ANGLIA RUSKIN UNIVERSITY

EARNINGS MANAGEMENT: A STUDY OF CREDIT INSTITUTIONS IN HUNGARY 1999-2012

ENDRE BERETKA

A thesis in partial fulfilment of the

requirements of Anglia Ruskin University

for the degree of Doctor of Philosophy

Submitted: January 2016

ACKNOWLEDGEMENT

I wish to thank my Family for their continuous support and patience given towards this study.

I am most grateful to my supervisors, Dr. Andrew Armitage and Dr. Lenka Krupova for their advice and guidance during my research study.

ANGLIA RUSKIN UNIVERSITY

ABSTRACT

LORD ASHCROFT INTERNATIONAL BUSINESS SCHOOL

DOCTOR OF PHILOSOPHY

EARNINGS MANAGEMENT: A STUDY OF CREDIT INSTITUTIONS IN HUNGARY 1999-2012

ENDRE BERETKA

January 2016

After the fall of the communist regime in Hungary, the country went through a transitional change. As a result, new financial reporting and accounting standards were put forward for adoption by Parliament in compliance with pertaining European and international legislation. The examination of credit institutions' financial statements is an unexplored area in Hungary. This study set out to investigate their annual financial reports to seek evidence if credit institutions, both large and small by assets size, avoided earnings decreases and/or engaged in earnings management (EM) prior to and after the 2008 financial crisis.

The Burgstahler and Dichev (1997), Degeorge, Patel and Zeckhauser (1999) models and Kolmogorov-Smirnov, Monte-Carlo Method, accrual, benchmark and distributional tests were used to study credit institutions financial statements for the period of 1999-2012. A total of 16 banking industry specific ratios were selected to analyse credit institution's annual financial statements. Four hypotheses were tested with three empirical testing approaches with 95% and 99% confidence intervals and 0.05 and 0.01 significance levels.

The findings of this study confirm that foreign and domestic credit institutions trading in Hungary, regardless of their size, not only managed their earnings but also avoided earnings decreases both prior to and after the 2008 financial crisis. Additionally, 7 out of the 16 tested ratios do not contain total assets; therefore, they do not suffer from a possible reverse accruals effect. The application of non-accruals base ratios for statistical testing may increase the power of the test.

The conclusion and the original contribution this study provides to the pool of knowledge on the subject in question adds new evidence to existing literature on earnings management by being the first to examine as well as to provide significant evidence on earnings management of foreign and domestic credit institutions trading in Hungary, an ex-communist Eastern European economy.

Key words: Earnings Management, Financial Ratios, Credit Institutions in Hungary, Discontinuity

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

Chapter 1

1. Introduction

1.1. Personal Quest to Research

During my professional career, I was unwillingly become aware of aggressive accounting practices in several companies I worked for in the past. I raised concerns and expressed disagreement with such practices, where the management used accountants and finance leaders to achieve company goals by engaging in accounting manipulation that led to earnings management. Witnessing aggressive accounting practices prompted me to investigate the subject by reading research material on the phenomenon of earnings management.

Bierman (2008) writes about accounting and finance lessons of the energy giant Enron. Jones (2011) discusses the Xerox (photocopying and printing company) company's scandalous accounting reports, in which they overstated their revenues. Jones (2011) further writes on the WorldCom accounting scandal, where WorldCom manipulated its accounting books that led to the fraud of $3.9bn. Jones (2011) also points out, that apart from Lehman Brothers and Bear Stearns banks, which collapsed due to accounting scandals, other companies worldwide went bankrupt due to creative accounting. For example, Bank of Credit and Commerce International in the United Kingdom, Bank of Crete in Greece, CO OP in Germany, ETBA Finance in Greece, Kanebo in Japan, Mirror Group in the United Kingdom, Parmalat in Italy, just a few to mention. Bierman (2008) writes about on the auditor, Arthur Andersen's role in the Enron collapse. Jones (2011, p.475) points out that *'…lack of due professional diligence of the auditors….'*. Larcker and Richardson (2004, p.626) argue, as companies pay extensive fees for audits, auditors are becoming dependent on fees paid for audits. This form of dependence can result in a kind of auditors' '*financial reliance'* on companies, due to the fees they receive for their auditing services. This state can compromise the independence of auditors who screen the financial statements to verify whether companies follow the Generally Accepted Accounting Principles or GAAP. Furthermore, it seems that due to recent bank collapses, such as Lehman Brothers, Bear Stearns, Bank of Credit and Commerce International, Bank of Crete and ETBA Finance, financial authorities do not have working advance warning models and/or approaches against possible manipulation of financial statements. Wiggins, Piontek and Metrick (2014) point out '*Regulator Inaction*' prior to Lehman Brothers bankruptcy. Evidence of creative accounting that led to high profile company bankruptcies points towards regulators failure to recognise creative accounting practices and thus prevent bankruptcies.

Earnings management has been investigated in the banking industry. One of the earliest studies that examined banks was made by Beatty, Chamberlain and Magliolo (1995). Since 2000 additional studies investigated banks, such as Beatty and Harris (2001); Beatty, Ke and Petroni (2002); Shen and Chih (2005) and others. However, apart from this study, there is no evidence that these financial reports of credit institutions in Hungary have ever been, or are currently being investigated for evidence of earnings management. The sections bellow and Chapter 2 in particular will outline studies that were published on credit institutions in Hungary.

1.2. Background of Hungary's banking sector

In the mid-19th century, Hungary was part of the Austro-Hungarian dual Monarchy. Financial institutions were still a growing industry at the time. Hungary had four big banks and a few smaller local savings banks. Out of these, only the First Pest Domestic Savings Banks and the Pest Hungarian Commercial Bank were truly Hungarian financial institutions in the mid-19th century. The other two trading banks were in the ownership of the Austrian National Bank and the Vienna Creditanstalt branch in Pest. The major foreign investors were British, Austrian and French, who formed the Anglo-Hungarian Bank and the Franco-Hungarian Bank.

By the end of the 19th-century banks from Belgium, France and Austria were the main investors in the Hungarian Banking industry, who formed the major banks, a total of six, referred to, at the time, as the Big Six. Apart from these, the Pest Domestic Savings Bank was a non-profit oriented bank at the time it had been formed and nearly all of its shares were owned by Hungarian subjects. The Pest Domestic Savings Bank later became a joint stock company. Before the First World War, Hungary had over 5000 banks and financial ventures. Barcsay (1991).

With the breakout of the First World War, the Austro-Hungarian Empire fell apart, which also led to a breakup of the Austrian-Hungarian Bank in 1918. The Central Bank of Hungary, (Magyar Nemzeti Bank - in Hungarian), was formed in 1924, the first independent central bank in Hungary. Functions of the central bank were taken over by the Royal Hungarian State Bank, or 'Magyar Királyi Állami Jegyintézet' – in Hungarian, in 1921 and it operated until 1924. After its formation, the Central Bank of Hungary had the same share of duties as its western counterparts, with the addition of foreign exchange tasks. Most importantly Hungary had a strong banking system with its independent Central Bank. (Source: the Central Bank of Hungary, and 'A Magyar Országos Levéltár Segédletei' - in Hungarian)

After World War II, Hungary's political path changed towards communism. In 1946, as part of the political changes, the shares of the Central Bank of Hungary ('MNB' in Hungarian) were nationalised. Commercial and savings banks were closed. By 1947, all financial institutions were nationalised and the banking system went from 'two-tier banking' to a so-called 'mono-banking' structure. The main role of the MNB was to 'organise state funding, manage the investments accounts of the state', and deal with commercial duties. The Central government was overseeing the complete operation of the Central bank. (Source: The Central Bank of Hungary – MNB)

In 1949, The National Savings Bank, (Országos Takarékpénztár, OTP - in Hungarian) was formed to deal with deposits and had total monopoly. The MNB and the OTP management were also overseen by the central government. Prior to 1987, the Hungarian economy went through an early reform between 1960 and 1980, to become more open towards Western Europe. The reforms in 1960 led to more foreign investments in the 1970s. Due to these investments, in 1979 the MNB took steps to modernise its functioning and started co-operation with 5 foreign banks. In 1979 a strict state control of banking was slightly eased, as a foreign bank, namely the Central European International Bank (CIB), was allowed to trade in Hungary. This was a joint venture with MNB, where MNB had a 34% stake and six foreign banks had 11% stakes each. The main tasks of CIB were to deal with 'foreign trade payments and provide financial support for export', (Neale and Bozsik, 2001; Majnoni, Shankar and Várhegyi, 2003). From the mid-1980s a number of changes were implemented. In 1983, the communist government reached a political decision to change the MNB's monobanking structure to a two-tier banking system (Ábel and Szakadát, 1997).

After 1989, the communist regime fell in Hungary. The first free parliamentary election since World War II took place in 1990, and since then Hungary has been going through a transitional change. Financial reporting and accounting legislations were drawn up and adopted to comply with European and international reporting standards. By 1999 the Hungarian financial sector has gone through privatisation (for example Hungarian Foreign Trade Bank – MKB, Országos Takarékpénztár - OTP Bank privatisation, Budapest Bank – BB, and other, Ábel and Szakadát, 1997), and consolidation (for example, Kereskedelemi Ès Hitelbank – K&H Bank and Magyar

Hitel Bank – MHB; Neale and Bozsik, 2001). Foreign banks (for example General Electric Bank and European Bank for Reconstruction and Development - EBRD) took part in the Hungarian banking privatisation in the form of green-field investments (for example ABN Amro and Creditanstalt of Austria, Neale and Bozsik, 2001; Szapáry, 2001). In 1999, the Hungarian Financial Supervisory Authority (HFSA) was formed, and since 2013 it is part of the Central Bank of Hungary (MNB).

1.3. Research Gap

From 1990, researchers Neale and Bozsik (2001), Szapáry (2001), Várhegyi (2008) were reporting about the way in which assets and loans of Hungarian banks had been privatised, consolidated and taken over. As yet, there have been no attempts in Hungary, as an ex-communist state and a transitional economy, to investigate the financial statements of banks concerning their 'earning anomalies' either by domestic or foreign researchers. Both foreign and domestic-owned banks are operating in Hungary currently, yet only a few research papers have been published thus far, such as '*Banking sector reform in Hungary: Lessons learned, current trends and prospects*' (Szapáry, 2001), or '*The Hungarian Banking System 20 Years After Modernisation',* (Várhegyi, 2008), and the Central Bank of Hungary (MNB) published studies on banks' financial dealings.

However, this does not mean that the financial and non-financial companies were excluded from research elsewhere. In fact, scholars worldwide have been investigating Earnings Management (EM) for over 35 years. For example, a study on Bond Covenants, a type of 'agency problem' was published by Smith and Warner (1979), or Healy (1985), who investigated the effect of bonus schemes on accounting decisions. Watts and Zimmerman (1978) show 'EM due to political costs', whereas Schipper (1989) wrote on the 'EM phenomena'. These early studies on EM had been published far earlier than the Hungarian political and economic transition began in 1989.

As of this thesis, there is no evidence that research on earnings management of Banks financial statements in Hungary has ever been investigated.

1.4. Research Question

The aim of this study is to examine whether there was any earnings manipulation that could have lead to earnings management in the year-end results within credit institutions in Hungary for the period of 1999-2012. The research question of this study reads:

> **'*Did credit institutions trading in Hungary avoid earnings decreases for the period of 1999-2012?'***

Four hypothesises are tested with a total of 16 ratios to answer the research question:

$H0_{(a)}$: Credit institutions (Banks) in Hungary do not manage earnings.

$H0_{(b)}$: Credit institutions (Banks) in Hungary do not manage earnings to avoid earnings decreases.

$H0_{(c)}$: Large and small Credit institutions (Banks) scaled by a median of Total Assets in Hungary do not manage earnings to avoid earnings decreases.

$H0_{(d)}$: Credit institutions (Banks) in Hungary do not manage earnings 'prior to' and 'after' 2008 when the financial crisis starts.

Hypothesis $\mathbf{H_{(a)}}$**:** is tested with 14 ratios, as well as with accrual models, whereas hypothesis $\mathbf{H_{(b)}}$**:** is tested with two additional ratios. Details of testing for each hypothesis are explained in the three main empirical testing approaches, in Chapter 4.

1.5. Contribution to Knowledge

This study differs from earlier studies which investigated earnings management of USA, Western European and Asian countries and also tested accruals in non-financials industry (for example Gore, Pope and Singh, 2007; Sun and Rath, 2012; Enomoto, Kimura and Yamaguchi, 2013) and loan loss provision (for example Kwak, Lee and Eldridge, 2009; Balboa, López-Espionosa and Rubia, 2013; Norden and Stoian, 2014) in the financial industry. This is the first study of this kind in Hungary, in a post–communist, Eastern European country, that investigated earnings management of foreign and domestic credit institutions trading in Hungary, by applying ratio analysis of financial statements in combination with Burgstahler and Dichev (1997), Degeorge, Patel and Zeckhauser (1999) models and with Kolmogorov-Smirnov, Monte-Carlo Method and distributional tests. Additionally, this study tests samples with the accrual approach and performs benchmark analyses of the ratios. There is no evidence that an exact same or a similar study has ever been undertaken in an Eastern European country, in Hungary, or elsewhere that investigates Hungarian banks, with the same or similar research methods, as this study did. This study fills the research gap by providing statistically significant evidence that credit institutions in Hungary engaged in earnings management. Apart from statistical evidence, this study also provides a possible explanation for bank managers’ dealings that may explain why all four hypotheses were rejected which consequently led to an alternative answer to the research question. This study provides new evidence to the existing literature on earnings management, as well as additional contribution to the body of scientific knowledge.

1.6. Limitations and Strengths of the Study

This study presents an in-depth analysis of the Hungarian banks' financial statements in search of possible earnings manipulation. One limitation might be a slightly smaller length of the population of 10 years for financial industry compared to USA and EU studies, which test all industry population with a longer length of the population, for example, 18 years of USA population in the Burgstahler and Dichev (1997) study. The second limitation, which may be construed as the main limitation of this study, is that it suffers from the absence of cash flow analysis and comparability since cash flow statements were unavailable for testing. Due to these limitations, the power of tests might not be the same as of the above mentioned EU and USA studies. Additionally, a third limitation, namely, the tests power, i.e. 9 ratios tested out of 16. This study could not differentiate reversal accruals from the sample, as the Dechow, Hutton, et al. (2012) study points out.

Despite its limitations, this study has its strengths; it cross-examines the financial statements of the credit institutions respectively with a total of 16 ratios, instead of 2-5 variables as earlier studies did. This study also tests sample on assets size, searches for Earnings Management prior to and after the 2008 financial crisis, applies the accrual testing approach and performs benchmark analyses of the 14 ratios. Nevertheless, financial firms cannot be excluded from research, nor from testing banks' data, as banks are an important part of the world economy. Thus by excluding them from scrutiny, we would be too naive to believe that they always follow the rules.

1.7. Structure of the thesis

Chapter 1. The introduction outlines a personal quest to research and present a brief history of the Hungarian banking sector as well as to highlight the current research gap. It highlights the research question in view of the strengths and limitations of this study.

Chapter 2 presents the literature review on Earnings Management, its techniques, motivations, detection and the role of auditors. Furthermore, the literature review focus is on relevant research publications using financial and non-financial company data, as well as grouping studies on a country level. Highlighting and writing in-depth critical reviews of relevant research publications such as Burgstahler and Dichev (1997); Degeorge, Patel and Zeckhauser (1999); Durtschi and Easton (2005; 2009); Beaver, McNichols and Nelson (2007); Burgstahler and Chuck (2015) that were applied for testing the research gap in this study. Initial summary of Chapter 2, studies are grouped as per financial and/or non-financial companies with a short summary of findings. The final part of Chapter 2 summarises the chapter.

Chapter 3 describes Hungary's Banking industry development from 1987 since the political and economic transition began. The outline of Hungary's banking sector transformation, the adoption of International Financial Reporting System (IFRS) and also the list of differences between Hungarian Accounting Standards (HAS) and IFRS are included. It points out regulations to report year-end financial statements under HAS, as well as to research the gap in knowledge about earnings management in Hungary. It includes a review of studies published on credit institutions trading in Hungary. A summary of key differences between Hungarian Accounting Standards and

IFRS are highlighted and various types of financial intermediaries trading methods are outlined. There is a summary of Chapter 3 at the end.

Chapter 4 explains the types of data, and the source and length of the population, and presents credit institutions' data availability format, as well as a number of credit institutions on a yearly basis. It presents formulas for each ratio that follows hypotheses that attempt to answer the research question. Furthermore, it explains accrual and distributional methods of testing, by presenting the accrual and the main models of Burgstahler and Dichev's (1997, p.103) and Degeorge, Patel and Zeckhauser's (1999, p.31), as well as statistical formulas of Kolmogorov-Smirnov one-sample test and benchmark test analysis. Each hypothesis is tested with specific, a total of three main empirical testing approaches. Explanations of each step of calculation in Excel and in SPSS are highlighted in the *Appendix*. Chapter 4 concludes with the summary of the chapter.

Chapter 5 begins with a short summary of testing methods presented in Chapter 4. Each Testing Approach results, with included statistical output tables and histograms, are explained with arguments and comparisons to earlier similar, comparable studies in the subsections of each Testing Approach. Furthermore, it explains statistical and corporate reasons for accepting or rejecting each hypothesis. It also refers to possible limitations of the study. It interprets results of statistical outputs and histograms of the four hypotheses in an attempt to answer the research questions. Chapter 5 concludes with an in-depth discussion of the results for each Testing Approach. It also puts forward reasons for rejecting the hypotheses that were formulated to answer the research question.

Chapter 6 concludes this study by making a brief overview of the aim of this study, as well as the hypotheses that made an attempt to answer the research question. It outlines the empirical findings of each hypothesis and points out the main limitations and strengths of the study. It presents conceptual conclusions by comparing results to similar and relevant studies within the banking industry and also presents answers as to why this study is unique, what new is in it and in what way it represents a major contribution to the pool knowledge. It highlights implications and recommendations for a future study.

Chapter 2

Literature Review on Earnings Management

2.1. Introduction

Chapter 1 presented the introductory section in which the rejection of the researcher to take part in practising aggressive accounting was highlighted, and the fact that it made him curious if this phenomenon of aggressive accounting to manage earnings was only a coincidence or it was and still is a widespread practice. It was also shown that accounting manipulation led to dramatic bankruptcies of well-established and respected companies. The earnings management phenomena, the role of accountants, and strengthening of the accounting standards were highlighted in the Schipper (1989) study. One of the earliest documents on management practises was written in the 18th century by Adam Smith:

> *'The directors of such companies, however, being the managers rather of other people's money than of their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Like the stewards of a rich man, they are opt to consider attention to small matters as not for their master's honour, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less in the management of the affairs of such a company. (Adam Smith, 1776, p.408)'*

Adam Smith elegantly expressed concerns of management bad practises. Since the 18^{th} century, accounting has been evolving, and one of the first definitions on Accounting was written by Duncan (1908, p.84):

> *'Accounting is that science which treats of the methods of recording transactions in business, and interprets the statements recorded in books and documents so that the layman may have a clear conception of the exact financial and managerial standing of the firm or enterprise both in parts and as a whole.'*

A textbook, a theoretical statement by Duncan, which does not always hold true in practice though, as this study will present evidence in this and the following chapters, which all in all challenge Duncan's statement. Similarly, a textbook explanation of accounting that Sterling (1967, p.97) writes:

> *'... accounting as the process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information.'*

Sterling with the above statement does not clarify nor points out the intentional misinformation that a user will or might receive. Additional textbook explanations on accounting and financial reporting are by Higson (2003, p.67) and FASB 2008, CON 1. par. 43:

> *'Accounting is not an end in itself. As an information system, the justification of accounting can be found only in how well accounting information serves those who use it. Thus, […] the basic objective of financial statements is to provide information for making economic decisions.'* - Higson (2003, p.67).

'*The primary focus of financial reporting is information about an enterprise's performance provided by measures of earnings and its components. Investors, creditors, and others who are concerned with assessing the prospects for enterprise net cash inflows are especially interested in that information…'* – Financial Accounting Standards Board (FASB), 2008, CON 1. par.43.

The above quotations show the reader the purpose of the accounting process, financial reporting, but do not refer to a possibility for earnings manipulation during the accounting processes up to financial reporting. That is, myself and the reader might conclude, that in practise financial reporting presents information as they are written in textbooks. That is, financial statements always show true economic information of a company and no earnings management is present.

The author of this study experienced different management practises in presenting economic information of the company. The company's management has two different ways at its disposal to report earnings in the financial statement. They can either choose operating or accountings path, as McKee (2005, p.5) illustrates with an example the Management's decision whether to adopt Operating or Accounting Choices to achieve earnings management (EM). By choosing operating direction, EM is achieved:

- at the end of a quarter to introduce discount on products to boost sales, in order to meet the target and analysts' expectations
- hiring new staff
- purchasing new machinery
- delaying maintenance

Examples of Earnings Management achievements of accounting decisions:

- revenues
- accrual items
- expenses
- assets valuation

Management has a choice to make operating or accounting decisions from the above examples to achieve earnings management. With their decision they also create economic costs to the company, i.e. by delaying maintenance they risk sudden breakdown of machinery, and thus booking accruals will have to make a reverse entry in the coming fiscal year. All these entries will have an effect on earnings level. Empirical evidence, corporate managers and directors suggest that earnings, as part of the financial statements, are important for users, as Watts and Zimmerman (1978, p.113) write '*one function of financial reporting is to constrain management to act in the 'shareholders' interest'*.

Whether using the operating or the accountings path, the company's economic performance must be recorded under the Generally Accepted Accounting Principles, or GAAP (set of rules and principles of each country's accounting regulatory body) and followed and practised by financial professionals. When these rules are observed, financial statements show the financial performance of a company for a given period of time. When an accounting transaction is recorded before receiving cash for it, it is called an accrual accounting. During preparation of year-end financial reports, it is done under accrual accounting. Due to additional information, or, if accounting mistakes occurred during the month, it is common practice for accountants and managers to correct accounting entries before 'month-end' closings. The same practice applies for 'year-end' reports. During this process, accountants tend to over- or under-estimate accounting transactions (i.e. accruals, revenues, stock, expenses) by not following the GAAP principles for one reason or another.

Interpreting financial statements by external users, e.g. corporate, stakeholders, analysts, scholars performing ratio analysis and seeking correlation of the financial statements accounts in order to find any weaknesses and/or strengths of a particular company. An earlier study by Deakin (1976) investigated normality of the distribution of financial accounting ratios for manufacturing firms. From the distributional testing, the author concludes, ratios are not normally distributed. However, the author should also have tested non-manufacturing industry, as the study would be more complete and more of an interest. Whittington (1980) on the other hand investigated properties of accounting ratios, the 'proportional' relationship between calculated ratios. The author presented cases for regression analysis. The drawback of the paper is that the author does not apply hypothesis testing, nor does he provide test results of an industry. Nevertheless, Whittington (1980, p.229) points out the importance of '*testing empirically the appropriateness of the assumptions of ratio analysis*'. Another interesting paper on ratio analysis was published by McLeay and Fieldsend (1987), who investigated the size and textile sector effect of the French companies. The authors observe non-normality and conclude that size and sector effect varies between financial ratios. A slightly different study was done by McLeay and Omar (2000), who investigated ratios on the bases of unbounded ratios (values can be positive or negative) and bounded ratios (values are only positive). The authors tested manufacturing companies in Malaysia. Ratios such as Sales by Net Working Capital can have both negative and positive values; whereas, Sales by Total Assets may have only positive values. The authors point out that unbounded ratio 'may take extreme values in both tails of the distribution'. Bounded ratios may have higher values on the right-hand tail only of the distribution in question. Although the paper is of interest, financial ratios for financials differ from the same for the manufacturing firms.

2.2. Introduction to Earnings Management

Most of the studies over the past 35 years concerning earnings management (EM) have concentrated on the balance sheet, for items in the assets, and within assets, and researchers tested accruals. Scholars wanted to understand if EM is present and if so, why. Schipper (1989, p.91) writes, '… *the variety of accrual options available under Generally Accepted Accounting Principles and the susceptibility of accruals to manipulation mean that the resulting accounting numbers could in principle be managed to the point of uninformativeness, available empirical evidence indicates that accruals do in fact have information content'* - Schipper (1989, p.91). The author only mentions accruals, as a possible means of manipulation. This study presents, in the subsection bellow, an overview of the used techniques to manipulate accounting figures. Scholars all conclude that managers and accountants use their skills to manage earnings in a positive and in the negative approach to conceal EM. Therefore, EM can be a positive occurrence too, as McKee (2005, p.1) writes: *'Earnings management is not to be confused with illegal activities to manipulate financial statements and report results that do not reflect economic realist. These types of activities, popularly known as 'cooking the books', involve misrepresenting financial results.'*

When a firm's management does not follow Shareholders / Owner's (Principal) expectations, i.e. management (Agent) exceeds its authority, and the control over management is not sufficient, the Principal-Agent Problem occurs, as Marnet (2005) points out, also called the 'Agency Problem', Healy and Palepu (2001). Ronen and Yaari (2008, p.42) present an accounting scenario of a flow between Board of Directors, Management, Users and Gatekeepers. Part of the management's responsibility is to produce year-end financial statements, which the Board, as the Shareholders agent, approves or rejects. For example, creditors as one of the 'users', use the year-end financial statements to evaluate the firm's financial performance in repaying loans. Accurate and un-biased statements are therefore vital. If the control of the accounts is poor by the Gatekeepers, i.e. internal auditors, independent external auditors, analysts, credit agencies, regulators, manipulation is more likely to occur. Manipulation and the Principal-Agent problem can be suppressed if the Board of Directors and the External Auditors are truly independent (Marnet, 2005). Executive / manager manipulations are likely when the company's earnings are negative or in decline, as Burgstahler and Dichev (1997) write.

Public users of the financial statements are interested in the firm's operations, most importantly in the net profit as Ball and Brown (1968, p.160) write: *'Net profit can be defined only as the result of the application of set of procedures (X1, X2,...) to set of events (Y1, Y2, ...) with no definitive substantive meaning at all'.* In other words, net profit is not a fact, only a number, an end result from a set of procedures that an accountant adopted beforehand.

Lev (1989) investigates the 'returns and earnings relation'. The author points out that investors, no matter of the industry, use earnings as a measure of company performance. Lev (1989, p.155) argues that '*usefulness of quarterly and annual earnings to investors is very limited*'. The author points out of that the possible reason for this limited usefulness lies in financial reporting quality, where managers manipulate accounting figures in diverse forms. The quality of financial statements depends on the approach the accountants adopted prior to preparing their statements, whether they decide to apply conservative accounting, in which case, their statements will be of high quality. For example Dechow and Skinner (2000, p.239) show ‘The Distinction between Fraud and Earnings Management’, where the authors present accounting choices that can lead to earnings management, EM, or even Fraud. High quality means obeying the GAAP to the letter. On the other hand, a poor accounting approach and disregard for GAAP rules will result in a fraudulent accounting practice. Fraudulent actions are usually practised to achieve personal gain, i.e. higher bonus payments, career enhancements, etc. Poor accounting approach occurs when intentional manipulation of the accounts takes place, i.e. transactions with sales, inventory, accruals, expenses or assets. Balance Sheets show not only present but also past accounting choices made by accountants / managers. Balance sheet items are the area that is most managed, i.e. over or understatement of accruals, loan loss provisions for financial firms (Healy and Wahlen, 1999).

It is a well-known fact that company managers hold inside information about the firm’s economic state that stakeholders may or may not get hold of. Such situations occur when the number of external board members is limited or does not even exist, and all the financial information is in the hand of the company leader (CEO’s) who can monitor, guide and influence managers, as Hartzell and Starks (2003) write. If we just look back at no more than 13 years, companies such as Enron or WorldCom, and many-many others have contributed and gone down in history in one of the biggest company accounting scandals as Cornett, McNutt and Tehranian (2009) point out. Due to these high profile collapses the Sarbanes–Oxley Act of July 2002 was created in the USA. As per Sarbanes–Oxley, or SOX Compliance for short, publicly traded companies on stock exchanges in the USA must conform and comply, no matter their size. In the public statements of many company leaders, their primary goal has been earnings increase over the coming years i.e. growth of the company / earnings, increase in shareholders’ value.

