning by banks. (Beck, Goldreyer and Antonio, 2000) Interest rate risk emerges also from options that are imbedded in contracts with customers. (Bessis, 2002) A possibility to hedge interest risk from this source is to enter in derivatives. For this it is necessarily to involve in contract with external parties. For example by engaging in a forward rate agreement that give the right of payment of difference between an determined interest-rate as strike price and the LIBOR-rate if this rate is in the money at the end of a contract. Forward agreements are tailored contracts with specific amounts and terms and traded on an over-the-counter market. Interest rate futures were until the mid 90's the most popular derivatives at American banks for duration hedging with a annual value of 11,9 trillion dollar. (Simons, 1995) Other credit risk derivatives, mainly swaps, caps and floors have since then expanded this market.

Although derivatives are used to hedge risks, they are just like outstanding loans not free of credit risk. The International Swaps and Derivatives Association, ISDA (2010) emphasize that derivatives generate credit risk and recommend having enough capital to cover the risk that a counterparty of a derivative contract doesn't fulfill its obligation. Additional recommendations are to construct a netting agreement, which specifies conditions (e.g. failure to comply with obligations, bankruptcy, etc) that allows parties to cancel transactions from other contractual agreements and to consolidate

all existing obligations between the parties in one net obligation. In addition, rights of discourse on collateral assets in case of default can compensate losses experienced during bankruptcy. Values of collateral assets are ideally not linked to the value of the transaction. Central clearing of transactions reduces also credit risk and became more compulsory for over-the-counter markets with the Dodd Frank Act as reaction on the credit crisis. (Murphy, 2012) A clearinghouse tracks transactions between parties and determines daily net positions. Clearinghouse members with short and long positions in derivatives often must hold a clearing margin based on net position. (Hull, 2000) Duration-based hedging has less effect when credit risks increase. (Brown& Wang, 2002) Concluding that derivatives issuing counterparties can default, interest rate derivatives hold to support banking processes are a source of credit risk.

§ 2.4.3 Credit risks from retained loans

Danske Bank (2011) describes the successive phases of the credit intermediation process. A loan application inputs loan requests from different sale departments. The credit office of the bank processes and approving loans based on risk exposure data. Approved loans are automatically originated by the system. In the phase after origination, the bank monitors outstanding loans. Loans are subjected to a risk of non-performance by lenders and thus credit risk.

Many banks however focus only on the first phases of the credit intermediation process and start selling loan portfolios to external parties directly after origination. A way to do this is by asset backed securitization. Illiquid assets, such as loans, often with right of recourse on collateral assets holded by a counterparty (Credit Loan Obligations, CDO's), are therefore pooled and securitized. Loan pooling is a diversification technique that first groups similar loans (based on segment, geographic concentration and industry) and then spread loans to reduce the impact of the same risk exposure to a group of loans. These assets form the back of securities that can be sold directly or via a Special Purpose Vehicle in transparent tranches acceptable for market participants.(Matthews & Thompson, 2006) The first tranches contain the largest credit risks (e.g. 5% percent value of the total portfolio with the first 5% defaults) and are sometimes indicated as toxic waste and have higher concentrations of credit risk than the average of the portfolio. The last sold tranche has usually the lowest credit risk. (Hull, 2000) Asset-backed securitization transfers credit risks of loan portfolios from banks to external parties. The bank is only exposed to credit risk from retained loans owned by the bank self, excluding those held in a Special Purpose Vehicle.

For the loan portfolios that the bank intends to hold can credit derivatives reduce credit risk. Credit default swaps, credit spread options and convertible bonds credit derivatives enables banks to manage credit risks. (Hull, 2000) Credit derivatives are relatively safe since 97% percent of all credit

derivatives are covered with collateral assets. (ISDA, 2010) Again, here are default correlations with the issuing counterparty important. (BIS, 2005) Parlour & Winton (2008) argue that credit defaults swaps reduce incentives of monitoring loans by banks and show a trade-off of risk transfers between selling asset-backed securitization or buying credit default swaps. If credit risks are high, selling loan portfolios is more efficient. Monitoring of loans by third parties is considered to be less efficient and is most attractive when credit risk is high. BIS (2005) recommends market parties to have enough information before entering in credit risk transfers, especially in case of catastrophic risks. The next chapter elaborates more on what accounting theories predict about monitoring in the form of financial reporting.

§ 2.5 Conclusion

Banks have as credit intermediators advantages over direct financing by capital markets. The nature of relationships with customers, monitoring capabilities and commitment in the financial system to canalize resources in sustainable economic growth make banks special organizations. Core processes of risk, size and maturity transformations of economic assets, executed to perform banking services, are largely comparable between different bank types. Banks are just like any other organization exposed to different risks. Different views on risk and risk categories have been discussed. Not all definitions take the upward potential of risk in consideration. In the further discussion is credit risk assumed to have both a negative and positive potential. A positive credit risk is not fictitious when it is observable that default probabilities (e.g. AA-rate for the underlying asset) are not stationary values, but also possess the chance to became higher (Aaa) or lower (A, Bbb, etc) during a time-horizon. Credit risk can be separated from other risks by definitions, but risks tend to interact and result in joint risks. Adequate recognition and measurement of credit risk is important for risk management used to calibrate banking processes. The Value-at-Risk methodology can explain with one number the credit or market risk of all economic activity. Different sophisticated approaches and assumptions are described and determine the degree of reconciliation of VaR estimates and actual experienced risks. Banks try to match durations of portfolios to avoid expected market risks as interest rate risk (which can be estimated by VaR) and therefore hold large portfolios of interest-rate derivatives. By entering in these derivatives with external parties, banks are exposed to credit risk. Loan portfolios, that are the banking processes not sold with asset-backed securitization or hedged with uncorrelated collateralized credit derivatives, are a second source of credit risks.

Chapter 3: Background financial accounting theories and credit risk reporting

§ 3.1 Introduction

The previous chapter examined credit risk from a technical point of view. With the knowledge of these underlying economic matters, this chapter continues with the communication of credit risk, credit risk reporting. This chapter is divided in three parts. The first part describes the general financial accounting theories with assumptions as established within the scientific paradigm. The adoption of applicable financial accounting theories, as backbone for further research, will be advocated. After the introduction of general financial accounting theories, the third paragraph goes in detail about credit risk reporting with definitions and an overview of prior empirical risk reporting research, which will form the base for the hypotheses development in chapter four.

§ 3.2.1 Financial accounting theories

Hendriksen (1970) defines a theory as a coherent set of hypothetical, conceptual and pragmatic principles. Babbie (2007) distinguish normative, inductive and positive research approaches within social research. The Financial Accounting Standard Board (1976) views the conceptual framework as a normative theory of accounting that prescribes norms and values. Positive or descriptive theories make assumptions and try to predict and explain practices through logical deduction. Positive theories are tested against observations. Falsificationists accept theories until an observation is made that is inconsistent with a theory. Inductive theories on the other hand are derived from observations. (Deegan & Unerman, 2006)

This research will not use a normative approach such as the normative political economy theory and the stakeholder theory, since norms and values for financial accounting are largely prescribed by legal authorities with accounting standards. Chapter five presents an overview of financial accounting norms. An inductive research approach requires observations for a theory development. Useful observations of credit risk disclosures with matched risk levels are however not available now. Maunders (1987) states that inductive theories can't provide a basis for evaluation of current practice and future improvements. Positive research is the most suited research approach, it is up to date and can describe current accounting practices in changing environments and it leaves the normative role of which accounting practices should be performed up to the qualified legal authorities.

§ 3.2.2 Positive accounting research

Positive accounting research replaced normative accounting research in the sixties when statistical analysis lowered costs of empirical research. With the introduction of Ball & Brown's (1968) capital market-based research, which examined the share-price reactions on accounting information, the positive accounting paradigm was accepted and became the most important research approach in financial accounting science. (Deegan & Unerman, 2006) Watts & Zimmerman (1986) developed a wide applicable positive theory, the Positive Accounting Theory. The Positive Accounting Theory explains and predicts reporting behaviour, but doesn't prescribe a research method. There are a lot of different research methods and perspectives. Capital market-based accounting research method is nowadays the most used method and studies the aggregated reaction of investors observable on markets to accounting information. The field of market-based research includes studies that investigate the economic consequences of changed accounting policies, the value relevance of accounting information with respect to chosen accounting policies and various studies that examine earnings management and quality. Behavioral research is another method used for positive research and studies behaviour of accounting practices on individual level instead of aggregated level, e.g. with choices made by auditors, investors or reporting managers. This last method will not be used for the reason that behavioral information about scientific relevant individuals is difficult to obtain.

The Positive Accounting Theory (PAT) is a comprehensive set of theories with several perspectives and related assumptions from which falsifiable hypotheses can be deducted. It integrates the agency theory, the Efficiency Market Hypothesis (EMH) and the Capital Asset Pricing Model (CAPM)/market model.

Research that tries to explain practices based on the reaction to new accounting information by shareholders on stock markets require assumptions regarding the behavior of that stock market. Watts & Zimmermann (1986) defend the semi-stringent EMH. The semi-stringent EMH assumes that investors are rational and the capital market captures all public available information in share prices. The implication of the last assumption on accounting is that information from multiple sources are reflected in share-prices. Another implication is that accounting information is not able to manipulate the market, because it would contradict with available information from other sources. (Deegan & Unerman, 2006) When analyzing share-price reactions, the market model (derived from the CAPM) separates share-price changes triggered by market movements (the non-diversifiablemarket-wide factors) from share-price changes triggered by a company's specific risk profile (the systematic, diversifiable risk factors). The market model assumes risk-aversion by investors and homogeneity of expectation regarding future expected cash-flows. (Deegan &

Unerman, 2006) The market model also assumes perfect information and the absence of information costs. (Van der Sar et al, 2004) This contradicts with the assumptions of the agency theory. (see below) The Positive Accounting Theory assumes that managers have superior information in comparison with investors, although it is assumed that capital markets are efficient. The market has however only the public information and not the superior information of managers.

Central assumptions of the agency theory are self-interest, the existence of transaction and information costs (the costs of information asymmetry). Incentive problems between agents (PAT: the managers of a reporting entity) and principals (PAT: shareholders) are the fundament of the agency theory and are caused by conflicts in interest. Conflicts of interest arise from effort aversion by the agent, use of the principal's resources for private purposes by the agent, and differences in risk aversion and time horizons between principal and agent. To minimize the agency costs of these incentive problems, the agency theory predicts that agents engage in contracts that align interests with principals to achieve higher payoff. These alignment mechanisms are in practice the accounting systems and the monitoring costs to control these alignments mechanisms are the audit costs. Firms can be seen as a nexus of contracts and are viewed as an efficient system to produce goods and services. Inefficient designed and structured firms are outcompeted. (Deegan & Unerman, 2006).

The accounting system, as alignment mechanism, consists of accounting methods that can be determined in contracts. Because contracts can't give a complete guidance with all accounting methods, managers have flexibility. Healy & Palepu (2001) explain that both contracting relations and accounting method choices depend on a firm's specific assets and investment opportunities. The PAT presents two perspectives how managers effectuate their flexibility in the choice for accounting methods, an opportunistic perspective and an efficiency perspective. The opportunistic perspective regards all choices as driven by self-interest that serve the purposes of the agent. The efficiency perspective assumes that managers opt for accounting methods that most efficient presents the underlying performance of a firm and decreases agency and contracting costs.(Deegan&Unerman, 2006) Fields et al. (2001) explains that motivations for choices can differ for each accounting method and that both perspectives can coexist in a firm. Determination of mixed-motives is difficult in practice. The introduction of this chapter outlined that a theory is a coherent set of principles. Because both perspectives refute each other and don't lead to coherent principles, it will be assumed that only the efficiency perspective is valid. The existence and relative importance of voluntary disclosures is an argument against the opportunistic perspective.The next paragraph discusses (credit risk) reporting and demonstrates the role of voluntary risk disclosures in capturing all economic relevant risks.

Concluding this paragraph, the Positive Accounting Theory predicts that managers use their accounting discretion to communicate efficiently with their stakeholders and that they opt in cases of non-contractually specified accounting choices to reduce the information asymmetry. Contracts with specified accounting choices are still present and align interests of managers and stakeholders.

§ 3.3 Risk reporting theories

The function of financial reporting is to assist parties external to an organization (principals) in making decisions by supplying information about a firm that is controlled by the reporting managers (agents). (Deegan & Unerman, 2006) Risk reporting is seen as a way to communicate financial performance and governance. (Healy & Palepu, 2001) Beretta & Bozzolan (2004) describe risk reporting as the communication of a firm's value generating capabilities. Firms communicate the sustainability of their value generation capabilities, which help investors determine the firm's risk-profile for portfolio decisions. According to Dobler (2008), risk reporting with risk-related disclosures contain information about the distribution of future cash-flows and allows external parties to assess risks of future performance. Linsley, Shrives & Crumpton (2006) point out that the annual report without a paragraph with risk disclosures is not able to provide a coherent presentation of risks and actions that are undertaken to manage risks.

Contracting is one possible mechanism within the PAT for reducing information asymmetry. Other mechanisms included in the PAT are corporate governance, corporate control (e.g. the danger of hostile take-overs), information intermediation (e.g. external rating agencies) and voluntary disclosures. Economic and institutional circumstances influence the effectiveness of these mechanisms. (Healy & Palepu, 2001)

Beaver (1998) considers accounting information as a public good, because it is available for all investors, including potential investors that don't pay for information. The opportunity of free-riding by potential investors leads to underproduction of information. Dobler (2008) explains the rise in demand for risk disclosures by complex business structures, increase in reliance on financial instruments and international transactions. Dobler (2008) points out that increasing regulation for risk reporting can have adverse effects, although risk reports that are only prepared on a voluntary base contain poor risk disclosures. Linsley & Shrives (2005) conclude that legislation, the Basel II pillar 3 disclosure requirements for banks, provide merely a prescriptive list of disclosure that tend to focus on back-ward looking risk. Full risk disclosures are only obtainable when reporting managers are encouraged to think creatively.

Healy & Palepu (2001) describe motives for voluntary risk disclosures. Voluntary disclosures can be made by a company to ease capital transactions on the market. A reduction of information asymmetry as result of more disclosures can reduce the cost of capital. More risk disclosures lowers contracting costs and increase the liquidity of the company's share in the market. This makes share prices more accurate and suitable for remuneration of company employees. For corporate control purpose in order to avoid undervaluation by investors, voluntary disclosures can communicate the causes of poor earnings performance. As last, voluntary risk disclosures about future risks can give an indication of the management's ability to foresee risks and anticipate with changes to firm value. Helbok and Wagner (2006) describe that voluntary disclosures can reduce interference by legal authorities.

Risk reporting is subjective and largely not verifiable. A firm is more likely to disclose risks when it is hard to verify the disclosed information. (Dobler, 2008) Fuller & Jensen (2002) mention that reputation damage, confidentiality of information and potential claims are arguments that withholds companies to disclose risks. Dobler (2008) reasons that managers sometimes simply don't have (reliable) information and remarks that regulators don't request a negative report, a declaration of the managers that is not well enough informed about a risk. Forward looking risk disclosures triggers earnings management, when managers made assessments regarding to risk confidence intervals and actual numbers exceed these intervals. The audit of a forecast can be limited by a lack of observable values and has difficulties to cope with both adequacy, completeness and consistency. (Dobler, 2008)

Until so for the theoretical discussion of risk reporting. The next paragraph will examine prior empirical research that can function as inspiration for further research.

§ 3.4.1 Introduction to related empirical research on risk reporting

Empirical research on risk reporting is largely concentrated on summarizing risk disclosure practices and diverse association studies that help determining the usefulness of risk disclosures. Risk disclosure practices became more object of research when various authorities involved with the risk reporting wanted to assess existing practices. The approach of these studies can be mostly classified as normative. The association studies, on the other hand, are positive research and concentrate on the impact of risk reporting on other values in different settings based on expected theoretical relations. Most of these theoretical relationships are derived from the Positive Accounting Theory or one or more theories of the theories that are part of this theory (agency theory, information asymmetry theory, EMH and CAPM) with underlying assumptions. For bank holding entities is the market discipline theory as described in paragraph 2.2.1 also relevant. Appendix II gives a detailed overview of the literature that will be discussed in this last part of this chapter.

The risk reporting debate was started by various accounting standard setters and professional accountant organizations, such as the Financial Accounting Standard Board and the Institute of Chartered Accountants in England and Wales. The American Institute of Certified Public Accountants (1987) requested more disclosures about operations and estimates for the preparation of financial statements. The main conclusion was the existence of a risk information gap and the following reaction were recommendations of disclosure practices. (Linsley & Shrives, 2006) According to Schrand & Elliot (1998), there was a consensus that insufficient risk disclosures were provided in annual reports. BIS (2003) surveyed central banks of 13 countries with questions about the disclosure practices of 54 banks and concluded that only 60% of all defined risk disclosure items were on average reported by the sample. Disclosures levels of credit risk modeling and credit derivatives are low (34% of the total defined disclosable items were disclosed) and don't show improvements in the period from 1999 to 2001. In most cases, quantitative information was not given (only 6% showed the used parameters). Marshall & Weetman (2002) concluded that foreign exchange rate risks were largely not disclosed by stock listened British and American companies. Berger & Gleissner (2010) reported that the number of risk disclosures increased since 2000 for 92 German companies, but suggests that this is largely the effect of the introduction of the mandatory GAS 5 risk reporting standards in Germany. KPMG (2008) concludes based on a sample of 25 European banks that credit risk disclosures are the most developed and sophisticated disclosure items that the banks provide. This is in line with expectations since investors view credit risk as the most important risk in banking. A recent study shows that credit risk exposures increased in a sample of 15 European banks between 2010 and 2011 and that both accounting as credit risk disclosure policies widely vary across the different banks. Linsley, Shrives & Crumpton (2006) couldn't prove differences in reporting practices between nine British and nine Canadian international operating banks. The result suggests that for international operating banks, country specific reporting environments have a negligible influence.

§ 3.4.2 Emperical research examing associations between various items and risk disclosures

Besides this general evidence from the briefly summarized studies above about risk disclosure practices over time and cross-sectional between difference , a second large stream of research studies empirically investigated the effects and triggers of risk disclosures along various theories and hypotheses. The approach of this studies is to associate risk disclosure practices with various variables specified by various theories. Statistical techniques to associate a set of variables are correlation (measuring the degree of lineair association) and regression**.** Paragraph 5.4.1 discusses both techniques.

Associations have been performed in prior studies between risk disclosures and earnings returns relations, corporate governance structures, share of ownership, number of risk definitions, profitability, analyst following, size and stock-market reactions on new disclosures. More relevant for this study are the associations that have been analyzed between risk disclosures and indicators of risk such as equity price volatility, systematic risk, book-to-market value, analyst estimation accuracy, assets coverage, debt to assets and volatility of return on assets. Some studies verify whether effects are not caused by other factors. Control variables in regressions and control correlations include market-value, reporting standards, industry, total assets, risk-profile by risk-weighted assets, revenue composition or one of the before mentioned variables in the case that they are not used as part of the main association(s). Appendix II summarizes the detailed research approaches and sample characteristics (sample size, firm type, country and period) of this literature review. The underlying theoretical considerations that trigger the interest in these associations will be elaborated now.

Evidence was found for a positive association between the numbers of non executive directors (independent directors in the US) and the number of risk disclosures. Non-executive directors have lower involvement in daily management compared to executive directors, but are in most juridical environments legally accountable for mis-management and further also want to safeguard their reputation. Non-executives as partly outsiders of a firm therefore would ask more risk-disclosures to reduce the part of the agency costs they bear. A board that consists of more non-executives would then result in more risk disclosures, what has been confirmed by this research. The same analogy holds for the degree of independence of the audit committee (which often consist of non-executive directors). A positive association is here observable too. (Oliveira, Rodrigues & Craig, 2011) A larger share of ownership was proven to be negatively correlated with the amount of disclosures. The larger concentration of ownership results in more shareholder involvement in decision making and more active monitoring and controlling activies. The principals, the shareholders, discipline the agents, the management, more effectively, because less contractual agreements are necessarily to align the opposing interests. Fewer risk disclosures are required because the information asymmetry is lower, what lowers the agency costs. Agency costs can also be higher when large shareholders have conflicting interest and try to maximize their value with active involvement. The study of Oliveira, Rodrigues & Craig (2011) and Abraham & Cox (2007) present however evidence for a negative association between risk disclosures and ownership concentration. The study proves also that managers are pro-active in releasing both good as bad news. This result is in line with the efficiency perspective of the Positive Accounting Theory, because opportunistic managers would try to avoid bad news disclosures in order to maximize their wealth.

Lim & Tan (2007) find out that risk disclosures in the annual reports of non-financial firms with higher VaR estimates are related to high stock volatility and Beta factor. A VaR is expected to be a good indicator of risk, because it communicates the expected market risk and hence cash flow variations that will be reflected in equity prices. The study also investigated the earnings informativeness of firms with VaR estimates. The reponse of stock-returns to earnings is lower (lower earnings persistence coefficient), what is interpreted in a way that VaR estimates enables investors to make assessments of earnings information with future market risk estimates. VaR estimates are thus value relevant in the context of the definition of paragraph 1.1.1.

Linsley and Shrives (2006) showed significant positive associations between the number of aggregated risk disclosures (counted on disaggregated level by six risk categories with 33 risk disclosure items in total, with further separation of disclosures by (non-)monetary, prospective/backward looking and positive/negative nature) and firm size for a sample of 79 non-financial companies. This similar to the results of Oliveira, Rodrigues & Craig (2011) and is explained by an alternative theory, the legitimacy theory (not part of the Positive Accounting Theory). According to Deegan & Unerman (2006), firms have an undefined social contract (a crucial difference compared to the Positive Accounting Theory) with the society to meet public expectations along bounds and norms. A firm's legitimacy depends whether the goals of a firm are congruent with a larger social system. Oliveira, Rodrigues & Craig (2011) reason that large firms with public visibility require greater levels of legitimacy. Risk disclosures would thereby helps to defend reputational status and influence perceptions of stakeholders and are proved to have a positive association with firm size.

Linsley, Shrives & Crumpton (2006) investigated the association between risk disclosures and firm profitability for a bank sample. The researchers expected that banks with sophisticated risk management systems would be able to better manage risk and thereby create higher profits. Because more efficient risk management systems achieve higher profit levels with better information, the authors expected that the banks would also communicate this information with more risk disclosures. A view that is defended by the efficiency perspective of the Positive Accounting Theory, because with the information available, it would take little effort to communicate these risks, resulting in a very effective reduction of the information assymetry. A positive, but unsignificant association between profitability, however, couldn't confirm this perspective.

§ 3.4.3 Emperical research examing associations between risk and credit risk disclosures

The purpose of this thesis is to investigate the impact of credit risk disclosures on the investor perception of risk. A number of related association studies have tried to examine this association with varying conclusions.

First, from a theoretical point of view, Barry & Brown (1985) proposed a modified CAPM model that predicts an equilibrium of asset prices with the inclusion of information risk as part of the systematic risk of a company. Modern finance theories assume that a firm's value can be determined by discounting expected future earnings against a risk-adjusted discount rate (corrected for systematic risk). Information risk or parameter uncertainty may bias the correct estimation of firm value and thereby increases the systematic risk to which investors are exposed to. Jorgensen and Kirschenheiter (2003) developed a model that specifies an equilibrium for disclosing information based on the firms risk and variances in cash flows. Risk disclosing companies have lower risks and higher share prices, but disclosure efforts are constrained by costs. Both models require however empirically testing.

Lang & Lundholm's (1997) study helps to gain understanding of the functioning of capital markets and the role that analysts play in the accounting information processing. Analysts perform anlyst services and may be information providers (what would substitute the demand for risk disclosures) or information intermediares (and thereby complementair to accounting information). The researchers found a positive association; companies that disclose more information have a large analyst following and analysts thereby process and transmit information to the capital market. By knowing this facilitating role of analysts, the concept of analyst accuracy is introduced to approach the estimation risk of investors. Again, the agency theory, forms the crucial link. Informative earnings information with risk disclosures will reduce the information asymmetry between firm and investors. The study measures information asymmetry with the dispersion among analysts in earnings forecasts, the accuracy of analysts forecasts and the volatility of analyst earnings. Positive associations were found between these risk estimators and the informativeness assessed by industry-specific reporting commitees (formed by analysts). A problem with this approach is however that not the investor perception of risk is measured when investor and analyst perception differ.

A lower estimation risk theoretically leads to a lower systematic risk for investors according to Barry & Brown (1985). Botosan (1997) agrees with this perspective, but explains that by analyzing the systematic risk (the market Beta in the CAPM), the estimation risk can't be observed and considers estimation risk as non-diversifiable. Botosan (1997) drops this estimation risk theory and adopts a second approach that explains step by step the negative association. The transaction and information

costs that investors incur when buying stocks of firms with more disclosed information is lower. The spread between bid and sell prices are with lower transaction costs lower and ultimately a higher liquidity would enable the company to attract with more investors what reduces the cost that the company has to pay for capital. Botosan (1997) measures firm risk from the perspective of the firm, instead from the perspective of the investor. The cost of equity that the firm has to repay to it's investors is used as proxy for risk. The cost of equity is determined by the accounting earnings/equity price ratio corrected for dividend-pay out ratio and constant growth rate. The study provides evidence for a negative association between risk disclosures and risk for firms with a small analyst following. That the outcomes may not hold true for firms with a large analyst following is explained by the fact that the disclosure index is limited to 35 items for all risk categories (including non-financial risks). Firms with large analyst followings publish much more information that is not captured by the disclosure index. The author acknowledges also that the CAPM model is a more conventional way for estimating risk, but argument that the standard CAPM model doesn't explain anything else than the undiversifiable systematic risk.

Linsley and Shrives (2006) approached risk with the company's Beta, book-to-market-value of equity and two leverage ratio's (assets cover and gearing ratio). Altough the authors didn't give an explanation for these proxies, the leverage ratios may be good predictors for financial distress and the book-to-market value of equity may reveal addition risk information of non-activated/passivated balance items, such as goodwill or off-balance sheet liabilities. No evidence was found for a negative association between risk disclosure levels and one of these proxies for risk.

There is a difference between financial firms and non-financial firms risk reporting practices (Bessis, 2002), which requires that these reporting firms should be studied independently (Linsley& Shrives, 2006). Linsley, Shrives & Crumpton (2006) were the first that conducted a comprehensive study about the risk reporting practices within banks related to other variables. This study investigated positive associations between bank size, profitability, risk level and quantity of risk definitions in comparison with the level of risk disclosures. Positive signicant associations were noticed between the number of risk definition and firm size. The researchers however acknowledged that their risk level (book to market value of equity) measurement methodology was imperfect.

Reseachers of the Federal Reserve Bank in the US performed a research on the effectiveness of market discipline by banks. (Hirtle, 2007) Altough the purpose and theoretical background of the main research question thereby differs from the previous described studies until so far, this research operationalizes the effectiveness of market discipline with value relevance of disclosure information. Hirtle (2007) distinguishes also new dimensions of risk, internal estimated risk and external

estimated risk. The internal estimated risk is measured by calculating the returns on assets and measuring the volatility of these returns. The external estimated risk is measured with three proxies; the unsystematic (idiosyncratic/diversifiable) risk, the systematic (syncratic/diversifiable/market) risk and the total risk, which is the sum of the systematic and unsystematic risk. Instead of considering all risk disclosures types (as all other researchers did), this research only focuses on one financial risk, market risk. The market discipline effectiveness is analyzed by taking the lagged VaR estimates of future market risks and comparing them with the company risk-profile one year later. As expected, the market puts pressure on banks with high VaR estimates to lower the risk-profile (significant negative association found) and hence, market efficiency through VaR disclosures are not just value relevant, but also enchance market discipline, keeping in mind various control variables (size, risk profile by risk-weighted assets and revenue composition). Risk measured as total risk decreased without decrease in systematic risk (compensation by risk-adjusted returns), what implies thus a decrease in unsystematic risk. The result suggest a free lunch for investors, since investors are able to make a better risk-return trade-off with lower uncompensated unsystematic risk. The study doesn't explains whether this is done by more secure investments or improved risk management. It could be also possible that this caused by a lower estimation risk. Furthermore, the study also proved a negative association between risk disclosures that contained information about the VaR estimates of market risk and risk measured with both the internal as external estimates.

§ 3.5 Conclusion

This chapter lays the foundation for the hypothesis development by reviewing relevant theories and empirical research. A theory is a coherent set of principles with a hypothetical, conceptual or pragmatic nature. Positive theories are capable to describe both existing and future events, while an inductive theory is requires first the input of non-available observations. Positive theories entail assumptions. These set of principles are generalizations of events and lets the researcher explain and predict events. With logical deduction from these generalized statements are statements about specific events derivable. In the form of hypotheses are these statements falsifiable.

The Positive Accounting Theory explains and predicts the accounting practices that are used by firms. The Positive Accounting Theory consists of a wide set of principles and assumptions from several other theories, the agency theory, the market efficiency theory and the market model. Agents are rational, have conflicting interests with principals and serve self interest. There exist information asymmetry, information costs and transaction costs. The markets capture all public available information and firms originate contracts that align interests of principals and agents. Contracting prescribe the accounting behavior however only partly. Agents encounter also non-defined

accounting choices. The opportunistic perspective suggests that agents use this discretion to maximize own utility. One of the reasons for the conflict in interest is that agents try to reduce efforts. The existence of voluntary disclosures, a significant part of risk reports, are inconsistent with this perspective. Therefore the alternative perspective will be used, the efficiency perspective. This approach predicts that managers use their accounting discretion to efficiently communicate with their stakeholders and that they opt in cases of non-contractually specified accounting choices to reduce the information asymmetry.

The annual report doesn't provide a coherent presentation of risks. Risk reporting is the communication of a firm's value generating capabilities and helps investors determining the sustainability of the firm's value creation and risk-profiles. A risk report in the risk paragraph of the annual report can contain voluntary, mandatory, backward looking, forward looking, quantitative or/and qualitative disclosures. Disclosures are often subjective and not verifiable. Voluntary disclosures are important, because it allows creative managers to tailor disclosure items for specific risks.Voluntary disclosures supplement the space that is ignored by mandatory disclosures and help establishing a total picture of all risks to reduce information asymmetry. There are several incentives for voluntary disclosures from an efficiency perspective.

Empirical evidence proves that companies on average lack a full coverage of risk disclosures, although there are variations between different risk disclosure items. Regulators and professional organizations for accountants and auditors conclude the existence of a risk information gap. Improvements are shown after the introduction of more mandatory disclosure requirements. Credit risks are viewed by investors as the most important risks at banks and in line with expectations from the efficiency perspective are the best disclosed items.

Evidence is found for statistical significant associations between the level of risk disclosures and the number of non executive directors (positive), independency of audit committee (positive), firm size (positive), quantity of risk definitions (positive), profitability (positive), cost of equity (negative), volatility of return on assets (negative), total risk measured with equity price volatility (negative), and estimation risk (negative) Especially the risk measurement approach of Hirtle (2007) is inspiring for a follow-up study that examines the impact of credit risk disclosures on the investors perception of risk, instead of market risk related disclosures in the context of market-discipline. The other studies gave good examples for how to construct a solid theoretical and methodological base for a new research between the expected negative association between risk disclosures and risk. The hypothesis development in the next chapter explains the theoretical base for this research. Chapter five describes the methodological plan.

Chapter 4: Hypotheses development

The efficiency perspective of the positive accounting theory predicts that managers use their accounting discretion to choose accounting methods that establish an efficient communication with the investors and achieve a reduction of agency costs. This general statement will be transferred to a specific statement. First, if risk disclosures are a form of an accounting method, deduction leads to the statement that managers use their discretion to choose risk disclosures that establish efficient communication. Second, if the reduction of agency costs implies a reduction of the cost that investors incur with the investment in the company and thus the investors risk, then the accounting discretion will be used by the manager to reduce the risk as perceived by the investors.By aggregating these deductions, the efficiency perspective of the positive accounting theory predicts that managers use their accounting discretion to create risk disclosures for investors and reduce the risk as perceived by the investors. An implication is that risk disclosures must have a negative association with risk levels.

The above described deduction will form the base for the postulation of the hypotheses later this paragraph. Important to mention is that prior research (Linsley & Shrives, 2006 and Linsley, Shrives and Crumpton, 2006) took also a positive association into account deducted from the signaling theory. They acknowledge however that this can be a wrong assumption for two reasons. There can exist a circular relationship. Companies with low risks with a long track record of risk disclosures have already managed the lower the risk by disclosures, while high risk companies still try to achieve a lower risk. BIS (2003) show an annual increase of 2% in bank disclosures. It is therefore reasonable to assume that disclosures are relatively stable and signaling doesn't play an important role in banking. This study is demarcated to the observations of one year. A time series study over multiple years can express the effect of variations in independent variables. The second argument against the signaling theory reasons that high risk companies don't want to disclose, because it reveals the high risks. The last argument is however an application of the opportunistic perspective of the Positive Accounting Theory.

The result of prior empirical research that investigated this association is not automatically applicable to all situations. Plausible generalizations are possible if the sample of a proven hypothesis is representative and comparable with the population. As previous chapter explained, banks are different organizations than non-banks. Different countries with different economic and institutional settings, disclosure requirements, industries, periods in time or company characteristics distort the universal applicability of a result. Banks can be seen as a separate population and as implication,

empirical evidence from non-financials is not valid for banks. Banks are therefore studied independently in this thesis. As second, research that is grounded on incorrect assumptions may not present the true and require further evidence. Falsification with different assumptions can throw another light on the matters. The assumption that the book to market value of equity represents the level of risk is viewed as questionable in the scientific literature. This research will therefore continue to look for a more sophisticated approach of risk as this is perceived from the point of view of the investors.