Since 1991 cash flow statement reporting has been on the rise in the USA, EU and in some Asian countries, as it does not suffer from the same problem as earnings (earnings are easier to manipulate, which will be evaluated in more depth below). In order to reduce / eliminate EM, accounting standards were amended in 2003 by the International Accounting Standards Board (IASB), in order to improve the quality of reporting.

Following the IASB changes, Ewert and Wagenhofer (2005) showed evidence, despite IASB (2003) amendments; EM has not been eliminated but increased. The authors argue that by increasing reporting quality, managers using accounting transaction to achieve EM incur costs in the process and the company loses its value. Ewert and Wagenhofer (2005, p.1102) conclude '... *real earnings management strictly increases because the tighter standards induce a greater value relevance, which again increases the marginal benefit of real earnings management.*' The authors showed that IASB 2003 amendment has not achieved its purpose of reducing or eliminating EM.

2.3. A historical overview of Earnings Management

2.3.1. Definition of Earnings Management

Academics defined EM in several ways, the best explanation of EM is by Schipper (1989, p.92): *'….disclosure management' in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain (as opposed to, say, merely facilitating the neutral operation of the process). This definition limits the discussion, in that it includes only the external reporting function and not, for example, managerial accounting reports or activities (such as lobbying the Financial Accounting Standards Board) designed to influence or change Generally Accepted Accounting Principles. The definition of earnings* *management adopted here does not rely on any particular concept of earnings; it is based on a view of accounting numbers as information.'*

The discussion of Schipper's (1989) EM definition is more of a general one, as the author does not specify where i.e. in which part in particular of the financial reports EM may or might occur. In other words, EM is intentional disregard for GAAP principles in order to achieve earning goals.

Similarly, Healy and Wahlen (1999, p.368) point out that:

'Earnings management occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers.'

Fischer and Rosenzweig (1995, p.433) argue:

'There are many ways that accountants and managers can influence the reported accounting results of their organizational units. When such influence is directed at changing the amount of reported earnings, it is known as earnings management.'

All definitions of EM show accountants' / managers' influence on GAAP principles but are no specific to point out which area of financial reporting was influenced or altered in any way to achieve the desired earnings level, thus demonstrating engagement in earnings management in the process. In the next section, this study demonstrates the known earnings management techniques that accountants, financial professionals use to manipulate, alter accounting transactions to achieve their desired earnings.

2.3.2. Techniques to achieve Earnings Management

Although worldwide harmonisation of GAAP is slow, different continents and countries may have different approaches towards EM. Ayres (1994), Francis (2001), McKee (2005), Ronen and Yaari (2008), and others point out, earnings are managed in diverse forms, and the creativity of accountants to achieve EM is enormous. McKee (2005, p.13) explains twelve techniques that are used most to manage earnings:

- '*Cookie Jar Reserves*' technique, is a form of income smoothing, where expenses (i.e. estimates for pension / sales returns / warranty costs / bad debts / tax expenses) are over or underestimated in the current year in order to maintain expected performance in the present, and in the following year.
- *'Big Bath'* technique, also part of income smoothing, applied by companies who due to bad performance intend to report losses, will decide to report all possible losses at once. By applying this technique companies report huge losses in one year with the hope to close down a loss period and report steady growth in the following years. See for example Healy (1985, p.86). An example of reporting huge losses in one fiscal year is assets write-down, debt or operational restructuring.
- '*Big Bet on the Future*' technique arises when a company takes over that is, buys another firm. Examples of Big Bet method are when earnings are consolidated between acquiring and acquired firms, thus a possible increase of earnings, or writing off costs of the acquired firm, i.e. writing of future costs for research and development costs, R&D, which enhances future earnings. Or even including earnings of the acquired company, thus increasing present earnings of the acquiring firm.

- ‘*Flushing*’ the Investment Portfolio, a technique used by firms who wish to invest in buying securities (shares, bonds, options contracts, etc.). EM can occur when the timing of selling these securities generates a gain or a loss, thus, the management achieves its strategy to generate profit or loss. Management can decide to write down securities that are losing market value, thus in all cases, gains or losses are reported in the earnings before interest and taxes (EBIT), also known as operating profit.
- ‘*Throw Out*’ a problem child technique is applied when a parent company decides to sell entities that do not perform and generate losses. The company may create, a ‘special purpose’ entity for the transfer of financial assets, also called ‘variable interest entities’ (VIE), or structured entities. VIE is governed by IFRS No.10. Under IFRS 10, company management ‘requires deciding which entities are controlled’. The process of selling such a poorly performing entity provides an opportunity for EM. (Ernst and Young, 2011)
- ‘*Change GAAP*’, companies once adopt an accounting principle, it is not likely they will change it unless they decide to ‘volunteer’ for new accounting standard, which can be done in every 2-3 years, as per FASB (in the USA). Firms in some industries may improve ‘revenue and expense recognition’ rules, which also encompass an option for EM.
- ‘*Amortisation, Depreciation and Depletion*’ a technique under which accounting rules operating tangible and intangible assets are written off over a period of time. In order to write down the assets value, there is a need to set methodology. This process gives an opportunity for EM.
- ‘*Sale / Leaseback and Asset Exchange*’ techniques are practised when an asset is sold / leased back or exchanged at a time when it is most beneficial for the company, to attain

gains or losses. IAS 17 governs Leases. FASB 98 accounting for sale / leaseback transactions for real estate.

- ‘*Operating v. Non-Operating Income*’, income statements have two parts of income, the operating earnings or earnings before interest and taxes (EBIT), the main earnings source of the company performance, whereas non-operating earnings or expenses are items that do not occur from the company’s core operation, items such as assets write-downs, foreign exchange gains or losses, revenue from gifts / fund raisings, real estate development etc.
- *‘Early Retirement of Debt*’ is a technique, where bonds as a long-term debt are earlier executed by the management of the year of their choice, thus in this way managing earnings.
- *‘Use of Derivatives’* such as bonds, swaps, futures contracts, options are used to protect business interests, i.e. a financial company is trading currencies (i.e. Euros) on the futures market and applying options contracts to protect itself from an unexpected loss of earnings. Earnings Management (EM) is possible by applying derivatives and exercising the contract at a specific time.
- ‘*Shrink the Ship*’ is mainly done when companies repurchase their own shares. If no income was generated with the buyback, there is no income recognition in the books. Shares buyback does not affect the earnings, but it affects the earnings per share (EPS). This technique gives an option for EM.

Accountants and managers use creative EM techniques driven by motivation(s). In the next section, this study presents the known motivations.

2.3.3. Motivation for Earnings Management

As discussed in the previous section, the 12 earnings management techniques are achieved by accounting decisions that are designed to reduce or to influence earnings fluctuation. Making investment or production decisions to influence and to reduce earnings fluctuations are also called Income Smoothing. Income smoothing has been investigated by researchers, Copeland (1968), Beidleman (1973), Moses (1987), Tucker and Zarowin (2006), Matsuura (2008). Beidleman (1973, p.653) defines income smoothing as: '*the intentional dampening of fluctuations about the same level of earnings that is currently considered to be normal for a firm*'.

There is a rule in applying income smoothing: namely, if the management decides to reduce earnings fluctuations for long-term earnings growth, then once applied, it should not intervene in favour of using smoothing techniques again in the future, simply by not following this simple rule EM is created, Copeland (1968). Following Copeland (1968) paper, Beidleman (1973) investigates earnings smoothing with 6 discretionary items: Pension and Retirement expenses, Incentive compensation, R&D expenses, Remitted Earnings from Unconsolidated Subsidiaries, Sales and Advertising Expenses, Plant Retirements. Discretionary items are items that the management has under control. The authors present the test results of the six discretionary items where negative correlation suggests that earnings smoothing took place. Beidleman's (1973) study is one of the earliest investigations of smoothing earnings, which had an impact on later studies in EM.

Kirschenheiter and Melumad (2002) raised the question, 'Can Big Bath and Earnings Smoothing Co-exist as Equilibrium Financial Reporting Strategies'. The authors looked at scenarios of managers' actions on financial statements when bad or good news occurred on reported earnings. The authors argue that managers apply the 'Big Bath' technique when the news is 'bad', i.e. cash flow is low; managers manage books to 'underperform' earnings in the current fiscal year in order to report higher profits in the next. Similarly, when the news is 'good', i.e. cash flow is not low or it is high, managers 'Smooth earnings', depending on the level of the cash flow in the books. In short, 'Smoothing Earnings' is proportional to cash flow level. Kirschenheiter and Melumad's (2002) study is of high importance for understanding mangers' behaviour in corporate reporting. Further work on income smoothing was researched by Tucker and Zarowin (2006), who investigated if income smoothing improves earnings information of firms which reported past, current and future earnings plus the company's future cash flow. By testing accruals and other variables from the balance sheet, the authors show that higher negative correlation suggests higher income smoothing. The authors conclude higher income smoothing contributes to more earnings information.

Healy and Wahlen (1999, p.370) point out three motivations for Earnings Management:

a. Capital market motivations
b. Contracting motivations
c. Anti-trust or regulatory motivations

a. <u>Capital Market motivations</u>

Studies in this group have been looking at elements of financial statements such as accruals (Healy, 1985; DeAngelo, 1986; 1988; Ronen and Sadan, 1988; Schipper, 1989; Dechow and

Sloan, 1991; McNichols, 2002; and others), stock market data (Beidleman, 1973; Dechow, 1994; Dechow, Sloan and Sweeney, 1995; Sloan, 1996; Charitou and Vafeas, 1998; Degeorge, Patel and Zeckhauser, 1999; Barton and Simko, 2002; Leuz, Nanda and Wysocki, 2003; Shen and Chich, 2004; Suda and Shuto, 2005; Yu, Du and Sun, 2006; Charoenwong and Jiraporn, 2008; Sun and Rath, 2009; Cornet, McNutt and Tehranian, 2009; Amar and Abaoub, 2010; Jiang, Petroni and Wang, 2010; Tokuga and Tanaka, 2011; Abed, Al-Attar and Suwaidan, 2012; and others) to test Earnings Management.

2.3.3.1. Studies testing financials data to investigate capital market motivations for Earnings Management

For different types of industries, different items of accruals or balance sheet items have been investigated. For example for financials, for banks items that were mostly investigated for any possible Earnings Management (EM) were Loan Loss Provisions (LLP). One of the first papers that investigated LLP was by Beatty, Chamberlain and Magliolo (1995). The authors examined bank managers’ actions to see ‘how’ they engaged in manipulation of accruals and transactions to meet their tax, capital and earnings ‘goals’. The authors show evidence that loan charge-offs, Loan Loss Provisions (LLP) and security issue where these variables influenced and/or used to manage capital ratios. The authors further present evidence that ‘pension settlement gains and miscellaneous gains and losses’ were used to manage ‘earnings and/or capital’, but divulge no evidence of tax avoidance. The authors’ study is one of the first to examine and to show the existence of EM within banks. Another paper that tests financials data was drawn up Beatty and Harris (2001) who investigated ‘capital management (management of security gains or losses), tax and earnings’ and the dealings of publicly traded banks in the US. Samples for testing were used for 1991 and 1992 financial years. Before 1991, interstate banking in the US was not allowed. The authors wanted to see if banks manage their earnings to reduce their tax payment obligations on the state and 'interstate' level, on the company's group (consolidated statements) level, and on an individual bank level. Test results present evidence of earnings management (EM) where banks shift their security gains / losses to subsidiaries with lower tax rates with the intention to reduce subsidiaries and consolidated tax amounts. Such an asset shifting contributes to managing company group earnings amounts. The authors conclude that banks engage in EM in order to reduce state tax payments, as well as their consolidated tax contributions on banks group level. Beatty and Harris (2001) seal the fact that EM is present not only in the non-financials but also in the financial sector.

From 2000 and onwards, authors started to test only the financial industry in the search for any evidence of EM. For example, Lifschutz (2002) looked at evidence of EM in the US banking industry, specifically the SFAS No. 115 standards (the Statement of Financial Accounting Standards), that regulates security trading in the USA. The author was interested in managers 'gains trading' (selling securities). A total of 88 US banks were tested for the period from 1997 to 2000, and it was concluded that larger banks were less sensitive to 'change in return on equity (ROE)'. Lifschutz (2002, p.9) presents evidence of EM where banks managers '*took advantage of the flexibility in SFAS 115 and managed earnings through gains trading of securities*'. Similarly, Schrand and Wong (2003) investigated valuation allowances for deferred tax assets (DTA) in relation to EM, for publicly traded banks, using Compustat database. '*A deferred tax asset is recognized for temporary differences that will result in deductible amounts in future years and for carryforwards.'* - Statement of Financial Accounting Standards - SFAS No. 109. The authors conclude from test statistics that banks engage in EM when earnings are bellow or above the targets, apply income increases, or decrease valuation that will serve as a smooth income allowance for deferred tax assets for future years. The authors in the above studies have proved that Earnings Management (EM) will occur whether or not the accounting standards are flexible or strict, as bank managers will always seek ways to engage in EM to achieve their objectives.

2.3.3.2. Studies testing financials and / or non-financials data to investigate Capital market for Earnings Management motivations

Dechow (1994) investigates whether earnings are a more informative measure of performance than cash flow. She presents evidence that ‘accruals play an important role in improving the ability of earnings to reflect the firm’s performance’. Earnings as a measure of performance contain less noise (an error term, which has a zero mean, constant variance and is non-auto correlated) than either cash from operations or net cash flow (NCF). Dechow also accepts earnings manipulation of a firm’s management. The stock market puts less weight on noisy components of performance and concentrates on the more permanent cash flows. Data was collected from Compustat, for the period from 1960 to 1989, examined at quarterly, annual and four-year intervals. When the observation is ranked by Long Term Operating Accruals, LTOA (i.e. depreciation), the coefficient of determination (R^2) on cash from the operation’s regression does not fall but rises. This means that when the stock return is being regressed on cash from operations, the observations with low LTOA have similar results of R^2 as the results with high LTOA. This suggests that the long-term operating accruals play a less important role than working capital accruals do. Dechow (1994) demonstrates autocorrelation and explains that accruals and cash flows have predictable temporary components; therefore, net cash flow (NCF) and cash flow from operations have more noise than Earnings do. Comparing only R^2 may give a false conclusion that the earnings have higher, better explanatory power than cash flow. Dechow (1994) points out the adjusted R^2 for earnings are visibly higher than for cash flow from operations and net cash flow for both quarterly, annual and four yearly samples. This indicates that earnings are more tied to the stock returns than the cash flow. It may be concluded that cash flow is more difficult to manipulate than earnings. Reply to Dechow's (1994) paper was a paper by Sloan (1996) where the author uses a different approach, namely, the potential ability of cash flows and earnings in predicting the next period's earnings and not as Dechow suggests, whose approach is based on whether earnings are a more informative measure of performance than cash flow is. Data was obtained from Compustat from 1962 until 1991. Variables of earnings, accruals cash from operations were used from the financial statements. Sloan (1996, p.299) shows results of equation $Earnings_{t+1}$, confirms that earnings are mean reverting, and suggests the rejection of the null hypothesis. The author used the Dickey-Fuller test for testing random walk for H1. The statistics are very similar to the industry ones. The results confirm that the accounting rates of return are mean reverting. The author suggests that cash flow is more important in predicting the next period's earnings, than earnings. The author concludes that although cash flow is difficult to manipulate, the stock prices behave as the stakeholders look only for the earnings and do not differentiate between accruals and cash flow.

Kasznik (1999), on the other hand, finds that managers tend to use positive discretionary accruals to report higher earnings, especially during times when their earnings would fall below their earlier forecast due to overestimation. The author however does not mention the reversal accrual rule.

A slightly different area of testing was performed by Phillips, Pincus and Rego (2003), who looked into the effectiveness of deferred tax expenses (DTE) in search of evidence of earnings management (EM). Phillips, Pincus and Rego (2003, p.492) define deferred tax expense as it *'is a* *component of a firm's total income tax expense and reflects the tax effects of temporary differences between book income (i.e., income reported to shareholders and other external users) and taxable income (i.e., income reported to the tax authorities) that arise primarily from accruals for revenue and expense items that affect both book and taxable income, but in different periods'*. The authors investigate the influence of deferred tax expenses under SFAS No. 109, using non-financial US data for the period of 1994-2000. The authors compare deferred tax expenses (DTE) to accrual models in finding earnings management (EM) and present evidence that DTE is a better means of finding EM than the Jones and Modified Jones models (who tested EM by using accrual models). One limitation of the paper is that the sample period is too short due to an examination of SFAS No. 109. Furthermore, it should be pointed out that the author's results are country specific, as the tested sample referred only to US firms. Another study on tax expenses was done by Dhaliwal, Gleason and Mills (2004), who investigate tax expenses (a 'cookie jar reserve' technique to manage earnings), in order to meet analysts' forecasts. The authors present clear evidence that firms lower their effective tax rate whenever other means of earnings management actions (i.e. accruals) are not sufficient to meet the analysts' forecasts. The authors show that corporate managers use all possible means to achieve EM in order to meet analysts' forecasts. Testing multiple industries to investigate EM in the Anglo-American and Euro-Continental accounting models was done by Othman and Zeghal (2006), who investigated EM motives, cases of Canadian and French companies in particular. The authors show evidence how societies with different social and economic realities manage earnings differently. Specifically, Canadian firms' motives to manage earnings are initial public offerings (IPO's) and equity offerings, where French firms' motives for EM are tax rates and cost of debt ('contractual debt costs'). The authors study shows that EM is not only country or society specific, but that it is present all over the world, as this study will show in the following subsections.

Studies of earnings management in the past were investigated with accruals and the discretionary accruals model, for example the Jones (1991) model. Modelling reversal accruals were attempted by Baber, Kang and Li (2011) who investigate the reversal of discretionary accruals in connection with earnings management. The authors point out that the level of 'past accrual-based earnings management' is in connection with the 'speed of the reversed discretionary accruals'. The authors' study is of huge importance as their paper is the first to point out the importance of reversals of the accruals, whereas earlier studies simply ignored or did not take this rule into account. A similar study was done by Dechow, Hutton, et al. (2012) who argued that accruals booked in a period must reverse to the next. However, the authors do not specify the term 'next period', and state that the accrual based models have low testing power; whereas, models with reversal accruals improve testing power by 40%.

b. Contracting motivations

It is common practise in the corporate world that managers have bonus based salaries. It is also common practice that managers receive financial rewards on earnings-based bonus schemes. When it comes to contracting motivations, the papers presented by the authors do not specify whether specific industry data was tested. A qualitative paper on the 'agency problem' was published by Smith and Warner (1979), who investigated Bond Covenants, a type of 'agency problem', a conflict between 'bondholder and stockholder'. This paper is one of the earliest on earnings management (EM) that addresses agency conflicts. The authors looked at four types of covenants: production/investment, bond, dividend and financing; i.e. bond covenants are provision types such as a 'payment of dividends which restricts the firm from engaging in specified actions after the bonds are sold'. Stakeholders use policies as types of restrictions in making company decisions, i.e. monitoring cost has an influence on the production / investment policy. Furthermore, the authors point out that ‘stakeholders use these policies to hurt bondholders’. The authors conclude that dividend and financing policy have lower ‘monitoring costs (i.e. observation of provisions)’ than production / investment policy. The authors’ data and their arguments are based on ‘commentaries’ on earlier evidence, where their results lie in ‘qualitative’ evidence, and not in ‘quantitative’ evidence.

Whereas, Healy (1985) investigated the effect of bonus schemes on accounting decisions of discretionary and non-discretionary accruals and ‘changes of accounting procedures’. The author used Compustat and Moody Industrial Manual sample of 94 companies for the period of 1964-1980. Under bonus plans, companies apply diverse schemes such as stock types, ‘deferred salaries’, insurance / performance plans, etc. The author defines discretionary and non-discretionary accruals, where non-discretionary accruals ‘*... are accounting adjustments to the firm cash flow mandated by accounting standard-setting bodies (e.g. Securities Exchange Commission and the Financial Accounting Standards Board)’*, and discretionary accruals ‘…*are adjustments to cash flow selected by the manager’* - Healy (1985, p.89). The author presents evidence that ‘*bonus schemes create incentives for managers to select accounting procedures and accruals to maximise the value of their bonus awards*’, Healy (1985, p.106). However, measuring the error of discretionary accruals is one of the limitations of the study that the author also acknowledges. The second limitation is the total accruals used for testing discretionary accruals, and the third limitation is errors ‘in measuring earnings before discretionary accruals’. Nevertheless, over 30 years ago Healy (1985) started an important debate that bonus schemes led to EM under contracting motivation.

A qualitative summary study on information asymmetry was published by Healy and Palepu (2001) and investigated corporate disclosures and pointed to contract difficulties between investors and managers (also called the ‘agency problem’). The authors suggested ‘compensation agreements and debt contracts’, where managers were reporting to investors about the company’s performance and about the way the company assets were handled. Although this paper is a qualitative summary of earlier relevant papers, it is nevertheless interesting to include into the review of this study despite lacking quantitative elements. As it was pointed out earlier, sample testing provides far more tangible results.

Hartzell and Starks (2003) examine executive compensations in relation to institutional ownership. The sample was obtained from Standard and Poor’s (S&P) ExecComp database for the 1992-1997 periods. The authors’ present test statistics evidence to highlight the link between ‘institutional investors’ and managers ‘compensation’, as well as evidence for pay-for-performance that relates to ‘institutional influence’. Although the authors show evidence of contracting motivation, it is not clear from the tested sample if the test results encompass to all the industry, or refer only to a specific one.

Jiang, Petroni and Wang (2010) on the other hand investigated chief financial officers’ (CFO’s) and chief executive officers’ (CEO’s) influence on earnings management. The authors tested discretionary accruals in the pre and post Sarbanes-Oxley Act (2002) period. They presented evidence that ‘equity-based compensation’ gives motivation for CFOs to manage earnings at pre-Sarbanes-Oxley Act way, but find weaker evidence of EM after the implementation of the Sarbanes-Oxley Act. Limitations of the study are that the authors focus only on ‘firm-years’ data; and thus consider only ‘equity incentives of CEOs and CFOs’, and ignore the reversal accruals effect on their regression results.

c. Anti-trust or regulatory motivations

Motivations of this kind are for those who wish to avoid investigation by industry regulators, often a classical example in the financial industry. Most industries are regulated in one form or another but the most regulated is the financial industry, where regulators rely solely on accounting data. Watts and Zimmerman (1978) were one of the first scholars who investigated and found evidence of manipulation of earnings decreases due to political costs in a regulated industry and in the cases of firms pressured by politics. Further research studies were published on banks and other financial intermediaries who engaged in Earnings Management (i.e. Lifschutz, 2002; Shen and Chih, 2005; Yu, Du and Sun, 2006), and also ones that examined the phenomenon on a countrywide level (i.e. Shen and Chih 2005; Cornet, McNutt and Tehranian, 2009), which will be evaluated in more depth later on in this chapter.

One of the earlier relevant papers that relates to regulatory motivations is Dechow, Sloan and Sweeney (1996) who investigate companies that manipulated earnings and were duly investigated by the Security Exchange Commissions (SEC) in the USA. The authors find that earnings manipulation occurs when circumstances are conducive, such as the lack of an audit committee; when the owner is also the chief executive officer (CEO) or the chairman of the board; or if board members are external; in other words, when there is lack of proper corporate governance. The authors also find evidence of manipulation when companies wish to raise capital at low cost. Although the authors accepted the fact that their findings should not be generalised, 3-7 years later their findings were confirmed by real accounting scandals such as Enron, WorldCom and others.

Beneish (1999) looked at companies from the Compustat database for the period from 1987 to 1993, the only firms that broke the rules and regulations of the GAAP and were subject to investigation by the US Securities and Exchange Commission (SEC). The tested data is not specified whether it relates to financial or non-financial samples. The manipulated data consisted of unreal, over or understated profits, non-existent inventory and wrong capitalising costs (expenses added to the cost of fixed assets). In order to measure whether earnings management (EM) took place or not, the author had to compare the Compustat samples to those companies' samples which were 'non-manipulators'. Accounting data was used to calculate variables from their Financial Statements; namely, variables such as days' sales in receivables, gross margin index, asset quality index, sales growth index, and others, a total of eight variables. Beneish (1999, pp.25-27) presents test statistics and clear evidence of earnings manipulation. One limitation of the study is that the regression model was tested on publicly traded companies, thus the same model may not be applicable for privately owned companies. The second limitation is that the model may not be applicable in a reliable way for testing companies' data set to favour earnings decreases.

2.3.4. Detecting Earnings Management

2.3.4.1. Detection of Earnings Management - Tested with all industries data (including financials), vs. with the exclusion of financial companies

The authors back in the 1990's applied data from Compustat by excluding financials or selecting a sample of all industries. Some authors argue that financials have a special regulatory framework, which is true; therefore, they exclude financials from testing. This section presents relevant papers that use all data, including all samples with financials inclued and ones which exclude financials.

Dechow, Sloan and Sweeney (1995) were examining earnings management (EM) by testing total accruals, or non-discretionary accruals, (non-discretionary accruals, '... *are accounting adjustments to the firm's cash flow mandated by accounting standard-setting bodies, e.g. Securities Exchange Commission and the Financial Accounting Standards Board'* - Healy, 1985, p.89) models of Healy (1985, p.89), DeAngelo (1986), Jones (1991), Modified Jones and the Industry Model. The authors used a sample from 1950-1991, from Compustat, randomly selected 1000 firm-years, and made an assumption on accruals as if they had been managed: expense manipulation, revenue manipulation and margin manipulation. They calculated variables, changes in current assets, current liabilities, cash and cash equivalents, debt; depreciation and amortisation expenses, and applied them in all 5 models. The authors presented test results with low earnings management in all of the models, mainly due to the complexity and low power of the tests. Despite acknowledging low testing powers of the models and timing issues of the reversal accruals, the authors do not formulate alternative testing approaches.

Corporate leaders have goals to continuously increase earnings. Burgstahler and Dichev (1997, p.101) show evidence '*whether, how and why firms avoid reporting earnings decreases and losses*'. They use industrial and research data from Compustat from 1976 to 1994, excluding financial institutions, banks and regulated firms. The authors apply two theories to test hypotheses with the transaction costs and the prospect theories. The hypotheses are 1. '*Earnings are managed to avoid earnings decreases*.', and, 2. '*Earnings are managed to avoid losses*', (Page 102). For the tests, the authors used net income and earnings before extraordinary items (Net Income Before Extraordinary Items = net income before being adjusted by extraordinary items such as accounting change, discontinued operations, and others). The authors present graphical evidence of earnings management (EM) and confirm H1: they show that distributions are uneven near or at the zero point, and changes appear in order to avoid earnings decreases. The authors show evidence that two elements from earnings, i.e. cash flow from operations and changes in working capital were used to manage earnings. The authors conclude that cash flow from operations and working capital were used to manage earnings by company managers. Company managers managed earnings decline by reducing the ‘transaction costs with stakeholders’ applying the Prospect Theory i.e. by ‘averting losses’. The authors study is of pioneering importance, in the sense that instead of using the accrual approach, they applied a new, completely different model to test data. Additionally, the authors presented empirical results of the tested variables in diagrams, i.e. in the form of frequency distributions. Ever since, scientists have been applying the Burgstahler and Dichev (1997, p.103) testing approach, including this study.

Prospect theory was developed by Kahnemann and Tversky (1979) as criticism of the earlier expected utility theory. Prospect theory is a choice between alternatives with risk attached. In view of that, it has two phases, the ‘Editing phase’ – an analysis of prospects, and the ‘Evaluation phase’ – choosing the highest value of the edited prospect. The authors are suggesting a value function at a reference point, a reference point between losses and gains (above or below of a reference point), in the form of an S-shape. The S-shape value function is ‘steepest at the reference point’. But they do not specify how to determine the target or reference point, which means that the point itself depends on ‘the specific situation’. Prospect theory is of huge importance, as it shows that most people understand results as gains or losses. The application of Prospect theory was put to the test by Fiegenbaum (1990). The author investigates risk and returns with the help of the Prospect theory on a sample of 3300 companies in 85 industries for the 1997-1984 time frames. The author tested the Prospect theory with three hypotheses. Fiegenbaum (1989, p.194) shows evidence in favour of all three hypotheses thus the results confirm the risk-return association. However, the author does not specify which industries were tested; therefore, it can only be assumed that financials were also included. If so, association between risk and return levels might be different from industry to industry.

As cash flow was more acceptable for fund managers as a measure the firm's performance, researchers have started to examine cash flow influences on dividend changes. Charitou and Vafeas (1998) examined whether cash flow explains changes in dividends. The authors argue that cash flow is a better indicator of a firm's performance than accruals, as there was evidence that accruals had been a subject of managerial manipulation. They argue that cash flow is positively related to dividend changes, as it is a measure of performance and liquidity. The authors apply data from the Compustat for the period 1981-1991. The variables tested were taken from income statements and from balance sheets, such as dividend changes, operating income, cash flow from operations, lagged dividend yield (previous year cash dividend with the decreased market value of the equity) and a market to book ratio. Charitou and Vafeas (1998) came one step closer to finding the importance of cash flows in setting dividend policy. The authors tested variables from income statements and balance sheets. They conclude that dividend payments are influenced by a firm's performance, knowing that earnings are made from cash flow and accruals. Evidence emanating from their tests demonstrates that cash flow is neither a good measure of a firm's performance nor a component of earnings which would specifically explain dividend changes. The authors show the importance of cash flow when it is low, or during an investment period for that matter. The type of industry tested is not clear. It is presumed that the authors tested all-industry samples. This might have influenced the results knowing that high and low growth firms have different demands for cash flow and dividend policies. Also, the sample from 1985 to 1991 seems to be a bit short and it is a bit odd from them not to have included companies to a later date, up to 1997, for example, before the actual paper was published. Nor is it clear whether the tested sample is an all industry sample or not. This might also have influenced the results in view of the operational differences between high and low technology firms, especially in the instance of telecommunication, IT and financials.

A question arises whether cash flow improves its informational value over a longer period. Charitou and Clubb (1999), believe that a longer period of measurement interval in case of cash flows improves the matching convention. The authors produce an empirical analysis of incremental information of cash flows and conclude by quoting that ‘multiple cash flow variables may have incremental information content beyond an aggregate measure of accounting earnings but not beyond disaggregated earnings components’. The authors tested multicollinearity applying the Belsley, Kun and Welsh techniques, which they found not to be high. The authors excluded financials from their UK data sample (1985-1992) tests. In previous researches, cash flow was rejected as ‘valuation relevance’. In their paper, they show that when the return interval increases, the performance of the cash flow variable improves due to interval increases. Despite the significance of cash flow as a relevant valuation factor, this study finds the tested interval of eight years too short.

A similar paper on the informational value of financial statements was published by Lev and Zarowin (1999), who were examining how informative the earnings, cash flows, and book value changes are over time by applying cross-sectional regression. They were using a sample from 1964-1996, from the CRSP database from 1964-1995 (market value portfolios) and from the Compustat from 1978-1996 book value portfolios. The authors conclude that the earnings are not informative to investors, as they may believe in manipulation of statements and stock price changes because of reported earnings. They further argue that the drop of the coefficient of determination (R2) might be influenced by an increased importance of non-accounting information (possibly earnings manipulation). Therefore, the cross-sectional association between stock returns and reported earnings has been in decline over the sample period. The authors further analyse the change by classifying the firms as stable and changing ones. The R2 and the combined slope of the coefficient (ERC) are bigger for ‘No change firms’ and ‘Low change firms’ than for the ‘Change firms’ and ‘High change firms’, the significance level is lower than 0.10. The authors show that business change is negatively associated with the informational value of earnings, the return earnings association has a decline but it is not statistically significant. The time coefficient in variables is negative and statistically significant. Business change is influenced by intangible investments and research and development (R&D). The authors show evidence that if the R&D is increased, the coefficient of determination (R^2) and the combined slope of the coefficient (ERC) is larger in High-High firms than in Low-Low firms, which is a proof of a weak relation between earnings and returns. The same decline in returns-earnings is present where R&D report an increase over the sample period. Lev and Zarowin (1999) further analyse the business change and R&D change. Results show that the mean R&D intensity for high change group firms has a higher mean intensity of change than for the no change group. The same applies to the High change group and Low change group respectively. This confirms that the reliance on financial statements is minimal for firms which have a high investment in R&D. The authors also recommend capitalisation of intangible investments, systematic preparation of financial statements and restatement of financial reports towards improving the use of financial statements. This would help improve the matching convention. Apart from matching improvements, the authors should also have argued for more rigorous audits by recognised auditors in order to improve ‘the usefulness of financial information’ to investors, stakeholders and other interested parties.

Next to Lev and Zarowin (1999), a paper on the relevance of financial information, Francis and Schipper (1999) also investigated the relevance of financial statements to investors. The authors use a sample from 1952-94, from CRSP and Compustat. The authors are modelling the market adjusted returns ('The market-adjusted return method assumes that the expected market return constitutes the best predictor of each security's market performance', a very powerful testing method, as it gives a clearer picture on investors' returns) and accounting hedge portfolios. In explaining the market equity value, the authors demonstrated with statistical tests that there is a decrease in relevance of earnings information and an increase of relevance in balance sheet and book value information. It is fair to point out that the authors do not test the 'level' of decrease, they only present that their test statistics is an evidence of a change in value relevance.

Further testing of cash flow as a component of earnings was done by Degeorge, Patel and Zeckhauser (1999), and showed reasons for earnings management (EM), and misreporting of earnings. The author's study analyzes cash flow and earnings relevance of earnings management to the threshold, earnings manipulations, accruals and cash flow as measures of a firm's performance. Their evidence suggests that the cash flow component of earnings gives a better measure of the value of a company. This has also been confirmed by Sloan's (1996) paper. Degeorge, Patel and Zeckhauser (1999) show that earnings management has three thresholds. The first one is reporting profits, which can be positive, negative or zero (psychology has an important role); and another two, which are based on a benchmark as if profits were met. If it is bigger than the benchmark, then, it is a success; if smaller than the benchmark, it is deemed a failure. Executives/managers make available copies of their financial statements to investors, analysts and to the general public; therefore, the threshold is constantly being analyzed. When the manager influences financial statements, earnings are changed, and due to this change, the threshold changes as well. The reason for managerial manipulation varies but the most important reason for doing so is achieving targets. Earnings are targeted and set per periods; the authors show this as 'direct management or misreporting'. Direct management would be when profits increase / decrease in one year and reverse in the following year or in the year needed. Another typical example is inventory. Misreporting is likely only when there is no direct control over assets and no supervision is available. The authors have suggested that a threshold arises from three psychological effects:

a) Positive and non-positive numbers have an influence on human thought, i.e. positive numbers appear to be more acceptable.
b) The prospect theory.
c) Rule of thumb for reducing transaction costs.

The threshold is present even when there is small participation, and has a higher effect when participation is high, i.e. it is said that ‘The board of directors is threshold driven’. Degeorge, Patel and Zeckhauser (1999) suggested that reporting financial statements thresholds are divided into three groups:

a) Reporting positive profits, profits above zero;
b) Maintaining earnings from a previous financial period;
c) Meeting analysts’ predictions, their earnings forecast.

Managers, when report earnings, tend to report earnings above analysts’ forecast. Analysts react to these forecasts. For this reason, executives/managers tend to reduce analysts’ expectations by attempting to exert some sort of influence. The authors analyze quarterly data from 1974 to 1996. The selected data is 5,387, from 100,000 observations. They assume that managers have a constant incentive to manipulate earnings in order to achieve the threshold level. They also argue that ‘the board of directors is threshold driven’. The authors recognise that manipulation in itself is impossible to monitor, but earnings from published financial statements, on the other hand, can be monitored. They test the three thresholds: change in earnings per share (EPS) between two financial periods ($\Delta EPS = EPS_t - EPS_{t-1}$); forecast error of earnings per share, and zero/positive profits. The authors present a histogram of change in earnings per share, where the histogram displays a considerable shift of earnings from zero to positive. There is a big difference in distribution between zero positive and negative earnings, between –2 and 0, which might suggest managers' manipulation of earnings. The authors further analyzed the analysts' expectations. The gap between positive and negative forecast error for EPS is again substantial. The authors present a histogram of forecast errors for EPS ('the threshold of meeting analysts' expectations'), in which the distribution of forecast error has a sudden drop below zero in the negative scale and a stable drop on the positive scale, i.e. a left-skewed distribution. The third threshold: report a positive profit histogram of EPS, positive/negative profits exhibit a visible jump from 0 distributions towards the positive scale. This suggests managers' effort to shift from negative to positive earnings. But, one limitation of the authors' paper is that their model is based on earnings, specifically on the earnings per share (EPS), i.e. test statistics show results only for the ∆EPS variable. Furthermore, the authors do not mention comparing or running the same model on another variable, i.e. cash flow. The authors also assume constant motivation in manipulating EPS over the sampled data of 20 years.

Barton and Simko (2002) investigating Earnings Management (EM) found that managers report higher earnings and smaller negative earnings between periods and measure the level of overstatement of net assets in the Balance Sheet. Overstatement is a 'managerial incentive' to '*meet or to beat analysts*'. The authors use Net Operating Assets (NOA = equity minus cash and securities plus debt) 'relative to sales' to find out if companies with large NOA also had a large increase in accruals. The dependent variable was total accruals and explanatory variables for testing were total assets, revenue, property plant and equipment. All variables were calculated on a quarterly basis. The authors tested data from Compustat, period from 1993-1999, a total of

3,649 companies. Table 4 and 5 (pages 32 and 34) show descriptive statistics, and regression results show evidence of earnings management, but only for ‘managerial incentives’ to ‘*meet or to beat analysts*’, which is one of the limitations of the study.

A slightly different research was published by Durtschi and Easton (2005) who aspired to challenge earlier studies by re-examining them, namely, Burgstahler and Dichev (1997); Degeorge, Patel and Zeckhauser (1999); and others who applied the shape of frequency distribution of net income (NI) and earnings per share (EPS) at zero point, as determinants of earnings management. Earlier studies show that there is a discontinuity of frequency distribution for EPS, NI as an evidence of earnings management. The authors challenge this evidence and argue that, there is no discontinuity in the frequency distribution of NI and EPS due to deflation, which has no effect on the distributions of NI and EPS, as earlier studies claimed. The authors argue that, as earnings influence stock prices, companies with ‘small losses’ have lower stock prices compared to companies with ‘small profits’ that have higher stock prices. The authors further point out that companies with ‘small losses’ will have ‘deleted or missing’ data used for testing and such a sample will influence the shape of the distribution. The authors examine price as a deflator and show distribution results where net income (NI) does and earnings per share (EPS) does not have a discontinuity at zero points. The authors conclude with arguments pertaining to deflation, sample selection and characteristics of observation and claim that the shapes of distributions do not serve as good ‘evidence of earnings management’. Test results of this study reject Durtschi and Easton’s (2005) arguments against discontinuity of frequency distribution, which will be elaborated in detail in Chapter 4. Additionally, contrary to Durtschi and Easton’s (2005) findings, Gore, Pope and Singh (2007) present evidence of discontinuity in distributions of ‘earnings relative to targets’, which will be discussed in the section bellow. Shortly after the Durtschi and Easton (2005) paper, which questions the validity of discontinuity of frequency distribution, Burgstahler and Eames (2006) presented another work on earnings management (EM) investigating operating cash flow and discretionary accruals as elements of earnings in relation to analysts' forecasts. The authors use actual and forecast earnings per share (EPS) data from the Zacks Investment Research Database, from 1986 to 2000. Financials and utility companies were excluded from the sample. Test results of Earnings distribution show a clear jump at 'zero' point on the scale. Apart from earnings distribution, tests statistics also showed evidence of EM, where earnings were managed higher to meet or to outperform analysts' forecasts whereas forecasts were managed down. The authors' study would have been even more of an interest if they had separately tested financials as well, instead of excluding them from the sample.

Incentives to manage earnings by chief executive officers (CEOs) were examined by Begstresser and Philippon (2006). The authors were interested whether accruals are linked to CEO's stock-based compensation. It is well known that accruals can be used to increase or decrease reported earnings. The authors show a gradual increase in the use of accruals in the past two decades with a visible increase after 1995. By applying test statistics, they compute total accruals, and also discretionary and nondiscretionary accruals, similar to Dechow, Sloan and Sweeney (1995); and Jones (1991). The authors show evidence for the test period 1993-2000, demonstrating that there is a connection between high accruals and option exercises, or sale of shares by CEOs. However, the authors do not mention the timing effect of the reversal accruals, which may influence the power of the test results, as Dechow, Sloan and Sweeney (1995) pointed out.

Investigation of income tax and special items effect in connection with discontinuity of earnings around and at zero points was published by Beaver, McNichols and Nelson (2007). The authors write that '*The term 'discontinuity' is shorthand terminology for an unusually low frequency of small loss observations and an unusually high frequency of small profit observations, relative to* *the frequencies in the adjacent intervals of the earnings distribution. It does not imply that the cumulative distribution function is discontinuous at zero.'* - Beaver, McNichols and Nelson (2007, p.526). The authors run models with pre-tax and net income data and modify the Burgstahler and Dichev (1997, p.103) model, and point out that the standard deviation of the Burgstahler and Dichev (1997, p.103) model is understated. The authors suggest an alternative to overcoming an overstated standardised difference of the test statistics model, see Beaver, McNichols and Nelson (2007, p.540). However, it is not clear why the authors do not specifically explain the reasons for the modification of Burgstahler and Dichev (1997, p.103) standardised difference part of the model. The authors only refer to 'under and overstatements' of the Burgstahler and Dichev (1997, p.103) model test statistics, and do not explain the reasons for their modification (The results of this study contradict their arguments, which will be demonstrated in Chapter 5). The authors collected data from Compustat for the period of 1976-2001 excluding financial and utility firms. The authors suggest that special items (depreciation, interest expenses), and income tax have a role in the discontinuity of the net income distribution, and also confirm that their results do not mean that companies do not manage earnings to avoid losses. The authors present distributional evidence of pre-tax income as net income shows a visible difference between net income and pre-tax income distribution, where the pre-tax income distribution discontinuity is lower than the net income distribution. These results confirm the authors' argument that taxation has a direct influence on the discontinuity of net income distributions. The authors also show that apart from net income and pre-tax profit, special items also display a visible difference in distribution when included in the earnings. The authors confirm that their results are similar to the Durtschi and Easton (2005) results, but Beaver, McNichols and Nelson (2007, p.555) also point out that *'… results suggest that income taxes and special items do not cause firms to move from a small loss position to a small profit position,* *discretion in these items could enable some firms to avoid losses.'*. Further on in this section, this study presents alternative evidence in favour of Burgstahler and Chuck (2015) which proves that Beaver, McNichols and Nelson's (2007) results do not hold.

In a further study from Durtschi and Easton (2009) on Earnings Management (EM), the authors argue that shapes of earnings distributions, or discontinuity, do not necessarily provide an evidence of EM. The authors investigated earlier studies by Hayn (1995), Burgstahler and Dichev (1997), Degeorge, Patel and Zeckhauser (1999), Jacob and Jorgensen (2007) on earnings distribution and they point out that sample selection had a critical effect on the distribution. Durtschi and Easton (2009) argue that earlier studies had removed more 'small loss observations than observations of small profits'; thus, wrong sample selection and the application of scaling and averaging led to presenting false results as earnings management. Durtschi and Easton (2009, p.1280) conclude, *'…the observed shapes of earnings distributions around zero are not ipso facto evidence of earnings management; rather, additional evidence beyond the shape of the distribution must be brought to bear.'*. Burgstahler and Chuck (2015) study rejects Durtschi and Easton's (2009) evidence, which will be presented below in this section.

A different investigation on 'earnings quality' was reviewed by Dechow, Ge and Schrand (2010). The authors present a summary of 'earnings quality proxies', a summary of 'commonly used' empirical proxies with (regression) models linked to theories, which additionally highlight their strengths and weaknesses. Empirical proxies were shown as *'persistence of earnings; magnitude and residuals from accruals; smoothness of earnings relative to cash flow; timely loss recognition of earnings; benchmarks; investor's responsiveness and external indicators'* - Dechow, Ge and Schrand (2010, pp.351-352). The authors further review papers of 'Cross-country studies' in relation to earnings quality proxies, as well as 'the determinants and the consequences of earnings quality'. The authors outline the importance of reversal accruals which past papers simply disregarded and failed to include as an important accounting rule in their models, and thus, made potential testing errors. A further interest in this paper reveals that the authors suggest five areas for further research, namely *'multiple incentives on accounting choices; complementary accounting choices; earnings-related accounting choices; classical methods for construct validation; impact on earnings quality by determinant and consequence of quality'* – Dechow, Ge and Schrand (2010, pp.390-391). The authors make an attempt at producing a broad investigation; however, their paper puts forward only a useful summary and a basic guide for research students and practitioners alike.

Dechow, Hutton, et al. (2012) remind the reader that accruals, according to accounting rules and when booked in a period, are reversed to the next. The authors argue that earlier studies on testing models (Healy, 1985; Jones, 1991; Dechow, Sloan and Sweeny, 1995; Dechow and Dichev, 2002; and others) for the detection of different types of accruals (i.e. working capital accruals) in order to find possible manipulation in achieving earnings management, were not effective due to the omission of reversed accruals. The authors suggested a new approach in which tests also included reversed accruals, thus improving testing power. One problem with the accrual reversal technique is that different types of accruals are reversed in different periods. Therefore, when not all the accruals are reversed in a period but only a certain number, testing power does not improve. Another difficulty with this method is finding data that show accrual reversals. The authors touch on one of the most important areas of the accrual testing; whereas, most researchers fail to recognise or simply ignore facts about the reversals of the accruals. One of the basics of accounting is that an accrual must be reversed in 'a', or 'the next' period. Papers which did not account for reversals had biased test results.

In reply to the Durtschi and Easton (2005; 2009) papers, Burgstahler and Chuck (2015) test the evidence of Durtschi and Easton (2005; 2009), who claimed that sampling selection and research design remove discontinuity in earnings distribution and thus lead to a wrong interpretation of the results concerning earnings management. The authors furthermore point out that Durtschi and Easton's (2005; 2009) study does not take into account the size effect of a variable; it only takes into account the small companies' data. With the addition of 'scaling, selection and price earnings relations', it does not serve as a valid choice in explaining discontinuities. Jacob and Jorgensen (2007) present evidence of discontinuity in earnings distribution and contradict Durtschi and Easton's (2005) claim of no evidence of discontinuity. Burgstahler and Chuck (2015) also investigate Beaver, McNichols and Nelson (2007) who state that discontinuities arise due to the effect of income taxes and special items. Burgstahler and Chuck (2015) present evidence that Beaver, McNichols and Nelson's (2007) arguments for discontinuity arise due to the effect of income taxes and special items, *'…where there are higher tax rates above versus below the benchmark and is therefore limited to discontinuities in earnings levels at the zero benchmark.'* – Burgstahler and Chuck (2015, p.21). The authors point out that there is 'no such evidence'. Burgstahler and Chuck (2015) show by excluding special items from the 'earnings component' - that it is not an evidence of discontinuity in earnings distribution. Burgstahler and Chuck (2015) present evidence of discontinuity in earnings before and after special items and evidence of visible discontinuity in earnings after special items, but no evidence of discontinuity before special items. This suggests that special items including income taxes do not give alternative evidence of discontinuity in earnings distribution as Beaver, McNichols and Nelson (2007) argue. Beaver, McNichols and Nelson's (2007) argument for income taxes are applicable only to higher tax rates. Burgstahler and Chuck (2015, p.21) point out that, '…differences in tax rates cannot explain any of these discontinuities…'. Burgstahler and Chuck (2015) also examined regulated companies, banks and insurance companies and presented evidence of discontinuity at zero point. Burgstahler and Chuck (2015, p.2) summarise five ‘key characteristics of discontinuity consistent with the theory of Earnings Management’: 1. ‘Pervasiveness’, where the discontinuity is present in ‘earnings measures, such as earnings, changes in earnings and earnings surprise’. 2. ‘Evidence of a trough below the benchmark and a peak above the benchmark’, where discontinuities are present below and a peak above the benchmark. 3. ‘Covariation with earnings management incentives’, where discontinuities occur due to managers’ interference in earnings to ‘meet benchmarks’. Burgstahler and Chuck (2015) point to the work of Li (2014), who outlined a theory stating that discontinuity is positively autocorrelated to cross-sectional earnings distribution and presents evidence of discontinuity in earnings due to earnings decreasing and rising manipulation. 4. ‘Existence in earnings measures that are widely used in stakeholder decisions’, where discontinuities are present, namely, earnings such as net income, earnings per share or earnings before extraordinary items. 5. ‘Non-existence in earnings measures that are not widely used in stakeholder decisions’, where discontinuities are not present in earnings measures and that are not widely used in stakeholder decisions. Burgstahler and Chuck (2015) argue that earnings management characteristic 4 and 5 are ‘inconsistent with explanation’ as to why earnings measures are widely used in stakeholder decisions; in other words, they are difficult to show or to explain. Burgstahler and Chuck’s (2015) paper summarises evidence of EM in favour of discontinuities. The author of this study believes that the Burgstahler and Chuck (2015) paper is one of the most complete and up-to date studies that highlights evidence in favour of the presence of discontinuities in earnings distribution.

2.3.4.2. Detection of Earnings Management - Tested with a financials companies' data

This section summarises relevant papers on earnings management and its detection using financials' data for testing. Earnings management so as to avoid earnings declines across publicly and privately traded banks were investigated by Beatty, Ke and Petroni (2002). The authors hypothesized that public banks manage earnings whereas private banks do not. They investigate a period from 1988 to 1998, on the basis of data obtained from the Federal Reserve System, the Chicago Federal Reserve Bank and from Sheshenoff database. The test sample comprised 707 public banks and 1160 private banks, a total of 1867 banks. The assets of public banks are larger than those of private banks. The authors tested the smoothness of distribution of change in return on asset (ΔROA) for privately and publicly traded banks. Separate charts of histograms for privately and publicly traded banks are shown on page 560, where histograms have a shift above zero. There is a visible jump at zero points for the publicly traded banks suggesting a more dramatic change for the publicly traded banks in the test of 'small earnings change'. Apart from histogram investigation, the authors ran *t*-statistics to confirm or to reject earnings management. The authors concluded that there is evidence to support the hypothesis according to which public banks manage earnings to avoid earning declines. They show that public banks report fewer small declines in earnings than private banks. Also, it is shown that earning increases for public banks are bigger and for a period more sequential than for private banks. Furthermore, the authors find that public banks in order to avoid reporting small declines in earnings use their loan loss provisions more (non-cash expense that banks set aside to cover future losses on bad loans) than privately traded banks. Beatty, Ke and Petroni (2002) conclude that fever earnings declines for publicly traded banks are not a result of an economic condition but of earnings management. The authors have the same results as the strategies of public banks shareholders, who are using known techniques and available information on 'earnings-based' growth, which is the base for earnings management. As the authors test banks data, their results should not be compared to non-financials.

2.3.4.3. Research methodologies in Earnings Management

McNichols (2000) presents in her paper three research designs that have been applied by the researcher to investigate earnings management (EM) in diverse industries. The author summarises that three of these designs are 'total accruals, specific accruals and distributions approach' to investigate EM. Investigations under total accruals were mainly discretionary accruals and their relation to total accruals (by Healy, 1985; DeAngelo, 1986; Jones, 1991; Dechow, Sloan and Sweeney, 1995; and others); specific accruals investigation were concentrating on specific or single accruals (by Petroni, 1992; Beneish, 1999; Beaver and McNichols, 1998; and others); and distribution of earnings where earnings were investigated at a benchmark, i.e. zero point (Burgstahler and Dichev, 1997; Degeorge, Patel and Zeckhauser, 1999; and others). Most of the researchers at the time were concentrating on total accruals. McNichols (2000) also focuses on the analysis of the accrual question and excludes the distribution approach. The author concludes that accrual based tests, *'... Jones and modified Jones model approach are not sufficiently powerful or reliable to assess earnings management behaviour in many contexts…'* - McNichols (2000, p.337).

Since the McNichols (2000) paper, there was additional publishing on methodologies to investigate earnings management in diverse industries. These industries were split between financials and non-financial companies, and some papers investigating all industries data as well per country level. See for example Shen and Chih (2005); Suda and Shuto (2005); Yu, Du and

Sun (2006); Charoenwong and Jiraporn (2008); Durtschi and Easton (2005; 2009); Sun and Rath (2009); Cornet, McNutt and Tehranian (2009); Amar and Abaoub (2010); Jiang, Petroni and Wang (2010); Tokuga and Tanaka (2011); Abed, Al-Attar and Suwaidan (2012); Hamdi and Zarai (2012); Burgstahler and Chuck (2015); and other studies that are relevant to this study and are summarised in this literature review, by groups, by financials and non-financials, and later on per country level.

2.3.5. Limiting / Stopping Earnings Management – Increased Transparency, Role of Auditors

Transparency is of importance when reporting financial statements, as it reduces earnings management (EM). To meet analysts' forecasts company managers may decide to increases / decrease income, thus in this way they would manage earnings. This approach by company managers is also called an aggressive accounting and leads to poor transparent reporting that contributes to greater EM. Increased transparent reporting reduces, but it does not remove EM, and by poor transparent reporting earnings management (EM) increases (Hunton, Libby and Mazza, 2006).

In order to make sure the company's financial statements were prepared according to Generally Accepted Accounting Principles (GAAP), auditors who are independent certified public accountants produce financial statements that are accurate, truthful, and complete. Auditors assess earnings manipulation, as well as corporate governance risks. Apart from auditors, the company's management may appoint external board members as part of audit committees, whose role is to control the quality of financial statements. Their assessment of financial statements is crucial. Reliance on auditors has received criticism as Larcker and Richardson (2004, p.626) write: '*Critics contend that extensive fees paid to auditors, especially fees for non-audit services, increase the financial reliance of the auditor on the client. As a result, independence may be compromised because the auditor becomes reluctant to raise issues with the preparation of the financial statements at the risk of foregoing lucrative fees'*.

If auditors asses that they cannot rely on audit committees' and on board members' work, they could charge higher billing rates or refuse the appointment. In the previous literature, it was shown that companies who decided not to have internal controls such as audit committees had more cases of fraudulent financial statements. It was also shown that fewer board members allowed the possibility of manipulation or fraud (Dechow, Sloan and Sweeney, 1996).

Healy and Palepu (2001) write that auditors do not give any newly qualified information to shareholders about the companies' annual reports, but 'confirm' the information. The authors suggest three reasons for explaining the 'value of auditor opinions to investors', a) close auditor-manager relationship, b) auditor giving 'formal assurances only on the annual report', and c) auditors concern in reducing their own legal liability. In practise, the authors' explanation of auditors' opinion to investors has a very strong base, as the author of this study experienced exactly the same in his corporate financial and accounting experience.

The 'Big 8', or 'Big 5', referred to by auditors as the number of big accountancy firms have been gradually shrinking over the decades. The 'Big 5' accountancy firms comprised PricewaterhouseCoopers (PWC), Ernst and Young (E&Y), Klynveld Peat Marwick Goerdeler (KPMG), Deloitte and Arthur Andersen. Since the Enron scandal, Arthur Anderson stopped its accounting operation in 2002, and since 2002, the 'Big 4' accounting firms left are PWC, Deloitte, E&Y and KPMG.