With the same analogy of the holders of a loan as described in the previous chapter, an investors holding securities in a company is exposed two large risks. The risk of fluctuations of returns over a specific invested value (i) and the risk to lose the invested value completely, the downside risk (ii).These risks can be operationalized by the risk-profile of a company as perceived on the stock market by investors, the total risk (measured by equity price volatility). Alternatively, the total risk can be seen as the aggregation of the systematic risk (company's Beta) and the unsystematic risk. The unsystematic risk is a part of the total risk and is eliminable by portfolio diversification. It is therefore not straightforward to explain which component captures risk from the perspective that investors see, but at least the total risk is expected to be negativelty associoated with credit risk disclosure level and coincident with this the unsystematic risk or systematic risk component. The preceding yields to the following hypotheses:

H0 (i): There is no significant negative association between
a bank's systematic risk and the level of credit risk disclosures
H a (i): There is a significant negative association between
a bank's systematic risk and the level of credit risk disclosures

H0 (ii): There is no significant negative association between
a bank's unsystematic risk and the level of credit risk disclosures
H a (ii): There is a significant negative association between
a bank's unsystematic risk and the level of credit risk disclosures

H0 (iii): There is no significant negative association between
a bank's total risk and the level of credit risk disclosures
H a (iii): There is a significant negative association between
a bank's total risk and the level of credit risk disclosures

The original CAPM model also assumes that investors use perfect information to perfectly diversificated their risks, but there is an estimation risk. Botosan (1997) explains that estimation risk is part of the systematic risk and therefore undiversifiable. It seems that this is defendable only when it is assumed that the investors can't force companies to disclose information that they require to improve their estimation accuracy, reducing the information assymetry. Activistic shareholders may be able to manage this and in that case is estimation risk manageable for investors. This would imply that stockholders can't eliminate unsystematic risk only by portfolio diversification, but also at least partly with a reduction of estimation risk. In that case, higher credit risk disclosure score may lower the total risk and unsystematic risk components, but not the systematic risk component. This question may be answerable as byproduct of this association study.

A total different view on risk that hasn't been analyzed in any association study before is the probability of default estimated by external rating agencies. This value captures the investors perception of risk not direct, but the risk of financial distress. Financial distress however depends not only of the financial management of a company, but also on the operational performance and thus captures the deviations in total cash-flow generating capabilities. The following hypothes is therefore deducted:

H0 (iv): There is no significant negative association between
a bank's default probability and the level of credit risk disclosures
H a (iv): There is a significant negative association between
a bank's default probability and the level of credit risk disclosures

Chapter 5: Research design

§ 5.1 Introduction

The testable hypotheses of chapter four specify variables that require further methodological elaboration. This chapter will therefore start to find appropriate proxies that measure the variables credit risk disclosure level (paragraph two) and risk level (paragraph three). The corresponding statistical methods to obtain these variables are also included in these paragraphs. Paragraph four discusses the further methodology for the association between the measured variables. By knowing the data-requirements of the different methodologies, a sample design is constructed in paragraph five.

§ 5.2.1 Measurement of credit risk disclosure level

Most accounting behavioral research is based on analysis of quantitative data with analytical models. Although these studies are considered to be informative, because evidence is gathered about the role of this information in markets, they don't analyze qualitative disclosures and ignore the added value of these disclosure contents. (Arnold, 2007) According to Beattie et al (2004), changing regulator views on reporting put emphasis on narrative disclosures. New qualitative, "soft" information is however not recognized with existing research techniques. Therefore the need for disclosure metrics was risen and Beattie, McInnes & Fearnley (2004) reviewed five different approaches to analyze narratives in annual reports.

§ 5.2.2 Approaches for analyzing narratives in annual reports

Subjective analysis is based on the perceptions of investors or other stakeholders such as central banks and regulators about the disclosures of a reporting entity. Arnold (2007) sums up a number of limitations of this approach. First, investors can be biased by lack of firm understanding, understanding of the firm's industry and trends in disclosures. The investor's evaluation process is a black box and selection biases can exist because not all investors will respond. Survey based analyst ratings may be unclear for surveyed investors and included firms can be also biased by a selection process. (Healy &Palepu, 2001) The investigation by BIS discussed in paragraph 3.3.2 is an example of an application of this research approach.

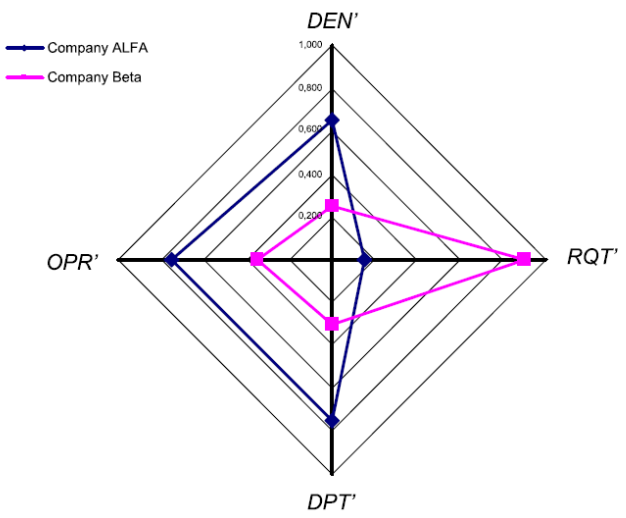
With a semi-objective approach makes the researcher a judgment about the disclosures level of a reporting company. The researcher examines the original disclosure vehicles. (Hassan & Marston, 2010) Beattie et al (2004) classifies within this approach two subcategories, disclosure index studies and content analysis studies.

§ 5.2.3 Content analysis studies

Content analysis (thematic content analysis, readability studies and linguistic analysis) is a research technique that makes interferences from data in relation to their context. (Krippendorf, 1980) With this method, the researcher doesn't only examine the original disclosures, but also analyzes the full text. Content analysis can analyze relations between concepts within a text, often splitted up in themes. (Hassan & Marston, 2010) Readability studies and linguistic analysis are primary focused on the understandability of disclosures and analyze the cognitive difficulty of texts, based on patterns of sentence length, used words, conjunction and category shifts. (Beattie et al. 2004)

Content analysis is characterized by multi-dimensional analysis and splits the disclosures based on different concepts of interest. Each disclosure unit (word, sentence or paragraph) is assigned to a theme (disclosure sub-category, e.g. credit risk or credit risk derivative information) and further analyzed by a number of conceptual dimensions e.g. time (past/future), scale (qualitative/quantitative) or sign (positive/negative). The studies of Linsley & Shrives (2006) and Linsley, Shrives & Crumpton (2006) discussed in paragraph 3.3.2 made use of content analysis and gathered results in a disclosure coding grid, a table with all dimensional combinations related to disclosure themes (the companies risk and credit risk). The researchers obtain not only the number of disclosures in each (sub) theme, but also the number of corresponding conceptual dimensions. Content analysis is ex post, it first analyses the text as whole and then let's the researcher makes conclusions about the disclosure levels based on gathered results. (Beattie et al. 2004)

The final judgment about the disclosure level depends on the assumption that the researchers makes regarding the best proxy. Linsley & Shrives (2006) assumed that the amount of disclosures don't differ from the quality of these disclosures and so the number of disclosure for each theme was the disclosure level. Beattie et al. (2004) explains that disclosure quality is a complex, context-sensitive and subjective issue. Different interrelated aspects contribute to disclosure quality and attempts have been done to find a good proxy with a measurable value. Disclosure quality can be approached by an aggregation of separate aspects, the relative amount of disclosures given a company's size and complexity (deviations proxied by the error residue of a regression of number disclosures on firm size and complexity), the spread of disclosures (H) over categories and sub-categories (the number of disclosures in a (sub)category as proportion of the total disclosures) taken as inverse (1-H) and the number of non-empty sub-categories. The higher this composite measure is, the higher the disclosure quality. Beretta & Bozzolan (2004) measured the four disclosure quality aspects for two companies and depicted the disclosure quality (and strategy) graphically:



RQT = relative quality

DEN = disclosure density, the category spread

OPR = non-empty subtopics

DPT = disclosure depth, the sub-category spread

Fig. 1. The risk-profile diagram: visualizing risk-communication strategies.

Beretta & Bozzolan (2004) proved also however that the effect of the size and industry has no significant influence on the disclosure quality.

Content analysis is very labour intensive, what restricted the sample sizes of prior research. Automatic content analysis is seen as a solution for this problem, but automatic content analysis with specified key-words overstate the amount of disclosures with 40%. (Hassan & Marston, 2010) Subjectivity of the researchers is another problem. A coding instrument to eliminate this subjectivity requires clear descriptions of categories, subcategories and corresponding conceptual dimensions and becomes more complex with an increase in dimensions. Problems with violation of reliability thresholds (more on this in paragraph§ 5.2.5) will be then be larger.

§ 5.2.4 Disclosure index studies

Disclosure index studies use disclosure indexes to examine disclosures. Hassan & Marston (2010) define disclosure indexes as an extensive list of selected items that may be disclosed in an annual report. This research technique differs from content analysis on a number of points. Whereas content analysis thoroughly analyzes the whole text, disclosure index studies don't analyze text units, but only verify the presence of items based on a pre-defined check-list. Disclosure index studies are ex-ante. The disclosures items are specified before the researcher examines the narratives in annual reports. The researcher can apply an existing disclosure index that has been developed by third parties or choose to develop the index self. In the last case, the researcher's involvement is larger and the researcher controls the whole process from beginning to the end. The disclosure index can include disclosure items that are mandated by authorities and/or voluntary disclosures. (Hassan & Marston, 2010)

Just like with content analysis, a coding instrument defines the rules how discovered disclosures are treated. With content analysis, rules for analysis of disclosure items and assignment to categories gave the researcher freedom especially when analysis is complex, what undermined the objectivity. Disclosure index studies require less subjective judgment. A coding instrument consist of rules for measurement, weighting and eventually nesting disclosure items. In the most simplified, binary form, the measurement rules, locate zero point for non-presence of a disclosure index item and one point for the presence of a disclosure index item. Alternatively, disclosure items are counted ordinal with more than two outcomes (e.g. three levels of disclosures with no disclosures (zero points), few disclosures (one point) or many disclosures (two points). It should be obvious that the second option increases subjectivity. Disclosure items can be weighted or unweighted. Some disclosures are considered to be more important for user groups and therefore weightings correct this by putting more emphasis on the score of these items of the disclosure index. A weighted disclosure index requires more subjective judgment, especially when the disclosure preferences of the user group are not clear or biased. As third part, the coding instrument can additionally establishes rules for nested disclosure indexes in which items are grouped hierarchical. (Beattie et al., 2004) Arvidson (2003) conducted a disclosure index study with nested indexes and unweighted binary measurement rules. The self developed disclosure index included 81 intangible asset disclosure items of which only the half was reported. The researchers used annual reports and literature about intangible assets as starting point for the development of the index. The in paragraph 3.3.2 mentioned studies of BIS made also use of an disclosure index, although strictly taken it is a subjective survey based research, because a panel of central banks made the judgment about the disclosures. Hassan & Marston (2010) remark two disadvantages of disclosure index studies. First, disclosures index studies recognize only the specified items and ignore disclosures to the extent of the index. A comprehensive disclosure index reduces this problem, although this will also result in more empty items. As second, inter-relationships between disclosure items are not recognized because a deep analysis with a multiple conceptual dimensions is not part of this research technique. If however the research approach doesn't require a deeper analysis with multiple dimensions (with coincidentally more subjective judgment), the merit of this advantage is limited. Content analysis allows the researchers however to measure disclosure quality and quantity. The next paragraph discusses reliability and validity issues of these two semi-objective research approaches.

§ 5.2.5 Reliability and validity

Content analysis studies and disclosure index studies require that the researcher makes judgments about the disclosure level (disclosure quality and/or quality). Beattie et al. (2004) explains that it is essential that all interferences by the researcher are reliable and valid. Validity implies that the researcher establishes interference procedures that cary out what the researcher wants to measure. Reliability consists of different qualitative aspects (stability, reproducibility and accuracy). Stability in content analysis and disclosure index studies captures the degree of consistency of interferences made by the same researcher over time. Interference procedures are accurate when the classification of text units corresponds to a general accepted norm. Reproducibility is often indicated by inter-coder reliability and measure whether to independent researchers make the same interferences from the same content. Stability and accuracy are hard if not impossible to measure. Reproducibility or inter-rater reliability is an approach that has been widely used in content analysis and disclosure index studies to verify the reliability of executed interference procedures. The coefficient of agreements between the researcher and another independent researcher can be used as proxy for the inter-rater reliability. Independent interferences that are made by the two researchers are therefore pair-wise compared. A more sophisticated method, applies the Scott's pi that incorporates the effect of random agreement by adjusting the observed matches for the expected matches. The coefficient of agreements is subsequently corrected by the calculated Scott's pi factor. (1 – [100 – percent of observed matches/100 – percent of expected matches]) Reliability values are not measured in this thesis for the practical reason that this research is conducted by one researcher. Validity and the three qualitative aspect of reliability can be seen as a base criterion for this kind of research and should therefore be carefully considered in further choices made to measure credit risk disclosures. When assuming that more subjectivity results in a lower coefficient of agreement and thus a lower inter-rater reliability, it is therefore important to choose a research approach and design interference procedures that keep subjectivity as low as possible.

§ 5.2.6.1 Selection of an research approach

Both the underlying accounting theories as the research question with hypotheses don't prescribe a specific research technique. The various approaches described in this chapter have advantages and disadvantages. Subjective analysis with investor surveys are able to capture the perceptions of a large target group. Survey techniques or investors self can bias the outcomes. Also the willingness of target groups to participate in a survey and thus the availability of data forms a problem for this approach. Content analysis is a complex research technique that allows to thoroughly analyze texts with as output an analysis with multiple dimensions. The measurement of credit risk disclosure level

however can be done with one dimension and don't require a further analysis of the content of the disclosures. Deeper analysis of credit risk disclosures has thus no merit for answering the hypotheses. Content analysis also means also more subjectivity and inter-coder reliability problems for the researchers. Disclosure index studies are relatively straight forward. Comprehensive disclosure indexes with binary coding rules and unweighted disclosure items minimize subjectivity and inter-coder reliability problems. A relevant disadvantage of disclosure index studies is that measuring the disclosure level with disclosure quality is not possible. This thesis will prefer the disclosure index technique over content analysis (and subjective surveys) for the reason of subjectivity and data availability, keeping in mind that disclosure level can then only be measured by the actual disclosure quantities. This point of view will be advocated by the fact that reliable and valid measured disclosure quantity levels results are a better base for answering the hypotheses than less reliable and valid measured disclosure quality and quantity levels.

§ 5.2.6.2 Measuring credit risk disclosures with a disclosure index

The fundamental tools for measuring credit risk disclosures are a disclosure index with a specification of credit risk disclosure items and a coding scheme. Because no up-to date disclosure index with related available, a new disclosure index should be developed in this paragraph. Arvidson (2003) reviewed disclosure indexes of prior studies and relevant theories before developing a new index.

The BIS study (2003) is one of the few studies that investigated bank disclosure practices with a disclosure index. The BIS study (2003) used a disclosure index for the survey. The disclosure index consisted of an unweighted hierarchical index with binary coding ("yes" for presence, "no" for non-presence and an option for "not applicable"). The answer "not- applicable" was included for exceptions, e.g. when the disclosure item in the context of bank was not relevant or material. The disclosure score expressed as percentage of the total possible disclosures was therefore corrected. The study divided 15 credit risk disclosure items in hierarchical groups; credit risk modeling, credit derivatives and other credit enhancements and internal and external ratings. The scope of the study was to examine trends in disclosure practices in the past three years and to view reporting practices in the context of the disclosure regulation. Since the publication of this study in 2003, the mentioned context changed. The Basel II pillar three legislation for (credit) disclosures at banks became effective in 2004 and the new International Financial Reporting Standard (IFRS) 7 was introduced in 2007. The next paragraph therefore quickly reviews relevant mandatory risk disclosure frameworks.

§ 5.2.6.3 Mandatory accounting and capital adequacy standards and risk reporting frameworks

Dobler (2008) describes three actions that regulators can perform to stimulate a risk reporting environment. Regulators can mandate risk reporting, impose risk management systems and set up enforcement mechanisms.

The International Accounting Standards Board (IASB) releases financial reporting standards that are mandatory for all stock-listened companies within the European Union. Chapter two explained the role of various specific assets and liabilities at banks. Accounting standards and risk frameworks prescribe the treatment of these assets and liabilities and the disclosure requirements for credit risks.

International Accounting Standard *(IAS) 32 – Financial Instruments: Presentation* and *IAS 39 Financial Instruments: recognition and measurements* contain provisions for the presentation, recognition and measurement of financial instruments. Financial instruments fill in by far the largest part of a bank balance. Hoogendoorn et all (2004) states that financial instruments can be used for funding, investment and trade and have the feature that they include all instruments that bear financial risks. A financial instrument is a contract that assigns the right of ownership of a financial assets to one entity opposed by a financial liability at an another entity or an equity instrument in another entity (residual interest in an entity). (IAS 32.11) A financial asset can be cash, an equity instrument in another entity (e.g. shares that are not held for sustainable investments and not in associates, joint ventures and subsidiaries), a contractual right to receive or exchange a financial asset (e.g. an derivative such as an put option with the right to sell a bank loan that is not owned) or a contract that can be settled in the owner's equity instruments (e.g. an option that gives the right to acquire a company's shares). A financial instrument is a derivative according to IAS 39.9 if it's value depends on another financial variable (price, index, rate or rating) or non-financial variable that is not specified in the contract. Furthermore, the contracts of a financial instrument, must be settled at a future date. European options are always settled at the expiration date. American option can be settled earlier. Exotic options can have deviating conditions, such as restricted settlement dates or conditional strike prices. The third and last requirement is that the initial investment to gain a position with a comparable exposure to the underlying value is lower than other types of contracts. Options are also compoundable, e.g. a call option on a call option with the same underlying values can increase the effect of a change in underlying value, but a put option on a call option hedges the effect. Financial liabilities are contractual obligations that are inversely related to the rights with financial assets (with an exception for held cash).

From the moment that a financial instrument causes a rise in rights from financial assets and/or obligations, the assets and/or liabilities have to be presented in the balance sheet. (EY, 2011) IAS 32.15 requires that the issuer of the financial instrument classifies the components of the financial instrument based on the substance (economic reality) of the contractual agreements. The components of a financial instrument are then settled as part of the owners equity or as liability. Compounded financial instruments (sometimes indicated as hybrid financial instruments) consist of both a parts, e.g. a convertible obligation is viewed as an option (financial assets, equity part) and a loan (financial liability, liability part). (Hoogendoorn et all, 2004) IAS 32.28 requires that the financial assets, liabilities and equity instruments of these instruments are separate presented. Offsetting of financial assets and liabilities is required according to IAS 32.42 when the there is a specific right and intention to settle the net position of the rights and obligations simultaneously. Hoogendoorn et all (2004) explains that netting agreements qualify for this treatments and banks use offsetting for debit-credit balances and interest settlement.

At the moment of the recognition the components of financial instruments (assets, equity instruments and liabilities) are valued against the initial fair value, the historical cost price. IAS 39 contains provisions for the subsequent measurement and treatment of results. IAS 39 defines categories (held-for trading, held to maturity, available for sale and loans and receivables) for different assets, equity instruments and liabilities (for the latter only the financial liability category). The assessment of financial instruments with these categories enables the standard setters to prescribe an appropriate valuation bases; historical (amortized) cost or fair value. IFRS 9 is expected to replace IAS 39 in 2015 and reduces the categories for financial assets to two categories (debt instruments and equity instruments). (EY, 2011) Hoogendoorn et all (2004) discussed the theoretical background for the valuation of financial instruments and considers the IAS 39 model as a mixed model, because the standards values some posts based on historical costs and some post against fair value. A full fair value approach values the interest element in all financial instruments. This is however not the case in the IAS 39 provisions.

Standard setters consider two issues when choosing to prescribe a valuation method, external validity and internal consistency. External validity implies that measured values must represent the economic reality of the financial markets in order to be useful for financial risk management decisions based on those values. Although external reporting has a different objective than internal reporting with financial risk management systems (e.g. supported by a duration analysis as described in §2.4.1 that also incorporates the interest element for the calculation of the duration gap) it is preferred to have a valuation basis for external reporting that matches with the economic reality of the financial risk management system. Internal consistency means that transactions and activities

with the same economic reality in an entity must be treated with the same measurement method.(Hoogendoorn et all, 2004) IAS 39 and also the future IFRS 9 make use of a mixed model that requires a specification of criteria to classify assets and liabilities. Hoogendoorn et all (2004) separate three possible criteria, the intention of the financial risk management to use the financial instruments in transactions for certain activities (e.g. indicated by duration), the underlying risks of the financial instrument and the type of instrument (e.g. derivatives or stock-listened).

The largest part of a bank's asset portfolio are issued (not acquired) loans and receivables. These assets can be classified as loans and receivables (amortized cost, changes in equity), available for sale (fair value, changes in equity) and under circumstances valued at fair value with changes through profit&loss.

Reclassifications are also possible in a mixed model, but IAS 39 is viewed as inflexible. Especially for self-issued loans by banks (loans and receivables , IFRS 9 is considered to be more flexible. IFRS 9 values these assets on historical costs after a business model test (with the purpose of the assets in the company, e.g. to collect interest payments) and a characteristics of financial assets test (specified rights and transactions). Reclassification to fair value of these loans after initial recognition is possible under IFRS 9 when there occurred a change in the bank's policies (EY, 2011). After the credit crisis in 2008, the IASB also started to allow reclassifications of obligations from held for trading (fair value, changes in p&l) to loans and receivables.

Entities can hold derivatives for speculative purposes or as part of their risk management strategies. Most banks try to eliminate markets risks and perform macro hedging transactions in which interest-rate risk is hedged on portfolio scale with derivatives. Derivatives are normaly valued against fair value under IFRS. IAS 39 however contains two deviating treatments of derivatives. First, derivatives can be embedded in a financial instrument in order to support the main contract, e.g. a interest cap (not in the money at the moment of agreement) on a interest-variable loan (value depends on fluctuations in interest-rate) or a purchase agreement for goods that requires payment in a currency that is not adopted as reporting currency. (value depends on a floating exchange rate) These so-called embedded derivatives must be separated from the other part of the contract when the economic characterics and risks differ between the base contract and the embedded derivatives. In case of separation, all components of the contract should be valued against fair value through profit&loss. As second, IAS 39 allows entities to apply hedge accounting under circumstances. Hedge accounting mitigates the problems arising from the mixed measurement model as incorporated in IAS 39. Entities can engage in derivative contracts to hedge the risks of an underlying position. With the mixed measurement model, it is possible that the underlying position and the derivative are

valued on different base. Also methods for results and the moments that results are taken into account can follow deviating regimes. For the correct representation of the economic reality, it is preferable to process the derivative and underlying position simultaneously. IAS 39 allows to aply three hedge accounting models, a fair-value hedge model (revalutations through profit&loss), a cash-flow hedge model (results first through equity, later tranfered to profit&loss), and a hedging model for net investments in foreign entities). A two side approach of risk incorporates both changes in values and changes in cash-flows. Hedge accounting is not compulsory and reporting entity may opt for the different hedge accounting models per hedge relation when conditions are met. For credit risk derivatives that are intended to hedge risks of financial assets carried at amortized cost, the estimation of the credit-risk mitigating effect of the hedge relation is difficult to measure, because another risk, liquity risk is also covered with this hedge. The IFRS 9 exposure draft propopes less stringent hedge accounting criteria with an option to include non-derivatives and the rejection of quantitative hedge effectiviness criteria. (EY, 2011)

The impairment provisions of *IAS 36 – Impairment of Assets* are not applicable for financial assets. IAS 39 specifies impairment triggers for financial assets that are valued against amortized cost or treated as available for sale instrument. (IAS 39.59) The activated financial assets can be under circumstances collectively impaired on portfolio level. This incurred loss model that allows only impairments when indications give reason to take impairment lossess is expected to be replaced by the expected loss model that corrects for the expected credit lossess. The carrying amount is then both amortized for interest receipts as for an expected credit loss. Current assets such as interest receivable may also be collectively impaired when specified conditions are met. IAS 39 doesn't allow entities to impair current assets with a dynamic method (e.g. with a percentage of the revenue). Static methods can be applied, e.g. after a re-evaluating the maturity of a portfolio of receivables.

Derecognition of financial instruments is under IAS 39 modulated with three checks, whether decreconition must be applied, if risk and rewards are tranfered and as last if the entity lost control. Pass through arrangements (in which the entity remains collecting cash-flows of transferred financial instruments for an acquiring party) must facilitate a direct transfer of cash-flows to the new owner. Financial instrument that are subjected to other contractual agreements such as guarantees may not be derecognized.

After recognition and measurement, the balance shows information about the presence of financial instruments. This is according to Hoogendoorn et all (2004) not sufficient to obtain the necessarily insights for the risks emerging from financial instruments. Most derivatives have a value of zero at the moment of activation, the trade date or settlement date. IAS 32 and IFRS 7 prescribe disclosure

requirements for financial instruments. IAS 32 demands disclosures about the applied methods for treatment, valuation, determination of results. Also disclosures are required about the durations of interest-bearing assets grouped in terms, concentration risks, special assets (such as non-activated assets and subordinated assets) and risk management policies. IFRS 7.1 explains that the objective of IFRS 7 is to let the user evaluate the significance of financial instruments and the implications for the financial position and performance. The reporting entity must present the user the nature of risks emerging from financial instruments. Hoogendoorn et all (2004) explains that disclosures help the user to determine the amounts, timing and certainty of future expected cash-flows emerging from financial instruments. Banks that apply IFRS 7 must release risk disclosures in groups that follow the relevant balance sheet items. Or, better formulated, the relevant financial rights and obligations, because some positions are not presented in the balance sheet. Risk disclosure must at least contain information about credit risks, liquidity and market risks, but risk disclosures are not necessarily limited to these financial risks, as described in § 2.3.3. (IFRS 7.32)

Credit risk must be disclosed under *IFRS 7 – Financial Instruments: Disclosures* with qualitative and quantitative disclosures in order to get an overall picture. (IFRS 7.33) Quantitative credit risk disclosures must be based on information that is normally supplied internally to key management people and contain summarized data of positions at the end of the reporting period. (IFRS 7.34) This means that amounts are mentioned that give the best representation of the maximum credit risk without correction for claimable collaterals or measures that increase credit quality such as netting agreements that are not subject for offsetting based on provision IAS 32.42. Impairments losses should be taken into account. (IFRS 7.36-B9) When the carrying amounts of the financial instruments already are incorporating maximum credit risks, a separate disclosure of this amount is not required, but a description of any credit risk mitigating measures must be disclosed. (IFRS 7.36) Even when the possession of these collaterals lead to recognition in the balance sheet (IFRS 7.38) The before mentioned provisions are applicable for financial assets that are past-due, not past-due or impaired. (EY, 2011) For impaired assets is a description required of the factors (e.g. economic circumstances, real estate prices) that triggered the impairment. For not impaired, but past due financial assets a maturity analysis with time bands of past due financial assets must be disclosed. (IFRS 7.38)

Besides of these quantitative credit risk disclosures, qualitative credit risk disclosures must be disclosed for all financial instruments. A reporting entity is obliged to describe the exposures to credit risk and the way how these risks emerge including any changes compared with previous reporting periods. Qualitative credit risk disclosures also include information about the risk management systems. Risk management objectives, policies, processes and methods must be disclosed. The next paragraph will show the risk management systems are largely prescribed by the Basel legislation for

banks. IFRS 7 require for the risk management of credit risks only under circumstances a maturity analysis. For market risks, a sensitivity analysis (e.g. value-at-risk) with assumptions, parameters and limitations is required that measures interdependencies between risk variables. (IFRS 7.33/40) Important to notice is that the mentioned risk disclosure requirements are the minimum risk disclosures. Banks may choose to disclosure more risks on voluntary base. Bischof (2009) investigated with a sample of 171 European banks the impact of the introduction of IFRS 7 in 2007 and concluded that disclosure levels increased, especially for credit risks.

The accounting standards as described above form one source of legislation that mandates risk disclosures. Another source of legislation that requires banks to disclose risks with a more or less comparable scope are the capital adequacy frameworks imposed by the Basel Committee on Banking Supervision. The next part will elaborate the risk disclosure frameworks imposed on banks by this authority.

Chapter two described the transformation processes that are typically for banks. A banks uses its leverage to make profits. A high leverage means higher yields on invested capital, but also substantially more risks. Paragraph 2.4.1 showed how duration mismatches at banks cause risks. Worldwide banking deregulation in the 80's and 90's resulted in a changing risk environment. Different jurisdictions in countries stimulated regulatory arbitrage strategies by banks and some national banking supervisors only took the risk exposures into account that were presented in the balance sheets. While more banks choose to operate internationally, (foreign) risk exposure at banks increased and the first problems with excess risk-seeking banks were created.The Basel Committee on Banking Supervision advised since 1974 national banking supervisors how to regulate international operating banks and released in 1988 the first global banking standard for banking capital adequacy, Basel I.

Basel I obliged international banks to hold a minimum capital reserve based on owned assets. Assets were therefore risk-weighted with a bucket-system. Sovereign debt exposures were assumed to have zero risk with a weight of 0%, while for example commercial loans were supposed to have a full exposure to risk and therefore counted as 100%. This classification was based on measured credit risks of these assets and later also market risks. The minimum required capital was calculated as 8% of the total of the risk-weighted assets. The standard distinguished different capital qualities. At least 50% of the minimum required capital (and thus 4% of the risk-weighted assets) had to be of the highest quality, Tier 1 capital that consists of common equity and preferred stock. A remaining second group, Tier 2 allowed capital of lower quality such as subordinated debt and hybrid instruments.

The Basel II standard superseded Basel I in 2004 and improved the weaknesses of the previous standard. Where the focus of Basel I was put on the minimum regulatory ratio, the base for capital with the Tiers and an uniform process to calculate the ratio with risk-weighted assets (Pillar 1 under Basel II), Basel II added new features as the governance on banks with a supervisionary review process (Pillar 2) and market discipline (Pillar 3). For Pillar 1, the standard included more detailed guidance for the measurement of the risks of the risk-weighted assets. Risk exposures of assets to operational risks were since then also taken into account for categorizing the risk-weights next to credit risks and market risks. The main merit of Basel II in Pillar 1 was the possibility to adopt new credit risk measurement methodologies. The bucket approach was thereby further sophisticated by allowing three methods for the measurement of credit risk as base for assessing credit risks. The basic standardized approach allowed banks to assess credit risk of assets by making use of external credit rating agencies (S&P, Fitch and Moody's). Two internal-ratings based (IRB) approaches based on internal risk management models were allowed to use for estimating credit risks. The Value-at-Risk approach elaborated in paragraph 2.2.4 is such a method and the concept of the capital adequacy is graphically depicted in the right figure in this paragraph. (as trade-off function of loan provison, profit and the unexpected capital loss on loans) The logic behind the Tier 2 capital (e.g. a convertible obligation) is to provide the bank a buffer in the case of insolvency. The objective of Tier 1 capital (attracted capital of the highest quality with no credit risk sensitivity) is to function as going concern capital. Although Basel II will be in place until 2013 when the implementation of Basel III starts, the standard is also known for its outrageous exceptions and unforeseen effects. Some banks managed to structure financial products that were in fact very risky, but required low minimal capital reservations based on risk-weighting to comply with Basel II. Two decades of erosion of capital levels with some banks reserving only 1% Tier 1 capital and the liquidity, economic and credit crises since 2008 showed the world that a capital adequacy standard required a revision.

Whereas Basel II (or effectively the national supervisor that enforces Basel II) keeps an eye on standard compliance on bank-specific, micro-prudential level, the scope of Basel III will additionally cover a macro-prudential approach that sets system-wide capital adequacy requirements. Basel III requires banks to implement a capital conservation buffer and a countercyclical buffer before 2016. The countercyclical buffer forms a measure to avoid a new credit crisis (a combination of credit increase system-wide followed by an economic downturn). The countercyclical buffer must breakthrough the vicious circle that are typical for most credit crises by requiring additional capital when system-wide credit levels (as percentage of the GDP) increase. The buffer with a range from 0% to 2,5% of the risk-weighted assets allows debuffering when system-wide credit conditions improve. A capital conservation buffer restricts banks to fully distribute earnings when Tier 1 capital levels are

not more than 2,5% above the minimum required capital. Banks have two choices, capitalize with additional capital raising and maintain the possibility to pay-out dividend without restrictions or retain a part of the earnings based on the distance with the bottom-line. Overall Tier 1 capital requirements will be annually increased from 2013 until 2019. Critics fear that the new standard will slow-down economic growth. Others think that the bucket-system with risk-weighted assets, that has been incorporated in all standards since 1988 must be replaced. Basel III will included in 2018 a leverage ratio for Tier 1 capital calculation. That approach will include an capital requirement calculation based on liabilities instead of assets. (King & Trabert, 2011)

Until so far an overview of the general scope of the Basel capital adequacy frameworks. The third pillar of Basel II contains a specific risk disclosure framework. The scope of this framework is to communicate the capital reservation discipline with other market participants in the banking sector, used risk assessment processes and exposures to risks (credit risks, market risks, operational risks, interest-rate risk and equity risk). It thereby complements the other pillars. (The New Basel Capital Accord, 2003) For comparison, IFRS 7 was designed to communicate risks emerging from financial instruments regardless of the sector to the users of financial statements. Basel II article 762 describes that the scope of accounting standards is less narrower, but that the accounting risk disclosure standards don't conflict with Basel II. IFRS 7 based risk disclosures standards can be used to verify Basel II risk disclosures by comparing the different statements in the (eventually externally audited) annual report.