Krishnan (2003, pp.2-5) also lists 'Big 6' accounting firms and investigates the absolute value of discretionary accruals between specialised and non-specialised auditors (discretionary accruals are non-obligatory expenses i.e. ‘anticipated bonuses’). The author did not put the ‘Big 6’ (at the time there were 6 of them) audit firms to one block to compare them to non-specialised auditors, but the comparison was done with the specialised ones as well. The author collected company data together with their auditors as per market industry from Compustat for a ten year period, i.e. 1989-1999. The author’s tests results confirm that the absolute value of discretionary accruals is lower for clients with specialised auditors compared to non-specialised ones. In other words, highly specialised auditors eliminate accruals-based earnings management better, compared to non-specialised auditors, who manage to eliminate less. This is in line with the corporate working experience of the author of this study.

A slightly different angle of earnings management (EM) investigation was done by Nelson, Elliott and Tarpley (2003) who searched for EM from an auditor’s perspective. The authors collected samples from a questionnaire sent to partners of the 5 Big Auditors firms. The questioner was directed to the partner and to two managers chosen by the partner. The base of the questioner was if the company’s financial statements were ‘treated as the company originally desired’ or not; that is, if there was a need for adjustment of the statements or not, and thus presence of EM. Nelson, Elliott and Tarpley (2003, p.22) show a summary of ‘Earnings-Management Approaches’, percentages in increases / decreases / no effect on ‘expenses and losses, revenue and other gains, business combinations and other approaches to achieving EM and adjusted by auditors. The authors find that the most common approach to achieve EM was ‘recognising too much or too little reserves, assets impairment in the current year; capitalising and deferring too much or too little, or modifying depreciation or amortisation methods’. The mentioned approaches have a current year income effect that has an influence on the future year periods income, thus a clear evidence of earnings management. This paper is of interest as tests sample of the survey data, which is the main limitation due to the accuracy of the questioners’ answers, i.e. how honest, accurate were the questioners' answers. Therefore, power and / or accuracy of the results is not the same as in case of the quantitative tests results.

Bedard and Johnstone (2004) investigated auditor's assessment of earnings manipulation risk and corporate governance risks. The authors hypothesize a positive relationship between earnings manipulation risk and planned audit hours and billing rates. They used more than 1000 clients to test hypotheses. For testing models, they used audit hours, planned billing rates variables and also added industrial variables for earnings manipulation risk and for corporate governance risk. They found evidence of positive connection between earnings manipulation risks with planned audit hours and increased billing rates. Billing rates and planned billing hours increase when auditors come to the conclusion that neither from the board nor from the audit committee would they receive any support. Furthermore, they do not find a significant relation between auditors billing rates and corporate governance risk. The reason for this could be that it is extremely difficult for auditors to evaluate in advance which firm is riskier therefore which needs more planned audit hours and higher billing rates. Despite the fact that auditors have tools for tracking and finding EM, in the case of small level EM, auditors might fail to find such manipulations. Auditors are distinguished between specialised (the so called 'Big 6', at the time of the paper was published) and non-specialised auditors. Specialised have large numbers of clients, take considerable time and funds to train their staff as well as invest in perfecting audit techniques. The 'Big 6' auditors also specialise for a variety of industries; therefore, when auditing for the sake of an argument, manufacturing, IT, banking, etc., they compare their results to industry-specific risks and errors. All these techniques help specialised audit firms to be more credible in comparison with non-specialised ones. But, as all companies, audit companies as well will protect their brand names by rigorous investigation and reporting any aggressive accounting or questionable transactions.

Arthur Andersen audit firm serves as a reminder that profit generating is also the number one goal even for Big audit companies.

A different investigating approach regarding earnings management versus audit quality was done by Tendeloo and Vanstraelen (2008). They investigated the European Union market and not, as previous papers, the US ones. The authors investigated if audit quality contributes towards the quality of financial reporting. At the time of the paper, and in earlier research papers, it was mentioned that there existed ‘Big 6’ audit companies, a number which was reduced to 4 audit firms, which are called the ‘Big 4’ auditors. The authors hypothesize that private firms audited by the ‘Big 4’ will not get involved in earnings management, compared to ones which are not clients of the ‘Big 4’ audit firms, on condition that private firms are based in a country with high taxes and a high level of control of financial statements by the tax authorities. The sample for a period of 1998-2002 was collected from six EU countries, from Amadeus European database, excluding financial companies. The authors select countries with similar financial and tax rules, splitting the six countries samples into two for testing purposes, one group with high tax rules and a second one with moderate tax rules. Results from tests statistics confirm that companies who appoint the ‘Big 4’ audit firms have less involvement in earnings management than client firms of the non-‘Big 4’ auditors. The authors also conclude low involvements in earnings management (EM) in countries with higher taxes and higher control of financial statements by the tax authorities. If one out of the four firms from the ‘Big 4’ audit companies make a poor control and fail to make detection, they will lose credibility and reputation. So it is in the interest of the ‘Big 4’ to be more rigorous and to give higher audit quality in the environment within the countries with high tax rules and higher control of financial statements by tax authorities. The authors’ study makes a solid contribution; however, the author of this study feels that the length of the tested data is far too short. Instead of four years, the authors should have tested at least eight or more years. Tests results would have been far more rigorous and / or different from the authors' published ones.

A similar research to Bedard and Johnstone's (2004), who investigated auditors in the banking industry, was done by Kanagaretnam, Lim and Lobo (2010). Kanagaretnam, Lim and Lobo (2010) investigate the auditor firm's reputation within the banking sector and its reputation pertaining earnings management. The authors tested banks from 29 countries, for the period 1996-2006. Their study concentrates on auditors from among the 'Big 5' and the non-'Big 5' ones and the auditor's ability to reduce 'income-increasing' EM in the banks' financial dealings. The authors predict that the 'Big 5' auditors specialised for the banking industry will lower EM of loan loss provision (specific for banking industry) for banks. The authors conclude, in separate tests of various auditor types and their expertise, that both the 'Big 5' and the non-'Big 5' auditors' manage to restrict the banks' activities towards 'loss-avoidance' and 'just-meeting-or-beating prior year's earnings'. Kanagaretnam, Lim and Lobo (2010) also find that in the same test of various auditor types and expertise, the 'Big 5' auditors with industry knowledge, e.g. banking industry, show higher restriction in achieving 'benchmark of loss-avoidance' and 'just-meeting-or-beating prior year's earnings'. The authors conclude that their results confirm that auditors have a big role in restricting banks to manage earnings. The authors' findings are in line with contemporary corporate practice, as most banks hire the 'Big 5', now the 'Big 4', i.e. auditors who have the 'know-how' to audit their financial statements.

2.4. Adoption of IFRS and Earnings Management

In this section, this study summarises relevant papers to earnings management (EM) and companies that adopted the International Financial Reporting Standards (IFRS) as their accounting standard. The IFRS is an accounting standards that was created by the International Accounting Standards Board (IASB). Tendeloo and Vanstraelen (2005) investigated EM of companies who apply the German GAAP versus those who apply the IFRS. A brief referral to IFRS is shown in their paper. The authors used to sample data between 1999-2001, excluding financials and utility firms. With the sample data, the authors tested discretionary accruals using the Jones Model (Jones, 1991). They drew three hypotheses: companies applying IFRS will not manage earnings comparing to companies that apply the German GAAP; they also state that the Big 4 auditors reduced EM more than the non-'Big 4' audit companies; and firms with IFRS reporting that are trading on the stock exchanges, engage less in EM. The authors show evidence from test statistics that firms which apply IFRS do manage earnings with discretionary accruals and 'earnings smoothing'. The authors also pointed out that firms 'earnings smoothing' is lower when audited by the 'Big 4' auditors. Tendeloo and Vanstraelen (2005, p.177) also point out that, '*… in general, adopters of IFRS cannot be associated with lower earnings management. ... the high-tech and innovative segment of the Deutsche Börse, which was closed after the surfacing of several corporate scandals and an overall slump in hightech stocks, provides an interesting example*.' One key drawback of Tendeloo and Vanstraelen's (2005) paper is that the authors do not take into consideration reversal accruals, as for example Dechow, Hutton, et al. (2012, pp.331-333) point out.

As Tendeloo and Vanstraelen (2005) investigate one country effect of IFRS on EM, Callao and Jarne (2010) investigate the effect of IFRS on Earnings Management in the European Union. Callao and Jarne (2010) were specifically interested in the European countries accounting practices, the Anglo-Saxon and the Continental European accounting models and tested discretionary accruals before and after the adoption of the IFRS. The authors accept the fact that by implementing IFRS, the new standards improved financial reporting in a number of countries as the new standards regulate accounting in areas that was not the case earlier. IFRS has also made financial reporting more detailed and consequently that should have led to the reduction of ‘information asymmetry’ between stakeholders and management. The authors pointed out that the IFRS standard is more flexible than some European Union member states’ accounting standards. Their first hypothesis is that IFRS increases EM which has a negative effect on reporting quality and the second hypothesis is that ‘firms’ features and country factors have an effect on accounting discretion’. The authors used a sample of eleven European Union (EU) member countries stock market data, excluding financials. The tested countries were the so called ‘old EU member states’. Data was used from the Amadeus database, excluding financials, and was split into ‘before’ and ‘after’ the IFRS implementation, that is 2003-2004 and 2005-2006 respectively. To test discretionary accruals, the authors used samples from 1999-2002. The authors use the Larker and Richardson (2004) model which is a modified version of the Jones (1991) and Dechow, Sloan and Sweeney (1995) model. The authors also analyzed Return on Asset (ROA) histograms at zero points. Test results show that not all sampled countries had a significant increase in discretionary accruals after the adoption of IFRS. In some countries, only the long-term discretionary accruals had a significant increase and in some countries, current and total discretionary accruals showed an increase. For the sampled data, most of the histograms for the ROA variable shows a clear switch above the zero point that explains the management of earnings to avoid losses. The authors conclude that the results confirm the first hypothesis that by the adoption of IFRS, discretionary accruals have increased thus confirming Earnings Management. The results show no evidence of earnings management (EM) for the second hypothesis, i.e. no difference between the ‘before’ and ‘after’ the adoption of the standards. The results would have been more powerful if the sample size was bigger. Two years of sample testing for EM before and after implementation of IFRS is far too low. The authors should have waited for at least a few years, or to redo their paper with a min 8-10 years sample. Additionally, as a limitation, reversal of accruals should have been highlighted in their study.

Jarva and Lantto (2011) investigated the quality of financial statements between International Financial Reporting Standards (IFRS) and Finish Accounting Standards, or FAS. The authors tested companies with pre (1999-2003) and post (2005-2009) adoption of IFRS, but excluding companies with voluntary adopters of IFRS, and also excluding financials. The authors estimated ‘earnings-returns models’ under IFRS and Finish Accounting Standards data was from Thomson Reuters. The authors found that by the adoption of IFRS, there is no significant evidence of an increase in reporting quality as it was under local GAAP, nor they believe that IFRS is ‘superior to local GAAP’. However, the authors’ test results migth be biased due to the limited and low power of the testing model in question.

Rudra and Bhattacharjee (2012) investigated if the implementation of IFRS reduces EM in an emerging country such as India. The authors used 2010 fiscal year for testing 100 firms that included all industries, including financials. The authors tested discretionary accruals using the modified Jones Model (1991) by Dechow, Sloan and Sweeney (1995). The result shows that adopting IFRS does not reduce earnings management (EM). Rudra and Bhattacharjee (2012) are in line with Tendenloo and Vanstraelen (2005), excluding the ‘Big 4’ auditors’ evidence.

Another paper on the EM and IFRS adoption in the European Union (EU) was by Capkun, Collins and Jeanjean (2013), who tested EM in the EU countries who adopted IAS/IFRS. The authors used samples from twenty nine European countries from 1994-2009. A sample of 3,853 firms was split between early adoption (from 1994 to 2004), late (until 2005 / 2006) and mandatory adoption (in 2005) of IFRS. Company observation comprised 20,278 companies for the sample. The authors also split the sample into subgroups by dividing them into domestic GAAP and IFRS for early, late and mandatory adoption, tested with ‘pooled estimation models’, as applied by Barth, Landsman and Lang (2008). Dependent variables were 'change in net income, change in cash flow and IFRS (0,1) where 1 is for post adoption and 0 for pre-adoption of IFRS'. Tested explanatory variables were size, growth, % change common equity, liabilities, leverage, turnover, cash flow, auditors and stock exchanges. The authors hypothesize that by the adoption of IFRS in 2005 EM (smoothing) is higher after this date, for late and mandatory adopters. The authors conclude that test results show evidence of lower earnings management (EM) in countries with early adopters of IFRS prior to 2005 year. The results show an increase in EM in countries for 'pre-2005 to post 2005 for early voluntary and late adopters of IFRS', as well as increase in EM in countries for mandatory adopters of IFRS. The authors also conclude that possible explanations for such a trend of EM, namely, for smoothing in countries which adopted IFRS is that IFRS gives 'greater flexibility in accounting treatment' than the local GAAP. Their findings are in line with Rudra and Bhattacharjee (2012) and Callao and Jarne (2010).

Wang and Campbell (2012) analysed EM before and after the adoption of International Financial Reporting Standards (IFRS) in China. The sample data was from 1998 to 2009, all Chinese listed companies, including all industries, a total of 1329 companies per year, which amounts to 11947 companies for the sample period. To test earnings management (EM) before and after the adoption of IFRS, the sample was split into two, one from 1998 to 2006 to investigate EM under Chinese GAAP and one for 2007-2009 to test EM under IFRS. The authors calculated accruals, cash flow from operations to find out if insiders applied techniques to smooth earnings and expenses. They also measured the correlation between two variables (accruals and cash flow from operations) applying the 'Spearman correlation coefficient'. Test results show weak evidence of EM prior and after the adoption of IFRS. Results for 'Spearman coefficient' shows a small difference between IFRS and Chinese GAAP, where the coefficient under Chinese GAAP is a bit smaller thus a slightly higher smoothing to achieve earnings management. The authors concluded that the test results do not show significant evidence that IFRS reduces or increases earnings management. As the authors findings do not provide significant evidence whether IFRS eliminates EM or not, additonal studies should be of interest to investigate the same comparison but perhaps with different testing, i.e distributional approach.

2.5. Earnings Management studies investigating Non-Financials companies in countries around the world

Earnings management (EM) was investigated not only on a company level but was also looked into at a country level and also at a multiple-country level. Researchers investigated and compared statistics from one country with statistics from another and investigated the country itself. In this section, this study summarises and comments relevant EM papers.

A multiple-country EM investigation was done by Leuz, Nanda and Wysocki (2003), who searched for EM from different continents, cultures and legal systems. The authors point out that company managers engage in EM to hide the company's true performance, so the external users of financial statements and stakeholders could not find managers' reasons nor their benefits from managing earnings. The authors split the sample into areas of strong / weak legal systems, strong investors' rights, large stock markets, weak investors' rights but strong legal systems. The sample consisted of thirty one countries for the period of 1990-1999. Test statistics showed that countries where outside investors' legal rights are strong, have big stock markets with diverse shareholders owners and a strong legal system, these countries have low earnings management. The authors conclude that a certain country's legal and institutional set-up has a strong influence on the quality of reported earnings. One limitation of the study is that the authors did not, or could not separate elements of the 'institutional factors'.

Similarly to Leuz, Nanda and Wysocki (2003) study, Enomoto, Kimura and Yamaguchi (2013), investigate real earnings management (EM) against accrual based EM of non-financial companies of thirty eight countries, for the period 1991-2010. The accrual based EM is based on managing accruals during the financial year upon the manager's discretion. By managing accruals, they can be discovered easier by auditors or financial authorities. Real EM is, on the other hand, more difficult to track, as real EM is a process where managers make business decisions that affect the company's 'future' cash flow, i.e. cut R&D, marketing, etc. expenses. The authors hypothesised that accrual EM is '*more constrained in countries with stronger investor protection'* and real EM is '*more often implemented in countries with stronger investor protection'* - Enomoto, Kimura and Yamaguchi (2013, p.5). The authors applied the Leuz, Nanda and Wysocki (2003) models in testing accrual and real EM. Test statistics show a result that confirms the hypotheses, that is, lower accrual based EM and higher real EM due to strong investor protection. The authors also conclude that real EM is lower in countries where more analysts investigate company's dealings. As the authors test evidence of EM based on accrual and real EM, they point out the reversal of accruals in future periods. However, they do not refer to possible biased test results and low testing power, due to the timing of the reversal accruals.

2.5.1. Cases of Japan

The Japanese accounting system is an investor-oriented accounting system; see for example Walton, Haller and Raffournier (2003) or Cooke and Sawa (1998) for further explanation and information.

Darrough, Pourjalali and Saudagaran (1998) investigated earnings management (EM) in Japanese companies. As Japanese companies prefer debt over equity as a source of capital, the authors hypothesize that a high debt to equity ratio will motivate managers to engage in 'income-increasing accruals'. The authors used a sample from the Nikkei Databank Bureau for the period from 1989 to 1992. The authors used a modified version of Pourjalali and Hansen (1996) model to test the sample. The model measures manipulation of discretionary accruals and consists of testing revenue, fixed and variable expenses. In 1990, the Japanese stock market crashed. Taking into account this fact, the authors tested the sample 'before' and 'after' the stock market crash. The explanatory variables tested were debt-to-equity, total assets, bonus, internal/external financing, ownership and stock market crash effect. The results show that the Debt-to-equity hypothesis is rejected, whereas for the total assets and for the number of employees results show significant evidence in favor of the hypotheses. The results also confirm income-increasing accruals for external financing and for the ownership of trust companies, but not for the ownership of financial companies. Evidence also confirms EM due to the market crash. But their study is limited by the length of the data tested, therefore, test results might not be as powerful as if they used a longer year sample.

A slightly different area of EM investigation of Japanese companies was conducted by Suda and Shuto (2005), who looked at the EM of Japanese companies, listed on several stock exchanges in Japan. The authors were interested to see if EM was present and how the company's earnings were managed. They used data from 1990 to 2000 from Japanese stock exchanges, excluding financial institutions such as banks, insurance companies and security firms. The authors tested two hypotheses, 'Japanese firm managers manage reported earnings to avoid decreases in earnings and losses', and, 'Managers are using accounting accruals as a method of earnings management'. The authors used the applied discretionary accruals model, variables from the financial statements such as accounting receivables, sales revenue, fixed assets (property, plant and equipment) and other. From their tested sample, the OLS estimation provides proof (cash flow is negative, the mean, median, R^2 and other) of Earnings Management. Apart from OLS estimation, the authors present graphical evidence (2005, pp.30-31) of earnings changes and thus confirming EM. The authors also point to the fact that managers in order to avoid losses manage and control accounting accruals. Suda and Shuto (2005) also point out that cost is linked to EM, that is, companies that are able to manage earnings cheaper, will act to manage earnings to '*move from negative pre-managed earnings to positive post-managed earnings*'. Apart from finding evidence for EM, they were also looking for reasons for EM. They found three reasons for EM: firstly, compensations in Japan are based on the earnings based contract; therefore, the higher the company's earnings, the higher the manager's compensation. This motivates managers to manage earnings; secondly, the governance system of Japanese companies is a bank-oriented system, that is, banks play the monitoring role. This occurs when a company has a bank loan. When a company has poor / negative financial figures, the bank can intervene to assume full control of that firm and manage it. It this case, the manager who was the earlier leader of the company becomes subordinate to the bank, which took over control. In order to avoid such a state, the manager's interest is to manage earnings; and thirdly, Earnings Management due to Tax. There is evidence that Japanese company managers tend to manage earnings in order to reduce profits, so that tax expenses would also be lower. However, one limitation of this paper is again the reversal accrual question, that was referred to earlier in this thesis, see for example Dechow, Hutton, et al. (2012).

A Japanese executive's compensation and earnings management were investigated by Shuto (2007). The author applied discretionary accruals for testing EM data obtained from Nikkei-Zaumi for Japanese companies for the period 1991-2000. Financials and utility firms were excluded. The authors applied the Kasznik (1999) model with the inclusion of 'change of cash flow from operations' as an independent variable. Other independent variables used for testing are total accruals, nondiscretionary accruals, discretionary accruals, net income and extraordinary items. Dependent variables are Salary, Bonus, and Compensation. To avoid testing company data multiple times, the author further tests data by applying the Fama and Macbeth (1973) model. Both models yielded the same results. Shuto (2007, p.24) concludes from the test results that '*discretionary accruals increase executive compensation*'. The author further states that managers apply the big bath technique as well as use extraordinary items to smooth income. The author admits to a limitation of his study due to the 'Keiretsu' effect ('Keiretsu' refers to a type of corporate structure, where organisations link together, which is specific for Japanese culture), as it could have an effect on Salary, Bonus, and Compensation variables results. See for example Miyashita and Russell (1994) on 'Keiretsu'.

The relationship between real earnings management and accounting earnings management was investigated by Matsuura (2008). The author investigated the 'relation between real and accounting earnings management to smooth income' and argues that accounting earnings management is a result of accounting entries under GAAP; whereas, real earnings management comes from 'real production and investment decisions'. The author points out, that GAAP rules give managers the option to manage earnings to 'achieve their goal', but within the rules of the GAAP. This approach is not a violation of rule and law. But in the case when managers cross the boundaries of GAAP rules, i.e. smooth income to achieve their goals, then, it certainly violates GAAP principles. Data was tested from 2003-2007, with companies listed on the Tokyo stock exchange. Dependent variables are cash flow from operation and total accruals, and the independent variable is 'unexpected' net income, a difference between current and last net income. The author presents test statistics, where real earnings management appears 'before' accounting earnings management. This means that company managers first make a decision they would smooth income to manage earnings, which upon their action reflects on the accounting numbers. One limitations of the paper is that the author tests only five years data with a regression model, despite the fact that regression analysis needs a longer period. Secondly, the author does not refer to reversal accruals; despite the fact that one of the variables tested were total accruals.

2.5.2. Case of the EU and European Economic Community countries

Coppens and Peek (2005) were investigating earnings management (EM) of private firms in the European Union (EU), one of the first European Economic Community members. The authors looked if EM is present in the private and public firms, and if it is, does the Tax effect give cause for the presence of EM? For the test statistics, the authors used the t-distribution and the applied estimation model of Degeorge, Patel and Zeckhauser (1999). A sample of audited data was selected for eight EU countries for 1993-1999 periods, from the Amadeus database. The sample excluded financial companies and institutions in Public Administration data. The authors used a consolidated financial statement, to analyse companies' performance, their net profits and changes in net profits. The authors investigated two hypotheses: 'Private firms do not manage earnings to avoid reporting losses' and 'Private firms do not manage earnings to avoid reporting earnings decreases'. The test results show that private companies manage their earnings to avoid losses, therefore, the authors reject the first hypothesis, but they cannot reject the second hypothesis. The authors do not provide a clear explanation for such a rejection, only a possible explanation of cash flow in relation to the firm's performance and its change in performance and level of performance. They also make a conclusion from the test results (average return on assets), that in countries where tax and financial rules follow each other, the profits are lower compared to countries where tax and financial rules do not follow each other, and subsequently profits are higher. Interestingly enough, results vary between the eight countries tested when looking at the ‘tax based explanation’, as in some countries results show loss avoidance, e.g. in Belgium and in Italy private companies have a low-profit preference and these private firms engage in earnings smoothing more than the public firms. The authors acknowledge the limitations of their research, which is due to the sample data. Also, owing to the small sample in case of the few countries that were tested, the authors could not test the ‘level of information asymmetry’, nor could they confirm that rejecting the second hypothesis is due to the small sample or perhaps an indicator of genuine ‘absence of earnings management’. The authors use a six year period of accumulated data, which seems to be a bit low.

2.5.3. The Case of Malaysia

The Malaysian accounting system is an investor-oriented accounting system, influenced by the United Kingdom and British Commonwealth countries. See Doupnik and Salter (1993) for further information, and / or Jurisdiction Profile on ifrs.org.

Aman, Iskandar, et al. (2006) investigated EM for companies that listed on the stock exchanges in Malaysia. The authors were particularly interested in ‘reasons’ for resorting to EM, especially before and after the economic crisis that occurred in Malaysia in 1997. The sample tested was from 1995 to 1999. The sample was taken from the Kuala Lumpur Stock Exchange. The authors used the Pourjalali and Hansen (1996) model for testing discretionary accounting accruals, and independent variables were debt-to-equity, total assets, tax rate, internal/external financing and ownership structure. From the tested variables the authors found that managers use accruals to smooth income upwards to gather investors. They also found that only two factors, namely size and ownership, show significant evidence of EM before and after the market crash. The authors conclude that during the year of the market crash in 1998, they found no evidence of EM. Evidence on EM migth have been different if the tested sample was bigger. Furthermore, as the authors test total assets, they fail to refer to the possible timing of the reversal accruals.

2.5.4. Cases of China

In 2006, China introduced a new accounting system based on IFRS. Despite claiming that their accounting system is investor oriented, and bearing in mind that China is a country with a communist past, it is still being closely monitored as a strong tax based society. See for example China's Jurisdiction Profile on ifrs.org.

Yu, Du and Sun (2006), investigated earnings management (EM) for Chinese firms that wanted to engage in rights issues. Those companies which were planning to raise capital by issuing additional shares (rights issues) had to meet a regulatory minimum of return on equity (ROE). The authors also pointed out that in China during the sample period, investors' preference for raising capital were rights issues and not borrowing from banks. Regulatory rules in China changed in the 1994-2002 period. Due to this change, the authors were particularly interested in this period and the sample was selected from 1994 to 2002. During this period, the Chinese Securities Regulatory committee (CSRC), the Securities watchdog in China, has introduced changes twice in the rules for the rights issues. The authors also pointed out that auditing practices were not of the same standard as in the rest of the world. This could also help managers to engage in EM to achieve their goals. In 1994, the CSRC sets rules for the minimum average ROE of 10% for the last three financial years for companies that wish to engage in rights issues. This means that any company that wants to engage in rights issue must meet the average return on equity (ROE) exceeding 10%. Then, the CSRS made additional changes in 1996, which stated that in each of the three sequential financial years companies must meet the 10% ROE or above. The next change came in 1999, where the three-year average ROE had to be above of 10% but no less the 6%. In 2001, the CSRC further lowered the requirements level, where the average ROE was set to 6% or above, prior to the last three financial years of the year of the rights issue. The sample for the 1994-2002 periods was collected from the China Stock Market Research Series (CSMAR). The authors hypothesized that company managers manage earnings due to CSRC regulations. In order to test their presumptions, they split the sample into three periods, the first for the period of 1994-1998 for testing ROE for the 10% level. The second period included the period between 1999-2000 testing for 6% and 10% levels and for the third period for 2001-2002 testing for a 6% level of ROE. The authors applied t-test statistics at 5% significance level due to a small sample, and demonstrating tests relevance, the authors show three sample distribution panels for the three tested periods, namely for 1994-1998, 1999-2000 and for 2001-2002 respectively. In case of all the three distributions, non-smoothness is clearly visible, which confirms that companies manage their earnings in order to meet the set targets of 6% and 10% of ROE set by the CSRC. For the selected sample for the period from 1994 to 2002, the authors examined CSRC regulations for rights issues in China, where it is stated that companies had to achieve 6% and 10% ROE before they could engage in rights issuing. The authors clearly showed that earnings management is evident due to pre-set thresholds of 6% and 10% of ROE.

Similary to Yu, Du and Sun (2006), but a slightly different area was investigated by Liu and Lu (2007) who tested the link between EM and corporate governance of the Chinese listed companies for the period 1999-2005. Liu and Lu (2007) hypothesize that low EM is associated with high corporate governance, where firms with ‘de-listing risk’ will have higher EM and firms with ‘requirements for rights issue’ will also have higher EM. The authors tested EM applying three types of variables: total, industry median adjusted and discretionary accruals. Test results show weak evidence to support the first hypothesis that well managed firms which act truly on behalf of shareholders will have low earnings management (EM). Stronger support filtered through confirming that Chinese firms do ‘manage earnings to tunnel’ with the fact that managers might engage in EM for their own benefit. The reasons being that the ‘controlling shareholders’ of the listed firms are local governments and they engage in ‘tunneling activities’; that is ‘transfer resources away from the firm for the benefits of their controlling shareholders’. Tunneling activities hide the true and fair value of the company. The test results of t-test and Wilcoxon test for the second hypothesis confirm that managers engage in EM to avoid de-listings from the stock exchange. As for the third hypothesis, namely, the rights issue requirements hypothesis, the authors again test data and show evidence of EM. Liu and Lu (2007, p.887) present evidence at three ROE threshold points, at ROE=0, at ROE=6% and at ROE=10%. These thresholds are an ROE requirements points, where firms engage in EM to get ‘rights issue’ and to ‘avoid de-listing’. The authors conclude that the presence of earnings management among Chinese listed firms is mainly due to ‘tunneling activities’, higher mainly in the emerging markets owing to poorer corporate governance.

Although Yu, Du and Sun’s (2006); and Liu and Lu’s (2007) studies on EM have similarities due to the same country of investigation (China) and the same variable (ROE), the authors document well researched studies with similar conlcusions of evidence of earnings management.

2.5.5. Cases of Australia

Australia has an investor oriented accounting system, mainly influenced by the accounting system of the United Kingdom. See for example Doupnik and Salter (1993).

Holland and Ramsay (2003), investigated EM companies listed on the Australian Stock exchange (ASX), for the period of 1990-1997, excluding financial firms. The authors applied discontinuities in the distribution of reported earnings at a threshold point, using Burgstahler and Dichev (1997, pp.103-104) model and test statistics. The authors used four variables to test data for earnings management (EM). The same approach was calculated for Cash Flow. The authors hypotheses were that 'Earnings are managed to report positive profits', and that 'Earnings are managed to sustain the previous year's profit performance'. Apart from test statistics, the authors present histograms for the same variables and evidence of earnings management (EM), revealing that there is '*evidence of discontinuity in the distribution of reported earnings and changes in earnings*' – Holland and Ramsay (2003, p.59). Due to a smaller sample, the results are similar, but not as powerful as for example the Burgstahler and Dichev (1997) results.

Contrary to Holland and Ramsay (2003) who applied the discontinuity approach, Sun and Rath (2009) investigate EM of Australian, ASX listed, companies for the period of 2000-2006 using the accrual model of Jones (1991). The authors point out that the capital market is not as big as in the US, and in Australia financial reporting is due twice a year, whereas in the US four times. The authors tested total accruals (discretionary accruals) using the 'Jones model' (Jones, 1991), and added an additional variable, namely, change in operating cash flow (ΔCF) in order to remove any correlation of discretionary accruals. A sample of nine industries, baring financials, was collected from DataStream. Sun and Rath (2009) present test statistics evidence of earnings management (EM) which confirm that small size companies, when cash flow is low, manage earnings. They also show weaker evidence that earnings management does not occur only when companies are short of cash, but also when companies are well financed. The authors conclude that EM is present in Australian companies and recommend an increase in the number of annual reporting of financial statements. The authors apply regression analysis for a six-year sample, which is rather low for a regression testing. A more recent paper by Sun and Rath (2012) studies ASX listed firms, manager's 'benchmark-beating behaviour and circumstances' to manage or beat earnings benchmark, using accruals for testing (discretionary accruals) with a 'Modified Jones model' (Jones, 1991). The sample year (excluding financial firms) is from 1999 to 2006. Apart from statistical testing, the authors, similarly to Burgstahler and Dichev (1997), apply histogram analysis of earnings and earnings changes to visually observe discontinuities. The authors find a discontinuity in the distribution of reported earnings, but also point out that discontinuities are not shown when discretionary accruals are not present in the earnings. They also show that companies with earnings below zero engage in earnings management using discretionary accruals to increase earnings 'upward', thus to 'beat earnings benchmarks'.

2.5.6. The Case of Tunisia

The World Bank reports on the Observance of Standards and Codes in Tunisia, wordlbank.org.
Amar and Abaoub (2010) investigated Earnings Management in an emerging market, with relatively new financial and accounting regulations. The uniqueness of this paper is that it investigates a debt-dominated financial market, as its firms have strong ties with the Tunisian banking system due to capital fundings; whereas Anglo-Saxon countries have equity dominated financial markets. Furthermore, the Tunisian ownership structure is a concentrated capital market, ownership of the share capital consists mainly of family and state-owned companies, whereas earlier research papers were investigating EM of a wider range of capital structures. The authors looking for EM set up two hypotheses:

> 'Managers seek to avoid losses.'
>
> 'Managers seek to avoid earnings decreases.'

The data tested was from the Tunis Stock Exchange for the period of 1997-2004. From the financial statements, net earnings and total assets were applied for ratios calculation. The authors used the testing models of Burgstahler and Dichev (1997). Test results of the histogram, Amar and Abaoub (2010, p.46) show the distribution of the Annual Net Earning, a jump at zero point, which points towards accepting H1. Furthermore, test statistics show a negative standardised difference which gives a statistical significance of accepting H1. Amar and Abaoub (2010) show a histogram of the distribution of Changes in Annual Net Earnings, where the distribution at point zero has a huge jump. The negative standardised difference from the test statistics confirms H2, a point where 'managers seek to avoid earnings decreases'. Amar and Abaoub (2010) show a histogram of surprises of net annual earnings where the distribution of histograms does not show any abnormality around zero. This indicates there is no evidence of accounts manipulation in order to avoid negative earnings surprises. Amar and Abaoub (2010) investigated EM by applying the Burgstahler and Dichev (1997) methodology for their tests. They find that Earnings Management is present in Tunisia mainly in bank dominated corporate governance. The author's evidence of EM is rather weak, mainly due to a smaller tested sample.

2.5.7. The Case of Jordan

Despite the fact the Jordan adopted IFRS, it is not really clear whether the Jordanian accounting system is an investor or a tax oriented one. Due to the implementation and the endorsement of IFRS, the assumption that can be made is that the accounting system is closer to an investor oriented one. Furthermore, there is little corporate governance information on Jordanian corporate governance. Some information on Jordanian corporate governance, for example, can be found at ifrs.org Jurisdiction Profile and in the study of Al-Farah, Abbadi and AL Shaar (2015).

Abed, Al-Attar and Suwaidan (2012) investigate Corporate Governance and EM for non-financial firms in Jordan from 2006 to 2009, using data obtained from the Amman Stock Exchange. The authors applied the Jones-model in testing discretionary accruals. The variables tested comprised: ‘proportion of independent directors, board size, the role of duality, ownership, company size, financial leverage, industry’. The authors point out that the agency problem is of no significance due to the ownership of firms, which are predominantly owned by an ‘identifiable group’, dominated by the Jordanian business culture. The authors find that only the ‘board size’ variable shows significant test statistics evidence of EM. A Jordanian board size is regulated, and each company may decide upon board membership numbers at its own discretion. The authors also add that companies which violate corporate regulations receive low penalties. The authors do not refer to the reversal accruals timing effect that may have influenced the power of their tests.

2.5.8. The Case of Taiwan

Taiwan implemented IFRS in 2009, see ifrs.rog Jurisdiction Profile for further information. Although IFRS is a relatively new implementation, Taiwan moved towards an investor accounting system far earlier than 2009.

Wu, Huang and Chen (2012) investigated the earnings management of Taiwanese companies. They investigated executive stock option (ESO) valuation and its relation to earnings management. They investigated the IT industry and data was obtained from the Taiwanese Stock Exchange for the period of 2001-2006. As accruals play a major role in stock option valuation, the authors investigated discretionary (DA) and non-discretionary accruals (NDA), as well as return on asset (ROA) as variables in determining EM, applying the Dechow and Sloan (1995) model in the process. The authors present statistical evidence and confirm that company managers engage in earnings manipulation in order to reduce the exercise price before the 'grant date'. As managers receive more executive stock options, Discretionary Accruals are also increasing. As earlier studies, Wu, Huang and Chen (2012) do not refer to the timing effect of the reversal accruals, or to the possible impact these have on the power of the tests. Furthermore, the tested sample is rather low, which could have influenced the test results as well their final conclusion.

2.5.9. The Case of the United Kingdom

The United Kingdom has an investor-oriented accounting system. The country is dominant in promoting and influencing the investor-oriented accounting system both in the British Commonwealth countries and elsewhere.

Gore, Pope and Singh (2007) investigate 'accruals-based earnings management'. They tested UK non-financials for the period of 1989-1998. Data consist of earnings 'before extraordinary items' with earnings in the year (t) by total assets in year (t-1), and earnings change by total assets in year (t-1). The authors point out that there is no confirmed rule which earnings to test, earnings after or before extraordinary items. Extraordinary items account transactions that seldom occur in a fiscal year, i.e. foreign exchange gains or losses, strikes, the sales of property and others. However, extraordinary items do not exist in all accounting standards, as for example under IFRS, where they were withdrawn in 2005. The authors apply the Jones (1991) regression models with discretional and non-discretional accruals, and also use the Burgstahler and Dichev (1997) model. The authors wanted to find out if discretionary accruals (DACC) were used to manage earnings, and if DACC influenced earnings distribution to achieve earning targets. The authors show evidence of 'discontinuities in the distribution of reported earnings', and in contrast to

Durtschi and Easton (2005), managers manipulate DACC, which is the main source of discontinuity in the earnings distribution, thus in order to achieve positive earnings targets, they engage in earnings management. Gore, Pope and Singh's (2007) paper applies a testing approach similar to the one applied in this study, particularly when it comes to testing the discontinuity of distribution. However, it cannot be seen from their work that they refer to reversal accruals.

2.6. Earnings Management research studies investigating Financials companies in countries around the world

2.6.1. The Case of Japan

As this study mentioned earlier, Japan has an investor-oriented accounting system.

Kwak, Lee and Eldridge (2009) investigated Loan Loss Provisions (LLP) of Japanese banks at recession time, from mid to the end of 1990 in particular. A sample of banks was selected from the Tokyo Stock Exchange, for the period of 1996-1999. The authors followed Beatty, Chamberlain and Magliolo (1995) and other three methodology to test hypotheses with discretionary (DLLP) and nondiscretionary 'components of LLP'. The authors conclude that during the recession, Japanese banks used 'higher DLLP's (income-decreasing) when their demand for external financing was high, to signal financial strength' and 'low DLLP's (income-increasing) when their capital ratio and pre-managed earnings were high'. Due to a small sample period, test statistics did not clearly confirm, or reject earnings management.

2.6.2. The Cases of Singapore and Thailand

Singapore is an investor accounting system oriented toward a free market system. See Ministry of Trade and Industry Singapore (mti.gov.sg). IFRS will be introduced in 2018.

Thailand also tends towards an investor accounting system. It also adopted the IFRS in 2014. See ifrs.org Jurisdictional Profile for both countries.

Charoenwong and Jiraporn (2008) were examining Earnings Management in Singapore and in Thailand. They examined data from the Singapore stock exchange between 1975 -2003, and for Thailand, the data was collected from the Thai stock exchange for the period 1975 -1999. For both countries, data consisted of financial and non-financial companies. The variables used were extracted from the financial statements by computing earnings per share (EPS) between two financial years. Few researchers argue that testing financial companies' data should be excluded due to strict financial regulation. The authors disagree with that argument, the reason being that financial institutions need to be investigated in the same manner as non-financial companies. Financial firms in the past decade have had liquidity difficulties, and in the past four years, financial companies have come close to illiquidity. For data testing, Charoenwong and Jiraporn (2008) applied t-statistics, the same as in the case of the Degoerge, Patel and Zeckhauser (1999) paper. Test results show weak evidence to sustain recent performance for non-financial companies for both Singapore and Thai data. Government-linked companies also show no evidence of managing earnings to report positive profits. The authors found a strong evidence of EM to report zero or positive profits in Singaporean non-financial companies and Thai financial and non-financial companies. The authors also found evidence that Thai financial and non-financial firms were managing their earnings before and after the financial crisis that took place in 1998. Another important fact for Thai non-financial firms is that despite analysts constant presence Earnings Management is present within each company's governance. Limitation of the study is that the authors do not compare their results to other research papers (i.e. Degoerge, Patel and Zeckhauser, 1999), or to industry standards.

2.6.3. The Cases of 48 countries worldwide

Shen and Chih (2005) investigated investor's protection, prospect theory and earnings management for the banking industry in 48 countries in North and South America, Asia, Africa, Europe, Australia. As banks play a major role in the capital markets their regulations are one of the toughest in the industry. The incentive for banks to manage their earnings is huge due to the banks liquidity, their assets, especially their trading assets and due to strict banking regulations. In every country, regulatory bodies imposed strong rules, but the strength of these rules differs from country to country. It has been noted as evidence in several and also in this research study that traders and bank managers in order to comply with the regulations manage their earnings. Data was collected from the Bankscope database for the period of 1993-1999, from 48 countries. Shen and Chih (2005) applied testing models of Burgstahler and Dichev (1997), Degegorge, Patel and Zeckhauser (1999) and Leuz, Nanda and Wysocki (2003). Shen and Chih (2005) tested if EM is present in the Banking industry, if the distribution is smooth at zero earnings level – at the threshold point and if EM differs across the countries. The authors show the distribution of 48 countries, and there is a visible jump at zero points, and thus they found that in the majority of the sampled countries, there is clear evidence of Earnings Management. Furthermore, the authors argue, Banks above the earnings threshold are 'risk-averters' and point out that in countries with strong legal protection and enforcement, EM increases as the banks' managers are motivated to avoid negative earnings in order to avoid penalties for negative earnings imposed by the authorities. The authors presented and explained a high quality research study by applying Prospect theory in combination with discontinuity and regression analyses and showed evidence of EM in the banking industry.

2.6.4. Cases of the USA

The USA, similarly to the U.K., has an investor-oriented accounting system, and has been influencing developing countries with its financial reporting system. The USA implemented IFRS in 2010.

Beatty and Harris (2001) were examining tax, earnings and capital management at publicly traded banks in the US, a subject which was earlier reviewed in this study, under Capital Motivation, Page 27 of the literature review.

Cornett, McNutt and Tehranian (2009) investigate publicly traded large banks in the U.S., to find out if there is a connection between earnings management and corporate governance factors such as a CEO’s pay for performance, board independence and capital. The data examined with OSL regression analysis was for the period from 1994 to 2002. The authors were particularly interested in managers’ pay per performance relation to earning management. The authors hypothesized that low reported earnings will increase EM, CEO’s performance based salaries will increase earnings management (EM), a tighter board control and independence will lower EM and low capital will increase EM. The data for testing was obtained from Bank Holding Company Performance and merger database from the Chicago Federal Reserve’s Web site. The tested period was for 1994 - 2002. Managers record loans loss provisions in the banks’ accounting books to offset future bad loans. Loan loss provisions (LLP) are non-cash expenses. Tests statistics show that EM is present at large US bank companies due to corporate governance and they cannot reject the hypotheses. They found that CEO's performance based salaries are a motivational factor for EM; that is, high performance based salaries relate to high EM and low-performance based ones to low EM. They also find that corporate governance has an influence on bank managers' action; that is, CEO's earnings management is lower in the presence of a board with high independence. The author's investigation of corporate governance in relation to EM in the banking industry is of significant importance, as it is one the few high-quality studies to date. The authors show evidence that corporate governance in the banking industry, specifically performance, board independence and capital contribute to EM.

The possible relation between discretionary accruals and earnings was investigated with regression analysis by Balboa, López-Espionosa and Rubia (2013). The authors were interested to find nonlinear connections and 'patterns' to show if bank managers used accruals in earnings increases or decreases. The authors point out that bank managers apply different EM techniques when earnings are high, i.e. income earnings are used; whereas in case of negative earnings, loan loss provisions (LLP) are overstated. The authors' study shows that bank managers have incentives to engage in EM.

Examining EM during the financial crisis was investigated by Cohen, Cornett, et al. (2014). The authors examine LLP of US banks before and during the financial crisis, and investigate the prediction of EM during the financial crises. The authors apply the regression model for testing and searching for evidence of EM by examining banks' 'tail risks' during the financial crisis. Tail risks are *'... extreme declines in a bank's stock price.'* - Cohen, Cornett, et al. (2014, p.171). Deutsche Bank (2010, p.1) defines tail risk *'…is technically a risk of a portfolio value move of at least three standard deviations (3σ) from the mean and is more probable (frequent) than anticipated by a normal distribution.'* The authors present a jump of the standard deviation of the discretionary earnings during the financials crisis. From the test results, the authors conclude that prior to the crisis the prediction of EM is low, but it is high during the crisis. The authors further point out that evidence of EM is higher before the 2007 financial crisis. The authors acknowledge the reversal accruals effect of the discretionary accruals in their study.

2.6.5. The Case of the Organisation for Economic Co-operation and Development (OECD) countries

Taktak, Shabou and Dumontier (2010) investigate income smoothing in the banking industry within the Organization for Economic Co-operation and Development (OECD) countries. The authors were seeking to find out if bank managers were smoothing earnings in ‘real or artificial form’, while trading securities plus ‘managing loan loss provision’, and within this process, whether they were complying with banking regulations. The authors point out that real smoothing is smoothing with real activities, i.e. selling securities when financial results are poor, while artificial smoothing refers to ‘manipulating accounting figures’. The data used for test statistics was from the Bankscope database, operating in the OECD member countries, for the period 1994 to 2002. The authors applied Eckel’s and Beidleman’s methods for testing smoothing. Taktak, Shabou and Dumontier (2010) show evidence that a high percentage of the OECD member countries, especially ‘continental European banks’, smooth their income both by artificial and by real activities, or by trading securities. The authors conclude that banks operating in ‘Anglo-American countries’ smooth their income less than banks in continental Europe. It may be concluded from the study that one of the main drivers of income smoothing is the legal system of a particular country. This is what the authors’ results show, namely, evidence of lower income smoothing within Anglo-American countries than within their European counterparts.

2.6.6. The Cases of Asian Countries

Wang, Chen, et al. (2012) investigate EM in the Asian banking industry. Sample data was collected from BankScope, for sixteen Asian countries, for the period 1996-2009. The authors investigated accrual estimates, specifically loan loss provision (which is a banking sector specific) for banks who adopted IFRS and for banks with local GAAP. The authors also looked at diversification and at the relation between accounting quality and transparency. The result of test statistics for loan loss provision for sixteen Asian Countries can be found in Wang, Chen et al. (2012). They present test statistics which shows evidence of income smoothing thus earnings management (EM) in nine out of the sixteen countries in question. The authors point out that income smoothing occurs when bank earnings are higher, and the level of loan loss provision (LLP) depends on the 'accounting quality, financial supervision and regulations'. The authors present Descriptive Statistics results combined with IFRS and local GAAPs. However, it would have been more of an interest if the authors split the IFRS data from the local GAAP and test data separately. In this way, apart from the tested hypotheses, additionally, the power of the standards of the tested variables could additionally be examined, i.e. IFRS vs. local GAAPs. Furthermore, IFRS may not treat accounting entries in the same way as the local GAAP does, as this study will show in the following chapter, in Chapter 3, the Hungarian Accounting Standards (HAS) vs. IFRS.

2.6.7. The Cases of Islamic Banks

Hamdi and Zarai (2012) investigate the presence of EM in Islamic banks. The authors point out that Islamic banks follow strict rules of ethical and moral values, as Islamic banks apply the rules of Sharia'ah, the Islamic 'jurisprudence', that is, no interest is being applied to transactions. The authors apply earnings distribution and the prospect theory approach to finding evidence of EM within the Islamic banks. They hypothesize that 'managers seek to avoid losses and earnings decreases'. The authors also point out that due to a short sample period from 2000 to 2009, the time series accrual based approach would not suit their testing purposes. Data was obtained from the Islamic Banks and Financial Institutions Information (IBIS) Database. The authors apply the Burgstahler and Dichev (1997) statistical model and test discontinuities in earnings distribution; additionally, they also run Fiegenbaum's (1990) regression model. They present mixed evidence in their study, showing distributions that, in both cases, are not smooth at zero threshold point, where there is a discontinuity. Distributions to the right at zero points are higher than distributions to the left at zero points. The authors further present test statistics of negative mean and standardized difference to the left, which indicates earnings management 'to avoid losses'. The Hamdi and Zarai's (2012) results show that managers seek to 'avoid earnings losses', and not to 'avoid earnings decreases', and they conclude that Islamic banks are engaged in earnings management to 'show positive earnings'. As the authors test total assets variables, there is no reference to the timing of the reversal accruals, nor any indication that the test results might be biased. Furthermore, results from the study are not really sufficient in order to make a conclusion in favour to EM. Nevertheless, paper is of interest due to its subject of investigation, namely, Islamic banks.

2.6.8. The Cases of Dutch Banks

The Netherlands adopted IFRS in 2002 and has an investor-oriented accounting system.

Norden and Stoian (2014) investigate the loan loss provision (LLP) of banks trading in the Netherlands for the period from 1998 to 2012. The authors were interested to find out if LLP plays a role in earnings management, specifically in the volatility of banks earnings ‘before and after loan loss provisioning’. They used smoothing and regression analysis of quarterly data for the sample period. The authors confirm from their results that they are in line with the earlier studies, that is, banks manage earnings by smoothing the ‘volatility of earnings with LLP’. Furthermore, the authors show, banks have higher LLP when ‘discretionary earnings’ are also higher, and banks that pay dividends will increase LLP if their ‘expected dividends are lower than current earnings’. The authors show with distribution and regression analysis that EM is present within the Dutch banks, who manage LLP to achieve their goal earnings. However, as the paper tests several variables, including total assets, the authors failed to refer to the timing of the reversal accruals. Additionally, four-year data is rather short to test reliably. Furthermore, as the paper was published in 2014, the authors should have mentioned, under their references, or in their text, the Baber, Kang and Li (2011); and/or Dechow, Hutton, et al. (2012) papers, studies which are indispensable to refer to when it comes to researching EM with accruals.

The next section presents summary on earnings management investigating non-financial companies and countries.

2.7. Summary of Earnings Management research studies, investigating Non-Financial companies in countries around the world:

Table 2.a.		
Author(s) Name / Title of the Study	**Area / What was investigated**	**What was found / Limitations**
Leuz, Nanda and Wysocki (2003). *'Earnings management and investor protection: an international comparison'*.	Examined EM in 31 countries with different legal and cultural backgrounds. Splitting sample into strong and weak legal system, the authors looked at earnings smoothing and accruals manipulation as drivers of EM.	The authors conclude that a country's legal and institutional set-up has a strong influence on the quality of reported earnings; that is, strong legal protection within corporate governance is directly linked to high reporting quality. The authors should have applied a different model for data testing, as the accrual model does not show high testing power.
Enomoto, Kimura and Yamaguchi (2013). *'Accrual-Based and Real Earnings Management: An International Comparison for Investor Protection.'*	Investigated real EM (making decisions to affect the company's future cash flow) against accrual-based EM ('change in accruals processes') of companies throughout 38 countries.	EM levels and EM types depend on each country's efficiency in enforcing investor protection. That is, accrual based EM is reduced by strong investor protection; with strong investors protection real EM increases
Case of Japan:		
Darrough, Pourjalali and Saudagaran (1998). *'Earnings Management in Japanese Companies.'*	Investigated 'income increasing accounting accruals' of Japanese firms before and after the market crash in 1990.	The authors conclude that Japanese companies prefer debt over equity as a source of capital and managed earnings both before and after the market crash in 1990. However, as discretionary accruals were tested, the power of the test is questionable.
Suda and Shuto (2005). *'Earnings Management to avoid earnings decreases and losses: Empirical evidence from Japan.'*	Investigated if EM is present in Japanese companies traded on the stock exchanges for the 1990-2000 period by applying the discretionary accrual model.	The authors show that Japanese company managers manage earnings and influence accruals to 'avoid decrease of earnings and losses'. The authors also point out that the cost effect is linked to EM and list three reasons for EM: salary compensation, bank-oriented system and tax effect on profits.

Shuto (2007). *'Executive compensation and earnings management: Empirical evidence from Japan.'*	Investigated Japanese executive compensation and EM by applying accruals for testing.	Presents evidence of EM, where Japanese managers apply the 'big bath' technique and extraordinary items to smooth income, in order to manage earnings.
Matsuura (2008). *'On the Relation between Real Earnings Management and Accounting Earnings Management: Income Smoothing Perspective.'*	Investigates the relation between real and accounting earnings management of Japanese companies.	The authors show evidence that real EM appears before accounting EM, that is, first a decision is made to engage in EM and then action is taken by manipulating accounting entries.
The Case of the EU:		
Coppens and Peek (2005). *'An analysis of earnings management by European private firms.'*	Investigated if EM was present in the public and private firms within the European Union. The authors specifically looked if companies engaged in the avoidance of reporting losses and earnings decreases.	The authors test results reject that companies do not manage earnings to avoid losses. But cannot reject the second hypothesis as reporting earnings decreases. They do not explain why they cannot reject the second hypothesis, i.e. due to a small sample or perhaps because of a 'true absence of EM'.
The Case of Malaysia:		
Aman, Iskandar, et al. (2006). *'Earnings Management in Malaysia: A Study on Effects of Accounting Choices.'*	By applying discretionary accruals, authors investigated EM of companies that are listed on the Malaysian stock exchange.	The authors show evidence of EM for two variables before and after the market crash 1998, but show no evidence of EM during the year of the crash.
Cases in China:		
Yu, Du and Sun (2006). *'Earnings management at rights issues threshold – Evidence from China.'*	The authors investigated EM of the Chinese firms who engaged in right's issue and had to meet regulatory minimum on return on equity (ROE).	The authors found evidence of EM due to poor auditing practices, and firms manage their earnings with 'non-core' income to meet the required ROE threshold levels for the right's issue.
Liu and Lu (2007). *'Corporate governance and earnings management in the Chinese listed companies: A tunneling perspective.'*	The authors looked at EM and corporate governance of listed Chinese companies.	The authors conclude that the presence of earnings management in Chinese listed firms are mainly due to 'tunneling activities', to a higher degree mainly in the emerging markets due to poorer corporate governance.
The Case of Australia:		
Holland and Ramsay (2003).	Investigated EM companies listed on the	The authors show evidence of discontinuities in the distribution of

'Do Australian companies manage earnings to meet simple earnings benchmarks?'	Australian Stock exchange (ASX), applying discontinuities in the distribution of reported earnings at a threshold point.	reported earnings and changes in earnings at a threshold point. Such a discontinuity leads to EM, as managers manage earnings to maintain the profits trend from the previous years. But, the power of the test is weak due to a small sample or due to the firms' size effect.
Sun and Rath (2009). *'An Empirical Analysis of Earnings Management in Australia.'*	Investigated EM of Australian, ASX listed companies, applying the 'Jones model' (Jones, 1991) to test total accruals (discretionary accruals).	The author's present statistical evidence of EM, for companies that are of small sizes, when cash flow is low, companies manages earnings. A weaker evidence of EM does not only occur when companies are short of cash but also when they are well financed.
Sun and Rath (2012). *'Pre Managed Earnings Benchmarks and Earnings Management of Australian Firms.'*	Studied ASX listed firms, managers' benchmark-beating behavior and circumstances to manage or beat earnings benchmarks. Using accruals for testing (discretionary accruals) with the 'Jones model' (Jones, 1991).	The authors find a discontinuity in the distribution of reported earnings, but also point out that discontinuities are not shown when discretionary accruals are not present in earnings. They present evidence that positive earnings and positive earnings change where benchmarks were applied to manage earnings 'upward', thus to 'beat earnings benchmarks'.
The Case of Tunisia:		
Amar and Abaoub (2010). *'Earnings Management Thresholds: The case in Tunisia.'*	Investigated EM in a debt dominated financial market in Tunisia, due to capital fundings from banks. By applying the Burgstahler and Dichev (1997) model, the authors investigate earnings management at zero earnings, last periods' earnings, analyst earnings forecast and meeting earnings targets.	The authors test distributions of earnings and show discontinuity in the tested sample. They show evidence of discontinuity in histogram results, although in my view the results are weak due to a small sample.
The Case of Jordan:		
Abed, Al-Attar and Suwaidan (2012). *'Corporate Governance*	The authors examined EM of 'corporate governance mechanism'	The authors conclude that only board size has a significant relation to earnings management.

and Earnings Management: Jordanian Evidence.'	in Jordanian non-financial firms by applying the modified Jones (1991) model. Sample for 2006-2009 was used from the Amman Stock Exchange.	Limitation of the study is a small sample size and testing power, as tests were performed only at 0.05 and 0.10 significance levels.
The Case of Taiwan:		
Wu, Huang and Chen (2012). *'Earnings Manipulation, Corporate Governance and Executive Stock Option Grants: Evidence from Taiwan.'*	Authors tested executive stock option valuation and its relation to earnings management by using a sample of IT industry from the Taiwanese Stock Exchange. The authors tested discretionary accruals by applying the Dechow and Sloan (1995) model.	The author's present evidence where the discretionary accruals are 'positively' linked to executives stock options. Executives manipulate earnings to influence the stock option exercise price in order to increase the value of stock options.
The Case of The UK:		
Gore, Pope and Singh (2007). *'Earnings management and the distribution of earnings relative to targets: UK evidence.'*	The authors tested UK non-financial companies for the period of 1989-1998 applying the Jones (1991), as well as the Burgstahler and Dichev (1997) model. Apart from the test statistics, the authors also apply discontinuity analysis of the results.	The authors find, in contrast to Durtschi and Easton (2005) that managers manipulate DACC, which is the main source of discontinuity in the earnings distribution, in order to achieve positive earnings targets, they engage in earnings management.