The disclosure requirements for credit risks largely correspond with IFRS 7, but are on some points more specified. IFRS 7.33b requires general disclosure about the risk management processes, Basel II article 772 demands an disclosures about the credit risk identification, measurement, monitoring and controlling processes. Both disclosure frameworks require segmentation of credit risks based on concentrations. Basel II demands more specific for geographical locations and industries. (article 774 vs IFRS 7.34c) For credit risk enhancement with securitization, related operational activities (policies, amounts and the bank's involvement) must be disclosed under Basel II. There where IFRS 7.33b only asks for a disclosures about the used credit risk measurement methods, Basel II first specified allowable methods with the first pillar and requires disclosures about the chosen approach(es) with applied procedures, model inputs, assumptions and calibrations (stress testing and backtesting), e.g. the name of the external credit rating agency with the standard measurement approach.

§ 5.2.6.4 Applying risk disclosure frameworks as disclosure index

The credit risk disclosure requirements of both previously described frameworks have been summarized in appendix I. This list will be used as disclosure index for the measurement of the credit risk disclosure level. The approach of the BIS (2003) study will be followed. The coding instrument specifies an unweighted index with binary coding. These coding instrument rules will limit subjectivity. The disclosure index is used to analyze the annual reports of the sample what will lead to a measurement of the disclosure level of banks within the sample. In paragraph 5.4 are the sample criteria discussed.

§ 5.3 Measurement of the investors perception of risk

The Modern Portfolio Theory (MPT) as developed by Markowitz (1952) distinguished a firm's systematic risk from non-systematic risk. The latter is diversifiable and the Capital Asset Pricing Model (CAPM, a further development of the MPT) assumes that investors only get compensated for the systematic risk component. An implication of this is that the return on stocks that an investor achieves by holding a portfolio of assets represents the compensation for the incurred risks. CAPM specifies a method for the measurement of these risk in relative terms with a company specific Betafactor (β). The Beta factor implies the sensitivity of company specific cash-flows and earnings relatively to market-wide movements. Cash-flows and earnings are assumed to be incorporated in the stock-price according the earlier discussed Efficient Market Hypothesis. When this sensitivity is perfectly correlated with the market, the Beta factor equals to one. Higher Beta factors reflect a higher sensitivity and thus a higher systematic risk. The Beta factor is operationalized by regressing the relation between the expected stock-price returns (E(Re)) on the expected market returns in excess over the risk-free interest-rate (E (Rm) – Rf). CAPM uses therefore the following formula: (Palepu, Healy and Peak, 2010)

$$E(Re) = Rf + \beta\,(\mathrm{E(Rm)} - \mathrm{Rf})$$

Rewriting the CAPM formula to an univariate regression model yields to:

$$Y_t = \alpha + \beta\, X_t + u$$

Whereas the dependent stochastic variable Y_t is denoted by $E(Re) - Rf$ and the independent non-stochastic variable X_t is denoted by $\beta\,(\mathrm{E(Rm)} - \mathrm{Rf})$. The terms α and u are the intercept and the disturbance term. An assumption of the univariate regression models is that the independent variable is exogenous and determined by variables outside the equation and the dependent variable is endogenous determined by the defined relation. The causality is thereby only from right side to

the left side of the equation. This regression model expresses the economic theory that a high systematic risk is compensated by stock returns. When developing new regression models, testing for exogeneity of dependent variables may show the need for alternative multivariate models. (Brooks, 2008) The CAPM model includes only the systematic risk component as reason for investor compensation. Small firms generate however higher returns than larger firms. Although the original CAPM model doesn't give an explanation for this (whether this is caused by higher risk or undervaluation), the model can therefore be corrected by adding an extra independent control variable that takes the size-effect exogenous. This has explenationay power when market values of firms are lower than $16,3 million. (Palepu, Healy and Peak, 2010)

The regression-based CAPM model delivers a conceptual base for the measurement of the systematic risk, but doesn't prescribe practical methodological aspects. The regression requires time series of data that are collected over a period with a regular interval. Standard & Poor's approach is to measure the expected future stock returns and market returns for stock-listened companies by taking historical returns. Returns are derived from stock prices. The continuously compounded returns method converts stock prices (p_t) in unit-free return values (Re_t) and has as advantage over simple compounding that issues with the frequency of compounding are avoided. The following equation can be applied for conversion. (Brooks, 2008) Stock prices are preferably corrected for non-retained earnings (dividend paid) and other capital gains.

$$Re_t = 100\% \times \ln \frac{p_t}{p_{t-1}}$$

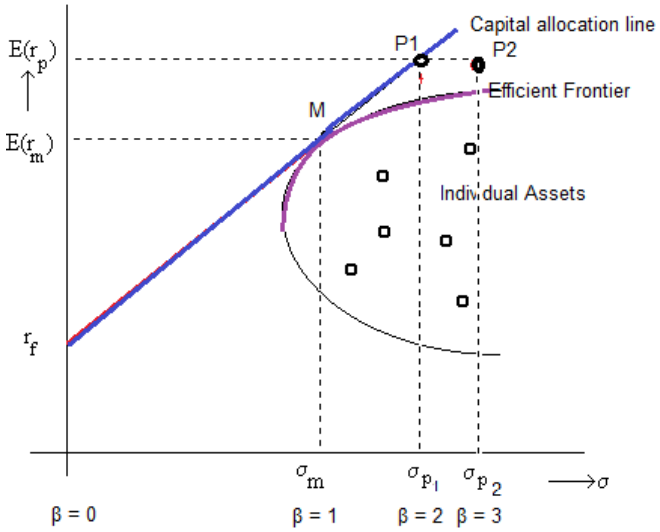
An interval of daily stock-returns over a period of three years will used as time series data. This because Basel II requires this interval and period for the backtesting of applied VaR risk measurement models. (Jorion, 2001) Although the purpose of stress testing is not the same as measuring a banks systematic risk, the assumptions regarding the data are equal, a stable historical data set that can be extrapolated. As benchmark for market returns is the MSCI World taken. This choice doesn't constrain with the choices made in the demarcation. For sake of legislation comparability is chosen to investigate banks that are headquartered in a modern European country. However, many of these banks are worldwide operational and underlying earnings cash-flows are thus world-wide generated. Sensitivity is therefore worldwide and requires an approach that reflects this. The risk-free interest rate will be measured by a 10 year bond (10y Bundesanleihen, Bunds) issued by the German Debt Agency. At this moment of writing are similar bonds against lower risk-free interest rates traded (in Denmark and Switzerland) The liquidity of these bonds is lower, what makes the prices less stable and more volatile. Ten year periods are usually applied to match with underlying cash-flows that are usually discounted during a long-term period.

An ordinary least squares (OLS) regression will be conducted on the specified variables for every bank within the sample. After the Beta factor is estimated, testing for the following conditions with corresponding diagnostic methods will be executed to verify that the estimator indeed approaches the Best Linear Unbiased Estimator (BLUE). Only the stationary Beta factor will be measured.

	Assumptions		**Diagnostic methods**
1	$E(u_t) = 0$	errors have a mean of zero	(Adjusted) R^2
2	$var(u_t) = \sigma^2 < \infty$	errors have a finite and constant variance (homoscedasticity)	Newey-West test
3	$cov(u_i, u_t) = 0$	errors are uncorrelated (no serial/auto correlation)	Durbin-Watson test
4	$cov(u_t, x_t) = 0$	errors are uncorrelated with x variables	
5	$u_t \sim N(0, \sigma^2)$	errors are normally distributed	Bera-Jarque test

Because only one regressor is included in the regression, testing for multicollinearity is not necessarily. (Brooks, 2008)

The Beta factor captures the systematic risk (in the next also indicated variable $Y_{2\,i}$), whereas the standard deviation of stock returns (volatility) captures all risks related to value fluctuations of a share. (variable $Y_{1\,i}$), This approach will therefore also be used to measure the investor's perception of risk. The volatility is measured by measuring the standard deviation of stock returns of the sample of banks. Stock returns are the only necessarily inputs for this approach and data collecting procedures follow the same analogy as for the Beta factor estimation. The figure on the next page depicts the difference between unsystematic, systematic risk and total risk graphically. The Efficient frontier (purple part of the hyperbole) represents combinations of (un)correlated individual assets that yield to the most favorable equity price variance-return combinations when riskless assets are not available. The blue Capital allocation line shows the most efficient security combinations when risk-free assets are included. Returns (Y-axis) of portfolios on the Capital allocation line are achieved with the systematic risk (X-axis). Portfolio P indicates an efficient portfolio, where the total risk is the systematic risk and the unsystematic risk is diversificated away. Point P2 is an inefficient portfolio. The total risk is composed of the systematic risk (the distance between the Y-axis and σ_{p1}), the total risk (Y-axis - σ_{p2}) and the unsystematic risk ($\sigma_{p2} - \sigma_{p1}$, variable $Y_{3\,i}$). (Edwin, Elton & Gruber, 2011)



The downside risk perception of investors is operationalized with credit risks. Credit rating agencies issue opinions about the creditworthiness of entities. Moody's delivers credit ratings for long-term deposits, subordinated debt, preferred stocks and the entity's overall financial strength. The long-term deposits are the most widely accepted and used credit ratings. These credit ratings indicate the 5 year median default probability. The credit ratings of Moody's range from AAA (0,020% chance to default) to C (20%). (California ISO) (variable $Y_{4\,i}$),

§ 5.4.1 Statistical methods for analyzing associations with correlation

A number of studies use correlation as tool for analyzing associations. [Linsley, Shrives & Crumpton (2006), Linsley & Shrives (2006)]. Correlation is a very flexible statistical technique that requires few assumptions (no assumptions regarding causality) and requirements (regarding normality of variables and explanation power already possible with sample of 20 observations) for inputted variables. (Brooks, 2008) For this reason, this technique will be used for exploring associations.

The measured variables for risk level ($Y_{n\,i}$) and credit risk disclosure level score ($X_{1\,i}$) combined for each bank in the sample forms a bivariate item. The table included in this paragraph marks the bivariate items. Theories about the underlying meaning of these variables have been described in chapter two and three. With the hypothesis development in chapter four is an association expected. Different correlation methods can test for associations. The outcomes of these methods show the correlation between the biviarate items. Pearson correlation is the degree of linearity of the association between the bivariate items. The more linear the estimated correlation coefficient (γ) is, the stronger the association is. The linear association is specified by:

$Y_{n\,i} = \gamma X_{1\,i}$ what yields to: $Y_{1\,i} = \gamma X_{1\,i}, Y_{2\,i} = \gamma X_{1\,i}, Y_{3\,i} = \gamma X_{1\,i}$ and $Y_{4\,i} = \gamma X_{1\,i}$.

	Risk level ($Y_{n\,i}$)				Credit risk disclosure level ($X_{1\,i}$)
	$Y_{1\,i}$	$Y_{2\,i}$	$Y_{3\,i}$	$Y_{4\,i}$	$X_{1\,i}$
Method	Total firm risk	Systematic risk	Unsystematic risk	Credit rating	Content analysis with disclosure index
Variable	Volatility	Beta factor	$Y_{1\,i}$- $Y_{2\,i}$	Default probability	Disclosures score

The correlation coefficient (γ) can be estimated with to statistical methods, Pearson correlation and Spearmen rank correlation. Spearmen rank correlation allows to transform non-lineair associations of bivariate items into linear associations. Variables are therefore ranked in orders and the difference in order (d) is used to calculate correlation coefficient. (z are the total included bivariate items) Spearmen rank correlation assumes that an increase or decrease in one of the variables results also in an increase or decrease of the other variable. Spearmen rank correlation doesn't depend on the assumption of a normal distribution. When the assumption of normality is correct Pearson correlation performs better. The coefficients are estimated as following:

Pearson correlation

$$\gamma(x,y) = \frac{cov(x,y)}{\sigma(x)\ \ \sigma(y)} = \frac{\sum(x_i - x)(y_i - y)}{\sqrt{(\sum(x_i - x)^2 \sum(y_i - y)^2)}}$$

The Spearmen rank correlation

$$\gamma(x,y) = 1 - \frac{6\sum(d_i)^2}{z(z^2-1)}$$

Both methods test against a H:0 hypothesis of no association, but in a different way. As implication of this the statistical interference differs for the two methods. In case of small samples, the assumption of normality is often not valid and Spearmen rank correlation is more defendable. Pearson correlation rejects for small samples (e.g. a sample size of 20) easier the H:0 hypothesis. (Mathematics in education and industry, 2007) Pearson correlation is recommend only when sample size is larger than 25. (Wright and Bonett, 2000)

§ 5.4.2 Statistical methods for analyzing associations with regression

The majority of reviewed prior research employed regression as technique for analyzing associations. [Abraham & Cox (2007), Oliveira, Rodrigues & Craig (2011), Botosan (1997), Berger & Gleissner (2008, Lang & Lundholm (1997), Hirtle (2007) and Lim & Tan (2007). Regression is a more powerfull technique, because it able to explain relationships after defining the exogenous and endogenous variables variables. With regressions is it possible to analyze the incremental impact a decrease/increase of explanatory variable(s) on the explained variable. (Brooks, 2008) The thesis has as purpose to investigate the impact of credit risk disclosures on the investor's perception of risk. Regression is therefore adapted in this thesis for deeper analysis of the expected associations after a brief exploration with correlation. It also allows to include control variables. Altough for the

estimation of systematic risk, a control variable for firm size was not necessarily; this thesis will add an extra control variable for firm size measured by total assets ($X_{2\,i}$). The theoretical motivation herefore is the same as applied in Oliveira, Rodrigues & Craig (2011); the legitimacy theory. The procedures for verifying the BLUE-estimator of the Beta factor estimations will be used here too with additional testing for multicolineairity (correlation between the explanatory variables, what is thus not unexpected) with a correlation-matrix The risk disclosure and risk variables are specified in paragraph 5.4.1 and an overview of all estimates can be found in appendix IV. The following regressions will be performed:

$$Y_{1\,i} = \alpha + \beta\, X_{1\,i} + \beta\, X_{2\,i} + u$$

$$Y_{2\,i} = \alpha + \beta\, X_{1\,i} + \beta\, X_{2\,i} + u$$

$$Y_{3\,i} = \alpha + \beta\, X_{1\,i} + \beta\, X_{2\,i} + u$$

$$Y_{4\,i} = \alpha + \beta\, X_{1\,i} + \beta\, X_{2\,i} + u$$

§ 5.5 Sample selection

The previous paragraphs specified the methods that will be applied to measure disclosure risk levels and investor perception of risk and the statistical methods to analyze associations and relations between these variables. This paragraph will construct an appropriate sample from which the necessarily data can be gathered. Starting point hereby are the data-requirements of these methods.

The population that has been targeted by the problem statement are European banks. In the demarcation is explained that for reasons of legal comparability the focus has been set on international banks headquartered and operative in developed European countries. The euro-zone can be considered as developed and jurisdictions are largely comparable (EU-IFRS and Basel II). A wider approach with all EU or European countries doesn't seem to be in line with this perspective.

Banking activities, especially at international operating banks, are usually performed by a group of entities. With the word bank will be in the next meant the parent entity within a group of entities that have as primary activity banking. The sample will contain the 50 largest stock-listened banks. Bank size is measured by asset portfolio. Other bank specific values such as earnings (sometimes negative) or equity (standard capital requirements) are less explanatory. Only public traded banks with observable stock-prices over the period 2008-2010 are included. This allows to collect the stock prices and thus meet the data requirements of the different risk estimation methodologies. In case of multiple stock-listenings, data will be retrieved from the stock-listening on which the banks is mostly traded (expressed in share volume). Bloomberg is used as data source for stock returns and the risk-free interest rate. Moody's delivers the credit ratings for the sample of banks. Banks within the

sample must therefore be assessed by Moody's with as reference date 31 December 2010. The credit risk disclosures are analyzed with the disclosure index and coding instrument. Reporting year 2010 is taken as period, because not all banks have already published the 2011 annual report. The annual reports of 2010 form the source for credit risk disclosures. Availability of the 2010 annual report is a criterion for banks included in the sample. The sample will contain 50 bank holding entities.

The sample based on the before mentioned criteria is constructed with Thomson One Banker. Appendix III shows the search query (SIC codes for banks, country codes for euro-countries and stock-listening codes) that resulted in the final sample (Appendix IV), what delivers a potential sample of 74 banks. Entities that perform banking activities, but not as primary activity, errors in the potential sample (e.g. inclusion of Volkswagen AG) and banks that haven't credit ratings, statistical significant Beta factors, and annual reports of 2010 have been excluded from the sample.

Chapter 6: Empirical research: Results and analysis

After the execution of the empirical study according the methologies described in the research design (chapter five), the next section will discuss the results. The various statistical outputs require an extensive analysis with interpretation before hypotheses can be answered and conclusions can be drawn in chapter seven. The data measurement processes with outputs will be topic for topic commented; 1) the Beta factor estimation used to measure the systematic risk, 2) the volatility estimation to measure the total risk, 3) the credit rating to measure credit risk and 4) the disclosure index study to measure the credit risk dislocusre level. The output of these processes form the input for the final process; 5) the association of the variables as specified by the hypotheses with correlation and regression.

The stock prices of the sample, the MSCI index (Bloomberg ticker: MXWO:IND) and risk-free interest rates for the bunds (GDBR10:IND) are exported to Excel from Bloomberg. Stock prices are converted in stock returns in Excel and excess returns are taken by substracting the risk-free interest from stock returns from the stock returns (both for the sample as for the bench). The Excel data is imported in Eviews 5 and 51 regressions ($Y_t = \alpha + \beta\, X_t + u$, for every bank apart) are performed with the command "ls (n) < Bank variable less risk-free interest variable > c1 < MSCI benchmark less risk-free interest variable >". Ls (n) activates the Newey-West function for additional testing and correction for autocorrelation (six lags). Durbin-Watson statistics around a value of two prove the absence of autocorrelation. The BLUE assumption of normality is tested with Bera-Jarque. Regressions results with descriptive statistics can be found in Apendix IV. The H:0 hypotheses for regression is formulated as β is zero. The sample banks have clear significant Beta estimators on 1% confidence levels, but an exception on this is the Osterreichische Volksbanken. The H:0 for this bank is rejectable for p-values higher than 0,65. This bank is therefore omitted from the sample and replaced by the Banca Populare di Sondrio. Durbin-Watson values range from 1,63 to 2,87. Autocorrelations seems not to be an issue. Testing for normality shows graphically fat tails what implies a leptokurtic distribution of errors. Testing with Bera-Jarque leads to a rejection of the H:0 hypothesis (residual normality) for all banks. The sample is however large enough and problems with normality can be ignored without consequences. (Brooks, 2008) Beta factors vary from 0,14 to 2,21 with 1,11 on average. Investors in bank shares bear a slightly higher systematic risk than random market investors. The sample contains 23 banks that have lower systematic risk than the market. A choice for another benchmark than the MSCI Worldwide index and the risk free interest rate (2,15 to 4,68) could have resulted in higher or lower Beta estimators.

Stock price volatility is measured in Excel by taking the standard-deviation of the stock-returns. The Excel-command "=STDEV" calculates the standard deviation of stock returns for all banks. Standard deviations are 3,56 on average and vary from 0,69 to 8,31. Choices for other benchmarks or risk free interest rates wouldn't affect these figures.

Moody's investors service issues credit ratings. Credit ratings are traced back to 31-12-2010 and subsequently converted into default probabilies. Default probabilities range from 0,04% to 0,41%. These outcomes are in line with the expectation. Moody's investor service expected an default probability of 0,2% on average for European banks. The sample average is 0,15%. Compared with the US banking sector (0,3%) and other sectors, e.g. the media sector (4%) is this lower.

The annual reports (registration documents for French banks) of the sample have been retrieved from the respective bank's websites. The disclosure index (Appendix I) is used as reference point for assessing the presence of disclosure items in the annual reports. Recognition of specified items was binary recorded in a separate workfile (Appendix VII) with a zero for non-presence and a one for presence. The option "non-aplicable" (e.g. for reasons of materiality) was substituted for non-presence. The sum of present items is the ouput of the disclosure index study. Disclosure amounts vary from 12 to 26 with a theoretical maximum of 31 and an average of 20,3 credit risk disclosures per bank.

All outputs have been gathered in Appendix IV. The five data-series (with 6 decimals) are imported in SPSS 17 and Pearson and Spearman correlation have been performed on the expected associations. A QQ-plot shows whether the assumption of a normal distribution of observed inputs is valid. This is the case for total risk, systematic risk and credit risk disclosures. The observed default probabilities are not normal distributed. The QQ-plot shows fat tails, with more than expected observations for extreme high and extreme low default probabilities. Spearman correlation is therefore expected to be a better approach for the estimation of correlation coefficients that include credit risk and therefore preferred for the Risk disclosures - credit risk association.

The final association gives the following correlation results:

Correlation coeficients	**Pearson**	**Significance (2 t.)**	**Spearman**	**Significance (2. t.)**
$Y_{1\,i} = \gamma X_{1\,i}$	*0,138*	*0.338*	*0,241*	*0.091*
$Y_{2\,i} = \gamma X_{1\,i}$	*0,397*	*0.004*	*0,444*	*0.001*
$Y_{3\,i} = \gamma X_{1\,i}$	*0,023*	*0,874*	*0,089*	*0,539*
$Y_{4\,i} = \gamma X_{1\,i}$	*-0,772*	*0.000*	*-0,778*	*0.000*

Both the Pearson as the Spearman correlation coefficients are statistical significant on 0.01 level for

the association of risk disclosures and systematic risk and risk disclosures and credit risk. The Spearman correlation coefficient is statistical significant on 0.10 level for risk disclosures and total risk. (A complete overview of SPSS outputs are found in Appendix VII.)

Based on the earlier considerations, the results can be interpretated as a statistical significant strong negative (-0,778) association for risk disclosures and credit risk and a statistical significant weak (0,397) association for risk disclosures and systematic risk.

The correlation results give an explorative impression of the expected associations. The general trend for risk derived from equity prices (the total risk, unsystematic risk and systematic risk) are positive associations, but not all approaches yield in statistical significant evidence for associations at acceptable levels. Risk measured with credit ratings shows however a negative association.

Continuing with the regression results, which will have a decisive say (for the reason that the underlying technique is more capable in exactly explaining relationships), three lines of analysis have to be performed. First, an analysis wheter the estimated coefficients are BLUE. Violations of regression assumptions will be discussed. Tests that are included are an analysis of normality and mean of the errors ($u_t \sim N(0, \sigma^2)$ and $E(u_t)$ = 0 tested with Bera-Jarque), analysis of autocorrelation between errors ($cov(u_i, u_t)$ = 0 tested with Durbin-Watson), an analysis for homoscedasticity of errors ($var(u_t)$ = $\sigma^2 < \infty$ tested with Newey-West) and analysis of multicollineairity (not a BLUE assumption) between independent variables ($cov(X_{1i}, X_{2\,i})$ = 0 tested with Spearman-correlation). Subsequently by knowing if the estimators are BLUE, the regression output and the significance of this output will be discussed.

Multicollineairity estimated with a correlation matrix seems to be a problem. (see Appendix VIII.0) A correlation coefficient of 0,53 was found between the indepent variables risk disclosure level and size. This strong correlation is not unexpected, because studies have proven an association between these variables as explained in paragraph 3.4.2. Brooks (2008) noticed that multicollineairity is merely a data problem and although multicollineairity doesn't influence the whether an estimator is BLUE, presence results in higher standard errors of estimates and thus lower explanation power. Possible remedies are ignoring it, dropping or transforming collineair variables.

The estimates of the second regression (explaining systematic risk) is not BLUE. Autocorrelation is absent for all regressions (Durbin-Watson values between 1,82 and 1,97), even so is hetroscedasticity (automatically corrected in Eviews after Newey-West test), errors have a mean of zero for all regressions, but the Bera-Jarque (p values of 0,00 0,70, 0,00 and 0,028) tests indicates a violation of the normality assumption (errors are normally distributed) for the second regression. The error plot

shows a playkurtic distribution of errors. Outliers can't give an explanation for this problem and thus the only solution that remains in order to fulfill this BLUE assumption is to collect more data, because the sample size is too small to ignore it. (This was not the case with Beta estimation)

By knowing implications of the regression estimation, the outputted coefficients can be further analyzed. The first conclusion is that most coefficients are statistically unsignificant at acceptable levels (5%). Only the effect of credit risk disclosures on default probability and size on systematic risk are significant. The first finding seems to be in line with earlier association found with the correlation analysis and indicates a negative association between risk disclosure level and risk, when risk is measured with default risk. The second result disproves the theory that firm size for larger companies has no impact on the systematic risk as described in paragraph 5.3. The coefficients of the firm size variable indicate a negligible small effect (nearly 0 for all regressions of which only the estimator of regression two is significant, but not BLUE). These results show thus a consistent, but unsignificant direction for all four regressions. Again, the associations including a risk indicator that is calculated with equity prices show unsignificant positive coefficients. The difference compared with correlation is that the association with systematic risk is here also unsignificant. This maybe the effect of the non-BLUE estimators due to the violation of the normality assumption. The following overview gives a summary of all findings that can be found in Appendix VIII:

	Estimators						**Best lineair unbiased estimator**			
Regression coeficients	α	**Sign. (2 t.)**	$X_{1\,i}$	**Sign. (2 t.)**	$X_{2\,i}$	**Sign. (2. t.)**	$var(u_t)$ = $\sigma^2 < \infty$	$cov\,(u_i, u_t)$ = 0	$u_t \sim N(0, \sigma^2$	$E(u_t)$ = 0
$Y_{1\,i} = \alpha + \beta\, X_{1\,i} + \beta\, X_{2\,i} + u$	*2.72*	*0.010*	*0.039*	*0.42*	*0.00*	*0.51*	*yes*	*yes*	*yes*	*yes*
$Y_{2\,i} = \alpha + \beta\, X_{1\,i} + \beta\, X_{2\,i} + u$	*0.63*	*0.013*	*0.018*	*0.19*	*0.00*	*0.00*	*yes*	*yes*	*no*	*yes*
$Y_{3\,i} = \alpha + \beta\, X_{1\,i} + \beta\, X_{2\,i} + u$	*2.09*	*0.016*	*0.021*	*0.59*	*0.00*	*0.24*	*yes*	*yes*	*yes*	*yes*
$Y_{4\,i} = \alpha + \beta\, X_{1\,i} + \beta\, X_{2\,i} + u$	*0.60*	*0.00*	*-0.022*	*0.00*	*0.00*	*0.88*	*yes*	*yes*	*yes*	*yes*
			$cov(X_{1i}, X_{2\,i})$ = 0 no							

The main research question *"Have reported levels of credit risk disclosures in the annual reports of 50 European banks impact on the investors' perception of firm-risk?"* will be answered with this association study. The theory suggested a negative association when managers choose to establish efficient communication. Credit risk disclosures reduce thereby the risk levels as perceived by investors. The following hypotheses are postulated to provide evidence for the expected association:

Hypothesis (i)	**Results**
H0 (ii): There is no significant negative association between a bank's total risk ($Y_{1\,i}$) and the level of credit risk disclosures (X_{1i})	*accepted*
H a (ii): There is a significant negative association between a bank's total risk ($Y_{1\,i}$) and the level of credit risk disclosures (X_{1i})	*rejected*

There is no evidence for a negative association between the total risk and the level of credit risk disclosures. The proposed deduction from the Positive Accounting Theory is rejected by this hypothesis.

Hypothesis (ii)	**Results**
H0 (i): There is no significant negative association between a bank's systematic risk ($Y_{2\,i}$) and the level of credit risk disclosures (X_{1i})	*accepted*
H a (i): There is a significant negative association between a bank's systematic risk ($Y_{2\,i}$) and the level of credit risk disclosures (X_{1i})	*rejected*

There is no evidence for a negative association between the systematic risk and the level of credit risk disclosures. Moreover, there is even a weak siginifcant positive association found with correlation, but this association is unsignificant positive with a more powerfull regression analysis. The proposed deduction from the Positive Accounting Theory is rejected by this hypothesis.

Hypothesis (iii)	**Results**
H0 (ii): There is no significant negative association between a bank's unsystematic risk ($Y_{3\,i}$) and the level of credit risk disclosures (X_{1i})	*accepted*
H a (ii): There is a significant negative association between a bank's unsystematic risk ($Y_{3\,i}$) and the level of credit risk disclosures (X_{1i})	*rejected*

There is no evidence for a negative association between the unsystematic risk and the level of credit risk disclosures. The proposed deduction from the Positive Accounting Theory is rejected by this hypothesis.

Hypothesis (iv)	**Results**
H0 (iii): There is no significant negative association between a bank's credit risk ($Y_{4\,i}$) and the level of credit risk disclosures (X_{1i})	*rejected*
H a (iii): There is a significant negative association between a bank's credit risk ($Y_{4\,i}$) and the level of credit risk disclosures (X_{1i})	*accepted*

There is evidence for a negative association between the credit risk measured with default probability and the level of credit risk disclosures. The proposed deduction from the Positive Accounting Theory is defended with this hypothesis. Moreover, the evidence shows a strong negative association with correlation and a negative coefficient with regression.

The conclusion in the next chapter will link this evidence back to the earlier proposed theories.

Chapter 7: Summary, conclusion, limitations and recommendations

§ 7.1 Summary and conclusion

Risk reporting with risk-related disclosures allows investors to estimate the distribution of future cash-flows and related risks. Risk reporting is mandatory, but managers may disclose extra risks on voluntary base. There are several incentives for voluntary risk disclosures. Positive accounting theories give predictions how companies communicate financial information. The Positive Accounting Theory describes two perspectives how managers effectuate their flexibility in the choice for accounting methods; an opportunistic perspective (all reporting choices are driven by self-interest and therefore voluntary risk disclosures wouldn't exist) and an efficiency perspective. The efficiency perspective predicts that in case of accounting flexibility, methods are chosen that most efficient communicate information. Based on the positive research paradigm, various scientists conducted research that tried to examine disclosure practices. There is no evidence presented for an (negative) association between credit risk disclosures and risk levels for banks and even no study published that examine this association. Risk levels in various studies were operationalized with book to market value of equity (banks), cost of equity and beta factor. For cost of equity (earnings-price ratio), a negative association was found at non-banks. The book to market value is considered as an unsophisticated risk indicator and other approaches are desirable. Another related study measured risk with systematic risk and found a negative association with market risk disclosures for a banking sample.This study looked for associations at banks with various risk level indicators; default probability, volatility and beta factor.

Credit risk is the largest risk for banks. There is until so far no study published that analyzed risk in relation with credit risk disclosure levels for banking entities. Three hypotheses were deducted from the efficiency perspective of the Positive Accounting Theory. When managers apply methods that are intended to increase efficiency, they will publish high levels of risk disclosures that lower the risk at investors. The H:0 hypotheses were specified by a no significant negative association between the three risk indicators (systematic risk; unsystematic risk; and default probabilty) and risk disclosure level. In that case, the deduction from the Positive Accounting Theory is rejected. The alternative hypothesis (a significant negative association) defends the proposed theory. The negative association between risk and risk disclosure level is also theoretically explained by other researchers in more detailed steps. Information risk and estimation risk due to information asymmetry could be solved with risk disclosures and thus a negative association between risk and risk disclosure level is expected. Second, from transaction cost perspective, information risk increases the bid-ask spread of

share prices and therefore makes stock less volatitle. Less volatile stocks are punished by the market, because higher cost of capital is required to compensated the lower volatility. Both streams thus suggest that it is effective to reduce information risk with risk disclosures. A negative association between risk is therefore expected.

Testing for the hypotheses requires appropriate data. A research design therefore was constructed to deliver the necessarily inputs for the association study. First, the measurement of credit risk disclosures was elaborated. A binary coded, non-nested disclosure index is applied to approach the credit risk disclosure level. A disclosure index reduces the subjectivity in comparison with content analysis, but makes it impossible to draw conclusions about the disclosure quality. As disclosure index are the IFRS 7 and Basel II-pillar three risk disclosure requirements adapted. An implication of this is that the index only consist mandatory items. Risk levels were measured with the company´s systematic risk, unsystematic risk, total risk and default probability. Finally, correlation analysis with Pearson and Spearman correlation and regression was performed between the operationalized variables.

The results indicate a negative association between risk and risk disclosure level, when risk is measured with default probability. This confirms the expected relationship, but when risk is measured with values derived from equity prices no negative association was found. It is therefore obvious that these risk measures differ from a risk measure based on the assessment of default probability. Default probability assessed by external rating agencies may not contain the same risk perceptions that investors have as reflected by stock prices.

Botosan found that the negative association was only observable for companies with a small analyst following, which are in general smaller companies. This was explained by the fact that the risk disclosure index contained too few items that explain the risk profile of large companies. The credit risk disclosure index used in this research is however very comprehensive. On the other side, it could be also possible that not the risk disclosure index is the problem for indicating an association between risk and risk disclosure level, but the approach for measuring risk. Estimating consistent risk profiles of companies with a large analyst may be difficult as this research indicates. Stock-prices of large companies contain a direct observable aggregated reaction of many individuals, whereas the credit rating contains a risk perception of one analyst. If the number of analysts is indeed lower in the association of credit rating with credit risk disclosures, then this result is in line with the findings of Botosan. Hirtle, however showed a significant negative association between systematic risk and risk disclosure level. It may be easier to falsify negative associations with low analyst followings due to

lower sample size requirements. Botosan included 122 firms with a period of 1 year. Hirtle's (Federal Reserve Bank) study was enormous is comparison; 141 firms during a period of 21 years.

Company size doesn't seem to have an explaining role in the associations with risk, although the number of risk disclosures are correlated with the firm size. The legitimacy theory would have predicted this, because large companies have to show that their actions are harmonious with the public norms and values.

The main question *"Have reported levels of credit risk disclosures in the annual reports of 50 European banks impact on the investors' perception of firm-risk?"* cannot be answered straightforward, because the hypotheses that were intented to underbuild conclusions regarding the risk-disclosure to risk perception causality showed an unexpected, but explainable inconsistency . If the investor's perception of risk is approached by the bank's default probability, the answer is "Yes, credit risk disclosures have impact on the risk perception and this impact is a risk reduction". More data may be necessarily before associations between credit risk disclosures and risk measured by equity prices are significant enough too.

§ 7.2 Contribution to the existing literature

This research extends the existing evidence for the expected impact of risk disclosures. Banks should be able to minimize information asymmetry with the market by improving their risk disclosures. This study is the first study that investigate the impact of credit risk disclosures for a bank sample. With caution can be said that the association is also negative for credit risk disclosures and that banks indeed can reduce risk by disclosing more credit risk disclosures. These implications can be interesting for banks that try to lower their cost of capital, banks that have low equity liquidity, banks that want to convince the market of undervaluation of shares and don't have capital to rebuy shares to signal this, investors or investor unions that try to finds ways to the lower estimation risk of potential investing activitees and standard setters that are considering to improve or mandate existing risk reporting requirements, because some credit risk items were not or not much disclosed.

§ 7.3 Limitations and suggestions for future research

The scope of this study was partly demarcated by a few important and explained choices. First, a longitudinal study (e.g. Hirtle) could have provided more evidence for answering the main research question when including the relationship between risk disclosure level and the risk levels over time. Factors that are observable over multiple periods, such as the economic crisis, instability of financial markets and changes of legislation are ignored in this study. The results of this research provide

however a clear body of evidence of the situation in 2010 and may be used as base for future research involving multiple periods. Second, this research preferred high reliable quantitative disclosure data over less reliable qualitative disclosure data. Although it is obvious that qualitative disclosures data provide a better indication of the underlying disclosure practices, issues with subjectivity and inter-rate reliability can reduce the relevance of the final outcomes. By extending the sample up to 50 firms, the disclosure outcomes of this study still can give a good indication of the underlying disclosure practices without considering qualitative aspects. Future research can also focus on the development of a more comprehensive credit risk disclosure index that has a larger disclosure coverage with more ex-ante specified credit risk disclosure details. Third and as last, the scope of this research was limited to the credit risk disclosures, because credit risk is the most material risk at banks (often 80% of the risk in total). Future research could fine-tune the applied risk disclosure measurement methodologies by including also the other risks (market risk, interest rate risk, liquidity risk etc) keeping in mind risk interactions and analyze the risk disclosure practices as whole in relation with the risk levels. It would be then interesting to look in what degree disclosures about less material risks such as liquidity risk influence the risk levels. That analyzed with changes over multiple periods may shed a new light on the usefulness of risk disclosures.

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ING Groep NV

Banco Santander SA

Societe Generale

Banco Espanol De Credito SA

National Bank Of Greece SA

Banco De Sabadell SA

Banco Comercial Portugues

Mediobanca Banca DI Credito Fin SA

Espirito Santo Santo Financial Group SA

Unicredit	Banco Espirito Santo SA
Commerzbank AG	EFG Eurobank Ergasias SA
Intesa Sanpaolo	Permanent TSB Group Holdings PLC
Banco Bilbao Vizcaya Argentaria SA	Bank Of Cyprus Public Company Limited
Natixis	Bankinter SA
Dexia	Cyprus Popular Bank Public Company Limit
KBC Groep NV	Alpha Bank SA
Caixabank SA	Banca Popolare DI Milano
Banca Monte DEI Paschi	Bank Of Piraeus SA
Erste Group Bank AG	Banca Carige
Deutsche Postbank AG	Banco BPI SA
Landesbank Hessen-Thuringen-Baden-Weurttemberg	Pohjola Pankki A OYJ
Bank Of Ireland	Osterreichische Volksbanken AG
Bank Of Greece SA	Fondiaria-SAI
Allied Irish Banks PLC	IKB Deutsche Industriebank AG
Banco Popolare	Agricultural Bank Of Greece SA
Landesbank Berlin Holding AG	Credito Emiliano
Banco Popular Espanol SA	Sampo OYJ
SNS Reaal	Banca Popolare DI Sondrio
Unione DI Banche Italian	

2011:

Danske Bank	Vestia
SEB	

Appendix

Appendix I – Credit risk disclosure index

	Disclosure item	
1	Exposures to credit risk	*IFRS 7.33a*
2	Arise of credit risk from exposures	*IFRS 7.33a*
3	Exposure changes compared with previous reporting periods	*IFRS 7.33c*

4	Credit risk management objectives and policies	*IFRS 7.33b*
5	Credit risk management strategies, scope and organizational structure	*Basel II-773*
6	Credit risk management processes and credit risk measurement methods	*IFRS 7.33b*
7	Techniques to indentify, measure, monitor and control credit risks	*Basel II-772*
8	When the standard approach is used: ratings, agencies and risk buckets with ratings	*Basel II- 775-5a/b*
9	When a IRB approach is used: supervisors acceptance, estimates, assumptions and controls	*Basel II- 775-6a/b*
10	Changes in credit risk management and measurement	*IFRS 7.33c*

11	Maximum exposure to credit risk without collaterals and credit enhancements	*IFRS 7.36a/b*
12	Average gross credit risk exposure over the reporting period	*Basel II-774b*
13	Gross credit risk exposure at the end of the reporting period	*Basel II-774b*
14	Separate credit risk disclosure for major types of credit risk (loans, securities and derivatives)	*Basel II-774b*
15	Separate credit risk disclosure for geographical concentrations (countries and regions)	*Basel II-774c*
16	Separate credit risk disclosure for counterparty and industry concentrations	*Basel II-774d*

17	Description of any credit risk mitigating measures (collaterals, netting agreements	*IFRS 7.B10*
	loan commitments, guarantees and credit insurance)	
18	Collaterals in the balance sheet	*IFRS 7.38*
19	Circumstances when the possession of collaterals is transferred or uses credit enhancements	*IFRS 7.38*
20	Description of securitization activities with applied accounting policies	*Basel II-775-9a/b*

21	Impairment triggers for impaired assets	*IFRS 7.37b*
22	Analysis of impaired financial assets with carrying amount before impairment loss	*IFRS 7.37b + IFRS 7.IG28*
23	Impairment losses taken on held-to maturity investments	*IFRS 7.20e*

24	Maturity analysis for past due financial assets that is been also used internally	*IFRS 7.37a*

25	Description of credit risks for non-impaired and non-past due financial assets	*IFRS 7.33c*
26	Description of the assessment of credit risks for non-impaired or non-past due financial assets	*IFRS 7.IG25*
27	External credit ratings customers and other counterparties	*IFRS 7.33b*
28	Reports on credit worthiness of customers and other counterparties	*IFRS 7.33b*
29	Historical information about customer default rates	*IFRS 7,36c*
30	Description of renegotiated terms for financial assets	*IFRS 7.36d*
31	Description of financial assets that require renegotiation to avoid impairment or past-due	*IFRS 7.36*

Appendix II – Overview prior relevant literature

Author(s)	Main findings	Sample *Size –type- period*	Research approach	Methodology
Lim & Tan (2007)	1) Firms with high market risk measured with **VaR** have lower earnings informativeness 2) VaR is positively associated with stock return **volatility** and **systematic risk**. 3) a high VaR is associated with a weak **earnings-return relation** VaR is therefore a value that contains information for assessing the information of earnings.	81 - non financial stock listened US firms – 1997-2002	Positive research - return-earnings relation – Returns explained with VAR disclosures, market-to-book, debt-to assets, market-value, earnings and earnings persistence	Association study-OLS Regression – 15 control variables – 16 variables total
Oliveira, Rodrigues & Craig (2011)	1) Good and bad news disclosed in equal proportions, indicates managers pro-activeness and confirms the efficiency perspective of the PAT. managers maintain high levels of bad news to increase credibility 2) positive associations between risk disclosures and **independency of non- executive directors** and risk disclosures and **auditor type**	81 – non financial (of which 42 stock-listened) Portuguese firms - 2005	Positive research – PAT with agency theory – content analysis – nested risk disclosures explained by ownership, governance, audit practices and leverage with stock-listening and reporting standards as control variables	Association study-4 OLS regressions – 2 control variables - 3 variables total per regression Correlation used for testing multicollineairity
Abraham & Cox (2007)	1) positive association between risk disclosures and **independency of non- executive directors** 2) negative association between risk disclosures and **share of ownership**	100 – stock listened – British firms-2002	Positive research – PAT with agency theory – content analysis – risk disclosures explained by ownership and governance With firm size, industry and firm risk as control variables	Association study-OLS Regression – 3 control variables – 5 variables total
Botosan (1997)	1) negative association between risk disclosures and **cost of equity** for firms with a low analyst following	122 – US manufacturing firms – 1990	Positive research – PAT– agency theory – efficiency perspective – disclosure index study - Cost of equity explained by Beta factor, market value and risk disclosures, (analyst following)	Association study-2 OLS Regressions – 2/(4) control variables – 3/(5) variables total

Author(s)	Main findings	Sample *Size –type- period*	Research approach	Methodology
Linsley, Shrives & Crumpton (2006)	1) positive significant association between risk disclosures and bank **size** (market capitalization) and number of **risk definitions** 2) no significant association between risk disclosures and **risk (book to market value of equity)** 3) no significant association between risk disclosures and bank **profitability** (return on assets) 4) no significant difference in disclosure practices between British and Canadian banks	18 – 9 British banks and 9 Canadian banks -2001	Positive accounting theory- agency theory - efficiency perspective –content analysis – Total disclosures Canadian and UK sample compared – Total disclosures associated with total assets, number of risk defenitions, market capitalization and risk measured with the book to market value of equity	Association study- Mann-Whitney U-test - Spearman-rank correlation
Berger & Gleissner (2008)	1)Evidence for an increase in disclosure scores, but the researchers noticed during the content analysis that this was largely contributable to the implementation of GAS 5 2) only strong significant association between risk disclosure quality and two control variables that are derived from this value (the assessment of the risk management systems and the assessment of information quality), but not with other items e.g. **risk** measured with a **leverage ratio**)	92- stock-listened German firms – 2000-2005	Positive research – content analysis – disclosure quality measured – 1)association analyzed with correlation between disclosure quality and various items (market capitalization, earnings information and risk measured with the leverage ratio) 2) disclosure scores compared over time	Association study- Disclosure score based on a scale from 0 to 3 assessed researchers – with full points when the German risk standard GAS 5 was applied - Pearson correlation – 2 "control" correlations
Lang & Lundholm (1997)	1) Firms with informative disclosure policies (high disclosure scores) have a larger **analyst following** 2) Firms with informative disclosure are valued with more **analyst accuracy (estimation risk)** 3) a lower estimation risk indicates less **information asymmetry** and therefore theoretically seen yield higher disclosure scores to a lower **cost of capital**	460 – US firms – 1985-1989	Positive research – PAT with agency theory – survey based research– 1) Number of analysts explained by disclosure scores, market value (control variable) and returns/earnings correlation (control variable) 2) investor forecast accuracy (corrections of forecasted earnings) explained by disclosure scores with market value, returns-earnings correlation and earnings variations as control variables	Association study- Disclosure score based on investor rating - Spearman correlation - OLS Regression analysis with 2 control variables Hausman test on the exogeneity of independent variables

Author(s)	Main findings	Sample *Size –type-period*	Research approach	Methodology
Linsley & Shrives (2006)	1) No evidence was found for an association between risk disclosures and company **risk level** (measured by the **company's Beta, book to market value of equity, asset cover and gearing ratio**) 2)Positive significant association between firm **size** and risk disclosures	79 – non financial stock listened British firms - 2000	Positive research – PAT with agency theory – Content analysis – Nested risk disclosures – associations investigated with correlation between firm size and risk disclosures, and with correlation between risk levels and risk disclosures	Association study-Pearson correlation
Hirtle (2007)	1) Evidence that market discipline reduces risk-taking behavior. The effectiveness of market discipline is observed by analyzing the association between 1 year lagged VAR estimates and risk. This association is negative when risk is measured as systematic risk (Beta factor) and unsystematic risk (idiosyncratic risk measured as residual of total risk and systematic risk), but only significant for unsystematic risk. Total risk decreases without decrease in systematic risk (compensation by risk-adjusted returns). Investors are able to make a better risk-return trade-off. This confirms the effectiveness of market discipline, but doesn't explains whether this is done by more secure investments or improved risk management 2) A negative association was found between the number of **market risk disclosures related to VAR estimates** and risk (both estimated with market and accounting data) 3) firms that introduce new market risk disclosures are punished by the market, a negative association between risk adjusted returns (approached with the Beta factor) and firms that release new market risk disclosures indicates a learning process for the stock-market	141 – US bank holding entities with trading activities– 1994-2004	Positive research – market discipline theory –non-nested binary coded disclosure index combined with content analysis of VAR estimates and new items-associations investigated with regression – risk is measured indirect from stock-prices (Beta factor and volatility), as well as direct from the accounting numbers (the volatility of return on assets) and explained by lagged forward looking market risk disclosures (18 items related to VAR estimates), the VAR estimate, a dummy (0 or 1) whether a company introduces a new risk disclosure that isn't disclosed before by a sample firm and control variables (size, risk profile by risk-weighted assets and revenue composition)	Association study-Regressions with dummy and control variables

Author(s)	Main findings	Sample *Size –type-period*	Research approach	Methodology
BIS (2003)	1) Banks should increase transparency through more risk disclosures, 40 % of all expected risks (average) were not disclosed 2) An annual increase of 2% in disclosures over the observed period 3) highest disclosure scores found for accounting policies and capital structures, low disclosure scores found for more specific matters (credit risk derivatives, credit risk modeling,securitization and credit ratings)	54 – international operating banks – headquarter in 13 countries - 1999-2000-2001	Normative research – survey based research with disclosure index	Disclosure score measured as percentage with total disclosure scaled by total defined disclosures
KPMG (2008)	1)The observed banking sample applied various disclosure practices about business risks, ALM risk, operational risks and risk strategies 2) credit risk and market risk disclosures were subjected to less qualitative variation 3) credit risk is the best disclosed risk category	25-international operating European banks in - 2007	Positive research – content analysis - disclosure quality measured	Disclosure score based on a scale from 0 to 5 assessed by KPMG Advisory researchers
KPMG (2012)	1)Lower 1-day 99% VaR estimates in 2011 compared to 2010 due to a rejection of the historical volatility extrapolation 2) increase in maximum credit exposures, impairments and credit risk in 2011 3) large variation among banks in impairment approach on portfolio base (individual versus collective impairment)	15 – international operating European banks – 2010-2011	Positive research – content analysis	

Appendix III – Sample selection

Appendix IV – Sample and data overview

	Name	Current Total Assets (million)	Bloomberg ticker	Country	Annual report and credit rating available	Credit rating	Default probability %	Beta factor	Stock Volatility	Number of credit risk disclosu-res
1	*Deutsche Bank AG*	*2797966,2*	*DBK:GR*	*DE*	*yes*	*Aa3*	*0,056*	*1,688*	*3,76126*	*25*
2	*BNP Paribas*	*2539083,4*	*BNP:FP*	*FR*	*yes*	*Aa2*	*0,04*	*1,402*	*3,599542*	*25*
3	*Credit Agricole SA*	*2230870*	*ACA:FP*	*FR*	*yes*	*Aa2*	*0,04*	*1,562*	*3,919112*	*26*
4	*ING Groep NV*	*1649360,5*	*INGA:NA*	*NL*	*Yes*	*Aa3*	*0,056*	*2,210*	*5,146371*	*26*
5	*Banco Santander SA*	*1601599,4*	*SAN:SM*	*ES*	*Yes*	*Aa2*	*0,04*	*1,438*	*3,090701*	*22*
6	*Societe Generale*	*1527637,9*	*GLE:FP*	*FR*	*yes*	*Aa2*	*0,04*	*1,422*	*3,897733*	*23*
7	*Unicredit*	*1186639,9*	*UCG:IM*	*IT*	*yes*	*Aa3*	*0,056*	*1,533*	*3,774175*	*25*
8	*Commerzbank AG*	*853668,37*	*CBK:GR*	*DE*	*yes*	*Aa3*	*0,056*	*1,565*	*4,228061*	*22*
9	*Intesa Sanpaolo*	*813801,2*	*ISP:IM*	*IT*	*yes*	*Aa2*	*0,04*	*1,390*	*3,276795*	*25*
10	*Banco Bilbao Vizcaya Argentaria SA*	*767662,72*	*BBVA:SM*	*ES*	*yes*	*Aa2*	*0,04*	*1,366*	*2,938564*	*24*
11	*Natixis SA*	*654905*	*KN:FP*	*FR*	*yes*	*Aa3*	*0,056*	*1,512*	*4,718837*	*25*
12	*Dexia NV*	*534899,77*	*DEXB:BB*	*BE*	*yes*	*A1*	*0,08*	*1,387*	*4,67511*	*24*
13	*KBC Groep NV*	*367291,76*	*KBC:BB*	*BE*	*yes*	*A1*	*0,08*	*1,919*	*5,468611*	*26*
14	*Caixabank SA*	*348112,05*	*CABK:SM*	*ES*	*yes*	*Aa2*	*0,04*	*0,824*	*2,161484*	*25*
15	*Banca Monte DEI Paschi SA*	*303802,77*	*BMPS:IM*	*IT*	*yes*	*A2*	*0,114*	*0,873*	*2,510879*	*21*
16	*Erste Group Bank AG*	*271705,84*	*EBS:AV*	*AT*	*yes*	*Aa3*	*0,056*	*1,647*	*4,340663*	*22*
17	*Deutsche Postbank AG*	*248695,01*	*DPB:GR*	*DE*	*yes*	*Aa3*	*0,056*	*1,115*	*3,594373*	*24*
18	*Landesbank Hessen-Thuringen-Baden-Weurttemberg AG*	*212875,44*	*IFUD:GR*	*DE*	*yes*	*Aa2*	*0,04*	*0,139*	*0,694053*	*23*
19	*Bank Of Ireland PLC*	*199263,15*	*BKIR:ID*	*IR*	*yes*	*Baa2*	*0,23*	*1,771*	*8,308634*	*20*
20	*Bank Of Greece SA*	*185989,74*	*ETE:GA*	*GR*	*yes*	*Ba1*	*0,408*	*1,233*	*4,055074*	*15*
21	*Allied Irish Banks PLC*	*172599,36*	*ALBK:ID*	*IR*	*yes*	*A1*	*0,08*	*1,547*	*7,648639*	*20*

	Name	Current Total Assets (million)	Bloomberg ticker	Country	Annual report and credit rating available	Moody's Credit rating	Default probability %	Beta factor	Volatility	Number of credit risk disclosu-res
22	*Banco Popolare SA*	*169876,21*	*BP:IM*	*IT*	*yes*	*A2*	*0,114*	*1,221*	*3,464224*	*21*
23	*Landesbank Berlin Holding AG*	*169416,32*	*BEB2:GR*	*DE*	*yes*	*A1*	*0,08*	*0,405*	*2,591264*	*22*
24	*Banco Popular Espanol SA*	*168607,83*	*POP:SM*	*ES*	*yes*	*Aa3*	*0,056*	*1,244*	*2,964468*	*25*
25	*SNS Reaal NV*	*166429,3*	*SR:NA*	*NL*	*yes*	*A3*	*0,144*	*1,486*	*3,918125*	*23*
26	*Unione DI Banche Italian SA*	*165441,55*	*UBI:IM*	*IT*	*yes*	*A1*	*0,08*	*0,941*	*2,504705*	*21*
27	*Banco Espanol De Credito SA*	*139976,01*	*BTO:SM*	*ES*	*yes*	*Baa3*	*0,307*	*0,886*	*2,288251*	*15*
28	*National Bank Of Greece SA*	*137032,12*	*ETE:GA*	*GR*	*yes*	*Ba1*	*0,408*	*1,233*	*4,055074*	*15*
29	*Banco De Sabadell SA*	*129087,11*	*SAB:SM*	*ES*	*yes*	*Ba1*	*0,408*	*0,780*	*2,013298*	*14*
30	*Banco Comercial Portugues SA*	*119321,81*	*BCP:PL*	*PT*	*yes*	*A3*	*0,144*	*0,776*	*2,5376*	*20*
31	*Mediobanca Banca DI Credito Fin SA*	*108445,23*	*MB:IM*	*IT*	*yes*	*Baa2*	*0,23*	*0,728*	*2,188537*	*12*
32	*Espirito Santo Santo*	*108066,68*	*ESF:PL*	*PT*	*yes*	*Baa1*	*0,182*	*0,307*	*1,380772*	*18*
33	*Banco Espirito Santo SA*	*103234,84*	*BES:PL*	*PT*	*yes*	*Baa1*	*0,182*	*0,685*	*2,727721*	*18*
34	*EFG Eurobank SA*	*97485,1*	*EFG:GR*	*GR*	*yes*	*Ba1*	*0,408*	*1,113*	*4,12959*	*14*
35	*Permanent TSB PLC*	*93275,23*	*IPM:ID*	*IR*	*yes*	*Baa3*	*0,307*	*1,738*	*7,88069*	*17*
36	*Bank Of Cyprus SA*	*83122,89*	*BOCY:CY*	*CY*	*yes*	*A3*	*0,144*	*0,941*	*3,405711*	*20*
37	*Bankinter SA*	*77093,79*	*BKT:SM*	*IT*	*yes*	*A1*	*0,08*	*0,983*	*2,802783*	*21*
38	*Cyprus Popular Bank Public Company Limit SA*	*74886,88*	*BOCY:CY*	*CY*	*yes*	*Baa2*	*0,23*	*0,941*	*3,405711*	*16*
39	*Alpha Bank SA*	*74878,09*	*ALPHA:GA*	*GR*	*yes*	*Ba1*	*0,408*	*0,989*	*3,83121*	*20*
40	*Banca Popolare DI Milano SA*	*66493,01*	*PMI:IM*	*IT*	*yes*	*A1*	*0,08*	*1,033*	*2,844028*	*19*
41	*Bank Of Piraeus SA*	*62536,99*	*TPEIR:GA*	*GR*	*yes*	*Ba1*	*0,408*	*1,006*	*3,625829*	*12*
42	*Banca Carige SA*	*56996,46*	*CRG:IM*	*IT*	*yes*	*A2*	*0,114*	*0,808*	*2,49158*	*25*
43	*Banco BPI SA*	*54601,27*	*BPI:PL*	*PT*	*yes*	*A2*	*0,114*	*0,813*	*2,612312*	*22*
44	*Pohjola Pankki A OYJ*	*53300,32*	*POH1S:FH*	*FI*	*yes*	*Aa2*	*0,04*	*0,101*	*3,284184*	*20*

	Name	Current Total Assets (million)	Bloomberg ticker	Country	Annual report and credit rating available	Moody's Credit rating	Default probability %	Beta factor	Volatility	Number of credit risk disclosu-res
45*	*Osterreichische Volksbanken AG*	*53254,19*	*VBPS:AV*	*AT*	*yes*	*Baa1*	*0,182*	*0,013*	*0,94461*	
46	*Fondiaria-SAI*	*51431,87*	*FSA:IM*	*IT*	*yes*	*Baa2*	*0,23*	*0,952*	*2,82681*	15
47	*IKB Deutsche Industriebank AG*	*44341,5*	*IKB:GR*	*DE*	*yes*	*Aaa*	*0,02*	*0,857*	*5,444003*	21
48	*Agricultural Bank Of Greece SA*	*41290,51*	*ATE:GA*	*GR*	*yes*	*Baa1*	*0,182*	*0,834*	*3,618269*	19
49	*Credito Emiliano SA*	*40016,52*	*CE:IM*	*IT*	*yes*	*A2*	*0,114*	*0,907*	*2,723516*	13
50	*Sampo OYJ*	*38310,7*	*SAMAS:FH*	*FI*	*yes*	*Baa2*	*0,23*	*0,861*	*2,408227*	12
51	*Banca Popolare Di Sondrio*	*37742,1*	*BPSO:IM*	*IT*	*yes*	*Baa2*	*0,23*	*0,861*	*2,192639*	17

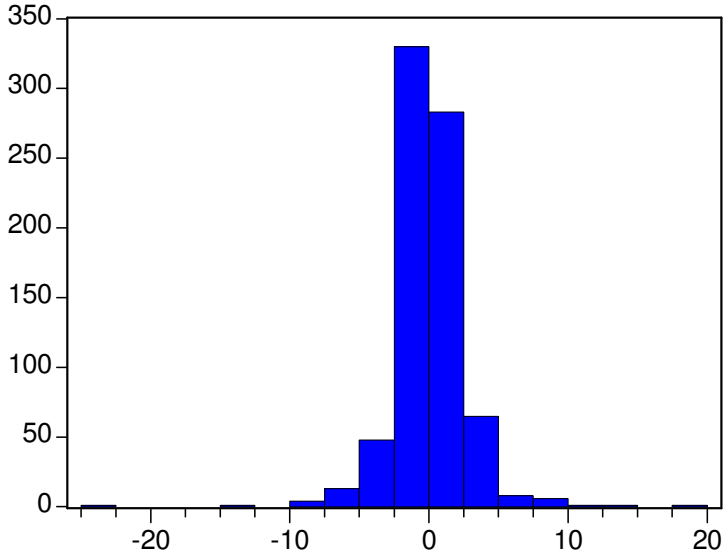
Appendix V – Statistical results beta factor estimation

1.) Deutsche Bank AG

Dependent Variable: A01
Method: Least Squares
Date: 08/08/12 Time: 12:08
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.688379	0.094346	17.89569	0.0000
C	-0.318051	0.082809	-3.840781	0.0001

R-squared	0.507953	Mean dependent var	0.338160
Adjusted R-squared	0.507305	S.D. dependent var	3.716525
S.E. of regression	2.608712	Akaike info criterion	4.758211
Sum squared resid	5172.086	Schwarz criterion	4.770379
Log likelihood	-1810.879	F-statistic	784.5666
Durbin-Watson stat	2.029198	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

Mean	2.72e-16
Median	-0.053032
Maximum	18.08968
Minimum	-24.10784
Std. Dev.	2.606997
Skewness	-0.374216
Kurtosis	18.10253
Jarque-Bera	7259.530
Probability	0.000000

2.) BNP Paribas SA

Method: Least Squares

Date: 08/08/12 Time: 12:13

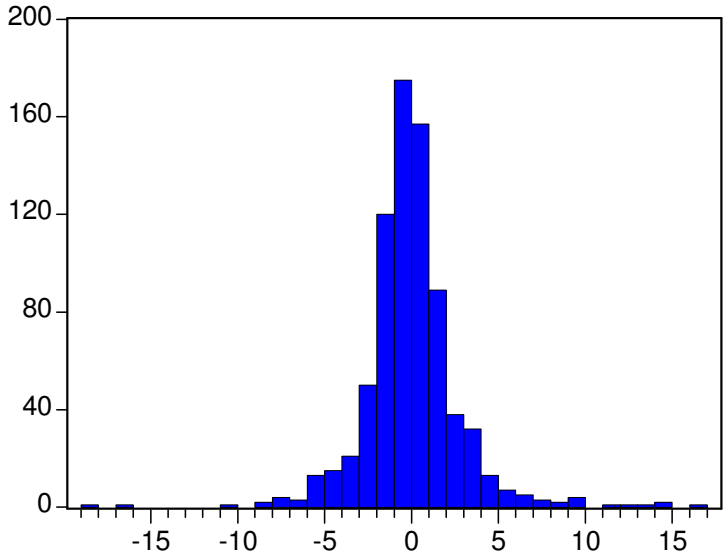
Sample (adjusted): 2 763

Included observations: 762 after adjustments

Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.402080	0.150428	9.320597	0.0000
C	-0.150677	0.108413	-1.389848	0.1650

R-squared	0.376896	Mean dependent var	0.394260
Adjusted R-squared	0.376076	S.D. dependent var	3.582949
S.E. of regression	2.830130	Akaike info criterion	4.921143
Sum squared resid	6087.322	Schwarz criterion	4.933311
Log likelihood	-1872.956	F-statistic	459.7005
Durbin-Watson stat	2.158774	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

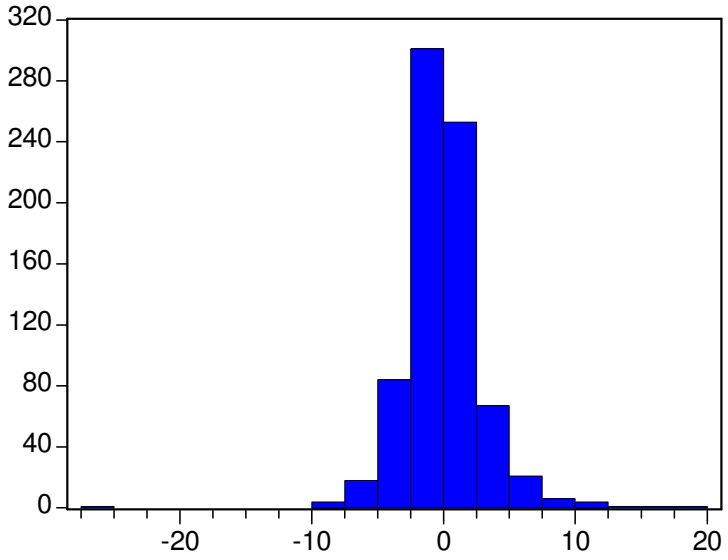
Mean	2.95e-16
Median	-0.150437
Maximum	16.76269
Minimum	-18.94413
Std. Dev.	2.828270
Skewness	0.370876
Kurtosis	11.91917
Jarque-Bera	2543.234
Probability	0.000000

3.) Credit Agricole SA

Dependent Variable: A03
Method: Least Squares
Date: 08/08/12 Time: 12:15
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.562314	0.130896	11.93558	0.0000
C	-0.254741	0.105744	-2.409039	0.0162

R-squared	0.394759	Mean dependent var	0.352474
Adjusted R-squared	0.393962	S.D. dependent var	3.901049
S.E. of regression	3.036905	Akaike info criterion	5.062176
Sum squared resid	7009.321	Schwarz criterion	5.074344
Log likelihood	-1926.689	F-statistic	495.6976
Durbin-Watson stat	2.138244	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

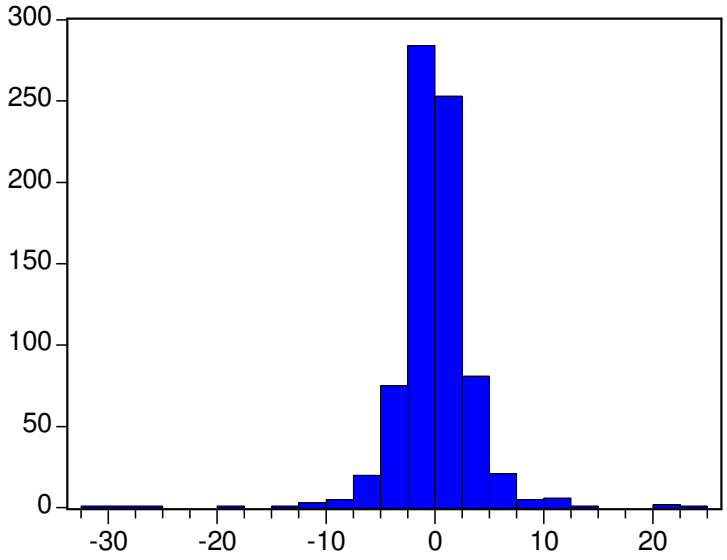
Mean	3.00e-16
Median	-0.091429
Maximum	18.52738
Minimum	-26.69877
Std. Dev.	3.034909
Skewness	0.015484
Kurtosis	14.65821
Jarque-Bera	4315.292
Probability	0.000000

4.) ING Groep NV

Dependent Variable: A04
Method: Least Squares
Date: 08/08/12 Time: 12:16
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	2.209952	0.111498	19.82051	0.0000
C	-0.511761	0.124713	-4.103521	0.0000

R-squared	0.458072	Mean dependent var	0.347167
Adjusted R-squared	0.457359	S.D. dependent var	5.122650
S.E. of regression	3.773557	Akaike info criterion	5.496534
Sum squared resid	10822.19	Schwarz criterion	5.508702
Log likelihood	-2092.180	F-statistic	642.4010
Durbin-Watson stat	2.163975	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