Source: Own presentation

2.8. Summary of Earnings Management research studies, investigating Financials companies in countries around the world

Table 2.b.		
Author(s) Name / Name of the Study	**Area / What was investigated**	**What was found / Limitations**
The Case of Japan:		
Kwak, Lee and Eldridge (2009). *'Earnings Management by Japanese Bank Managers Using Discretionary Loan Loss Provisions.'*	The authors investigated loan loss provision (LLP) of Japanese banks in relation to earnings management. Testing data was used from Tokyo Stock Exchange for 1996-1999 periods. The authors followed Beatty, Chamberlain and Magliolo (1995) and 3 other papers methodology to test their hypotheses.	The authors conclude that during the recession, Japanese banks used 'higher DLLP's (income-decreasing) when their demand for external financing was high, to signal financial strength' and 'low DLLP's (income-increasing) when their capital ratio and pre-managed earnings were high'. Due to a small sample the authors conclude that the results on EM be interpreted with 'caution'.
The Cases of Singapore and Thailand:		
Charoenwong and Jiraporn (2008). *'Earning Management to exceed Threshold: Evidence from Singapore and Thailand.'*	The authors searched for signs of earnings management and tested Singapore and Thai stock exchanges financial and non-financial data for the period of 1975-2003, applying the Degeorge, Patel and Zeckhauser (1999) 't-like' statistical model.	Test results show weak evidence to sustain recent performance for non-financial companies for both Singapore and Thai data. Government-linked companies show no evidence of managing earnings to report positive profits. There is a strong evidence of EM to report zero or positive profits in Singaporean non-financial companies and Thai financial and non-financial companies. The authors also found

		evidence that Thai financial and non-financial firms have been managing their earnings before and after the financial crisis that took place in 1998.
The Cases of 48 countries worldwide:		
Shen and Chih (2005). *'Investor protection, prospect theory and earnings management: An international comparison of the banking industry.'*	The authors investigated investors protection, prospect theory and earnings management for the banking industry in 48 countries for the period of 1993-1999, applying the Burgstahler and Dichev (1997), Degeorge, Patel and Zeckhauser (1999) and Leuz, Nanda and Wysocki (2003) models.	The authors show asymmetry in the distribution of net income in 48 countries, where there is a visible jump at zero point. They found that in 2/3 of the sampled countries, there was clear evidence of Earnings Management.
The Case of the USA:		
Beatty and Harris (2001). *'Intra-Group, Interstate Strategic Income Management for Tax, Financial Reporting, and Regulatory Purposes.'*	The authors investigated 'capital management (management of security gains or losses), tax and earnings' dealings of publicly traded banks in the US. Samples for testing were used for 1991 and 1992 financial years.	Test results present evidence of EM where banks shift their security gains / losses to subsidiaries with lower tax rates with an intention to reduce subsidiaries and the consolidated tax amount. Such an asset shifting contributes to managing company group earnings amounts. The authors conclude that banks engage in EM in order to reduce state tax payments, as well as their consolidated tax contributions on banks group level.
Beatty, Ke and Petroni (2002). *'Earnings Management to Avoid Earnings declines across Publicly and Privately Held Banks.'*	Searched for EM by investigating and then comparing evidence between privately and publicly owned banks.	Present evidence of EM in publicly traded banks by using LLP, then the privately traded banks.

Cornet, McNutt and Tehranian (2009). *'Corporate governance and earnings management at large U.S. bank holding companies.'*	Investigated publicly traded large banks in the U.S., to find out if there was a connection between earnings management and corporate governance factors such as CEO pay for performance, board independence and capital. The authors applied OLS regression analysis. The data examined was for the period from 1994 to 2002.	The authors show evidence of earnings management within 'corporate governance mechanism', specifically board independence, CEO pay for performance and capital. They also show evidence of earnings smoothing. They also show that higher board independence reduces earnings management. Despite the small (total) sample of 593 banks, the authors show evidence of EM.
Balboa, López-Espionosa and Rubia (2013). *'Nonlinear dynamics in discretionary accruals: An analysis of bank loan-loss provisions.'*	Investigated income smoothing by testing LLP with regression analysis and effects on earnings.	The author's present evidence that LLP is high when earnings are negative and there is income smoothing during high earnings and that is clear evidence of a nonlinear pattern.
Cohen, Cornett, et al. (2014). *'Bank Earnings Management and Tail Risk during the Financial Crisis.'*	The authors investigated LLP for evidence of EM before and during the financial crisis, prediction of EM before and during the financial crisis.	The authors show that banks engaged in EM to a larger extent prior to the crisis, and conclude that the test results show the prediction of EM was higher during the crisis, and lower before the crisis.
The Case of Organisation for Economic Co-operation and Development (OECD) countries:		
Taktak, Shabou and Dumontier (2010). *'Income Smoothing Practices: Evidence from Banks Operating in OECD Countries.'*	Investigated income smoothing in the banking industry within the OECD countries. The sample tested was from 1994 to 2002. The authors looked if bank managers were smoothing earnings in 'real or artificial form' while trading securities plus 'managing loan loss provision' and	The authors find that banks with poor results smooth their result with loan loss provisions or by managing security gains. Earnings smoothing is also present with 'insured deposits' but do not see the connection in 'non-insured debts'. They also point out that legal system plays a major role in income

	within this process whether they were complying with the banking regulations.	smoothing and that state, continental European banks smooth income more than the Anglo-American banks.
The Cases of the Asian Countries:		
Wang, Chen, et al. (2012). *'Income Smoothing and Earnings Management in the Banking Industry: Evidence in Asian Countries.'*	Investigated EM in the Asian banking industry for 16 Asian countries, for the period 1996-2009. The authors tested LLP with regression analysis of countries with IFRS and with local GAAP.	The authors point out that income smoothing occurs when bank earnings are higher, and with less control. Banks that adopted IFRS tend to 'estimate lower deviation from their expected LLP'. That is, the level of loan loss provision (LLP) depends on 'accounting quality, financial supervision and regulations'.
The Cases of the Islamic Banks:		
Hamdi and Zarai (2012). *'Earnings Management to Avoid Earnings Decreases and Losses: Empirical Evidence from Islamic Banking Industry.'*	Investigated presence of EM in Islamic banks in 27 countries. Islamic banks apply rules of Sharia'ah, the Islamic 'jurisprudence'. The authors apply the Prospect Theory and Burgstahler and Dichev (1997) model in testing discontinuities in earnings distribution. There was a total of 1244 banks year observations for the sample period.	The authors show mixed evidence in their study. While tests results show discontinuity in the distributions, thus indicating the presence of EM, tests statistics do not confirm 'account manipulations to avoid earnings decreases'. The authors conclude that Islamic banks 'are less likely' to engage in EM than non-Islamic banks, due to the fact that Islamic banks are 'risk averters'.
The Cases of the Dutch banks:		
Norden and Stoian (2014). *'Bank earnings management through loan loss provisions: A double-edged sword?'*	The authors investigated LLP of the Dutch banks, a total of 85, for the period from 1998 to 2012. They	The authors show that banks manage earnings by smoothing 'volatility of earnings with LLP'.

	were using smoothing and regression analysis of the quarterly data for the sample period.	Furthermore, banks have higher LLP when ‘discretionary earnings’ are also higher. Banks that pay dividends will increase LLP if their ‘expected dividends are lower than the current earnings’. The authors show with the help of distribution and regression evidence that EM is present with the Dutch banks which manage LLP to achieve their earnings goal.

Source: Own presentation

2.9. Summary of the Literature Review on Earnings Management

Financial statements are in constant use by the general public, analysts, investors, government and regulatory bodies alike. Credibility and trustworthiness of the numbers are therefore vital. By using financial statements, the likelihood of earnings management has always been a question. Chapter 2 presents summary of critically reviewed papers, published on the topic of Earnings Management (EM) that had been investigated for over three decades. Early research papers were published in the US and other countries in the EU and Asia. The motivation for these papers was diverse. The authors searched for the motivation behind EM itself, fraud, EM techniques, EM and corporate governance, the existence of EM. Evidence of EM presence was well documented within the research community in different industries as well in several countries and continents. As outlined in Chapter 2, only a handful of research papers have been published investigating banks, compared to vast existing literature on EM within non-financial industries.

EM was investigated with different techniques such as total accruals, specific accruals and discontinuity approaches looking items from profit and loss accounts, balance sheets and cash flow. Some researchers argue against manipulation, some showed firm statistical evidence within financials and other industry types that the existence of earnings management (EM) cannot be denied. It is up to the reader to decide for him or herself whether the researched evidence substantiated these claims. Having read the relevant papers, this study concludes that there is no perfect model for testing earnings management (EM). Furthermore, under accrual accounting, accrual entries must be reversed, as it may influence the testing power, as Baber, Kang and Li (2011) and Dechow, Hutton, et al. (2012) argue. However, papers critically reviewed in this study that investigate EM on accrual bases (i.e. by applying Jones, 1991; or other accrual testing models) simply do not refer to this basic accounting rule.

In limiting EM, auditors also play a major role and history has confirmed their role with more or less success in eliminating EM, although published evidence shows that auditors did / do not stop EM. Regulatory bodies also play an important role in finding any possible financial manipulations and earnings discrepancies. Apart from conservative accounting, well-controlled management, auditors and regulatory bodies play an important role in the transparency of the financial statements and also in stopping earnings management.

An intense search was performed to seek domestic or foreign published papers on EM pertaining to Hungarian credit institutions. There are few scientists in Hungary who have been researching financial intermediaries. The most up-to-date studies on the country's financial matters can be read on the Central Bank of Hungary's (MNB) internet site. Most studies investigating banks were published on the subject of mergers and acquisitions, banking periods since 1987 and competitions in the banking world in Hungary. Most of these research studies miss in depth econometrical tests and analyses. Only few studies were published, mostly by the Central Bank of Hungary (MNB), where there is some limited statistical analysis. However, even these research works are completely irrelevant to this study, as not even a paragraph refers to earnings management. The available research works are on general economics, on the monetary policy of the Central Bank of Hungary, as well as on comparisons of ratios, limited to return on equity (ROE) and return on assets (ROA). However, as of writing this thesis, there is no evidence of any published studies on earnings management of credit institutions in Hungary, or similar studies of any of the industries operating in Hungary. Due to this research gap, this study focuses entirely on investigating financial statements of domestic and foreign credit institutions trading in Hungary in search of evidence of 'earnings anomalies', that is, evidence of earnings management.

Despite detailed literature search for earnings management studies in Hungary, it was concluded, that since the 1930's, 1970' or since 1987 neither the Central Bank of Hungary (MNB) nor the Hungarian Financial Supervisory Authority (now under umbrella of MNB) published any research papers on financial intermediaries pertaining to earnings management. Studies on the history and types of Hungarian financial intermediaries represent an exception and they are included in this study, in the next chapter, in Chapter 3. It is fair to conclude that the Hungarian research community in the field of finance is still in its infancy compared to the EU, the USA and the so called 'newcomers', namely, the Asian scientists. It is also a strong fact that elements from the past communist regime are still present and influencing the Hungarian financial as well as the rest of the industry.

The next chapter, Chapter 3, presents the Hungarian financial banking history from the transitional period up to the present day.

Chapter 3

Hungary's Credit Institutions

3.1. Introduction

Chapter 1 of this study presents a brief summary of the Hungary's banking sector from the mid-19th century until 1989. Chapter 2 critically evaluates published research papers on earnings management (EM). As pointed out in Chapter 2, despite an intense search, the author of this study could not find any papers published in Hungary, or elsewhere, pertaining to earnings management within the financial sector nor within other sectors in Hungary.

Sections of Chapter 3 below summarise the most relevant published papers of the Hungarian credit institutions relevant to this study.

3.2. Hungarian financial institutions and the development of the banking industry from 1987 until the present day

3.2.1. The Central Bank of Hungary – Magyar Nemzeti Bank (MNB)

On 1st January 1987, the first significant change was introduced to the Central Bank of Hungary (MNB), namely, single-tier banking operations were scraped to be replaced by a two-tier banking system. Also, from 1987 the MNB stopped its commercial tasks and transferred the commercial duties to three newly formed banks, Kereskedelmi és Hitel Bank - K&H (Commercial and Credit Bank), Magyar Hitel Bank and the Budapest Bank. These newly formed banks were undercapitalised, and they had inherited bad loans. In 1991, new banking legislations were drawn up, the so-called ‘LX.’ (where ‘LX’ is a specific notation for the banking law, for 1991 year). Each legislative act has its own Roman numeral notation with the year when the law was passed and published in the ‘Hungarian Journal, Official Gazette’. In the case of ‘LX, 1991’, for example, it refers to a law numbered ‘LX’ that was published in 1991. The ‘LX, 1991’ law gave a clean path to the Central Bank of Hungary (MNB) to regain its independence as well as to concentrate its efforts on monetary policy tasks. The ‘LX.’ legislation also guaranteed to MNB (being part of its independence) that the government could no longer give any instructions to the bank. The first interest rates decision was made by the MNB in 1989, and since 1990 interest rate policy has been an MNB task as part of the monetary policy (Balatoni, 2008).

The MNB had new legislation passed in 2003 that filled legal / financial loop-holes of the 1991 legislation. After 2003, further financial legislative acts were drawn up with the latest being passed in 2013. The MNB’s main objective is price stability and it operates as an independent institution. It performs and implements monetary policy, sets the rate of interest, issues HUF (HUF refers to Hungarian Forint, HUF being the code for Hungarian currency) as legal tender, manages reserves in foreign exchange and gold, implements foreign exchange rate policy, oversees money circulation and publishes statistical data, (www.mnb.hu).

MNB regained its independence, became a member of the European System of Central Banks, and signed Article 127 of the Treaty on the Functioning of the European Union, ‘*the MNB Act, which establishes the Bank’s primary objectives and basic tasks as well as its institutional, operational, personal and financial independence and operation, stipulates that the primary objective of the MNB is to achieve and maintain price stability. … The MNB Act also stipulates* *the independence of the Bank in accordance with Article 130 of the Treaty on the Functioning of the European Union.'* (Source: MNB Yearly Report, 2012).

After over 40 years, Hungary's stock market was also decentralised in 1989 and reopened in June 1990 and has been operational ever since.

3.2.2. Hungary's Banking sector transition towards market economy after 1987

During the process of transformation from a single to a two-tier banking system in 1987, managers at the newly formed commercial banks had few experienced staff members. Managers dealing with banking duties, such as accounting, internal controls and corporate governance were also inadequate (Szapáry, 2001). From 1988, prior to privatisation, four types of financial institutions were operating: commercial, investment and savings banks, plus specialised financial institutions. The services of these institutions were limited comparing to today's banking products. These were personal banking services, long-term project financing, commercial services and 'specific aspects of banking', (Neale and Bozsik, 2001).

As part of the transformation process, further regulations were drawn in 1991, namely, the '1991 LXIX', an amended law that regulated banking operations (The 'LXIX.' law refers specifically to banking regulations and was published in the 'Hungarian Journal, Official Gazette' in 1991). Furthermore, new accounting legislation was created in 1991, namely the XVIII accounting law, and the banks were obligated to follow these rules to increase their trading transparency (similarly in 1991, it was published in the 'Hungarian Journal, Official Gazette' 'the XVIII' law, which describes accounting rules and principles). Bankruptcy laws were also drawn in 1991, the 'IL' regulation, which took effect in 1992. (Ábel and Szakadát, 1997). (the Roman numeral and publication year is the reference for each law respectively. The ‘IL, 1991’ law refers to Bankruptcy and Liquidation Proceedings published in the year 1991).

The ownership structure of banks was also changing. Despite the two-tier banking model, the state was still in ownership of the Hungarian banks. Additional laws (tax, privatisation, banks consolidation act in 1993 and other legislation) by the government gave green light not only to privatisation but they also made possible for foreign credit institution to mark their presence in the Hungarian banking market. Furthermore, one of the biggest challenges for banks was bad loans of the state-owned institutions at the age of bankruptcy. This led to different waves of consolidations (Neale and Bozsik, 2001):

a. Credit consolidation (instead of bad debts, 20 years long treasury bonds were used)
b. Bank consolidation (involved recapitalisation by the state)
c. Debtor consolidation (injection of capital to ‘bank’s debtors’)

But consolidation of Credit and Debtor consolidation as well as Capital increase was not free, for the period 1992-1994, it cost over HUF 333 billion. (Neale and Bozsik, 2001).

Another challenge was the privatisation of state-owned banks, such as the Hungarian Foreign and Trade Bank (Magyar Külkereskedelmi Bank – MKB), the National Savings Bank (OTP), Budapest Bank (BB), the Hungarian Credit Bank (MHB), the Savings Bank (Takarékban), the Commercial and Credit Bank (K&H) and the Mezobank (Meadowbank) / Agrobank. The privatisation of banks began with the MKB, in 1993. By 1994, the EBRD (European Bank for Reconstruction and Development) and other foreign banks started to buy stakes in the four big Hungarian banks, Kereskedelmi és Hitel Bank – K&H (Commercial and Credit Bank), Budapest

Bank - BB, Magyar Külkereskedelmi Bank – MKB (Hungarian Foreign Trade Bank), and Magyar Hitel Bank – MHB (Hungarian Credit Bank), as part of the privatisation. Only Országos Takarékpénztár – OTP (the National Savings Bank) was privatised through offering on the stock exchange, the only bank out of the five big banks which remained in Hungarian ownership. Mezobank (Meadowbank) / Agrobank was formed in 1980 and its main operation was to finance the Hungarian agrarian sector, (Neale and Bozsik, 2001).

Foreign banks entered the Hungarian banking industry as green-field investments and as part of the privatised institutions. Foreign banks saw different interests in acquiring Hungarian banks. In 1990's, Hungary's financial market was split between corporate and retail market, where foreign banks focused mostly on the corporate markets, whereas Hungarian banks focused mainly on retail banking, i.e. OTP (Országos Takarékpénztár), Savings Cooperatives, Postabank, K&H (Kereskedelmi és Hitelbank), MHB (Magyar Hitelbank), (Balatoni, 2008; and Várhegyi, 2008). In 1994, foreign employees were employed in several foreign companies trading in Hungary. By opening branches in Hungary, foreign banks not only wanted to be present in the Hungarian financial market but also to provide quality banking services to foreigners living and working in Hungary. After 1990 and until 2002, both the concentration and the market share of the Hungarian banks were in constant change, Várhegyi, (2004). Furthermore, the main goal of foreign banks in Hungary was profit, mainly making money for the parent companies based in Germany, Austria, France, and England. A good example of this are the Austrian banks in the '90s, the profit margin was the highest in the Eastern European markets (Várhegyi, 2001). But some banks were cautiously present in Hungary with a 'wait and see' policy. The overall goal of the acquisitions of Hungarian banks was presence in Eastern Europe and the exclusivity of ownership of the newly acquired Hungarian financial intermediaries. From 1995 to 2000, the ownership of banks was in rapid change. In 1995, foreign banks had more than 79% ownership and by 2000 it was 91%, see ownership breakdown of banks, (in Hungarian, Várhegyi, 2001). See also the percentage of ownership of Hungarian banks for the period from 1988 to 2008 (Banai, Király and Nagy, 2010).

In 1997, the Second Banking Act was drawn up which gave a free path to forming branches in foreign financial intermediaries thus complying with pertaining OECD regulations, and also, opened the way for the EU membership preparations (Majnoni, Shankar and Várhegyi, 2003).

The privatisation process was finalised by 1997 and most of the consolidations and takeovers were also finalised by 1999. In 1992, just prior to privatisation, Hungarian banks were on the edge of bankruptcy, unregulated, corrupted and badly managed, which led to an increased number of bad loans. Furthermore, two thirds of the bad loans were accumulated only with fifty companies. By the end of privatisation, Hungarian banks became stronger, stable enterprises. From 2000 onwards only a few takeovers took place and the Hungarian banking market settled down, (Neale and Bozsik, 2001). As the banking industry settled down, Hungarian banks' profitability had a gradual increase. For example, as Várhegyi (2004) reports, from 1999 the KPI's (Key Performance Indicator's) for the banking industry in Hungary, such as return on equity (ROE) was 5.8% and return on assets (ROA) was 0.49%. Molnár, Nagy and Horváth (2007) show that between 2001 and 2005 return on equity (ROE) was in the region of 19% with a gradual yearly increase, and the return on assets (ROA) increased from 1.6% in 2001 to 2.5 % in 2005, thanks to high fees, commissions and retail lending. However, the uptrend of ROA was declining from 2005 to be in the region of 1% in 2008, as Banai, Király and Nagy (2010) report. After 2008 ROE and ROA was in continuous drop reaching year end of 2011 in the region of 0.3%, and in 2012 ROA increased above 0.5% (Sources: The Central Bank of Hungary, MNB, 2012, 5. Annex -Chart A66; MNB, 2013, Chart A75).

In the monobanking system, the state, apart of being an owner, also took control of the supervision of banks and the MNB. During the transformation process, i.e. at the beginning of it, banks were regulated by the Ministry of Finance. Later on the supervisory tasks were given to an autonomous agency in 1992. Lack of supervisory knowledge and limited powers mean that this autonomous agency could not perform efficiently, although supervision was significantly improved by the time its powers were expanded (Szapáry, 2001).

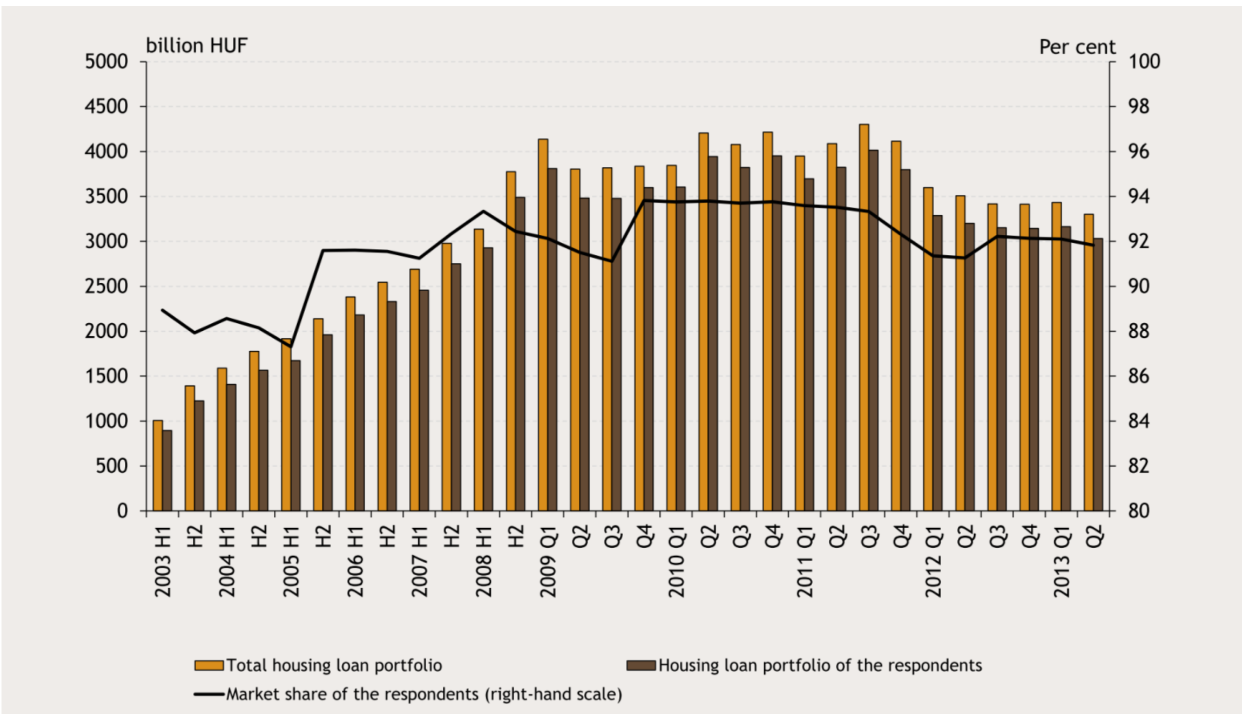
In 1999, the government recognised the importance of establishing a supervisory financial authority that would oversee the financial sector. Thus the Hungarian Financial Supervisory Authority - HFSA (Pénzügyi Szervezetek Állami Felügyelete, PSZÁF – in Hungarian) was formed on 1st April 2000. After its formation, a number of legislative acts were drawn, and the Act of CXXXV. 2007 regulates its operation (the 'CXXXV' law refers specifically to the financial sector and was published in the 'Hungarian Journal, Official Gazette' in 2000). The HFSA oversees operations of all the financial institutions, foreign or domestically owned that are trading in Hungary. It has gone through many positive changes, and today it is an independent body that not only monitors financial intermediaries but also cooperates with international financial and non-financial institutions. In 2013, under new legislation called 'Act CXXXIX', specifically on 1st October 2013, the HFSA was merged with the Central Bank of Hungary (MNB) and now they are operating as one institution (Legislation, 'Act CXXXXIX. in 2013' regulates tasks of the MNB that includes the tasks of the Supervisory Authority). With the gradual transformation in Hungary, the Hungarian Accounting Standards (HAS) have also gone through a slow but systematic change. First changes in the accounting practises were introduced after 1989 with the accounting XVIII law that took effect in 1992. The next major change in HAS took place in 2000, the 'Act C of 2000' law on accounting, whose purpose was to harmonise the Hungarian accounting practise with the EU directives. Since 2000, the 'HAS' has gone through

many amendments. Under HAS, it is obligatory to prepare Cash Flow as part of annual accounts. Only under simplified annual reports, cash flow is not obligatory. Financial intermediaries are required to prepare and to provide, apart from the Profit and Loss Account and Balance Sheet, the Cash Flow statements to the Hungarian Financial Supervisory Authority – PSZÁF / MNB.
One of the main benefits of the privatisation of the Hungarian banking industry was the initial capital injection to the undercapitalised and mismanaged banks, the implementation of new management practises and information technology, improved lending to corporate markets as well as to the public, improved banking services and constant training of staff by foreign banks. The first half of 1990 was a time of 'depression and imbalances'. But the change to an economic growth took place in the second half of 1990, an increase in incomes increased consumption on the part of the population especially after 2001, (Várhegyi, 2008). As an example of Macroeconomic and financial indicators for Hungary for 1992-2006, this confirms the points made above (Várhegyi, 2008). Such growth demanded more consumer lending, especially after 2001, and in 2004 under the socialist government program, which had 'an income raising effect'….'*meant that the economic environment favoured consumption lending*', Várhegyi (2008, p.353).