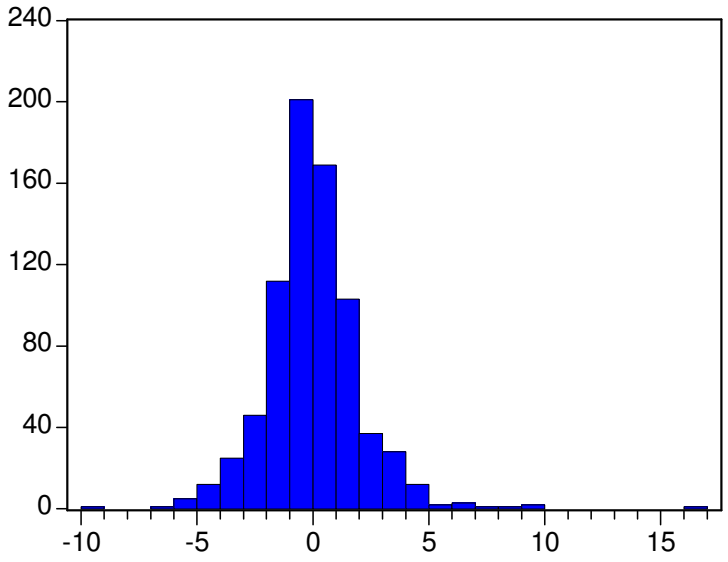
Mean	3.79e-16
Median	-0.105656
Maximum	23.34290
Minimum	-30.68693
Std. Dev.	3.771076
Skewness	-1.046243
Kurtosis	20.38820
Jarque-Bera	9738.614
Probability	0.000000

5.) Banco Santander SA

Dependent Variable: A05
Method: Least Squares
Date: 08/08/12 Time: 12:17
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.437820	0.086777	16.56924	0.0000
C	-0.196101	0.080914	-2.423564	0.0156

R-squared	0.545565	Mean dependent var	0.362727
Adjusted R-squared	0.544967	S.D. dependent var	3.053937
S.E. of regression	2.060067	Akaike info criterion	4.285975
Sum squared resid	3225.345	Schwarz criterion	4.298143
Log likelihood	-1630.956	F-statistic	912.4079
Durbin-Watson stat	2.087591	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

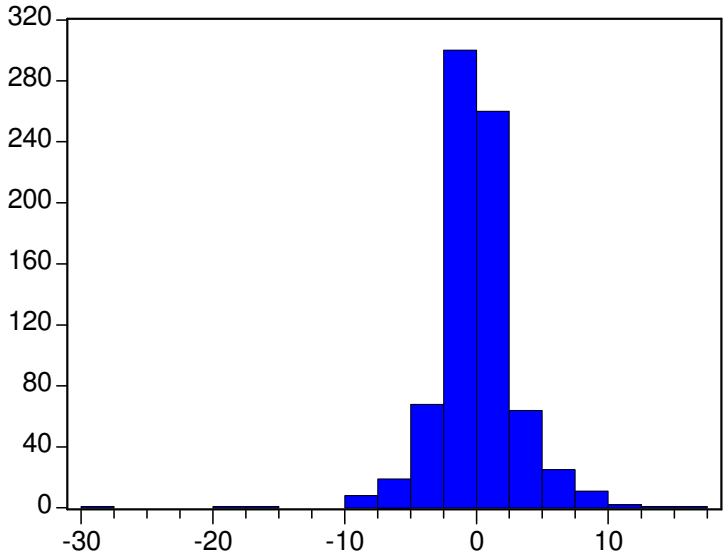
Mean	7.90e-17
Median	-0.096820
Maximum	16.18790
Minimum	-9.664238
Std. Dev.	2.058713
Skewness	0.919050
Kurtosis	9.849450
Jarque-Bera	1596.821
Probability	0.000000

6.) Societe Generale SA

Dependent Variable: A06
Method: Least Squares
Date: 08/08/12 Time: 12:18
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.421886	0.161842	8.785633	0.0000
C	-0.211631	0.109879	-1.926036	0.0545

R-squared	0.330579	Mean dependent var	0.341004
Adjusted R-squared	0.329698	S.D. dependent var	3.879770
S.E. of regression	3.176444	Akaike info criterion	5.152023
Sum squared resid	7668.246	Schwarz criterion	5.164191
Log likelihood	-1960.921	F-statistic	375.3092
Durbin-Watson stat	1.952602	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

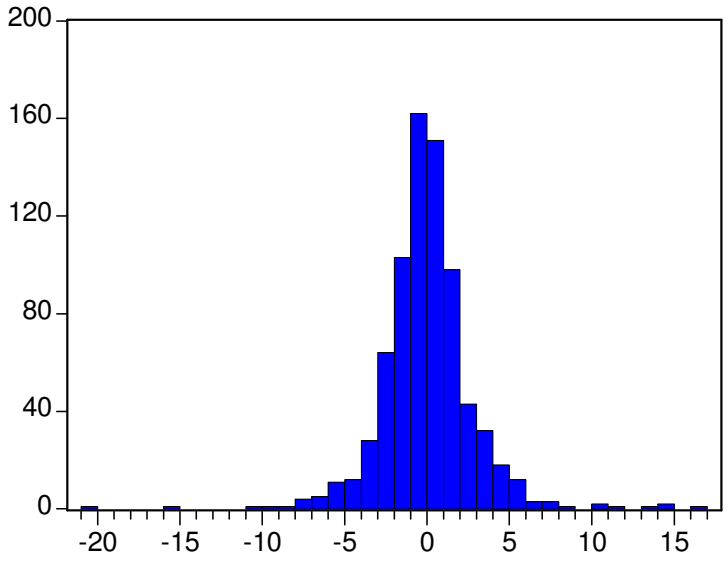
Mean	3.18e-16
Median	-0.131449
Maximum	16.96518
Minimum	-29.23322
Std. Dev.	3.174356
Skewness	-0.928404
Kurtosis	15.92681
Jarque-Bera	5414.968
Probability	0.000000

7.) Unicredit

Dependent Variable: A07
Method: Least Squares
Date: 08/08/12 Time: 12:20
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.533115	0.109188	14.04112	0.0000
C	-0.315584	0.097371	-3.241061	0.0012

R-squared	0.417077	Mean dependent var	0.280282
Adjusted R-squared	0.416310	S.D. dependent var	3.724305
S.E. of regression	2.845354	Akaike info criterion	4.931873
Sum squared resid	6152.988	Schwarz criterion	4.944041
Log likelihood	-1877.044	F-statistic	543.7753
Durbin-Watson stat	2.154339	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

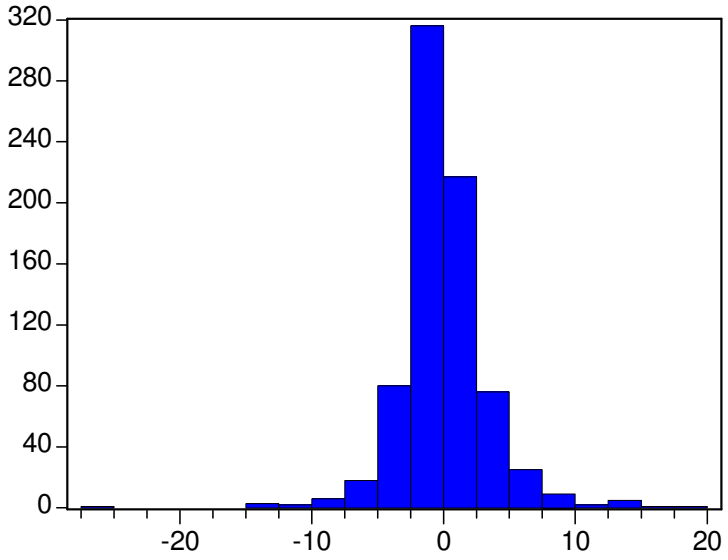
Mean	2.38e-16
Median	-0.099774
Maximum	16.27571
Minimum	-20.98732
Std. Dev.	2.843483
Skewness	0.113179
Kurtosis	11.98380
Jarque-Bera	2564.125
Probability	0.000000

8.) Commerzbank AG

Dependent Variable: A08
Method: Least Squares
Date: 08/08/12 Time: 12:21
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.565484	0.129689	12.07105	0.0000
C	-0.348442	0.121756	-2.861803	0.0043

R-squared	0.345586	Mean dependent var	0.260005
Adjusted R-squared	0.344725	S.D. dependent var	4.177818
S.E. of regression	3.381905	Akaike info criterion	5.277377
Sum squared resid	8692.335	Schwarz criterion	5.289545
Log likelihood	-2008.681	F-statistic	401.3441
Durbin-Watson stat	1.972010	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

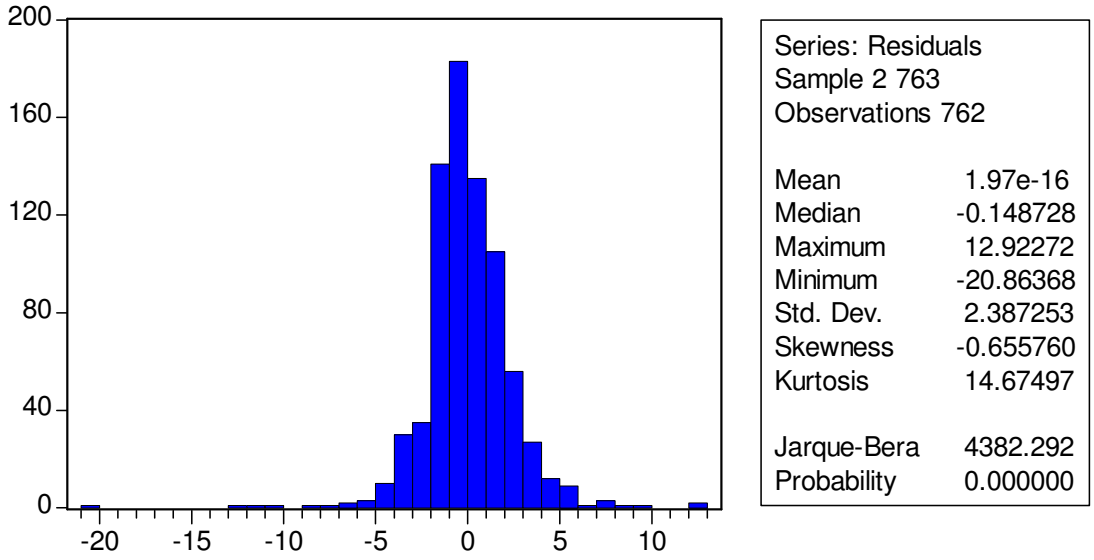
Mean	2.06e-16
Median	-0.251646
Maximum	17.73329
Minimum	-26.92599
Std. Dev.	3.379682
Skewness	-0.051040
Kurtosis	12.12704
Jarque-Bera	2645.195
Probability	0.000000

9.) Intesa Sanpaolo

Dependent Variable: A09
Method: Least Squares
Date: 08/08/12 Time: 12:22
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.390146	0.086693	16.03531	0.0000
C	-0.218363	0.080208	-2.722471	0.0066

R-squared	0.454924	Mean dependent var	0.321936
Adjusted R-squared	0.454207	S.D. dependent var	3.233477
S.E. of regression	2.388823	Akaike info criterion	4.582100
Sum squared resid	4336.921	Schwarz criterion	4.594268
Log likelihood	-1743.780	F-statistic	634.3003
Durbin-Watson stat	2.112887	Prob(F-statistic)	0.000000

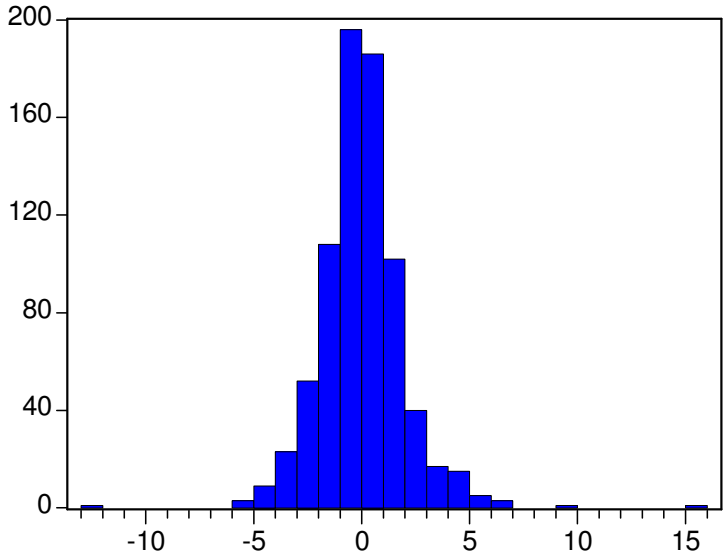


10.) Banco Bilbao Vizcaya Argentaria SA

Dependent Variable: A10
Method: Least Squares
Date: 08/08/12 Time: 12:23
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.365715	0.081807	16.69431	0.0000
C	-0.200399	0.077056	-2.600711	0.0095

R-squared	0.544498	Mean dependent var	0.330404
Adjusted R-squared	0.543899	S.D. dependent var	2.903626
S.E. of regression	1.960971	Akaike info criterion	4.187378
Sum squared resid	2922.510	Schwarz criterion	4.199546
Log likelihood	-1593.391	F-statistic	908.4893
Durbin-Watson stat	2.008361	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

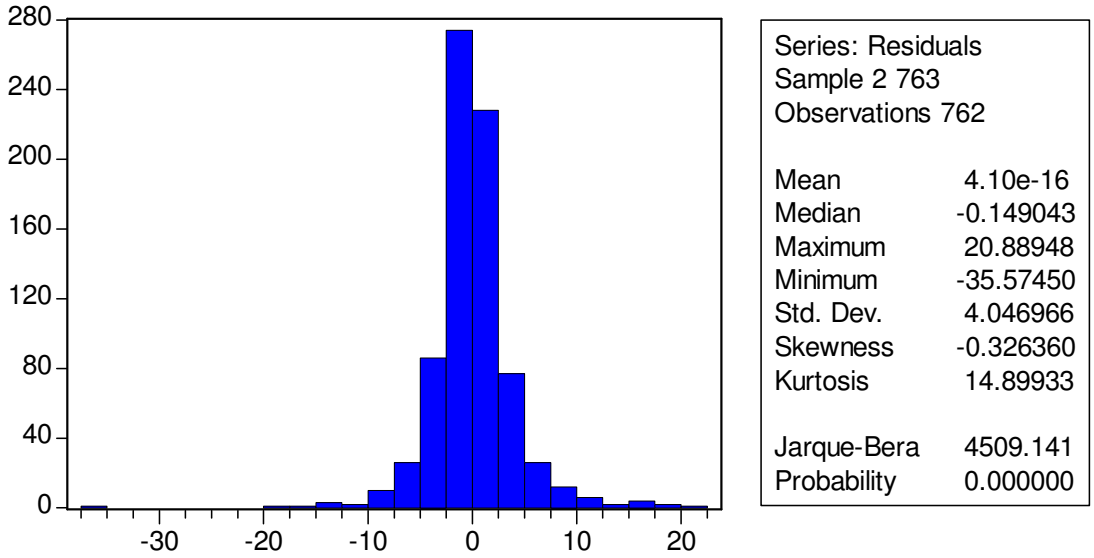
Mean	1.01e-16
Median	-0.042707
Maximum	15.38531
Minimum	-12.44030
Std. Dev.	1.959682
Skewness	0.610031
Kurtosis	10.68489
Jarque-Bera	1922.339
Probability	0.000000

11.)Natixis SA

Dependent Variable: A11
Method: Least Squares
Date: 08/08/12 Time: 12:24
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.511936	0.171427	8.819702	0.0000
C	-0.303871	0.151224	-2.009409	0.0448

R-squared	0.255692	Mean dependent var	0.283763
Adjusted R-squared	0.254713	S.D. dependent var	4.690869
S.E. of regression	4.049628	Akaike info criterion	5.637748
Sum squared resid	12463.61	Schwarz criterion	5.649916
Log likelihood	-2145.982	F-statistic	261.0832
Durbin-Watson stat	1.991350	Prob(F-statistic)	0.000000

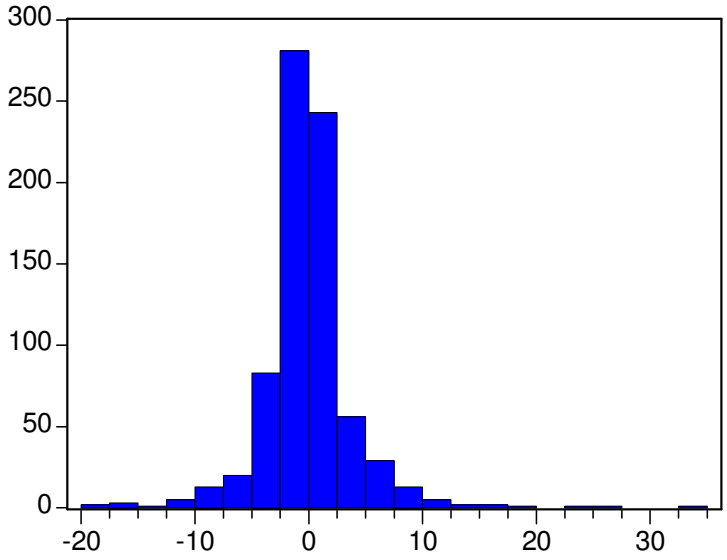


12.)Dexia NV

Dependent Variable: A12
Method: Least Squares
Date: 08/08/12 Time: 12:25
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.386821	0.229638	6.039154	0.0000
C	-0.288453	0.150139	-1.921243	0.0551

R-squared	0.219167	Mean dependent var	0.250554
Adjusted R-squared	0.218140	S.D. dependent var	4.647413
S.E. of regression	4.109374	Akaike info criterion	5.667040
Sum squared resid	12834.09	Schwarz criterion	5.679208
Log likelihood	-2157.142	F-statistic	213.3201
Durbin-Watson stat	1.848610	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

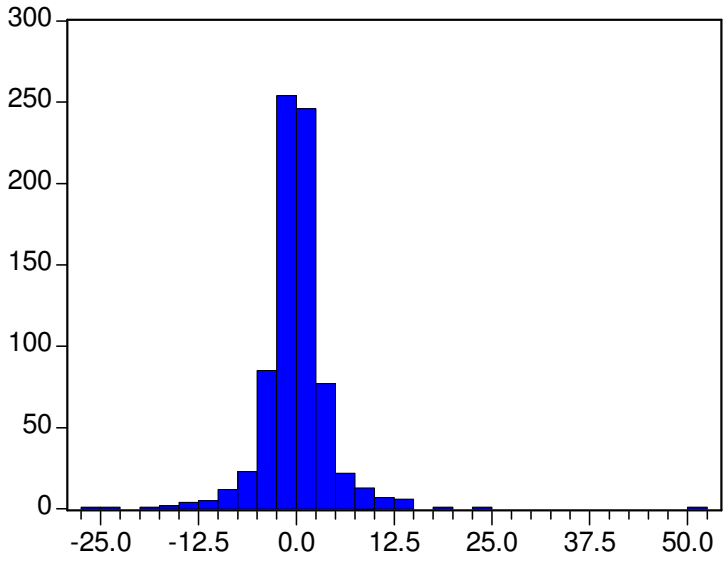
Mean	6.61e-17
Median	-0.230077
Maximum	32.58954
Minimum	-19.88781
Std. Dev.	4.106674
Skewness	1.091861
Kurtosis	14.64682
Jarque-Bera	4458.239
Probability	0.000000

13.)KBC Groep NV

Dependent Variable: A13
Method: Least Squares
Date: 08/08/12 Time: 12:25
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.919250	0.144486	13.28328	0.0000
C	-0.358819	0.148135	-2.422237	0.0157

R-squared	0.306785	Mean dependent var	0.387124
Adjusted R-squared	0.305872	S.D. dependent var	5.436177
S.E. of regression	4.529114	Akaike info criterion	5.861551
Sum squared resid	15589.79	Schwarz criterion	5.873719
Log likelihood	-2231.251	F-statistic	336.3402
Durbin-Watson stat	2.062974	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

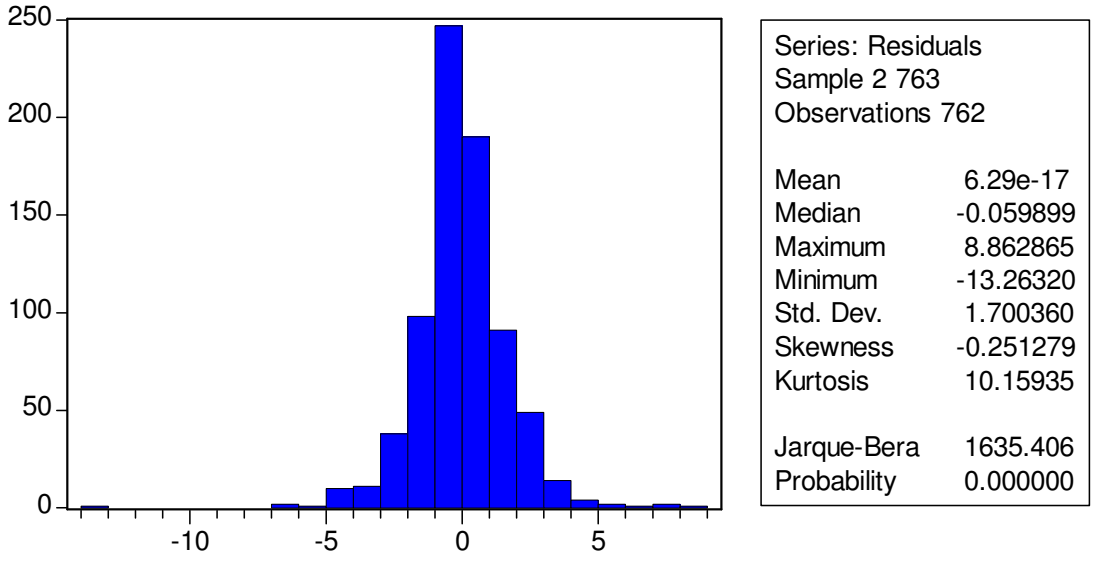
Mean	2.84e-16
Median	-0.076948
Maximum	51.72784
Minimum	-26.80081
Std. Dev.	4.526138
Skewness	1.650102
Kurtosis	29.80564
Jarque-Bera	23159.52
Probability	0.000000

14.)Caixabank SA

Dependent Variable: A14
Method: Least Squares
Date: 08/08/12 Time: 12:26
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.823794	0.063796	12.91296	0.0000
C	0.056122	0.052309	1.072896	0.2837

R-squared	0.366172	Mean dependent var	0.376300
Adjusted R-squared	0.365338	S.D. dependent var	2.135773
S.E. of regression	1.701478	Akaike info criterion	3.903493
Sum squared resid	2200.222	Schwarz criterion	3.915661
Log likelihood	-1485.231	F-statistic	439.0627
Durbin-Watson stat	2.520618	Prob(F-statistic)	0.000000

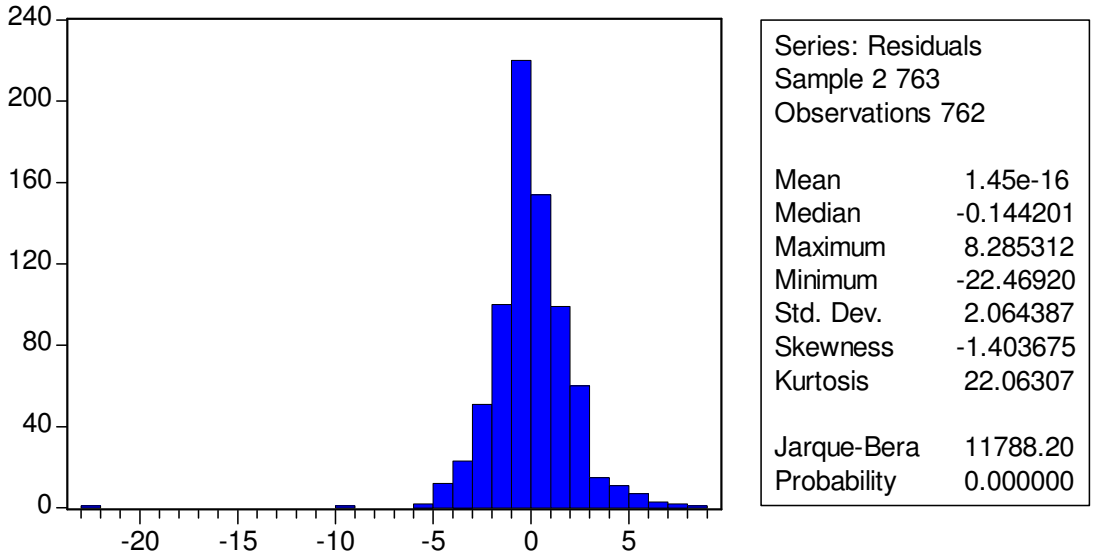


15.)Banca Monte dei Paschi SA

Dependent Variable: A15
Method: Least Squares
Date: 08/08/12 Time: 12:26
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.873490	0.082469	10.59168	0.0000
C	-0.104933	0.081900	-1.281235	0.2005

R-squared	0.305867	Mean dependent var	0.234561
Adjusted R-squared	0.304954	S.D. dependent var	2.477821
S.E. of regression	2.065745	Akaike info criterion	4.291480
Sum squared resid	3243.149	Schwarz criterion	4.303648
Log likelihood	-1633.054	F-statistic	334.8918
Durbin-Watson stat	1.906304	Prob(F-statistic)	0.000000

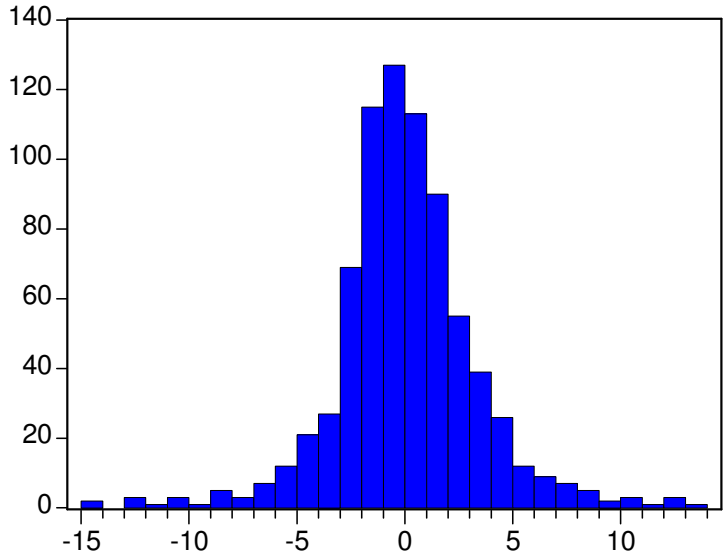


16.)Erste Group Bank AG

Dependent Variable: A16
Method: Least Squares
Date: 08/08/12 Time: 12:27
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.647068	0.123889	13.29470	0.0000
C	-0.222252	0.108535	-2.047737	0.0409

R-squared	0.378237	Mean dependent var	0.417904
Adjusted R-squared	0.377418	S.D. dependent var	4.201542
S.E. of regression	3.315178	Akaike info criterion	5.237521
Sum squared resid	8352.707	Schwarz criterion	5.249689
Log likelihood	-1993.495	F-statistic	462.3298
Durbin-Watson stat	2.016760	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

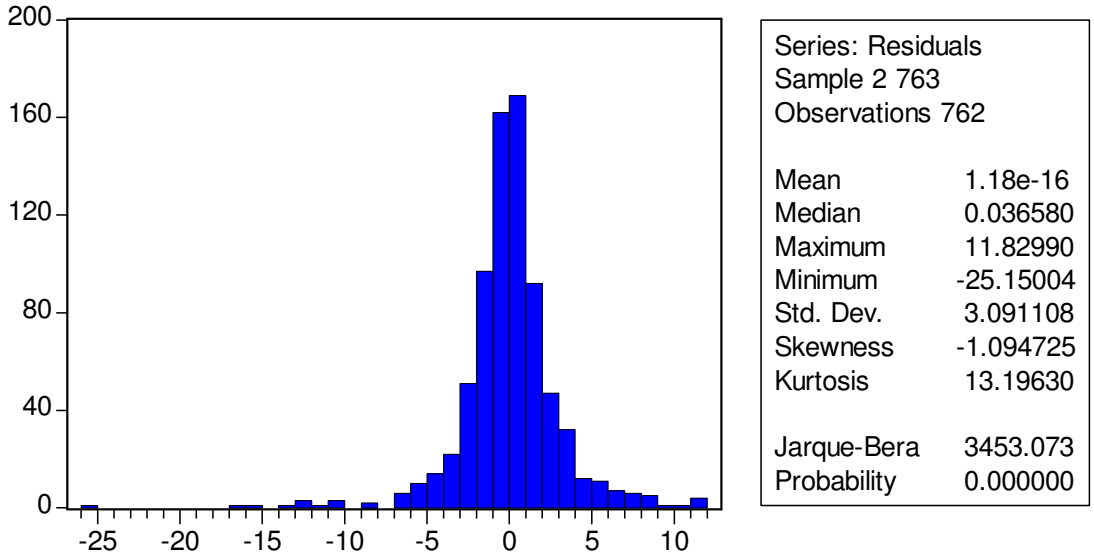
Mean	2.20e-16
Median	-0.147477
Maximum	13.23169
Minimum	-14.57710
Std. Dev.	3.312999
Skewness	0.000695
Kurtosis	6.082717
Jarque-Bera	301.7249
Probability	0.000000

17.)Deutsche Postbank AG

Dependent Variable: A17
Method: Least Squares
Date: 08/08/12 Time: 12:28
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.114880	0.121594	9.168841	0.0000
C	-0.134914	0.118175	-1.141653	0.2540

R-squared	0.242524	Mean dependent var	0.298399
Adjusted R-squared	0.241527	S.D. dependent var	3.551647
S.E. of regression	3.093141	Akaike info criterion	5.098873
Sum squared resid	7271.318	Schwarz criterion	5.111041
Log likelihood	-1940.670	F-statistic	243.3321
Durbin-Watson stat	1.916122	Prob(F-statistic)	0.000000

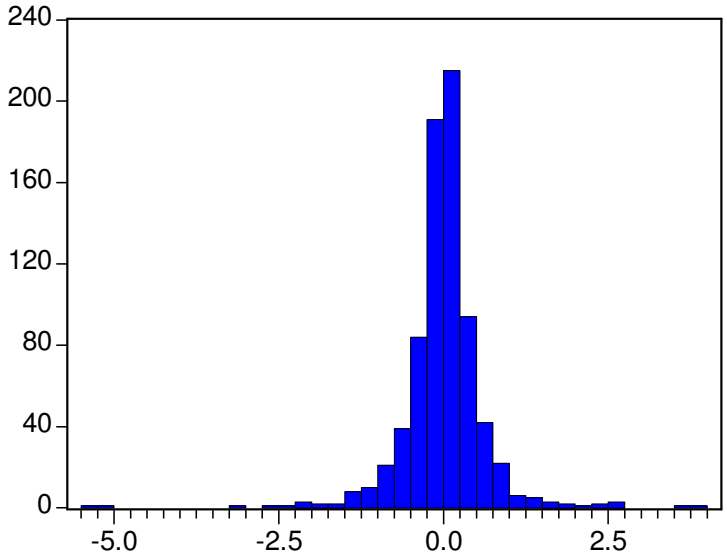


18.)Landesbank Hessen-Thuringen Baden-Weurttemberg AG

Dependent Variable: A18
Method: Least Squares
Date: 08/08/12 Time: 12:28
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.139242	0.039110	3.560275	0.0004
C	0.339340	0.022282	15.22919	0.0000

R-squared	0.101463	Mean dependent var	0.393459
Adjusted R-squared	0.100281	S.D. dependent var	0.685797
S.E. of regression	0.650503	Akaike info criterion	1.980479
Sum squared resid	321.5970	Schwarz criterion	1.992647
Log likelihood	-752.5626	F-statistic	85.81947
Durbin-Watson stat	2.873090	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

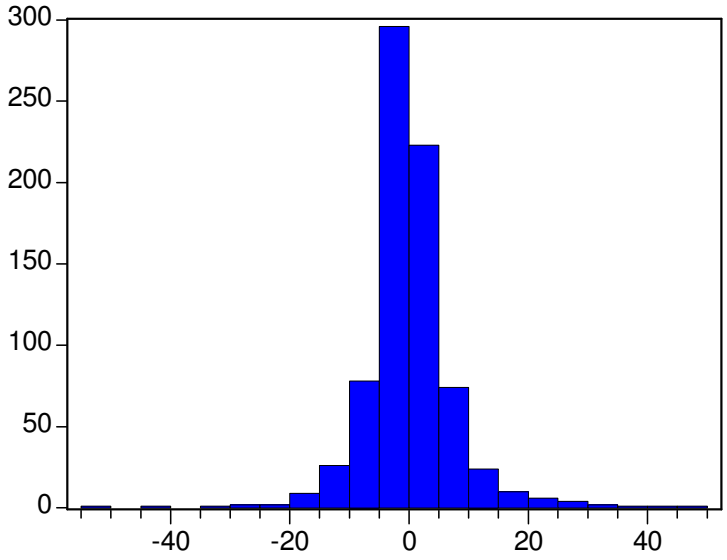
Mean	-2.80e-17
Median	0.022957
Maximum	3.822810
Minimum	-5.361317
Std. Dev.	0.650075
Skewness	-0.974915
Kurtosis	18.99115
Jarque-Bera	8239.715
Probability	0.000000

19.)Bank of Ireland PLC

Dependent Variable: A19
Method: Least Squares
Date: 08/08/12 Time: 12:29
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.771239	0.255952	6.920214	0.0000
C	-0.402445	0.271220	-1.483831	0.1383

R-squared	0.113950	Mean dependent var	0.285972
Adjusted R-squared	0.112784	S.D. dependent var	8.231869
S.E. of regression	7.753772	Akaike info criterion	6.936857
Sum squared resid	45691.95	Schwarz criterion	6.949025
Log likelihood	-2640.943	F-statistic	97.73964
Durbin-Watson stat	1.996001	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

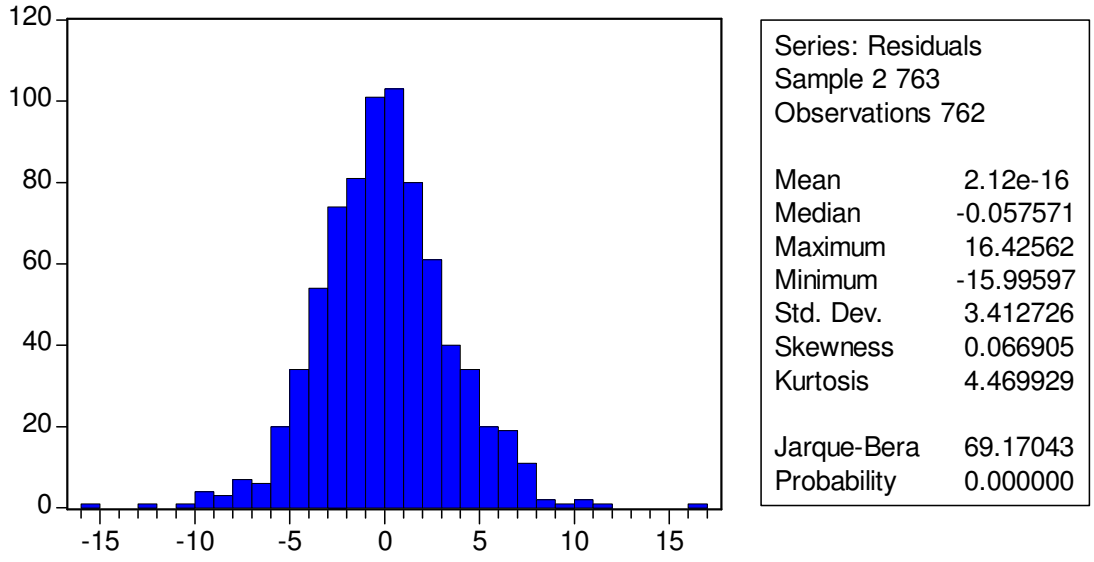
Mean	4.09e-16
Median	-0.535118
Maximum	48.83951
Minimum	-53.30526
Std. Dev.	7.748676
Skewness	0.421432
Kurtosis	11.99820
Jarque-Bera	2593.275
Probability	0.000000

20.)Bank of Greece SA

Dependent Variable: A20
Method: Least Squares
Date: 08/08/12 Time: 12:30
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.233078	0.107744	11.44451	0.0000
C	-0.321315	0.116574	-2.756315	0.0060

R-squared	0.243180	Mean dependent var	0.157937
Adjusted R-squared	0.242184	S.D. dependent var	3.922881
S.E. of regression	3.414970	Akaike info criterion	5.296836
Sum squared resid	8863.137	Schwarz criterion	5.309004
Log likelihood	-2016.094	F-statistic	244.2020
Durbin-Watson stat	2.066164	Prob(F-statistic)	0.000000

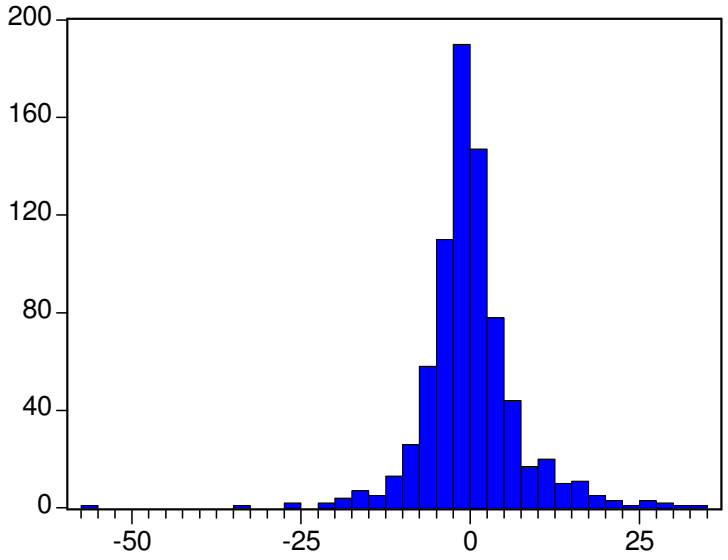


21.)Allied Irish Banks PLC

Dependent Variable: A21
Method: Least Squares
Date: 08/08/12 Time: 12:31
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.546728	0.300622	5.145090	0.0000
C	-0.431567	0.255994	-1.685852	0.0922

R-squared	0.102535	Mean dependent var	0.169590
Adjusted R-squared	0.101354	S.D. dependent var	7.578025
S.E. of regression	7.183734	Akaike info criterion	6.784137
Sum squared resid	39220.59	Schwarz criterion	6.796305
Log likelihood	-2582.756	F-statistic	86.82997
Durbin-Watson stat	1.636807	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

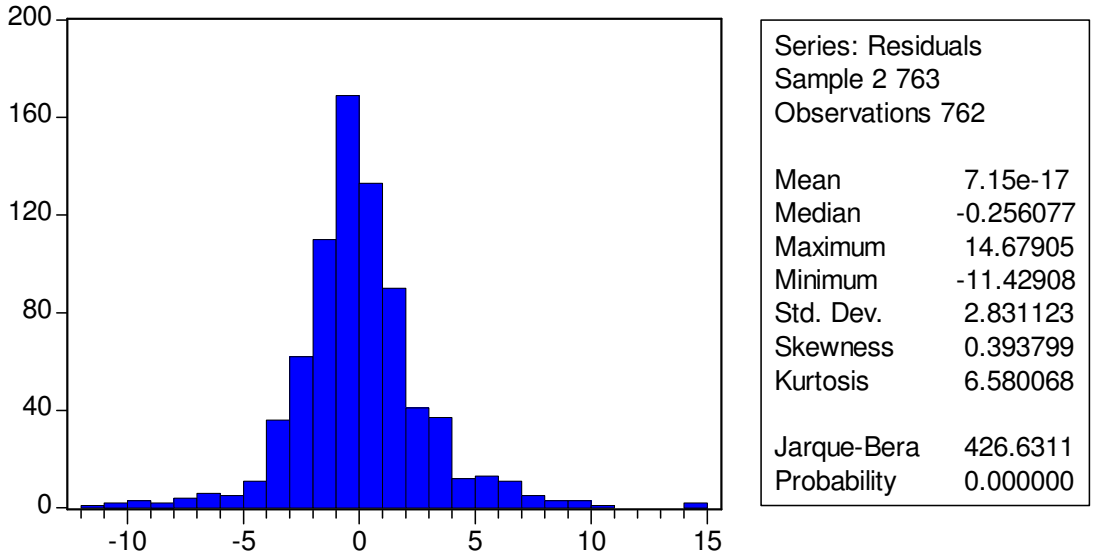
Mean	4.24e-16
Median	-0.413862
Maximum	34.71152
Minimum	-57.30053
Std. Dev.	7.179013
Skewness	-0.096663
Kurtosis	11.57891
Jarque-Bera	2337.913
Probability	0.000000

22.)Banco Populare SA

Dependent Variable: A22
Method: Least Squares
Date: 08/08/12 Time: 12:31
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.221270	0.105711	11.55290	0.0000
C	-0.240454	0.107316	-2.240615	0.0253

R-squared	0.314128	Mean dependent var	0.234210
Adjusted R-squared	0.313226	S.D. dependent var	3.418513
S.E. of regression	2.832985	Akaike info criterion	4.923160
Sum squared resid	6099.610	Schwarz criterion	4.935328
Log likelihood	-1873.724	F-statistic	348.0787
Durbin-Watson stat	1.925393	Prob(F-statistic)	0.000000

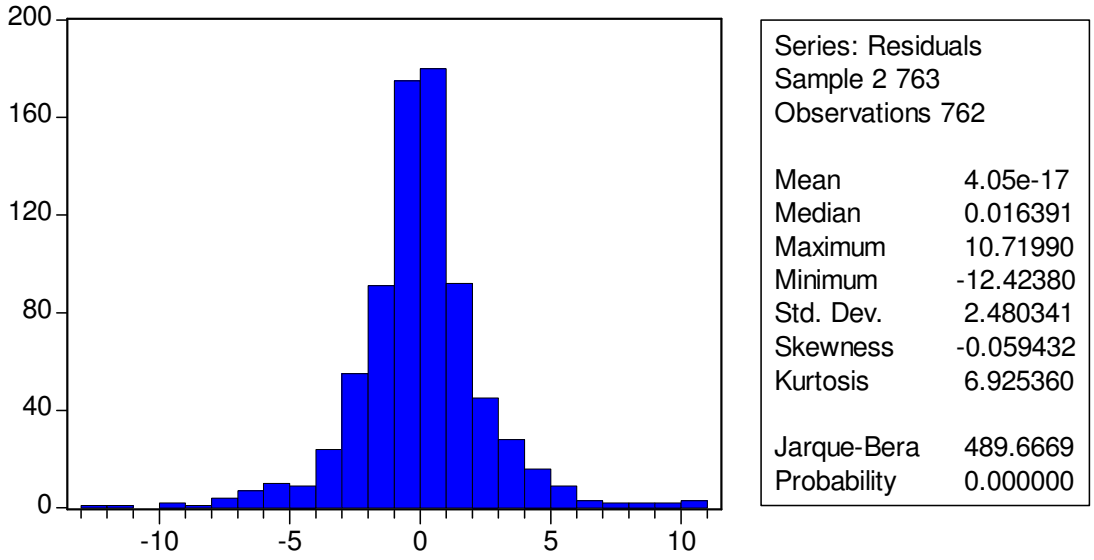


23.)Landesbank Berlin Holding AG

Dependent Variable: A23
Method: Least Squares
Date: 08/08/12 Time: 12:32
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.405057	0.096958	4.177640	0.0000
C	0.185645	0.086404	2.148562	0.0320

R-squared	0.061597	Mean dependent var	0.343076
Adjusted R-squared	0.060362	S.D. dependent var	2.560452
S.E. of regression	2.481972	Akaike info criterion	4.658605
Sum squared resid	4681.742	Schwarz criterion	4.670773
Log likelihood	-1772.929	F-statistic	49.88630
Durbin-Watson stat	2.347163	Prob(F-statistic)	0.000000

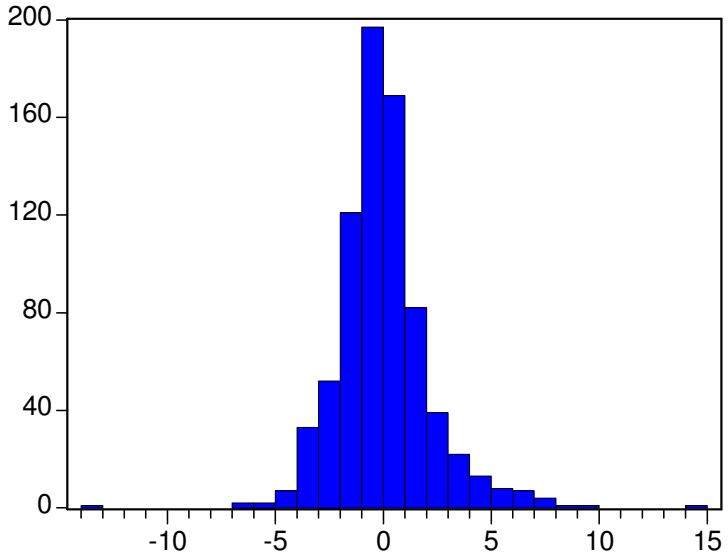


24.)Banco Popular Espanol SA

Dependent Variable: A24
Method: Least Squares
Date: 08/08/12 Time: 12:32
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.243920	0.088474	14.05976	0.0000
C	-0.199357	0.084402	-2.361986	0.0184

R-squared	0.443841	Mean dependent var	0.284109
Adjusted R-squared	0.443109	S.D. dependent var	2.929258
S.E. of regression	2.185963	Akaike info criterion	4.404611
Sum squared resid	3631.609	Schwarz criterion	4.416779
Log likelihood	-1676.157	F-statistic	606.5155
Durbin-Watson stat	2.036461	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

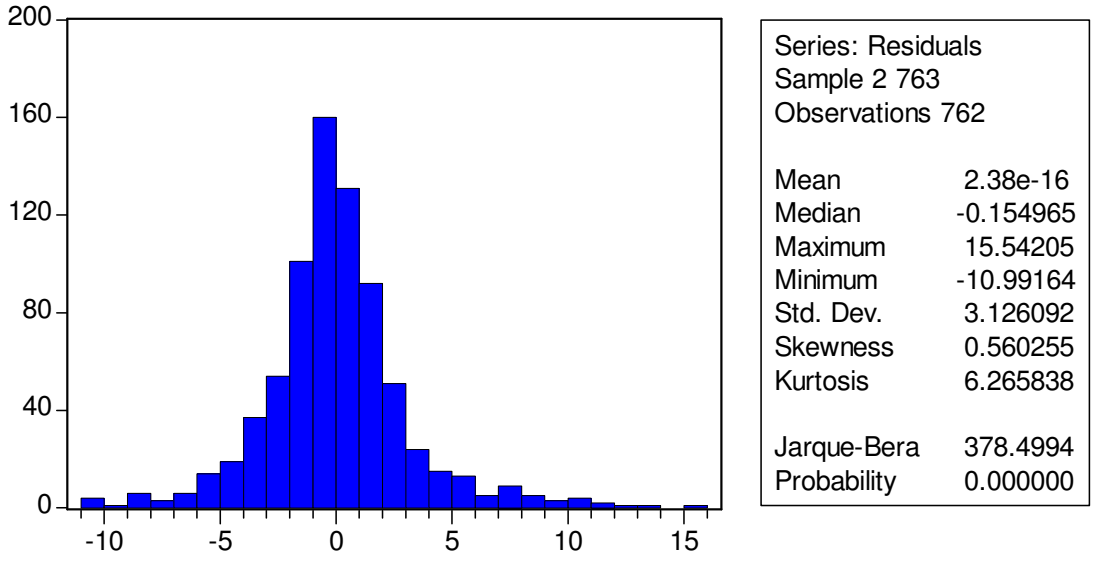
Mean	2.41e-16
Median	-0.199317
Maximum	14.68098
Minimum	-13.03592
Std. Dev.	2.184526
Skewness	0.806571
Kurtosis	8.722358
Jarque-Bera	1122.287
Probability	0.000000

25.)SNS Real Groep NV

Dependent Variable: A25
Method: Least Squares
Date: 08/08/12 Time: 12:33
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.486449	0.125778	11.81804	0.0000
C	-0.318619	0.114156	-2.791093	0.0054

R-squared	0.357527	Mean dependent var	0.259110
Adjusted R-squared	0.356682	S.D. dependent var	3.900088
S.E. of regression	3.128148	Akaike info criterion	5.121380
Sum squared resid	7436.835	Schwarz criterion	5.133548
Log likelihood	-1949.246	F-statistic	422.9295
Durbin-Watson stat	1.968253	Prob(F-statistic)	0.000000

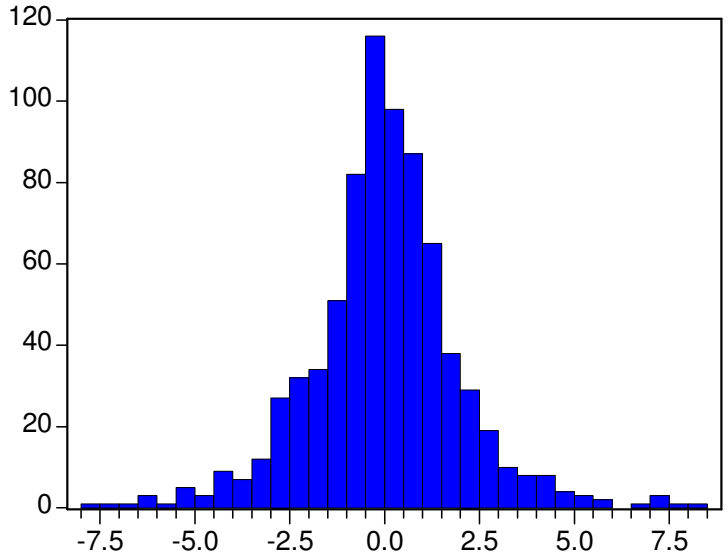


26.)Unione di Banche Italiano SA

Dependent Variable: A26
Method: Least Squares
Date: 08/08/12 Time: 12:33
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.941056	0.072476	12.98441	0.0000
C	-0.090569	0.066623	-1.359425	0.1744

R-squared	0.356788	Mean dependent var	0.275185
Adjusted R-squared	0.355942	S.D. dependent var	2.471663
S.E. of regression	1.983590	Akaike info criterion	4.210315
Sum squared resid	2990.317	Schwarz criterion	4.222482
Log likelihood	-1602.130	F-statistic	421.5703
Durbin-Watson stat	2.125440	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

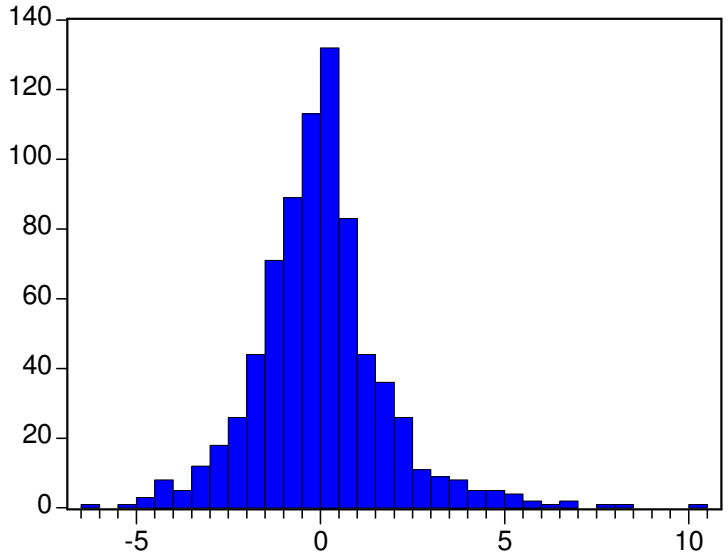
Mean	1.51e-16
Median	-0.025663
Maximum	8.034832
Minimum	-7.505451
Std. Dev.	1.982286
Skewness	0.081121
Kurtosis	5.121850
Jarque-Bera	143.7821
Probability	0.000000

27.)Banco Espanol De Credito SA

Dependent Variable: A27
Method: Least Squares
Date: 08/08/12 Time: 12:34
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.886178	0.064535	13.73181	0.0000
C	-0.019764	0.070381	-0.280808	0.7789

R-squared	0.378072	Mean dependent var	0.324661
Adjusted R-squared	0.377254	S.D. dependent var	2.261061
S.E. of regression	1.784300	Akaike info criterion	3.998550
Sum squared resid	2419.631	Schwarz criterion	4.010718
Log likelihood	-1521.448	F-statistic	462.0067
Durbin-Watson stat	2.156326	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

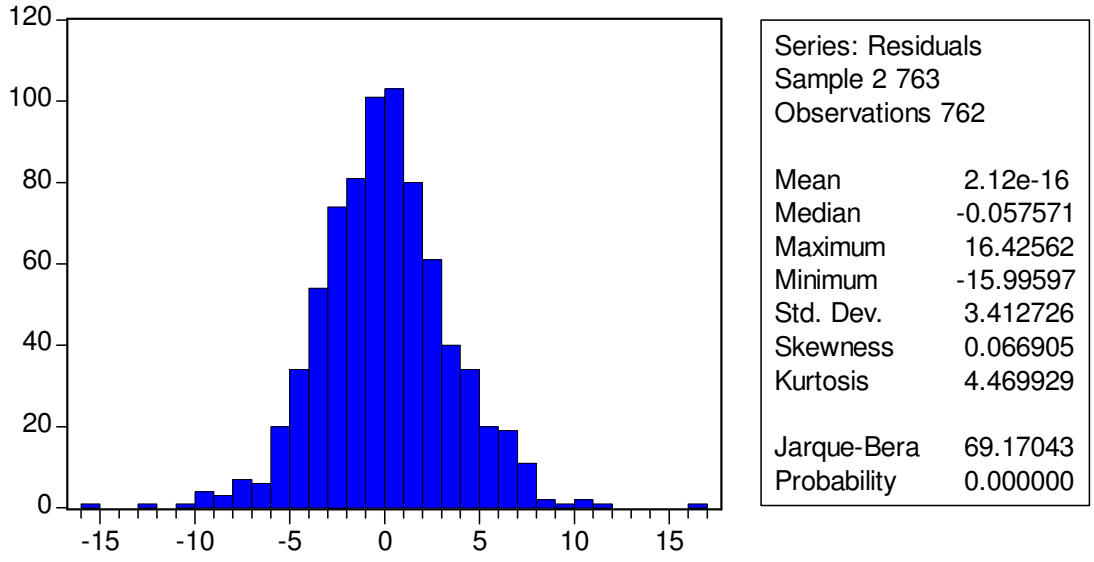
Mean	2.69e-16
Median	-0.045706
Maximum	10.01371
Minimum	-6.078769
Std. Dev.	1.783127
Skewness	0.793235
Kurtosis	6.326989
Jarque-Bera	431.3472
Probability	0.000000

28.)National Bank of Greece SA

Dependent Variable: A28
Method: Least Squares
Date: 08/08/12 Time: 12:34
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.233078	0.107744	11.44451	0.0000
C	-0.321315	0.116574	-2.756315	0.0060

R-squared	0.243180	Mean dependent var	0.157937
Adjusted R-squared	0.242184	S.D. dependent var	3.922881
S.E. of regression	3.414970	Akaike info criterion	5.296836
Sum squared resid	8863.137	Schwarz criterion	5.309004
Log likelihood	-2016.094	F-statistic	244.2020
Durbin-Watson stat	2.066164	Prob(F-statistic)	0.000000

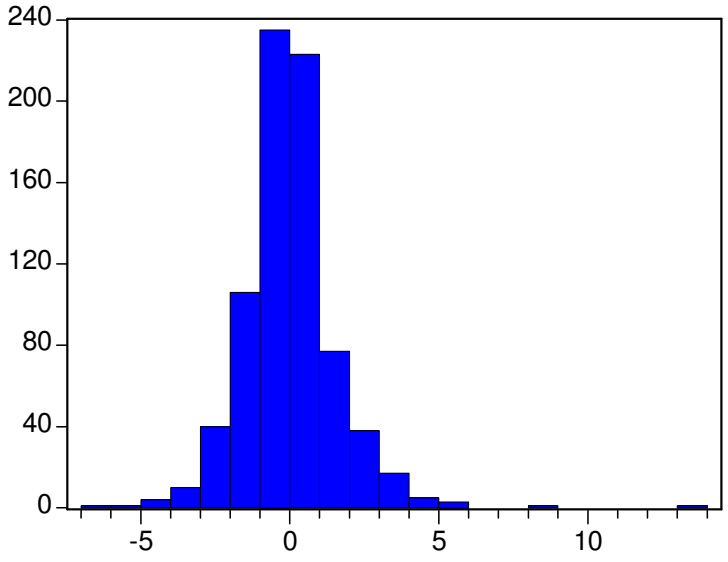


29.)Banco de Sabadell SA

Dependent Variable: A29
Method: Least Squares
Date: 08/08/12 Time: 12:35
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.780013	0.084150	9.269348	0.0000
C	-0.012226	0.068628	-0.178152	0.8587

R-squared	0.378362	Mean dependent var	0.290936
Adjusted R-squared	0.377544	S.D. dependent var	1.989422
S.E. of regression	1.569573	Akaike info criterion	3.742105
Sum squared resid	1872.304	Schwarz criterion	3.754273
Log likelihood	-1423.742	F-statistic	462.5758
Durbin-Watson stat	2.002800	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

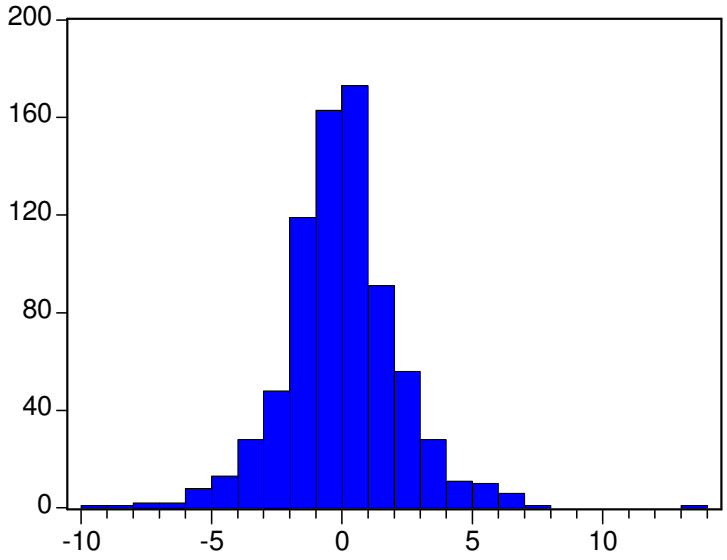
Mean	1.33e-16
Median	-0.052804
Maximum	13.90227
Minimum	-6.235604
Std. Dev.	1.568541
Skewness	1.225953
Kurtosis	12.62639
Jarque-Bera	3133.067
Probability	0.000000

30.)Banco Commercial Portugues SA

Dependent Variable: A30
Method: Least Squares
Date: 08/08/12 Time: 12:35
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.775674	0.084738	9.153740	0.0000
C	-0.083976	0.084343	-0.995656	0.3197

R-squared	0.232092	Mean dependent var	0.217500
Adjusted R-squared	0.231082	S.D. dependent var	2.525966
S.E. of regression	2.214968	Akaike info criterion	4.430974
Sum squared resid	3728.623	Schwarz criterion	4.443142
Log likelihood	-1686.201	F-statistic	229.7025
Durbin-Watson stat	1.804186	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

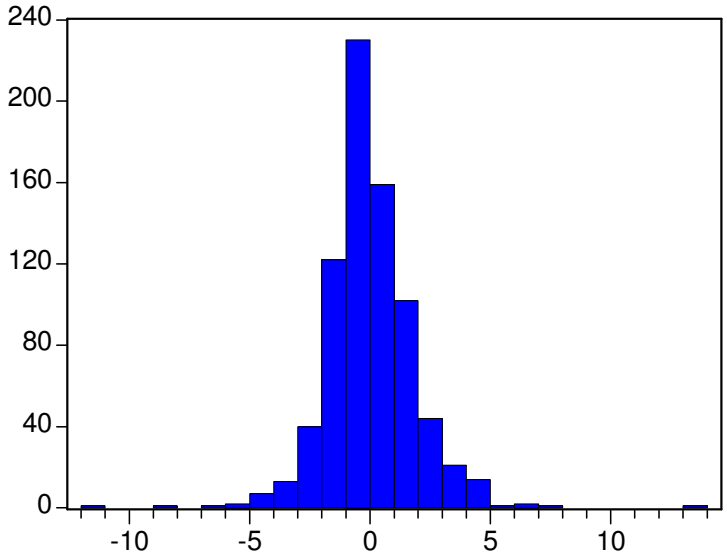
Mean	1.28e-16
Median	-0.038491
Maximum	13.06572
Minimum	-9.768370
Std. Dev.	2.213512
Skewness	0.196974
Kurtosis	5.828546
Jarque-Bera	258.9489
Probability	0.000000

31.)Mediobanca Banca di Credito Fin SA

Dependent Variable: A31
Method: Least Squares
Date: 08/08/12 Time: 12:36
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.727907	0.104926	6.937349	0.0000
C	0.032615	0.072742	0.448362	0.6540

R-squared	0.279607	Mean dependent var	0.315525
Adjusted R-squared	0.278659	S.D. dependent var	2.159636
S.E. of regression	1.834217	Akaike info criterion	4.053733
Sum squared resid	2556.907	Schwarz criterion	4.065901
Log likelihood	-1542.472	F-statistic	294.9801
Durbin-Watson stat	1.963645	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

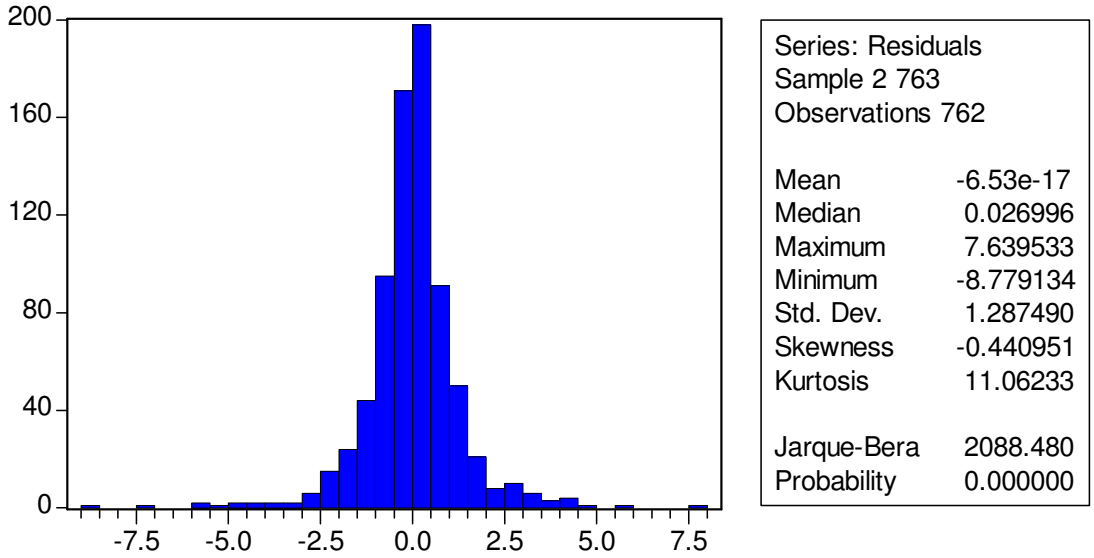
Mean	7.38e-17
Median	-0.126557
Maximum	13.07463
Minimum	-11.26216
Std. Dev.	1.833011
Skewness	0.337256
Kurtosis	9.255296
Jarque-Bera	1256.782
Probability	0.000000

32.)Esperito Santo Financial Group SA

Dependent Variable: A32
Method: Least Squares
Date: 08/08/12 Time: 12:36
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.306622	0.045968	6.670381	0.0000
C	0.222249	0.051721	4.297047	0.0000

R-squared	0.122497	Mean dependent var	0.341422
Adjusted R-squared	0.121342	S.D. dependent var	1.374420
S.E. of regression	1.288336	Akaike info criterion	3.347202
Sum squared resid	1261.456	Schwarz criterion	3.359370
Log likelihood	-1273.284	F-statistic	106.0936
Durbin-Watson stat	2.131855	Prob(F-statistic)	0.000000

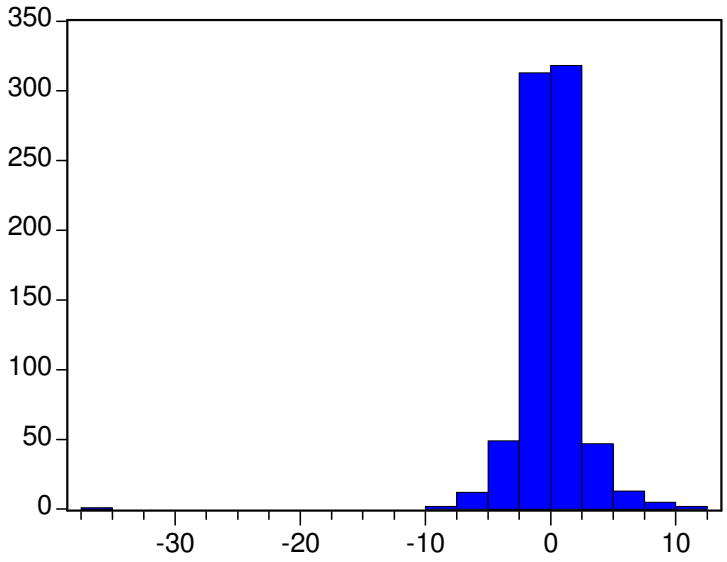


33.)Banco Esperito Santo SA

Dependent Variable: A33
Method: Least Squares
Date: 08/08/12 Time: 12:37
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.685306	0.098745	6.940162	0.0000
C	-0.048654	0.088596	-0.549167	0.5831

R-squared	0.156791	Mean dependent var	0.217700
Adjusted R-squared	0.155682	S.D. dependent var	2.715206
S.E. of regression	2.494916	Akaike info criterion	4.669008
Sum squared resid	4730.700	Schwarz criterion	4.681176
Log likelihood	-1776.892	F-statistic	141.3188
Durbin-Watson stat	1.749557	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