The Hungarian owned retail banks (for example Országos Takarékpénztár - OTP, saving cooperatives) were engaged in the retail market, whereas foreign international banks mostly concentrated on corporate lendings. The conservative government (1998-2002) introduced 'home loan support' that put a strain on public finances, and when the socialist government took power in 2002, they made an amendment to the home loan scheme. Still under the socialist government, lending by banks to consumers and companies was on the rise from 2001. In 2001, loans to households, as a percentage of gross domestic product (GDP) were 4%, and in 2007, it amounted to 21%. Comparing Hungarian lending to those of other Eastern European countries and to the EU, Hungary had modest lending, Várhegyi (2008).

Due to an aggressive lending policy by banks, a more visible increase in lending to Households sector was evident from 2003 as Figure 3.1 shows:

Figure 3.1. Lending to Households

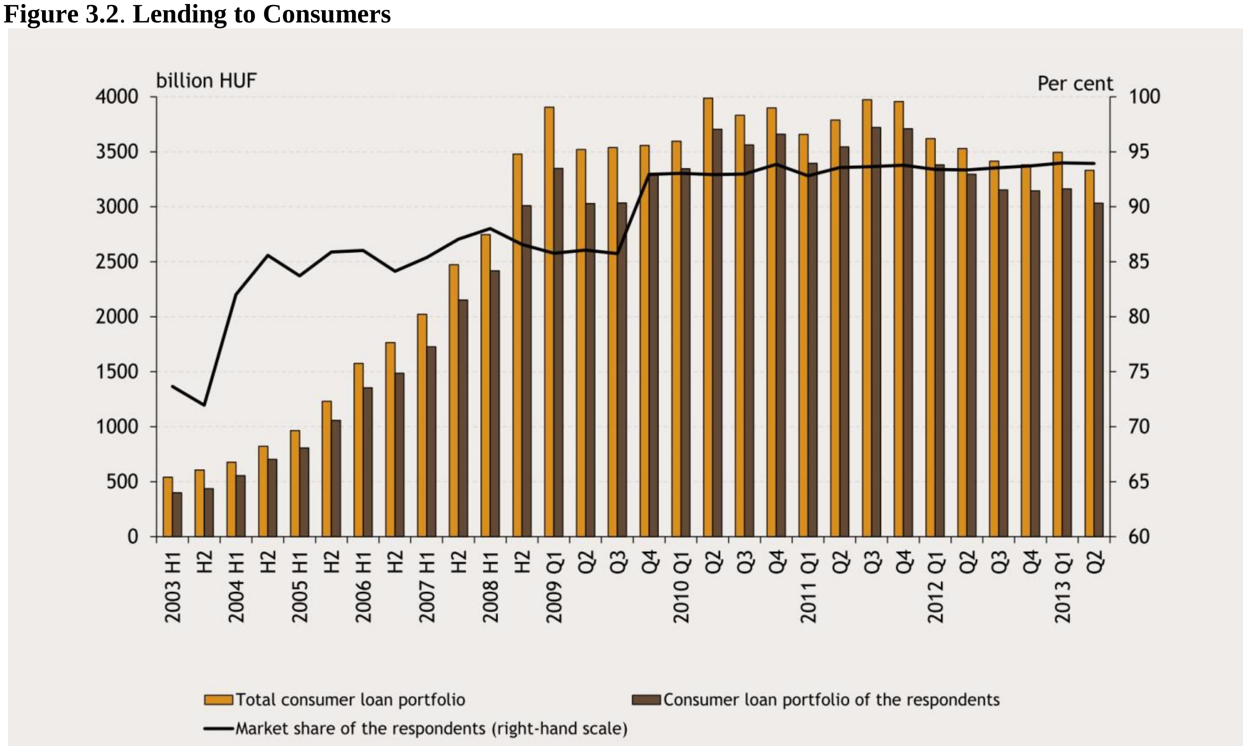


Notes: Figure 3.1 shows a visible increase from 75% in 2003 to a jump in lending reaching 97% in the years 2008/2009. *Source:* Annex 1. The Central Bank of Hungary (MNB)

In 2008, Lehman Brothers went into bankruptcy plus the US housing market collapse initiated a recession. Hungary and its industry were not an exception. Banks in Hungary enjoyed big returns in earlier years from 2000, as parent banks gradually eased their conservative lending policy in Hungary. The return on equity (ROE) and return on assets (ROA) percentage of Hungarian banks were almost twice as higher as those of foreign counterparts. But that changed soon enough as banks began to tighten credit conditions terms, see for example The Central Bank of Hungary, MNB Report - Trends in Lending - August 2013. From 2005, consumer (housing, car and other) and corporate lending were increasing with a significant jump in 2008 in foreign currencies such as Swiss Francs (CHF), EUROs, Japanese Yens (JPY) and in Hungarian Forints (HUF). The most significant jump in foreign currency lending was in CHF from 2006, mainly for housing and car loans.

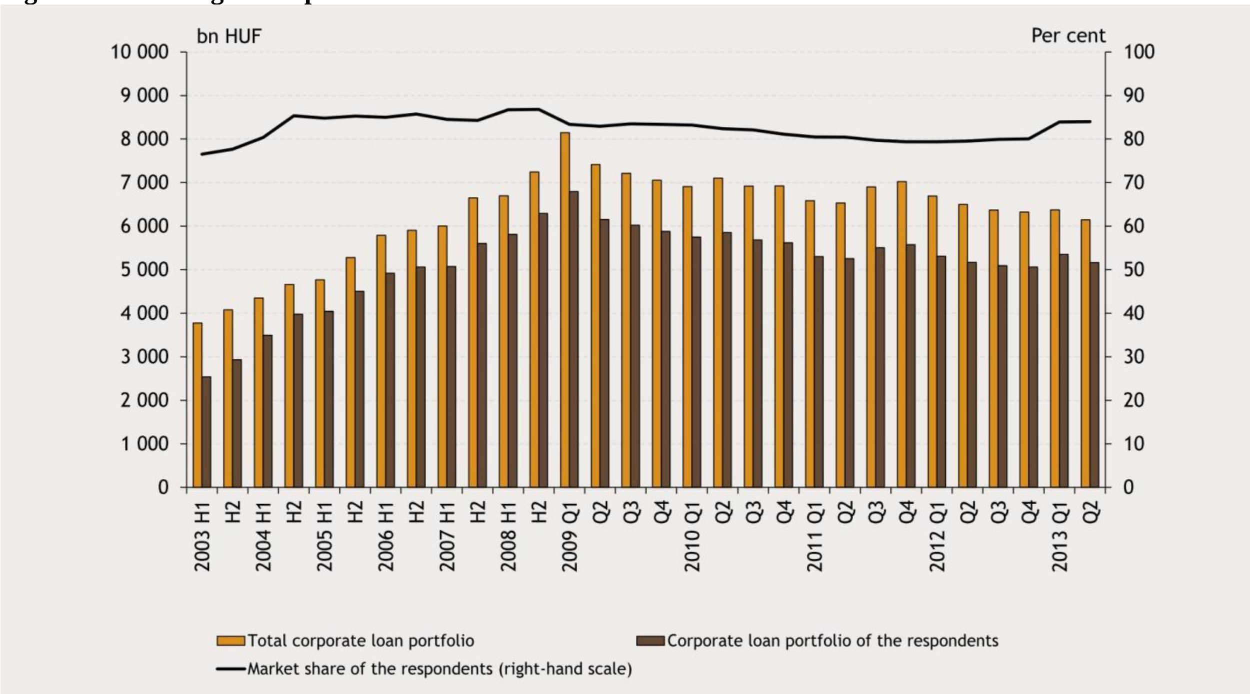
Figures 3.2, 3.3 and 3.4 present lending histories to Consumers and to the Corporate Sector from 2003, prior to the crisis, where there is a gradual increase in lending with a jump in 2008/2009:

Figure 3.2. **Lending to Consumers**



Notes: Figure 3.2 presents lending to consumers HUF 500 billion in 2003 and then an increase to almost HUF 4000 billion in the second half of 2008. This is an increase from 60% to 100% from years 2003 to 2008 / 2009. Lending after the 2008 financial crisis was between HUF 3500 billion to HUF 4000 billion on annual basis. *Source:* The Central Bank of Hungary (MNB)

Figure 3.3. Lending to Corporate Sector

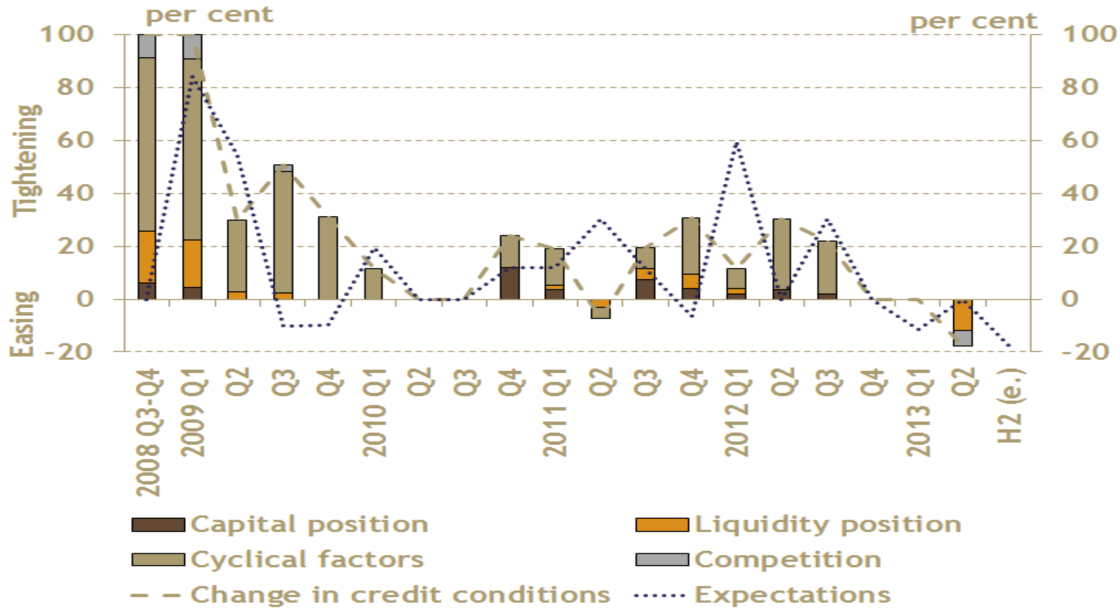


Notes: Figure 3.3 shows a similar increase in lending to corporate sector as in Figure 3.2, lending to consumers, the corporate sector's lending increase was similar, it went from 38% to 80% increase from years 2003 to 2009. After the 2008 financial crisis lending was between HUF 6000 to HUF7000 billion on annual basis. *Source:* The Central Bank of Hungary (MNB)

In October 2008, banks started to face their own vulnerabilities due to their aggressive lending policy. The foreign parent banks' policy started to change, as the Hungarian banks came to a liquidity trap and needed to recapitalise. In the last quarter of 2008 over 3 billion Euros were used to recapitalise the Hungarian banks by their foreign parent banks, (Banai, Király and Nagy, 2010).

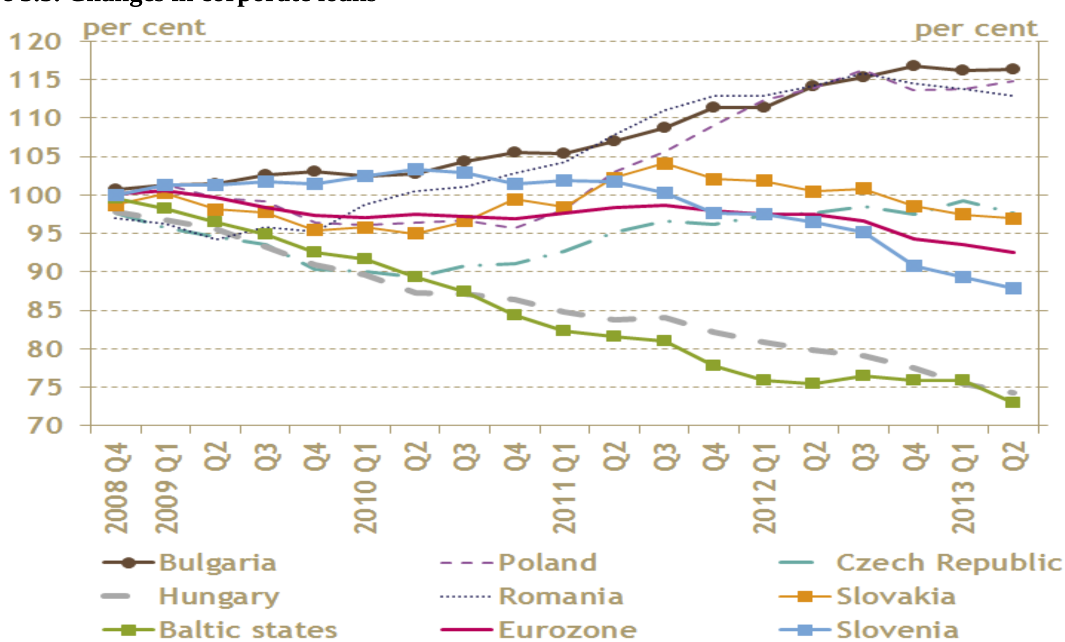
The contribution of individual factors to changes in banks' credit conditions in the corporate segment and to changes in corporate loans are presented in Figure 3.4 and in Figure 3.5 respectively:

Figure 3.4 Changes in credit conditions



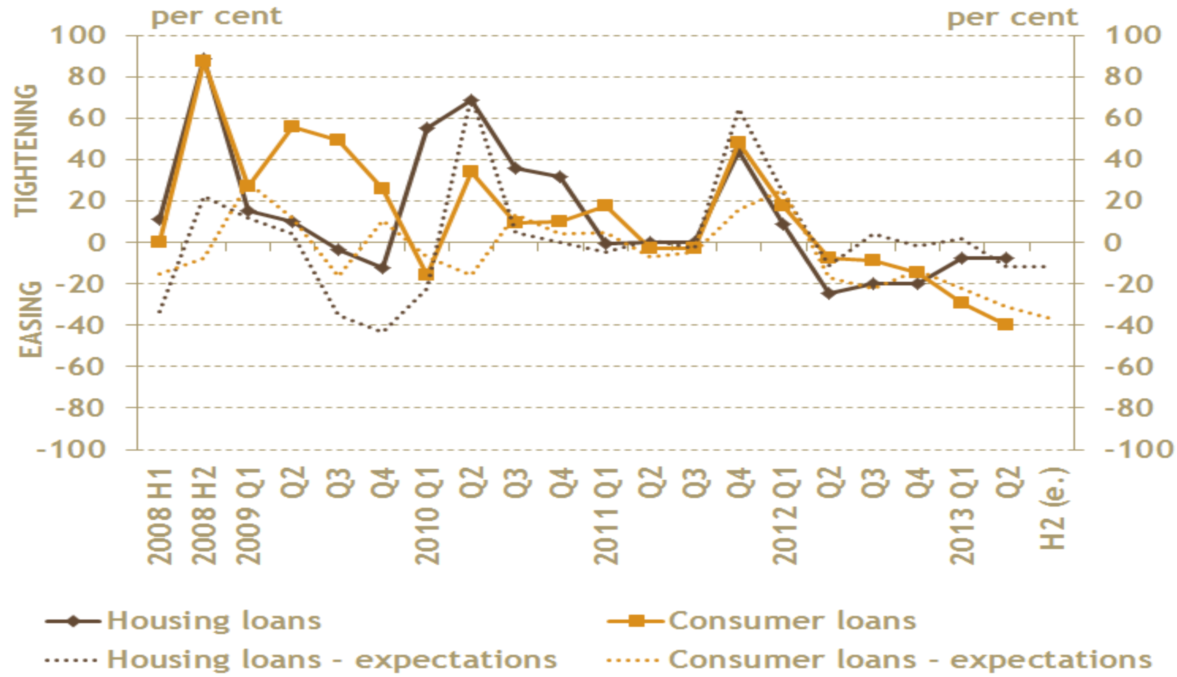
Notes: Figure 3.4. Due to the 2008 financial crisis the 'Change in credit conditions', the dashed line, has a significant decline since 2008 until Q2 2013. Liquidity, capital and credit conditions of the banks were also declining. *Source:* The Central Bank of Hungary (MNB), Aug. 2013

Figure 3.5. Changes in corporate loans



Notes: Figure 3.5 shows a decline of outstanding corporate loans in Hungary since the financial crisis started in 2008, compared to Eurozone and rest of the countries. Only the Baltic States witnessed a better decline in outstanding corporate loans, whereas Bulgaria, Romania and Poland increased in corporate lending. Changes in corporate loans outstanding in an international comparison (October 2008 = 100, exchange rate adjusted). *Source:* The Central Bank of Hungary (MNB), Aug. 2013

Figure 3.6. Changes in credit conditions



Notes: Figure 3.6 shows a huge jump in the tightening the credit conditions at the beginning of 2008, due to the 2008 financial crisis, and then banks slowly started to ease their lending conditions with the most significant ease in 2012 for Consumer and Housing loans. Easing Consumer loans was more significant beyond 2013. *Source:* The Central Bank of Hungary (MNB), Aug. 2013

3.3. The adoption of the International Financial Reporting Standards into the Hungarian Accounting Standards

Hungary, as a full member of the European Union (EU) since 2004, adopted IFRS on January 1st 2005. All financial companies listed on the Budapest Stock Exchange (BUX) must prepare consolidated financial statements by applying International Financial Reporting System (IFRS) rules under the 'EU Regulation of 1016/2002'. The adopted IFRS is the same version as the one adopted in the EU, with differences mainly pertaining to financial instruments. Despite the adoption of IFRS, all companies trading in Hungary must file annual accounts under the Hungarian Accounting Standards (HAS) to the court of registry and to the Ministry of Public

Administration and Justice, or Közigazgatási és Igazságügyi Minisztérium (KIM) in Hungarian, as per ‘Act of Accounting 2000’, or Act ‘C’. Act ‘C’ also consists of regulations referring to banks and insurance firms that are required to comply with the European Central Bank. Act ‘C’ for financial firms was amended in 2001. Firms with parent companies also prepare consolidated financial statements, regulated under Act ‘C’. The Hungarian Financial Supervisory Authority, or the HFSA/MNB, requires all financial intermediaries to prepare financial statements, Income Statements and Balance Sheets to be audited under the Hungarian Accounting Standards, or HAS. Firms are also obliged to provide a copy of their annual audited statements to the HFSA/MNB. The HFSA/MNB does not monitor consolidated financial statements whether they comply with IFRS rules or not. For example, if a certain company adopted IFRS rules, regardless of this standard, a year-end financial statement is mandatory to file under the HAS. Tax returns of companies are prepared under the HAS and not under IFRS. (Source: World Bank, 2004 and PriceWaterhouse Coopers, 2009).

‘*In the area of accounting, financial reporting, and auditing law, Hungary implemented the Fourth, Seventh, and Eighth EU Company Law Directives, and ISA. All companies, including banks and insurance entities, are required to present financial statements and, insofar as they are parent companies, consolidated financial statements prepared in conformity with the accounting regulations in Act C on Accounting of 2000’*…. ‘*While Hungarian accounting regulations are based on the Fourth and Seventh EU Company Law directives, they may not always be adequate to meet the expectations and needs of users - especially foreign users - of financial statements prepared by those public interest entities*’, (World Bank, Executive Summary, 2004).

3.3.1. Differences between the Hungarian Accounting Standards and the International Financial Reporting Standards

Table 3.1	The Hungarian Accounting Standards (HAS)	The International Financial Reporting Standards (IFRS)
Measurement bases	Uses historical cost, except for specific asset components (for instance derivatives and some securities) that are measured at fair value.	Uses historical cost, but intangible assets, property, plant and equipment (PPE) and investment property may be revalued. Derivatives, biological assets and most securities must be measured at fair value.
Full set of financial statements	Balance sheets, income statement, statement of changes in equity, cash flow statement and notes including accounting policies and comments. Statement of changes in equity and cash flow statements are not required in a number of cases.	Statement of financial position, Statement of Comprehensive Income, Statement of changes in equity, Statement of cash flows and accounting policies and notes.
Format of financial statements	A standard format (structure) is prescribed according to 4th EU Directive. Companies can choose between type A and type B.	Does not prescribe any particular format of financial statements.
Elements of financial statements	No definition of elements exists. The elements are listed by the Ministry of Finance.	Definition of assets, liabilities, equity, income and expenses is stated in the IFRS Conceptual Framework.
Functional currency	Not defined.	Financial statements must be prepared in functional currency. Afterwards, financial statements can be presented in any currency.
Statement of Comprehensive Income	Does not exist.	Required for all companies from 2009 according to IAS 1.
Revenues recognition	Mainly the tax rules followed.	Detailed guidance for revenue recognition in IAS 11 and 18.
Construction contracts	Revenue and cost based on invoiced amounts.	Percentage of completion method preferred; guidance in IAS 11.
Extraordinary items	Include unusual operations with regard to the normal activities of an entity and cases of random events, changes in accounting methodology and corrections of material prior-period errors.	Prohibited from 2005.
Prior period errors	Included in extraordinary items in	Comparatives are restated

	the income statement of the current period.	(retrospective adjustment).
Change in accounting policy	Included in extraordinary items in the income statement of the current period.	Comparatives are restated (retrospective adjustment).
Intangible assets	Measured at cost.	According to IAS 38, revaluations are permitted in rare circumstances.
Acquired intangible assets	Capitalised if the definition of intangible assets is met; amortised over their useful life. Revaluations and indefinite life are not permitted. Start-up costs are capitalised.	Capitalised if recognition criteria are met; intangible assets may have indefinite useful life or are amortised over the useful life. Intangible assets with indefinite useful life are tested for impairment annually. Training costs and advertising costs are expensed.
Internally generated intangible assets	Research and development costs are capitalised.	Research costs are expensed as they are incurred. Development costs are capitalised only if stringent recognition criteria are met.
Property, plant and equipment	Measured at historical cost. Spare parts are inventory (not property, plant and equipment). Component approach to depreciation is not allowed. Time value of money in case of deferred payment is not taken into account.	According to IAS 16, measured at historical costs or revalued amounts (fair value). Material long-term spare parts are property, plant and equipment. The component approach must be applied in determining depreciation for property, plant and equipment. Time value of money in case of deferred payment is taken into account.
Assets held for sale	No guidance exists – assets are presented and measured under the group of assets in which they were initially recognised until de-recognition.	According to IFRS 5, non-current assets are classified as held for sale if their carrying amount will be recovered principally through a sale transaction rather than through continuing use. A non-current asset classified as held-for-sale is measured at the lower of its carrying amount and is not depreciated.
Leases classification	A lease is only accounted for as financial lease when the ownership is transferred to the	According to IAS 17, leases are classified as finance leases if substantially all risks and rewards

	leassee at the end of the lease term.	of ownership transferred to a leassee. Substance rather than legal form is important. Conditions for finance lease are broader than just transfer of the ownership.
Impairment of assets	No detailed guidance was given.	According to IAS 36, if impairment indicated, write down assets to higher of the fair value less cost to sell and the value in use based on discounted cash flows. Reversals of losses permitted (excluding goodwill).
Borrowing cost	Capitalised contractual interest, not full borrowing costs.	Full borrowing cost capitalised according to IAS 23.
Investment property	No specific guidance; investment property treated as property, plant and equipment.	According to IAS 40, measured at depreciated cost less accumulated depreciation or fair value; changes in fair value recognised in the income statement.
Biological assets	No specific guidance. Treated as inventories or fixed assets, fair value measurement not permitted.	Measured at fair value according to IAS 41.
Foreign exchange losses	Particular exchange losses can be capitalised.	According to IAS 21, exchange gains and losses are expensed.
Long-term liabilities	In the case of deferred payment, time value of money is not taken into account.	In the case of deferred payment, time value of money is taken into account.
Provisions	Provisions for contingent liabilities, possible risks and expected losses are permitted. Provisions for future repairs of property, plant and equipment are created. Time value of money is not taken into account.	According to IAS 37, The provision is recognised if a present obligation from past events exists; the outflow of resources is probable and the amount can be reliably estimated. Where the effect of the time value of money is material, the amount of a provision shall be the present value of the obligation.
Deferred tax	Rules for deferred tax accounting are not included.	Full recognition of deferred tax liability and deferred tax asset when (for an asset when particular conditions are met).
Treasury stock	Recognised as investments.	Recognised as a reduction of equity.
Segment reporting	Minimum requirements.	Include the definition of a

		segment and detail requirements for segment reporting and disclosure in IFRS 8.
Risk analysis	Not required.	Detailed requirements for risk analysis in IFRS 7.
Share-based payments	No guidance	Detailed guidance for recognition and measurement in IFRS 2.
Financial instruments	Detailed guidance for banks comparable to IFRS. Minimum requirements for other businesses.	Detailed requirements for all businesses including banks and other businesses.
Events after reporting period	Not defined.	Detailed guidance in IAS 10.
Related party disclosures	Minimum requirements.	Detailed guidance and requirements for disclosure in IAS 24.
Earnings per share	No requirements.	Basic and diluted EPS must be presented in the Statement of Comprehensive income according to IAS 33.

Notes: Table 3.1 presents differences between the Hungarian Accounting Standards (HAS) and the International Financial Reporting Standards (IFRS). Own presentation. *Source:* RIBZ Consulting – Ildikó Rózsa (2013)

This study arrived at the conclusion that there are significant differences between the Hungarian Accounting Standards (HAS) and the International Financial Reporting Standards (IFRS). The main reason for this discrepancy is that the main goal of introducing HAS was to get the year-end figure for the deduction of corporate income tax, whereas the IFRS has its focus on informing investors. The IFRS is principle-based while the HAS is itemised, that is, rule-based, and almost every transaction is regulated. Despite the fact that the Hungarian accounting regulations are based on the Fourth and Seventh EU Company Law directives, the author of this study does not believe that the implementation of the IFRS as the main reporting standard will occur in Hungary in the foreseeable future. It is debatable whether the IFRS would be a better reporting standard than the HAS. For example, Jarva and Lantto (2011) argue that IFRS is ‘not supperior’ to the local GAAP, i.e. to the Finish accounting satndards.

3.4. Type of financial intermediaries trading in Hungary

The type and number of financial intermediaries operating in Hungary at the end of the year 2012:

- Credit Institutions operating as joint stock companies, a total of 41
- Cooperative Credit Institutions, a total of 128
- Branches of Foreign Credit institutions, a total of 9
- Financial Enterprises, a total of 250
- Payment Institutions, a total of 4
- Investment Enterprises, a total of 25
- Investment Fund Managers, a total of 35
- Insurance Associations, a total of 19
- Insurance Institutions, a total of 35
- Insurance Intermediaries, a total of 80
- Pension funds – health and voluntary mutual assistance, a total of 106

Source: The Golden Book, 2012 – HFSA / MNB

3.5. Summary of the Hungarian Credit Institutions

Growth of Hungary's credit institutions since the 19th century, before and after the World War I and II, to the present day has been a long and difficult journey. Before the transition, Hungary had an inefficient economy, a communist-run state where all decisions, not only political but also economic, were centralised by the communist regime. Since the transformation began in 1987, Hungary and its financial institutions have gone through long and difficult changes. New legislation was drawn up for a more efficient, competitive banking system and since then, the Hungarian Accounting Standards have become transparent. By joining the European Union Hungary adopted the EU directives as a full member of the EU. Total economy GDP has been rising ever since, including foreign investments and international reserves. Banking products for consumers and corporate clients have also been widened. Since the millennium change, the banking industry has become a modern and competitive industry with over forty Banks, Cooperative Institutions, Financial Enterprises, Pension Funds and other financial companies with foreign and domestic owners. Since its establishment, the Financial Supervisory Authority has been supervising the dealings of financial intermediaries in Hungary, and since 2013, it has been under the aegis of the Central Bank of Hungary, (MNB).

The next chapter, Chapter 4 presents the context of research design and data used in this study.