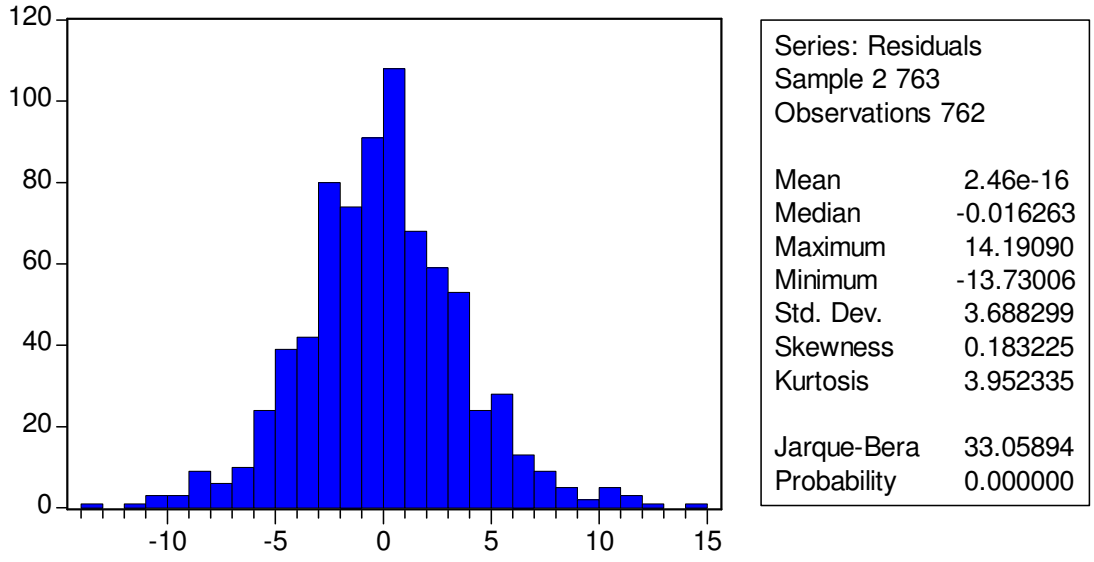
Mean	1.41e-16
Median	0.007914
Maximum	10.97230
Minimum	-35.27064
Std. Dev.	2.493276
Skewness	-3.348786
Kurtosis	56.27217
Jarque-Bera	91528.33
Probability	0.000000

34.)EFG Eurobank Ergasias SA

Dependent Variable: A34
Method: Least Squares
Date: 08/08/12 Time: 12:38
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.112745	0.113471	9.806399	0.0000
C	-0.225610	0.112993	-1.996666	0.0462

R-squared	0.183023	Mean dependent var	0.206874
Adjusted R-squared	0.181948	S.D. dependent var	4.080575
S.E. of regression	3.690725	Akaike info criterion	5.452144
Sum squared resid	10352.30	Schwarz criterion	5.464312
Log likelihood	-2075.267	F-statistic	170.2592
Durbin-Watson stat	2.096119	Prob(F-statistic)	0.000000

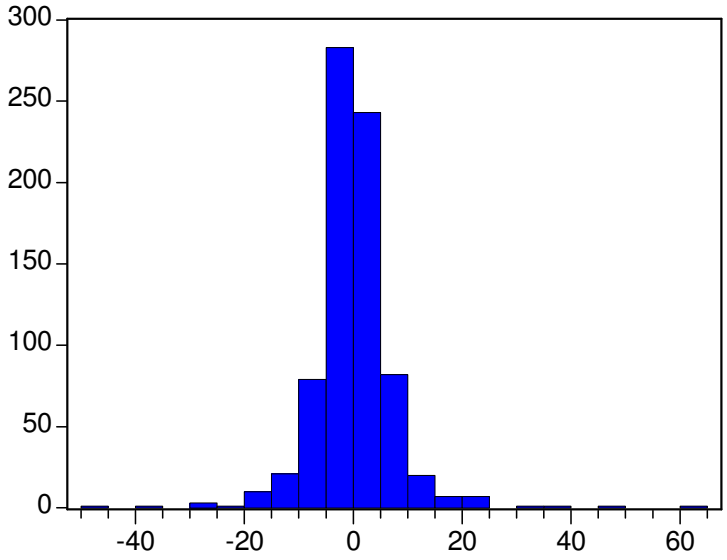


35.)Permanent TSB Group Holding PLC

Dependent Variable: A35
Method: Least Squares
Date: 08/08/12 Time: 12:38
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.738330	0.261758	6.640990	0.0000
C	-0.298196	0.264460	-1.127565	0.2599

R-squared	0.121999	Mean dependent var	0.377430
Adjusted R-squared	0.120844	S.D. dependent var	7.807864
S.E. of regression	7.320912	Akaike info criterion	6.821968
Sum squared resid	40732.77	Schwarz criterion	6.834136
Log likelihood	-2597.170	F-statistic	105.6030
Durbin-Watson stat	1.885443	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

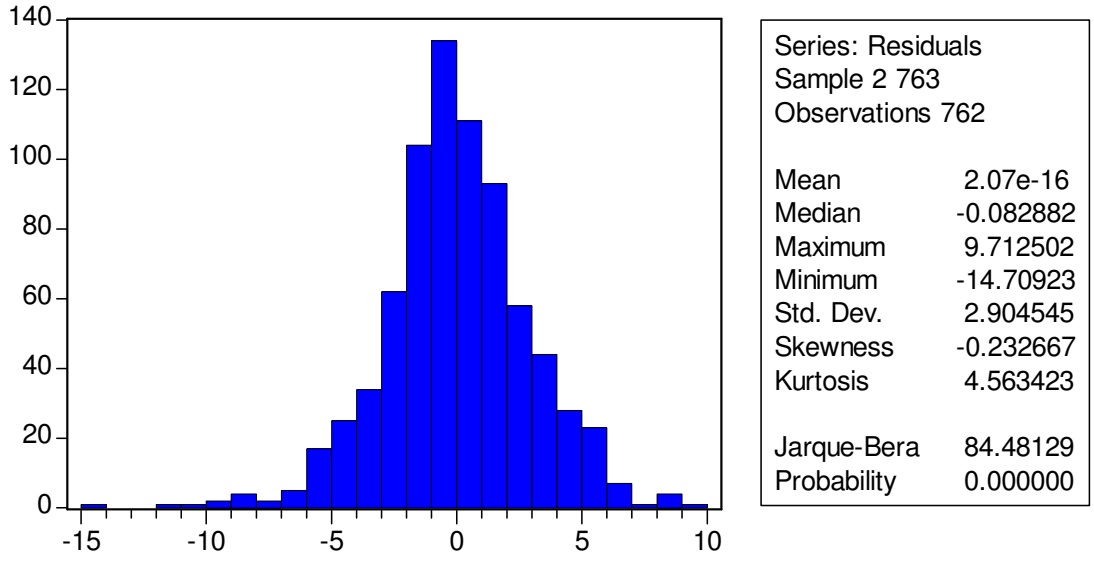
Mean	2.38e-16
Median	-0.237468
Maximum	60.70298
Minimum	-48.75316
Std. Dev.	7.316101
Skewness	0.820094
Kurtosis	16.35727
Jarque-Bera	5750.143
Probability	0.000000

36.)Bank of Cyprus Public Company Limited PLC

Dependent Variable: A36
Method: Least Squares
Date: 08/08/12 Time: 12:39
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.940508	0.093915	10.01444	0.0000
C	-0.200872	0.104878	-1.915297	0.0558

R-squared	0.205128	Mean dependent var	0.164669
Adjusted R-squared	0.204082	S.D. dependent var	3.257837
S.E. of regression	2.906455	Akaike info criterion	4.974367
Sum squared resid	6420.085	Schwarz criterion	4.986534
Log likelihood	-1893.234	F-statistic	196.1284
Durbin-Watson stat	1.909310	Prob(F-statistic)	0.000000

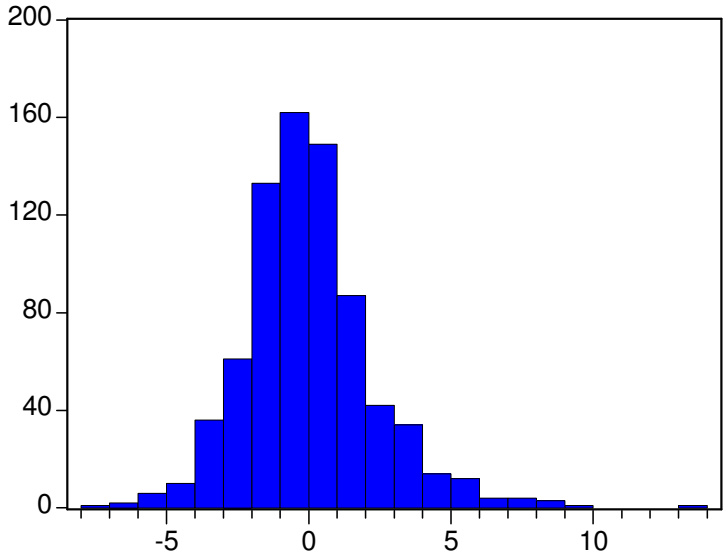


37.)Bank Inter SA

Dependent Variable: A37
Method: Least Squares
Date: 08/08/12 Time: 12:40
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.982837	0.080489	12.21087	0.0000
C	-0.093371	0.084480	-1.105248	0.2694

R-squared	0.309970	Mean dependent var	0.288622
Adjusted R-squared	0.309062	S.D. dependent var	2.769495
S.E. of regression	2.302078	Akaike info criterion	4.508123
Sum squared resid	4027.669	Schwarz criterion	4.520291
Log likelihood	-1715.595	F-statistic	341.4016
Durbin-Watson stat	2.085200	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

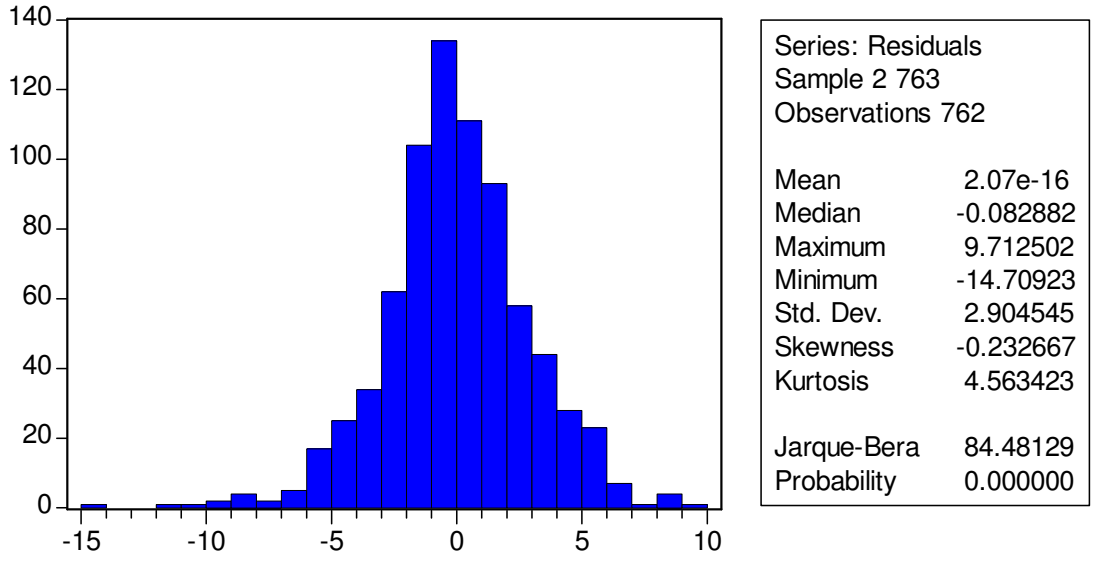
Mean	1.64e-16
Median	-0.225455
Maximum	13.48400
Minimum	-7.073326
Std. Dev.	2.300565
Skewness	0.826382
Kurtosis	5.664651
Jarque-Bera	312.1657
Probability	0.000000

38.)Cyprus Popular Bank Public Company Limited PLC

Dependent Variable: A38
Method: Least Squares
Date: 08/08/12 Time: 12:40
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.940508	0.093915	10.01444	0.0000
C	-0.200872	0.104878	-1.915297	0.0558

R-squared	0.205128	Mean dependent var	0.164669
Adjusted R-squared	0.204082	S.D. dependent var	3.257837
S.E. of regression	2.906455	Akaike info criterion	4.974367
Sum squared resid	6420.085	Schwarz criterion	4.986534
Log likelihood	-1893.234	F-statistic	196.1284
Durbin-Watson stat	1.909310	Prob(F-statistic)	0.000000

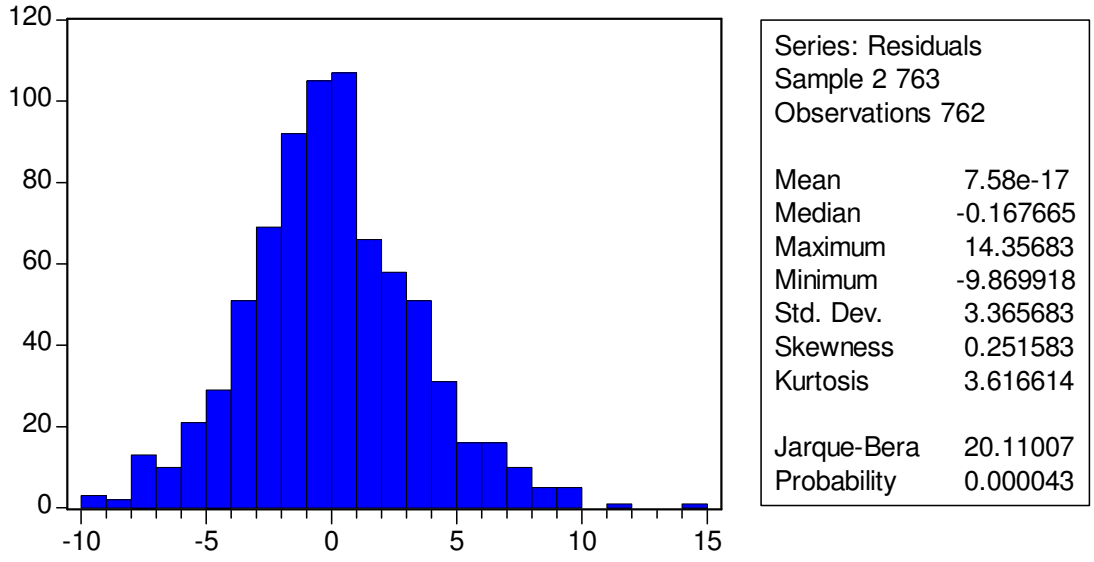


39.)Alpha Bank SA

Dependent Variable: A39
Method: Least Squares
Date: 08/08/12 Time: 12:40
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.989195	0.095949	10.30960	0.0000
C	-0.193637	0.112994	-1.713694	0.0870

R-squared	0.175330	Mean dependent var	0.190827
Adjusted R-squared	0.174245	S.D. dependent var	3.706236
S.E. of regression	3.367896	Akaike info criterion	5.269075
Sum squared resid	8620.472	Schwarz criterion	5.281243
Log likelihood	-2005.518	F-statistic	161.5804
Durbin-Watson stat	2.025921	Prob(F-statistic)	0.000000

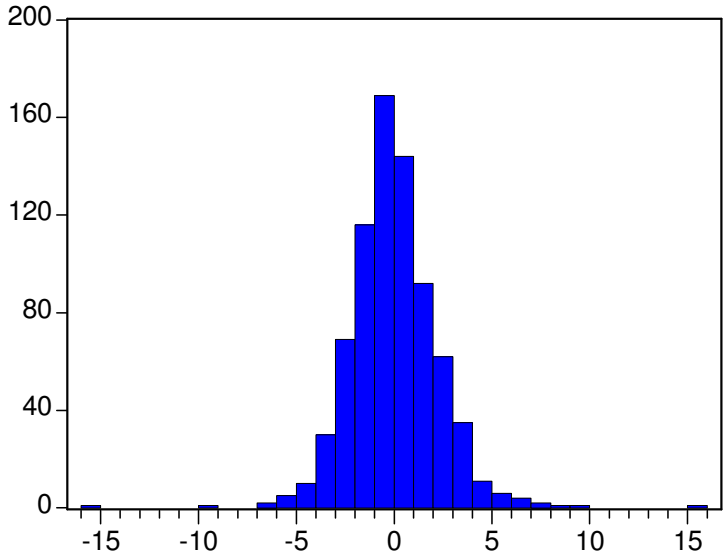


40.)Banca Populare di Milano SA

Dependent Variable: A40
Method: Least Squares
Date: 08/08/12 Time: 12:41
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.033418	0.122971	8.403785	0.0000
C	-0.138369	0.083335	-1.660400	0.0972

R-squared	0.333718	Mean dependent var	0.263283
Adjusted R-squared	0.332841	S.D. dependent var	2.806501
S.E. of regression	2.292345	Akaike info criterion	4.499649
Sum squared resid	3993.683	Schwarz criterion	4.511817
Log likelihood	-1712.366	F-statistic	380.6575
Durbin-Watson stat	2.130657	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

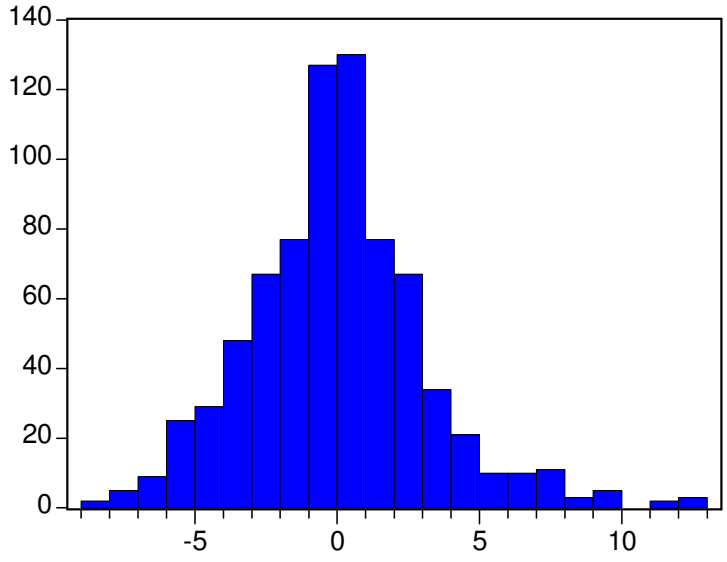
Mean	2.17e-16
Median	-0.132234
Maximum	15.20396
Minimum	-15.44329
Std. Dev.	2.290838
Skewness	0.257078
Kurtosis	8.854463
Jarque-Bera	1096.616
Probability	0.000000

41.)Bank of Piraeus SA

Dependent Variable: A41
Method: Least Squares
Date: 08/08/12 Time: 12:42
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.006445	0.098253	10.24336	0.0000
C	-0.224328	0.103340	-2.170785	0.0303

R-squared	0.202624	Mean dependent var	0.166840
Adjusted R-squared	0.201575	S.D. dependent var	3.507707
S.E. of regression	3.134298	Akaike info criterion	5.125309
Sum squared resid	7466.106	Schwarz criterion	5.137477
Log likelihood	-1950.743	F-statistic	193.1266
Durbin-Watson stat	1.963033	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

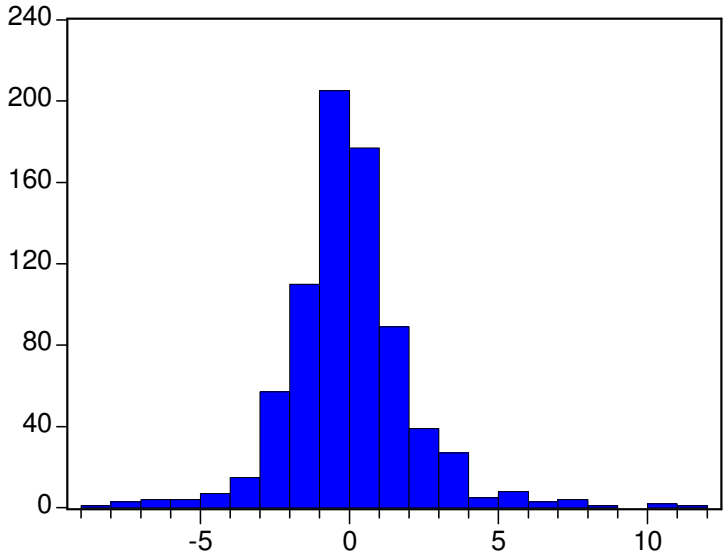
Mean	1.59e-16
Median	-0.067052
Maximum	12.87320
Minimum	-8.210771
Std. Dev.	3.132238
Skewness	0.548728
Kurtosis	4.374889
Jarque-Bera	98.25762
Probability	0.000000

42.)Banca Carige SA

Dependent Variable: A42
Method: Least Squares
Date: 08/08/12 Time: 12:42
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.807563	0.084008	9.612936	0.0000
C	0.000117	0.075314	0.001551	0.9988

R-squared	0.265529	Mean dependent var	0.313987
Adjusted R-squared	0.264563	S.D. dependent var	2.458666
S.E. of regression	2.108494	Akaike info criterion	4.332446
Sum squared resid	3378.768	Schwarz criterion	4.344614
Log likelihood	-1648.662	F-statistic	274.7583
Durbin-Watson stat	2.183873	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

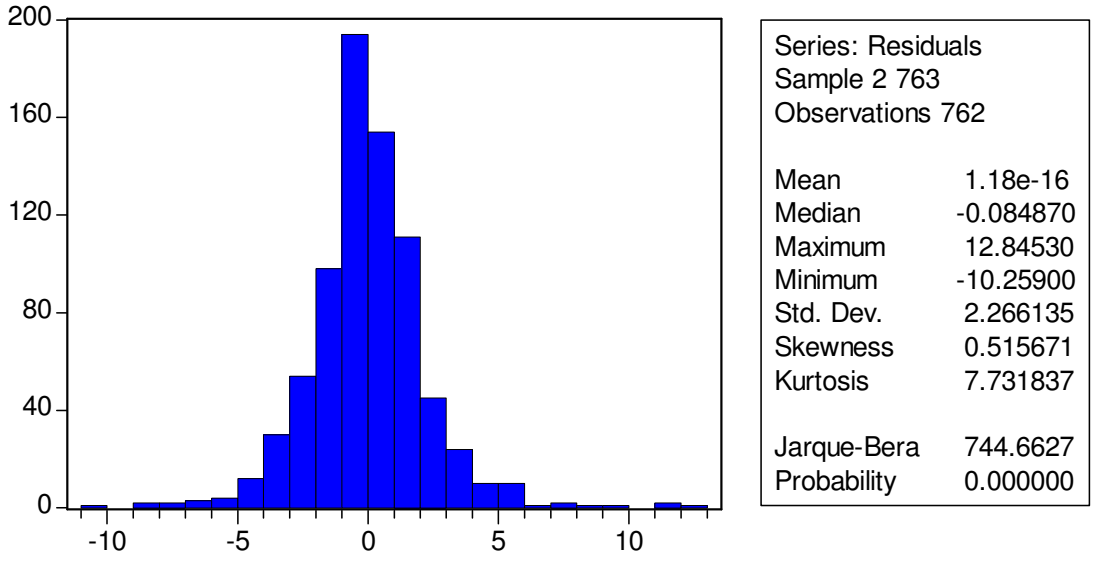
Mean	1.26e-16
Median	-0.128543
Maximum	11.76379
Minimum	-8.326094
Std. Dev.	2.107108
Skewness	0.654809
Kurtosis	7.585663
Jarque-Bera	722.1030
Probability	0.000000

43.)Banca BPI SA

Dependent Variable: A43
Method: Least Squares
Date: 08/08/12 Time: 12:42
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.812856	0.075787	10.72559	0.0000
C	-0.061148	0.080054	-0.763825	0.4452

R-squared	0.240511	Mean dependent var	0.254780
Adjusted R-squared	0.239511	S.D. dependent var	2.600310
S.E. of regression	2.267626	Akaike info criterion	4.477965
Sum squared resid	3908.016	Schwarz criterion	4.490133
Log likelihood	-1704.105	F-statistic	240.6726
Durbin-Watson stat	2.061115	Prob(F-statistic)	0.000000

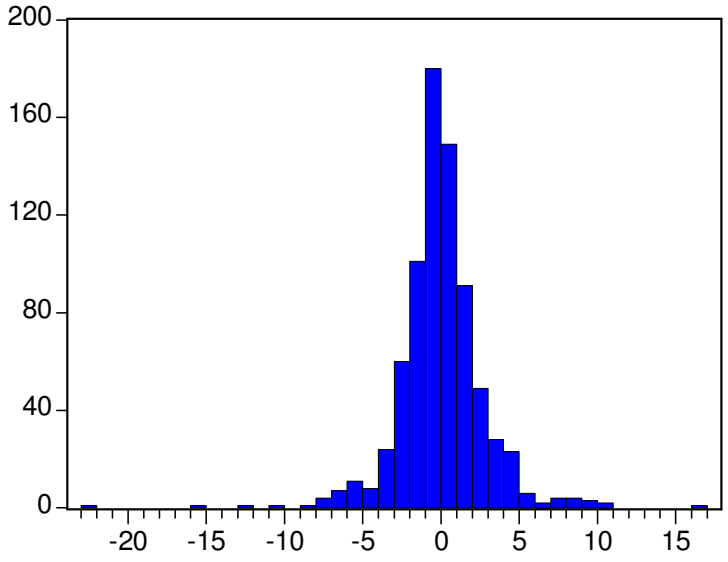


44.)Pohjola Pankki OYJ

Dependent Variable: A44
Method: Least Squares
Date: 08/08/12 Time: 12:43
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	1.011268	0.107625	9.396251	0.0000
C	-0.028379	0.084217	-0.336977	0.7362

R-squared	0.244277	Mean dependent var	0.364664
Adjusted R-squared	0.243282	S.D. dependent var	3.209992
S.E. of regression	2.792356	Akaike info criterion	4.894270
Sum squared resid	5925.913	Schwarz criterion	4.906438
Log likelihood	-1862.717	F-statistic	245.6591
Durbin-Watson stat	2.289519	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

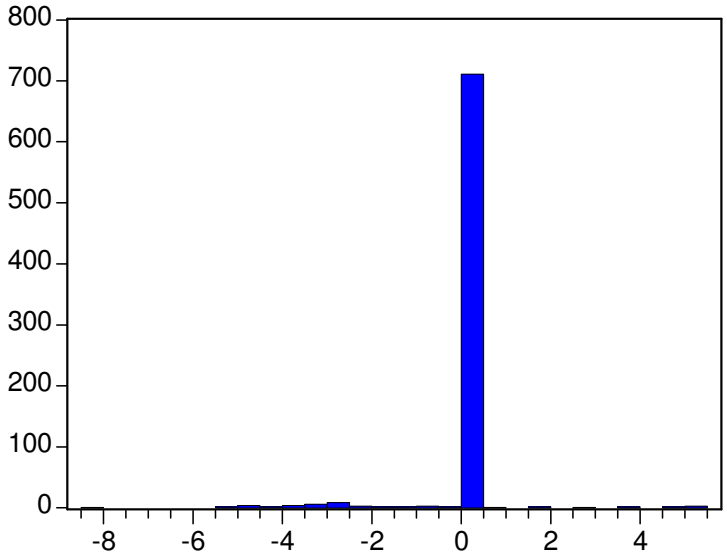
Mean	2.56e-16
Median	-0.076463
Maximum	16.74655
Minimum	-22.57630
Std. Dev.	2.790521
Skewness	-0.513164
Kurtosis	12.98702
Jarque-Bera	3200.206
Probability	0.000000

45.)Osterreichische Volksbanken AG

Dependent Variable: A45
Method: Least Squares
Date: 08/08/12 Time: 12:43
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.013330	0.028784	0.463106	0.6434
C	0.284870	0.035611	7.999420	0.0000

R-squared	0.000523	Mean dependent var	0.290051
Adjusted R-squared	-0.000793	S.D. dependent var	0.914811
S.E. of regression	0.915173	Akaike info criterion	2.663214
Sum squared resid	636.5318	Schwarz criterion	2.675382
Log likelihood	-1012.685	F-statistic	0.397372
Durbin-Watson stat	1.974122	Prob(F-statistic)	0.528639



Series: Residuals
Sample 2 763
Observations 762

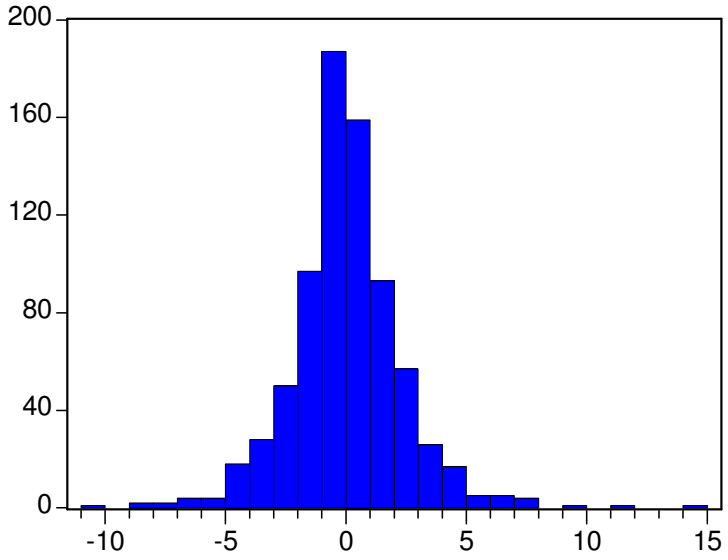
Mean	-4.01e-19
Median	0.111956
Maximum	5.117299
Minimum	-8.090515
Std. Dev.	0.914572
Skewness	-2.228317
Kurtosis	26.47504
Jarque-Bera	18127.31
Probability	0.000000

46.)Fondiaria SA

Dependent Variable: A46
Method: Least Squares
Date: 08/08/12 Time: 12:44
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.951699	0.096565	9.855517	0.0000
C	-0.133939	0.087983	-1.522323	0.1283

R-squared	0.286475	Mean dependent var	0.235952
Adjusted R-squared	0.285537	S.D. dependent var	2.789553
S.E. of regression	2.357896	Akaike info criterion	4.556037
Sum squared resid	4225.350	Schwarz criterion	4.568205
Log likelihood	-1733.850	F-statistic	305.1351
Durbin-Watson stat	2.151545	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

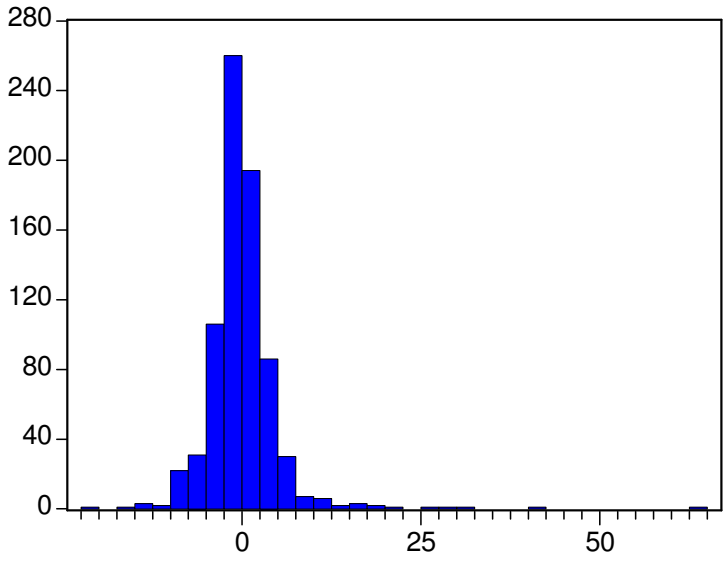
Mean	1.23e-16
Median	-0.050831
Maximum	14.67176
Minimum	-10.17550
Std. Dev.	2.356346
Skewness	0.428352
Kurtosis	7.053335
Jarque-Bera	544.9400
Probability	0.000000

47.)IKB Deutsche Industriebank AG

Dependent Variable: A47
Method: Least Squares
Date: 08/08/12 Time: 12:44
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.857432	0.191095	4.486937	0.0000
C	-0.094263	0.158676	-0.594062	0.5526

R-squared	0.062533	Mean dependent var	0.238989
Adjusted R-squared	0.061299	S.D. dependent var	5.379295
S.E. of regression	5.211815	Akaike info criterion	6.142355
Sum squared resid	20643.89	Schwarz criterion	6.154522
Log likelihood	-2338.237	F-statistic	50.69485
Durbin-Watson stat	2.136587	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

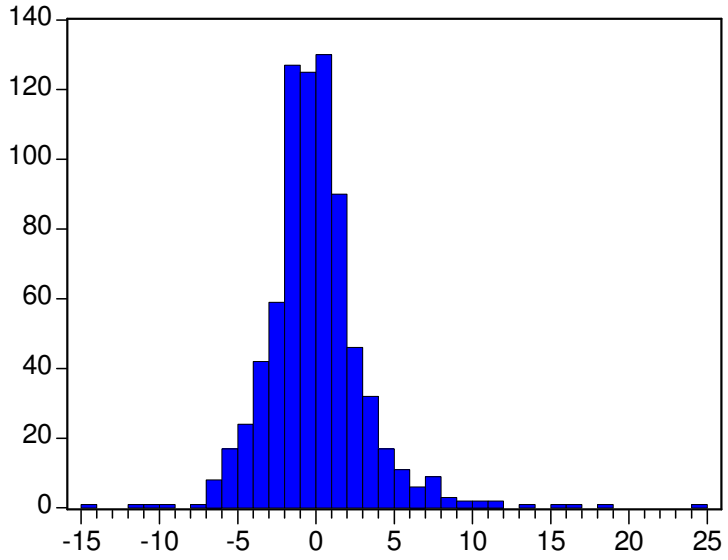
Mean	1.91e-16
Median	-0.262679
Maximum	63.24718
Minimum	-22.00537
Std. Dev.	5.208390
Skewness	3.830148
Kurtosis	40.51436
Jarque-Bera	46545.73
Probability	0.000000

48.)Agricultural Bank of Greece SA

Dependent Variable: A48
Method: Least Squares
Date: 08/08/12 Time: 12:45
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.834569	0.083741	9.966128	0.0000
C	-0.098752	0.096226	-1.026255	0.3051

R-squared	0.139929	Mean dependent var	0.225615
Adjusted R-squared	0.138797	S.D. dependent var	3.500155
S.E. of regression	3.248179	Akaike info criterion	5.196687
Sum squared resid	8018.505	Schwarz criterion	5.208855
Log likelihood	-1977.938	F-statistic	123.6481
Durbin-Watson stat	2.107034	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

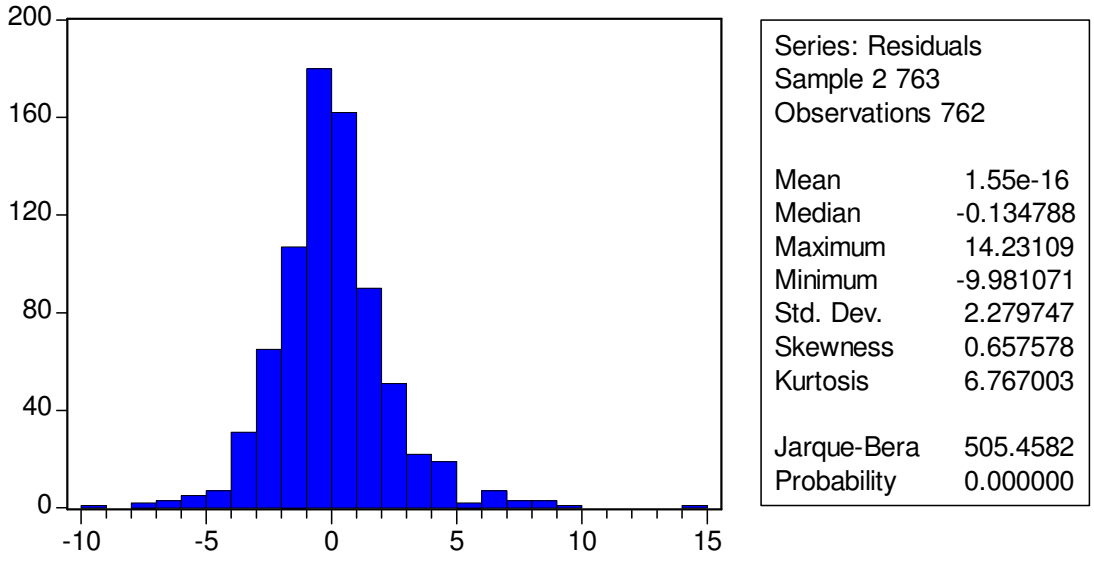
Mean	1.69e-16
Median	-0.175927
Maximum	24.11673
Minimum	-14.38966
Std. Dev.	3.246044
Skewness	1.339408
Kurtosis	10.95947
Jarque-Bera	2239.300
Probability	0.000000

49.)Credito Emiliano SA

Dependent Variable: A49
Method: Least Squares
Date: 08/08/12 Time: 12:45
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.907174	0.086271	10.51535	0.0000
C	-0.029732	0.086249	-0.344726	0.7304

R-squared	0.280436	Mean dependent var	0.322853
Adjusted R-squared	0.279490	S.D. dependent var	2.687522
S.E. of regression	2.281246	Akaike info criterion	4.489942
Sum squared resid	3955.105	Schwarz criterion	4.502110
Log likelihood	-1708.668	F-statistic	296.1958
Durbin-Watson stat	1.924399	Prob(F-statistic)	0.000000

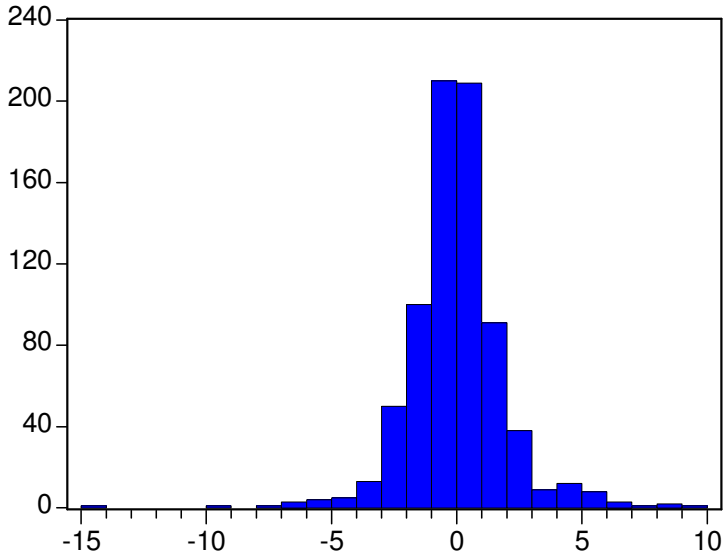


50.)Sampo OYJ

Dependent Variable: A50
Method: Least Squares
Date: 08/08/12 Time: 12:46
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.861238	0.090579	9.508141	0.0000
C	0.093165	0.070900	1.314022	0.1892

R-squared	0.329501	Mean dependent var	0.427896
Adjusted R-squared	0.328619	S.D. dependent var	2.353821
S.E. of regression	1.928670	Akaike info criterion	4.154159
Sum squared resid	2827.022	Schwarz criterion	4.166327
Log likelihood	-1580.735	F-statistic	373.4848
Durbin-Watson stat	2.228414	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

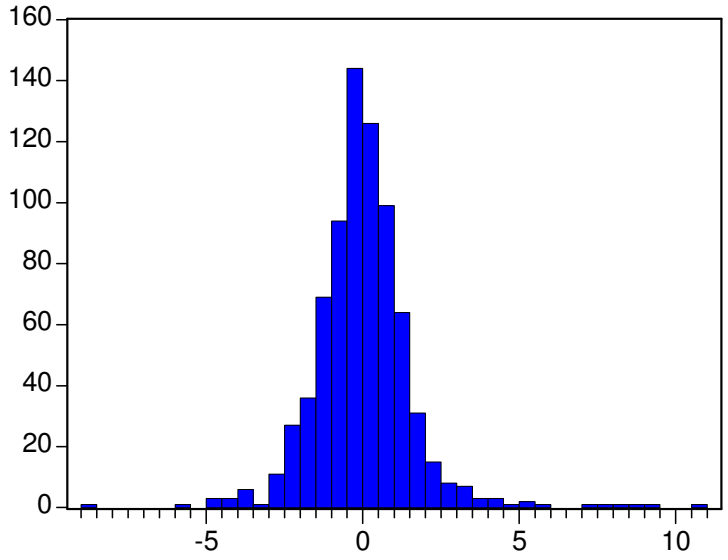
Mean	1.31e-16
Median	-0.049050
Maximum	9.121587
Minimum	-14.03337
Std. Dev.	1.927402
Skewness	-0.148729
Kurtosis	9.876413
Jarque-Bera	1504.110
Probability	0.000000

51.)Banca Populare di Sondrio SA

Dependent Variable: BPSO_IM_EQUITY
Method: Least Squares
Date: 08/08/12 Time: 12:57
Sample (adjusted): 2 763
Included observations: 762 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=6)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A00	0.521317	0.072425	7.198015	0.0000
C	0.130478	0.053132	2.455737	0.0143

R-squared	0.208641	Mean dependent var	0.333094
Adjusted R-squared	0.207600	S.D. dependent var	1.790525
S.E. of regression	1.593869	Akaike info criterion	3.772828
Sum squared resid	1930.719	Schwarz criterion	3.784995
Log likelihood	-1435.447	F-statistic	200.3736
Durbin-Watson stat	2.056596	Prob(F-statistic)	0.000000



Series: Residuals
Sample 2 763
Observations 762

Mean	2.39e-17
Median	-0.072318
Maximum	10.76721
Minimum	-8.578398
Std. Dev.	1.592822
Skewness	1.077109
Kurtosis	11.32008
Jarque-Bera	2345.193
Probability	0.000000

Appendix VI – Results disclosure index analysis

Sample number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Disclosure item number																										
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	0	1	1	1	0	0	1	1	1	0	1	1	1	1	0	0	0	1	1	1	0
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
8	0	1	1	1	1	0	0	0	1	0	1	0	1	1	1	0	1	1	0	0	0	1	1	0	1	0
9	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	1
10	0	1	0	0	1	1	0	1	1	1	1	1	1	1	0	0	1	0	1	0	0	1	1	1	0	0
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
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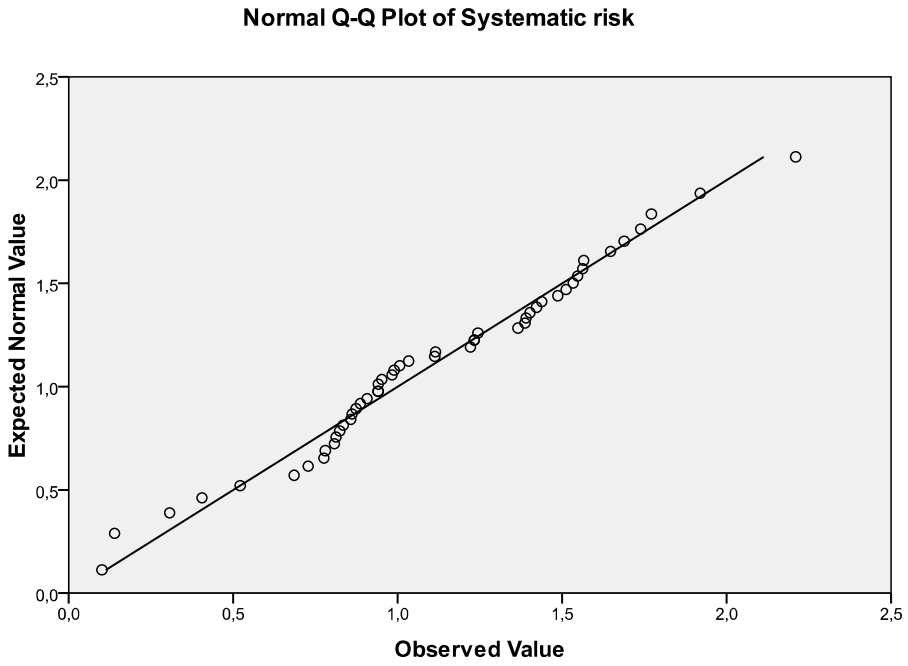
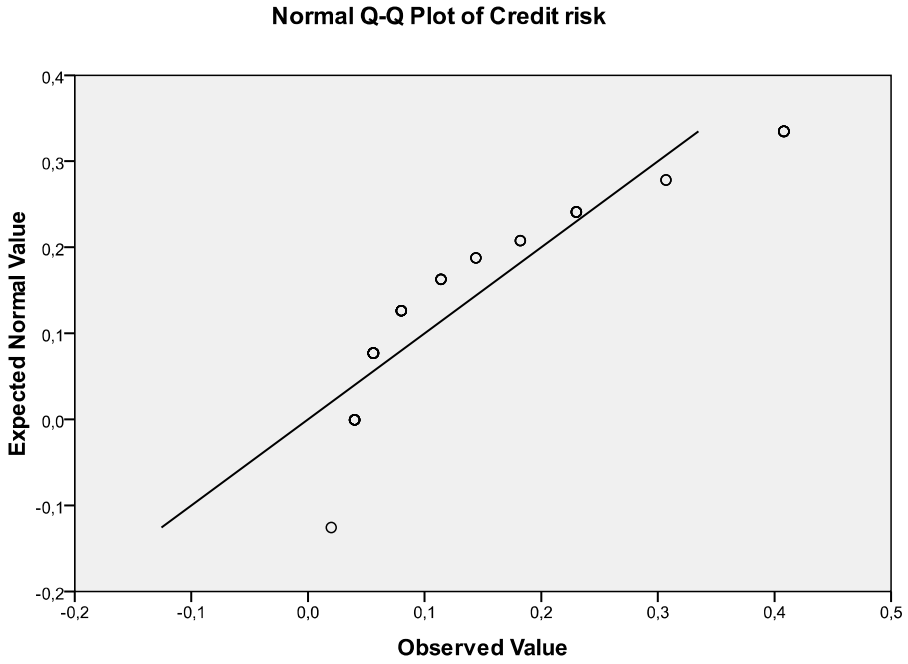
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1
19	1	1	1	1	0	0	1	1	1	1	1	0	1	1	0	1	1	0	0	0	1	1	0	1	1	1
20	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0
22	1	1	0	1	0	1	1	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
24	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
25	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
26	0	0	1	1	0	0	0	1	1	0	1	1	1	1	0	0	0	1	0	0	0	1	0	1	0	0
27	1	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1	0	0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
31	1	0	1	1	0	1	1	0	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	1	1
Total credit risk items disclosed	25	25	26	26	22	23	25	22	25	24	25	24	26	25	21	22	24	23	20	15	20	21	22	25	23	21

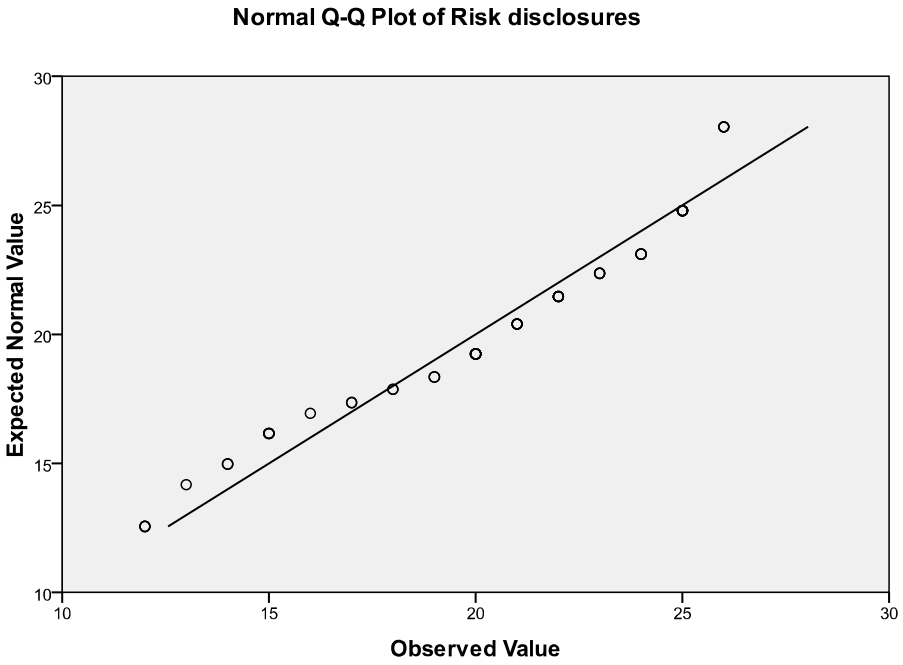
Sample number	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
Disclosure item number																									
1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1		1	1	1	1	1	1
2	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1		1	1	1	1	1	1
3	0	0	0	1	0	0	0	0	1	0	1	0	1	0	0	1	1	1		0	1	0	0	1	1
4	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1		1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1
6	1	1	1	1	0	1	1	0	1	1	1	0	1	1	1	1	1	1		1	1	1	1	0	0
7	1	0	0	1	0	1	1	0	1	1	1	0	1	1	1	1	1	1		1	1	1	0	0	1
8	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	0	0	0		0	1	0	0	0	0
9	1	0	0	1	0	1	1	0	1	1	1	0	1	1	1	1	1	1		1	0	0	0	0	0
10	0	0	0	0	0	0	1	0	0	1	1	1	1	1	1	1	0	0		0	1	0	0	0	0
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1		1	1	1	1	0	1
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1		1	1	1	1	0	1
14	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1		1	1	1	1	1	1
15	0	1	1	0	1	0	1	1	0	1	0	1	0	1	0	1	1	1		1	1	1	1	1	1
16	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1		1	1	1	1	1	1
17	1	1	1	1	0	1	1	1	1	0	0	0	0	1	1	1	1	1		1	1	1	1	1	1
18	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	1	1		1	1	1	1	1	1
19	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	1	0	0		0	0	0	0	0	0
20	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1		0	1	1	0	0	1
21	0	0	0	1	1	1	0	0	0	1	0	0	1	1	1	1	1	1		1	1	1	1	1	0
22	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	1	0	0		0	1	1	0	0	0
23	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1		0	1	1	0	1	0
24	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1		0	0	1	0	0	1
25	0	1	0	1	1	0	0	1	1	1	1	0	0	1	0	1	1	0		0	1	1	0	0	1
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0		0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0		0	0	0	0	0	0
31	1	1	0	0	1	0	1	0	0	1	1	1	0	1	0	1	1	0		0	0	0	0	0	1
Total credit risk items disclosed	15	15	14	20	12	18	18	14	17	20	21	16	20	19	12	25	22	20		15	21	19	13	12	17

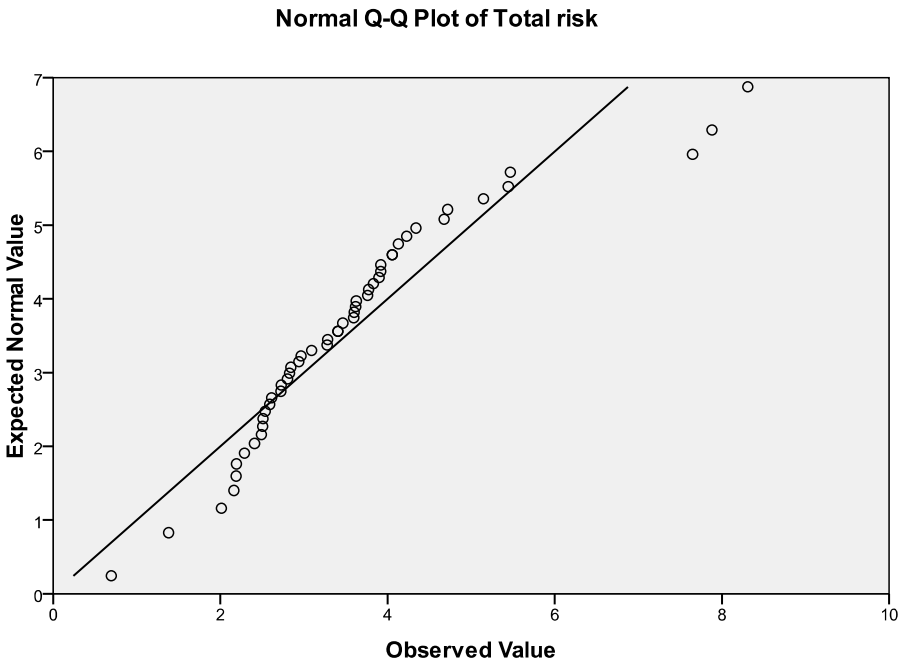
Appendix VII –Results association with correlation

Normality tests inputted variables:






Normal Q-Q Plot of Risk disclosures
Expected Normal Value
Observed Value
10
15
20
25
30


Normal Q-Q Plot of Total risk
Expected Normal Value
Observed Value
0
1
2
3
4
5
6
7
8
10

1.) Association systematic risk and credit risk disclosures

Descriptive Statistics

	Mean	Std. Deviation	N
Systematic risk	1,11271814	,445856369	50
Risk disclosures	20,30	4,191	50

A.) Pearson correlations

Correlations

		Systematic risk	Risk disclosures
Systematic risk	Pearson Correlation	1	,397**
	Sig. (2-tailed)		,004
	Sum of Squares and Cross-products	9,741	36,304
	Covariance	,199	,741
	N	50	50
Risk disclosures	Pearson Correlation	,397**	1
	Sig. (2-tailed)	,004	
	Sum of Squares and Cross-products	36,304	860,500
	Covariance	,741	17,561
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

B.) Spearman Correlations

Correlations

			Systematic risk	Risk disclosures
Spearman's rho	Systematic risk	Correlation Coefficient	1,000	,444**
		Sig. (2-tailed)	.	,001
		N	50	50
	Risk disclosures	Correlation Coefficient	,444**	1,000
		Sig. (2-tailed)	,001	.
		N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

2.) Association total risk and credit risk disclosures

Descriptive Statistics

	Mean	Std. Deviation	N
Total risk	3,55939609	1,478245145	50
Risk disclosures	20,30	4,191	50

A.) Pearson Correlations

Correlations

		Total risk	Risk disclosures
Total risk	Pearson Correlation	1	,138
	Sig. (2-tailed)		,338
	Sum of Squares and Cross-products	107,075	42,018
	Covariance	2,185	,858
	N	50	50
Risk disclosures	Pearson Correlation	,138	1
	Sig. (2-tailed)	,338	
	Sum of Squares and Cross-products	42,018	860,500
	Covariance	,858	17,561
	N	50	50

B.) Spearman Correlations

Correlations

			Total risk	Risk disclosures
Spearman's rho	Total risk	Correlation Coefficient	1,000	,241
		Sig. (2-tailed)	.	,091
		N	50	50
	Risk disclosures	Correlation Coefficient	,241	1,000
		Sig. (2-tailed)	,091	.
		N	50	50

3.) Association unsystematic risk and credit risk disclosures

Descriptive Statistics

	Mean	Std. Deviation	N
Y3	2,44667794882E0	1,207607249018E0	50
X1	20,30	4,191	50

Correlations

		Y3	X1
Y3	Pearson Correlation	1	,023
	Sig. (2-tailed)		,874
	N	50	50
X1	Pearson Correlation	,023	1
	Sig. (2-tailed)	,874	
	N	50	50

Correlations

			Y3	X1
Spearman's rho	Y3	Correlation Coefficient	1,000	,089
		Sig. (2-tailed)	.	,539
		N	50	50
	X1	Correlation Coefficient	,089	1,000
		Sig. (2-tailed)	,539	.
		N	50	50

4.) Association default risk and credit risk disclosures

Descriptive Statistics

	Mean	Std. Deviation	N
Credit risk	,14756	,121826	50
Risk disclosures	20,30	4,191	50

A.) Pearson Correlations

Correlations

		Credit risk	Risk disclosures
Credit risk	Pearson Correlation	1	-,772**
	Sig. (2-tailed)		,000
	Sum of Squares and Cross-products	,727	-19,315
	Covariance	,015	-,394
	N	50	50
Risk disclosures	Pearson Correlation	-,772**	1
	Sig. (2-tailed)	,000	
	Sum of Squares and Cross-products	-19,315	860,500
	Covariance	-,394	17,561
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

B.) Spearman Correlations

Correlations

			Credit risk	Risk disclosures
Spearman's rho	Credit risk	Correlation Coefficient	1,000	-,778**
		Sig. (2-tailed)	.	,000
		N	50	50
	Risk disclosures	Correlation Coefficient	-,778**	1,000
		Sig. (2-tailed)	,000	.
		N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix VIII –Results association with regression

0.)Correlation matrix for testing on multicolinearity

Correlations

		X1	X2
X1	Pearson Correlation	1	,531**
	Sig. (2-tailed)		,000
	N	50	50
X2	Pearson Correlation	,531**	1
	Sig. (2-tailed)	,000	
	N	50	50

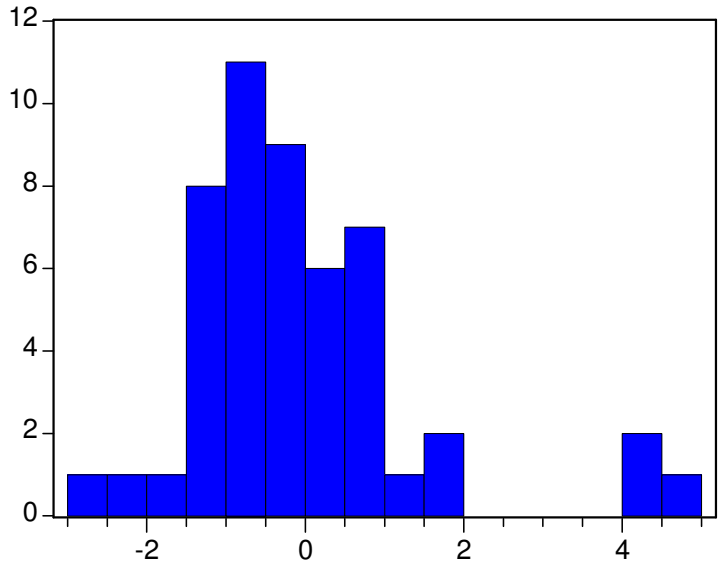
**. Correlation is significant at the 0.01 level (2-tailed).

1.)Association total risk and credit risk disclosures with additional testing

Dependent Variable: Y1
Method: Least Squares
Date: 11/20/12 Time: 12:14
Sample: 1 50
Included observations: 50
Newey-West HAC Standard Errors & Covariance (lag truncation=3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.718239	1.013545	2.681912	0.0101
X1	0.038874	0.047825	0.812845	0.4204
X2	1.17E-07	1.76E-07	0.664653	0.5095

R-squared	0.021193	Mean dependent var	3.559396
Adjusted R-squared	-0.020459	S.D. dependent var	1.478245
S.E. of regression	1.493290	Akaike info criterion	3.697965
Sum squared resid	104.8060	Schwarz criterion	3.812687
Log likelihood	-89.44913	F-statistic	0.508809
Durbin-Watson stat	1.969057	Prob(F-statistic)	0.604485



Series: Residuals
Sample 1 50
Observations 50

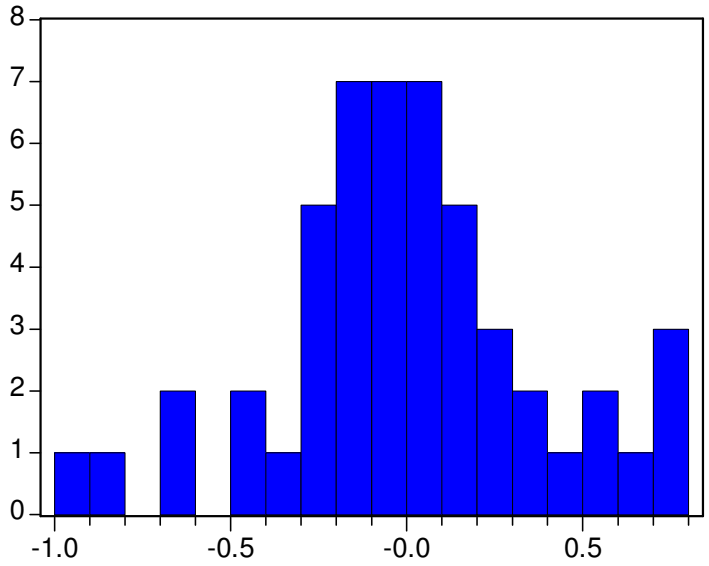
Mean	-3.15e-16
Median	-0.237180
Maximum	4.789571
Minimum	-2.943228
Std. Dev.	1.462497
Skewness	1.546314
Kurtosis	6.220606
Jarque-Bera	41.53469
Probability	0.000000

2.)Association systematic risk and credit risk disclosures with additional testing

Dependent Variable: Y2
Method: Least Squares
Date: 11/20/12 Time: 12:42
Sample: 1 50
Included observations: 50
Newey-West HAC Standard Errors & Covariance (lag truncation=3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.627595	0.241809	2.595421	0.0126
X1	0.017559	0.013238	1.326364	0.1911
X2	2.90E-07	8.41E-08	3.446834	0.0012

R-squared	0.293892	Mean dependent var	1.112718
Adjusted R-squared	0.263845	S.D. dependent var	0.445856
S.E. of regression	0.382542	Akaike info criterion	0.974170
Sum squared resid	6.877921	Schwarz criterion	1.088892
Log likelihood	-21.35426	F-statistic	9.781028
Durbin-Watson stat	1.942683	Prob(F-statistic)	0.000281



Series: Residuals
Sample 1 50
Observations 50

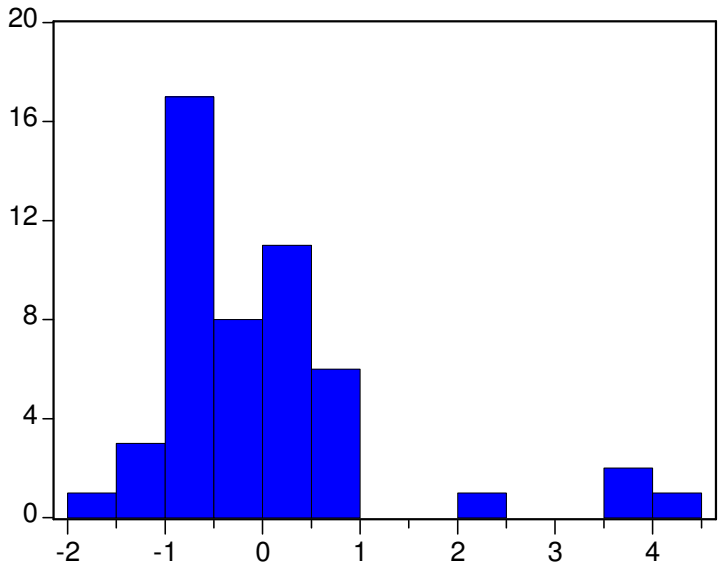
Mean	-1.17e-16
Median	-0.008740
Maximum	0.785202
Minimum	-0.953900
Std. Dev.	0.374654
Skewness	-0.156743
Kurtosis	3.489195
Jarque-Bera	0.703302
Probability	0.703526

3.)Association unsystematic risk and credit risk disclosures with additional testing

Dependent Variable: Y3
Method: Least Squares
Date: 11/20/12 Time: 12:43
Sample: 1 50
Included observations: 50
Newey-West HAC Standard Errors & Covariance (lag truncation=3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.090643	0.838061	2.494619	0.0162
X1	0.021315	0.039646	0.537634	0.5934
X2	-1.73E-07	1.46E-07	-1.179971	0.2439

R-squared	0.007143	Mean dependent var	2.446678
Adjusted R-squared	-0.035106	S.D. dependent var	1.207607
S.E. of regression	1.228621	Akaike info criterion	3.307787
Sum squared resid	70.94701	Schwarz criterion	3.422509
Log likelihood	-79.69468	F-statistic	0.169076
Durbin-Watson stat	1.985484	Prob(F-statistic)	0.844956



Series: Residuals
Sample 1 50
Observations 50

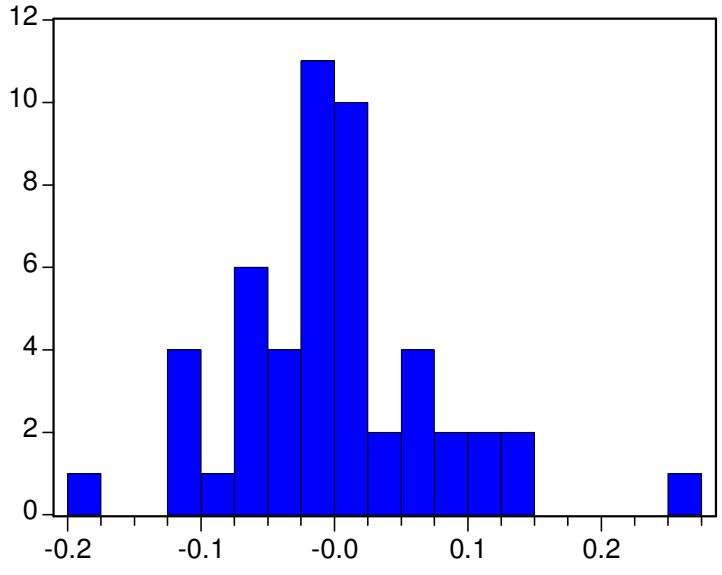
Mean	1.55e-16
Median	-0.149031
Maximum	4.054852
Minimum	-1.989328
Std. Dev.	1.203286
Skewness	1.820198
Kurtosis	6.753446
Jarque-Bera	56.96008
Probability	0.000000

4.)Association default risk and credit risk disclosures with additional testing

Method: Least Squares
Date: 11/20/12 Time: 12:44
Sample: 1 50
Included observations: 50
Newey-West HAC Standard Errors & Covariance (lag truncation=3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.601025	0.087157	6.895859	0.0000
X1	-0.022301	0.004005	-5.568132	0.0000
X2	-1.72E-09	1.11E-08	-0.155469	0.8771

R-squared	0.596253	Mean dependent var	0.147560
Adjusted R-squared	0.579072	S.D. dependent var	0.121826
S.E. of regression	0.079039	Akaike info criterion	-2.179621
Sum squared resid	0.293618	Schwarz criterion	-2.064900
Log likelihood	57.49053	F-statistic	34.70472
Durbin-Watson stat	1.824851	Prob(F-statistic)	0.000000



Series: Residuals
Sample 1 50
Observations 50

Mean	-2.46e-18
Median	-0.006148
Maximum	0.253115
Minimum	-0.197049
Std. Dev.	0.077409
Skewness	0.546833
Kurtosis	4.491071
Jarque-Bera	7.123748
Probability	0.028386