Chapter 4

The Context of Research Design

The primary focus of Chapter 4 is on data, research methods, hypotheses, theories and testing approaches in an attempt to answer the research question that reads:

> *'Did credit institutions trading in Hungary avoid earnings decreases for the period of 1999-2012?'*

4.1. Research Data

4.1.1. Types of Data

Crowther and Lancaster (2012) write that data can be primary and secondary. Primary data becomes existent through research, i.e. it is collected via surveys, observations, interviews and experiments. Secondary data is existent prior to research and only awaits collection. Apart from being primary and secondary, data can also be qualitative and quantitative, as Crowther and Lancaster (2012) point out. Quantitative data is said to be objective and more scientific as it is '… *associated with more traditional scientific approaches to research*…' – Crowther and Lancaster (2012, p.75). '*Numbers are used to record much information about science and society, for example pressures, bending forces, population densities, cost indices etc. This type of data is called quantitative data',* as Walliman (2011, p.71) explains. The author further describes that Qualitative data is based on words, for example, on emotions, ideas, beliefs, judgements and it refers to qualities or attributes. Qualitative data is difficult to measure due to its form, whereas quantitative data does not convey emotions, ideas or beliefs. Therefore, both types of measurement of data depend on the type of research being conducted.

Once the type of data has been determined, the next step is data collection. Data can be collected in various forms, as Crowther and Lancaster (2012) point out. These comprise case studies, secondary data collection, experimentation, observation, interviews, surveys and action research. The type of data required in the context of the research question is called secondary data. Secondary data is already existent; it was produced by experts. In order to collect secondary data, there is a need to locate it and to assess its credibility. Sources of secondary data can be in diverse forms:

- Written materials (such as organisational materials, production records, personal data, emails, letters, etc.);
- Non-written materials (such as television and radio programs, video and tape recordings, etc.);
- Survey data (such as economic data, economic forecast, a government census of the population, sales, etc.).

Secondary data can also be accessed via the internet, for example, the company’s financial statements such as its profit and loss account, balance sheet, cash flow statement and other available data. There are also companies that offer services, as part of their database management, for scientific research, which can also be downloaded from the internet. Specifically, the internet site of Bureau van Dijk Electronic Publishing (http://www.bvdinfo.com) statistical offices of particular countries, financial authorities etc. For example for the Hungarian financial authority secondary data, i.e. the so called Golden Book can be accessed via https://www.mnb.hu/en/supervision, from where data for this study was gathered.

Population consists of the whole survey sample. Donley (2012, p.92) defines a population as '... *the complete list of elements that the sample will be derived from.'* Walliman (2011, p.94) shows Sample relation to Sampling Frame and Population, where Population consists of the whole survey. Sampling Frame is part of the Population, as it is interested in a specific area, or in 'certain groups' of the population.

4.1.2. Gathering the Data of the Hungarian banks

Since 1989, the accounting regulations have gone through changes, with a major law passed in 2000, namely the 'Act C of 2000 on Accounting' act, and harmonisation has been on-going ever since. Hungary has adopted the European directives and implemented them into the Hungarian Accounting Standards, or HAS. Under the 'Act C' The Profit and Loss Accounts and Balance Sheet statements are mandatory for companies at the end of each fiscal year. A cash flow statement is also obligatory, but only as a part of Notes accompanying the financial statements. Companies' financial reports are required by law and must be submitted to the Court of Registry and to the Ministry of Public Administration and Justice, or Közigazgatási és Igazságügyi Minisztérium (KIM) in Hungarian, where the general public, analysts, investors can access them for various purposes. Financial intermediaries are obliged by the Hungarian Accounting Standards (HAS) to send their year-end audited reports to the Hungarian Financial Supervisory Authority, the HFSA (PSZÁF, in Hungarian). On 1st October 2013, the HFSA merged with the Central Bank of Hungary (Magyar Nemzeti Bank - MNB, in Hungarian). Prior to 1st October

2013, the HFSA was accessible on www.pszaf.hu internet site, and since 1st October 2013, it can be reached on the MNB internet address: https://www.mnb.hu/en/supervision in English. Additionally, the reader can find further information on Credit Institutions' Data on the MNB internet site. Credit Institutions' Data is prepared under the Hungarian Accounting Standards (HAS) only.

Prior to gathering data, it was necessary to ascertain that the data collected was reliable, valid and relevant to test the research question. The collection of reliable data connotes that the data findings will consistently be without any error(s) or bias, as Saunders, Lewis and Thornhill (2012) point out. The source of the data was, therefore, crucial, as the credibility of the tests rely on credible data, with nil or minimal possible errors. As the research of this study focuses solely on the investigation of credit institutions trading in Hungary, the first attempt to gather data on banks in Hungary was from the Hungarian Financial Supervisory Authority, or the HFSA / MNB. After making contact with the HFSA/ MNB, credit institutions audited data was obtained from the HFSA / MNB, for the period from 1999 to 2012. Due to takeovers and mergers, the period before 1999 was excluded due to the incompleteness of financial reports; consequently, using data from the period prior to 1999 would have created the risk of possible false results in the statistical analysis due to '*Type I'* or '*Type II'* errors. '*Type I'* error refers to a '…*probability of rejecting true hypothesis*...', whereas '*Type II'* error refers to '…*the probability of accepting the false hypothesis…*', (Gujarati, 1995, p.131).

The sample for testing is not as large as for example Burgstahler and Dichev's (1997) or Holland and Ramsay's (2003) as they were testing all industries except financials. The HFSA/MNB publishes data on a yearly basis according to Hungarian Accounting Standards (HAS). The samples consist of one listed and other non-listed companies. Only the OTP Bank is listed on the Hungarian Stock Exchange, but despite its listing, the OTP Bank yearly figures were prepared under HAS. Furthermore, banks' data applied in this study is from the year-end financial statements of diverse total assets sizes. Banks trading in Hungary prepare and send their audited financial statements to the Hungarian Financial Supervisory Authority (HFSA / MNB) as well as to the Court of Registry. Banks calculate their own Equity book value at each year-end, on 31st of December, whereas in the Burgstahler and Dichev (1997) study, the authors use the calculated 'beginning-of-the-year market value of common equity' from the Compustat database.

The population for testing consists of companies of different asset sizes in all areas of the industry. The Hungarian Financial Supervisory Authority, as part of the Central Bank of Hungary, (HFSA/MNB) publishes data on a yearly basis according to Hungarian Accounting Standards (HAS) only. The nature of the data published by the HFSA / MNB has its own limitations, as only Profit and Loss Accounts and Balance Sheets are available. A further limitation is that the HFSA/MNB does not use the detailed financial statements of financial intermediaries, but prepares its own. For example, under current assets, 'Cash and current accounts' are published as one figure, whereas in company statements, they are usually split. The HFSA/MNB states that the Golden Book is, *'The data of credit institutions, and it contains the data of joint-stock companies and the data of financial enterprises qualified as credit institutions from a prudential point of view.'* (*Source:* www.mnb.hu).

An extract of the published Balance Sheets and Profit and Loss account and bank data are included as an example and are presented in Table 4.1 and in Table 4.2:

Table 4.1: Extract from the Golden Book's Balance Sheet

Assets

	Description	Total assets	Cash and current accounts	Securities for trade	Securities for investment	Placements with the Central bank and other banks	Loans	Equities and partici-pations	Accrued interest receivables	Other accruals and other assets	Tangible and intangible assets
1.	Allianz Bank ZRt.	115 047	4 015	56 545	9 159	2 190	39 569	0	1 218	881	1 470

Liabilities

	Description	Total liabilities	Deposits	Deposits from monetary institutions	Loans borrowed	Issued securities	Accrued interest payable	Other accruals and other liabilities	Subor-dinated liabilities	Provisions	Own capital
1.	Allianz Bank ZRt.	115 047	66 681	4 055	19 255	14 625	1 543	1 661	0	734	6 493

Table 4.1 presents Golden Book extract. *Source:* The Hungarian Financial Supervisory Authority (HFSA/MNB)

In order to see what 'Other accruals and other assets' under Assets truly comprise is difficult to state due to the lack of explanations in the '*Golden Book*' – the main source of data in this study.

Table 4.2: Profit and Loss accounts that the HFSA/MNB publishes contain credit institutions' data on a yearly basis in the following format: Table 4.2:

Table 4.2: Extract from the Golden Book's, the Profit and Loss account

Profit and Loss account

	Descrip-tion	Total interest income	Total interest expenses	Net interest income	Divi-dends reveived	Net com-missions and fees income	Profit or loss from financial transac-tions	Profit or loss from other business activities	General admini-stration expenses	Net changes in losses on value adjustment and provisions	Profit or loss from ordinary (business) activities	Extraor-dinary revenues	Extraor-dinary expenses	Profit or loss before tax	Profit or loss after tax	Retained profit or loss
1.	Allianz Bank ZRt.	6 940	4 468	2 472	0	2 784	27	-616	6 122	-1 083	-2 538	0	0	-2 538	-2 563	-2 563

Table 4.2 shows Golden Book extract. *Source:* The Hungarian Financial Supervisory Authority (HFSA/MNB)

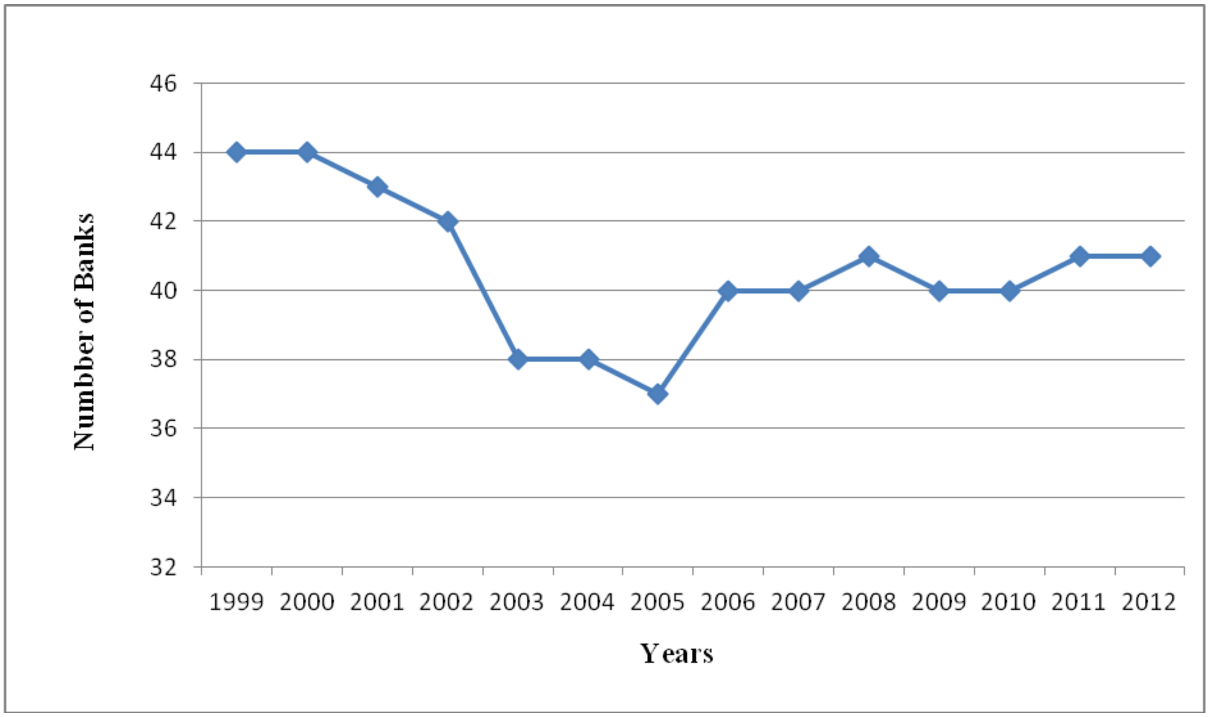
In the Hungarian Financial Supervisory Authority's (HFSA/MNB) Golden Book, the characteristics of the Population are 'Grouped by Type'. For example, profit and loss account is grouped by 'Total Interest Income', or for 'Profit or Loss After Tax', please see Tables 4.1 and 4.2 while 'Grouped by type' population refers to distinctive groups. However, a number of banks undergo changes during the financial year due to takeovers and mergers. The population at the time of the collection of data was available for the period from 1999 to 2012 financial years and it is only for Credit institutions operating as joint-stock companies. A sample of the population ranges from 37-44 banks per year.

Comments cited from the yearly Golden Book's 'methodology' part:

'The banking sector's data include the figures of credit institutions working as public or private limited liability companies (Nyrt. / Zrt.), that is, banks and specialized credit institutions (mortgage lending institutions, home savings and loan associations) together with state-owned MFB (Hungarian Investment and Development Bank) and EXIM (Hungarian Export-Import Bank) and also the clearing house so called KELER Rt. Some institutions went through transformation such as acquisition, merger, and some wound up without successor. The institution named 'Postai Elszámoló Központot Működtető Intézmény (Magyar Posta Zrt.)' is listed in the sector of payment institutions, because the institution has to operate according to the regulations for payment institutions – with a few exceptions'. (*Source:* Methodology - Golden Book's, HFSA/MNB).

Figure 4.1 presents yearly fluctuations of the Credit institutions operating as joint stock companies in Hungary for the period between 1999 and 2012. Figure 4.1:

Figure 4.1: Yearly fluctuations of the Credit institutions



Notes: Figure 4.1 shows credit institutions operating as joint - stock companies. The chart above outlines that number of changes of banks on the yearly basis. This is caused mainly by takeovers and mergers. *Source:* The Hungarian Financial Supervisory Authority (HFSA/MNB) Golden Book and own calculation and presentation.

The available population data was not as detailed as the data from foreign databases, for example from Compustat or Amadeus; nevertheless, it gave me an opportunity to outline the research design so as to test the research question and hypotheses. This is discussed in Section 4.2.

4.2. Hypotheses

Chapter 1 of this study presented the Research Question, it reads as:

> **'*Did credit institutions trading in Hungary avoid earnings decreases for the period of 1999-2012*?'**

Panik (2005, p.569) writes, the '… *hypothesis is a statement about the probability distribution of a random variable.'* In an attempt to investigate the research question, this study applies an alternative (research) hypothesis, namely, a 'directional' approach, as Martin and Bridgmon (2012, p.32) write. Martin and Bridgmon (2012, p.31) note '*A directional alternative hypothesis does state an expectation of the outcome of the study'.*

To answer the research question, the following four hypotheses were formulated from five research studies. Hypothesis **$H0_{(a)}$:** was designed from the Jacob and Jorgensen (2007) study, hypothesis **$H0_{(b)}$:** from the Burgstahler and Dichev (1997) paper, hypothesis **$H0_{(c)}$:** from the Holland and Ramsay (2003) paper, whereas hypothesis **$H0_{(d)}$:** was designed from the Charoenwong and Jiraporn (2008) and from the Cohen, Cornett, et al. (2014) studies. Hypotheses **$H0_{(a\text{-}d)}$:** read as:

$H0_{(a)}$: Credit institutions (Banks) in Hungary do not manage earnings.

$H0_{(b)}$: Credit institutions (Banks) in Hungary do not manage earnings to avoid earnings decreases.

$H0_{(c)}$: Large and small Credit institutions (Banks) scaled by median of Total Assets in Hungary do not manage earnings to avoid earnings decreases.

$H0_{(d)}$: Credit institutions (Banks) in Hungary do not manage earnings 'Prior to' and 'After' 2008, when the financial crisis starts.

Hypotheses **$H0_{(a\text{-}b)}$:** are directly linked to the research question, whereas Hypotheses **$H0_{(c\text{-}d)}$:** are additional hypotheses to investigate EM per banks' assets size, prior to or after 2008.

4.3. Testing Approaches

In the literature review of this study, in Chapter 2, the summary of Dechow, Ge and Schrand's (2010) study was critically reviewed and the 'commonly used' empirical proxies were highlighted, such as accruals, with (regression) models linked to theories. This study also applies a regression model, testing Total Accruals and Non-Discretionary Accruals. However, in search of evidence of earnings management (EM) by applying only the accrual approach is not robust enough, therefore it may not be sufficient, as evidence based only on accruals is rather weak, see for example Healy (1985). Knowing the weakness of the accrual method, this study additionally applies the standard discontinuity model. However, Durtschi and Easton's (2005; 2009) studies argue that discontinuity may arise other than EM. In contrast to Durtschi and Easton's (2005; 2009) arguments, Gore, Pope and Singh's (2007) and Burgstahler and Chuck's (2015) evidence reject Durtschi and Easton's (2005; 2009) findings.

This study concludes that by applying only the accrual or only the distribution method may not be robust enough, and uses both the accrual and the distribution method for testing. Additionally, the author of this study designed the Distribution of Ratios Method, a new testing approach.

The three main empirical testing approaches are:

1. ***The Standard Discontinuity Method***. Hypothesis, $\mathbf{H0_{(b)}}$**:** is tested with Scaled Earnings$_{(t)}$ (Profit after Tax$_{(t)}$ by Total Assets$_{(t-1)}$), or $\mathbf{PAT_{(t)} / TA_{(t-1)}}$; and Scaled Earnings Change (ΔProfit after Tax by Total Assets$_{(t-2)}$), or $\mathbf{\Delta PAT / TA_{(t-2)}}$ ratios.

2. ***The Accrual method***. With the availability of accruals, the author of this study designed the following two regression models:

   1. $\mathbf{E_t = \beta_{1jt}\ (TACCR._{\ jt}) + \varepsilon_{jt}}$
   2. $\mathbf{PAT_t = \beta_{0jt} + \beta_{1jt}\ (NDA_{jt}) + \beta_{2jt}\ (DA_{jt}) + \varepsilon_{jt}}$.

   Where $\mathbf{E_{(t)}}$ = Scaled Earnings change in period$_{(t)}$; **TACCR.** = Total Accruals in period (t) divided by Total Assets in period (t-1); $\mathbf{PAT_{(t)}}$ = Profit After Tax in period$_{(t)}$; $\mathbf{NDA_{(t)}}$ = Non-Discretionary Accruals$_{(t)}$ = Accrued interest payable$_{(t)}$; $\mathbf{DA_{(t)}}$= Discretionary Accruals$_{(t)}$ = Other accruals and other liabilities$_{(t)}$; $\boldsymbol{\beta}_{\mathbf{jt}}$ = **j** and **t** are firm and time for the parameter; $\boldsymbol{\varepsilon}_{\mathbf{t}}$ = error term in period (t).

   Models tested **TACCR.** (Total Accruals), **DA** (Discretionary Accruals) and **NDA** (Non-Discretionary Accruals) data to answer Hypothesis, $\mathbf{H0_{(a)}}$**:.**

3. ***The Distribution of Ratios Method***. It has four Testing Approaches:

3.1. From the 14 ratios, in SPSS, histograms were run at median, zero point, which is the threshold point for visual investigation only.

Apart from the accrual approach, as well as from the visual investigation of the 14 ratios, this study re-calculates the 14 ratios to test Hypothesis $\mathbf{H0_{(a)}}$**:** by applying Burgstahler and Dichev's (1997, p.103), as well as Degeorge, Patel and Zeckhauser's (1999, p.31) models, and then histograms and test statistics with Kolmogorov-Smirnov one sample test are performed. Additionally, benchmark analysis was calculated for each ratio.

3.2. Earnings (Profit After Tax) in period (t) divided by Total Assets (TA) in period (t-1), or $PAT_{(t)}$ by $TA_{(t-1)}$ and Change in Earnings divided by Total Assets (TA) in period (t-2), or ΔPAT by $TA_{(t-2)}$ variables were calculated with Beaver, McNichols and Nelson's (2007, p.540) **modified** Burgstahler and Dichev's (1997, p.103) model.

3.3. The same as Holland and Ramsay (2003, p.54), Total Assets (TA) were split into large (LC) and small (SC) companies based on sample median of total assets and calculated with the Burgstahler and Dichev's (1997, p.103) and the Degeorge, Patel and Zeckhauser's (1999, p.31) models of Earnings in period (t) divided by Total Assets in period (t-1); and Change in Earnings divided by Total Assets in period (t-2) ratios. Additionally, the Kolmogorov-Smirnov one-sample test statistics was run to test $\mathbf{H0_{(c)}}$**:**.

3.4. Splitting Total Assets (TA) into 'prior to' and 'after' 2008, when the financial crisis started, $\mathbf{H0_{(d)}}$**:**, was tested with the Kolmogorov-Smirnov one-sample test statistics with Earnings in period (t) divided by Total Assets in period (t-1), and Change in Earnings divided by Total Assets in period (t-2) ratios.

4.4. The First Empirical Approach – The Standard Discontinuity Method

4.4.1. Descriptive Statistics of the sample used for the First Empirical Approach

Prior to calculations of each ratio in Excel, to start with, banks' year-end audited financial statements results were used from the Hungarian Financial Supervisory Authority (the HFSA / MNB's) database, for the period from 1999 to 2012. Then from each year's balance sheet and profit and loss account numbers for the total assets and liabilities, equity, deposits, loans, accrued interest receivables, total interest income, total interest expenses, net interest income, profit or loss after tax amounts were imported to '*Credit Inst (banks) BASE variables calculation 2012_1999.xlsx*' excel sheet. For example, the '*Credit Inst (banks) BASE variables calculation 2012_1999.xlsx*' excel sheet for the year 2012 is presented in Table 4.3.

Table 4.3: Extract from Credit Inst (banks) BASE variables calculation 2012_1999.xlsx excel sheet

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		2012 Auditált adatok, millió forint	total assets	Average tot assets	total Liabilities	Equity	Deposits	Loans	Acrued Interest Receivables	Total Interest income - SALES	Total interest expenses	Net int. Inc. - NET Int. SALES	Profit or loss after tax
2	1.	Agrár-Vállalkozási Hitelgarancia Alapítvány*	26,643	26,055	26,643	77	0	717	951	1,738	0	1,738	**1,384**
3	2.	Banco Popolare Hungary Bank Zrt.	39,082	42,884	39,082	257	18,435	28,492	204	1,855	642	1,213	**-1,437**
4	3.	Banif Plus Bank Zrt.	20,129	23,445	20,129	0	0	13,194	85	3,162	775	2,387	**932**
5	4.	Bank of China (Hungária) Hitelintézet Zrt.	53,920	58,237	53,920	10	24,896	19,494	206	2,038	483	1,555	**1,497**
6	5.	BUDAPEST Hitel- és Fejlesztési Bank Nyrt.	908,157	916,466	908,157	1,943	463,983	574,847	4,913	76,539	21,750	54,789	**9,136**

Notes: Table 4.3 presents data as follows: in column 'A', the number of banks, in column 'B', the name of the credit institutions, in column 'C', the 'total assets', etc. Within the file, there are 14 sheets, each sheet representing the fiscal year with ratios calculations. The process of inputting amounts were done for each balance sheet and profit and loss account item to calculate each ratio for each year from 1999 to 2012, using formulas as described under section 4.6.2., Chapter 4. *Source:* Own calculation and presentation.

Prior to testing the models, descriptive statistics of the ratios were run from the base sample.

Table 4.4 Descriptive Statistics

	Earnings $_t$ / Total Assets $_{(t-1)}$	Change in Earnings / Total Assets $_{(t-2)}$
Number of Observation	482	411
Mean	.0007	.0027
Std. Error of Mean	.00194	.00224
Median	.0048	.0014
Std. Deviation	.04252	.04544
Variance	.002	.002
Skewness	-3.947	1.722
Std. Error of Skewness	.111	.120
Kurtosis	27.438	32.214
Std. Error of Kurtosis	.222	.240
Range	.48	.72
Minimum	-.37	-.31
Maximum	.12	.41

Notes: Table 4.4 shows descriptive Statistics for Scaled Earnings (Profit After Tax in period t divided by Total Assets in period t-1); and Scaled Earnings Change (Change in Earnings divided by Total Assets in period t-2) ratios, calculated from the base sample, for period 2000 - 2012. *Source:* Own calculation and presentation.

The next section outlines the Standard Discontinuity Methods.

4.4.2. Earnings Management Model 1

This study calculates descriptive statistics of scaled earnings and scaled earnings change, the same ratios as in Holland and Ramsay's (2003) study, where scaled earnings equals Profit After Tax in period (t) divided by Total Assets in period (t-1); and scaled earnings change is ΔPAT = Change in Earnings (t) – (t -1) divided by Total Asset in period (t-2). Due to the nature of the data in the balance sheet, it cannot be distinguished if accruals were reversed, and if so, in which period. Therefore, testing scaled earnings and scaled earnings change might also suffer from testing power, due to reversal accruals as, for example, Dechow, Hutton et al. (2012) study explains.

Testing was performed with the Burgstahler and Dichev's (1997, p.103) model:

$$\mathbf{EM1} = (AOi - EOi) / SDi \qquad (1)$$

EM1 is equal to the actual observation (AO) in period (i) minus the expected observation (EO) in period (i). The result of the actual minus the expected observation is divided by the standard deviation (SD) of the difference in period (i).

Where,

EM1 = Earnings Management testing Model 1

AOi = Actual Observation in interval (i)

EOi = Expected Observation in interval (i) = (ni-1 + ni+1) / 2

SDi = Standard Deviation of the difference; where the SDi is the difference between actual and expected observation in interval (i)

The Actual Observations (AO) of the ratios were calculated earlier, and we need to calculate the Expected Observation (EO), the Estimated probability observation 'i' divided by total observation, which was needed to calculate the SDi = Standard deviation of the difference, in interval (i). The standard deviation of the difference was explained by Shen and Chih (2005), and by Hamdi and Zarai (2012) who similarly interpret the Standard Deviation of the difference formula, as this study does. With this approach, this study tests hypothesis **$H0_{(b)}$:** for Earnings (Profit After Tax) in period (t) divided by Total Assets in period (t-1); and for Change in Earnings divided by Total Assets in period (t-2) ratios.

In *Appendix 2.1*, this study explains elements and calculations of the SDi formula with an example. Additionally, the SDi formula is outlined in testing Approach 3.2, bellow of Chapter 4.

4.4.3. Earnings Management Model 2

Same as for Earnings Management Model 1, (EM1), the Degeorge, Patel and Zeckhauser's (1999, p.31) model was applied to tests smoothness and continuity of the distribution, a '*t-like test statistics, τ*'.

Earnings Management Model 2, EM2, formula reads:

$$\mathbf{EM2} = \tau_n = [\ \Delta p_n - \text{mean}\ (\Delta pi)\ ] \ / \ \text{s.d.}\ (\Delta pi) \qquad (2)$$

where, i ϵ R, i ≠ n. p_i is the ratio of the actual sample for year i of banks years, Δpn is the difference of p_i - p_{i-1}. Mean (Δpi) is the average of Δp but excluding pi and s.d. (Δpi) is the standard deviation of Δp, excluding Δpi. The same model was applied by Shen and Chih (2005).

Testing Approach 3.1, with EM2 model, **H0$_{(b)}$:** is tested for the Profit after Tax in period $_{(t)}$ divided by Total Assets in period $_{(t-1)}$; and Change in Earnings divided by Total Assets in period (t-2) ratios. The actual observations (AO) of each variable per yearly base was imported from the base excel sheet called '*Credit Inst (banks) BASE variables calculation 2012_1999.xlsx*' to '*Degeroge et al – EM2.xlsx*' excel sheet. For example, for the variable debt to equity, DTE, all variables' data for 2012 is copied into a new sheet, namely, into the 2012 column. The same was performed for the year 2011 until 1999. An explanation for each calculation is shown in *Appendix 2.2*.

4.5. The Second Empirical Approach - The Accrual method

4.5.1. Descriptive Statistics of the sample used for the Second Empirical Approach

Since 1991, researchers investigated earnings management (EM) by applying the accrual approach, the widely used Jones's (1991) accrual model. The authors tested total, non-discretionary and discretionary accruals in search for EM. See for example Dechow, Sloan and Sweeney (1995) for more details. Prior to modelling, this study runs descriptive statistics. The Sample was tested with the Accrual Method with data from the Hungarian Financial Supervisory Authority (HFSA), now part of the Hungarian Central Bank (HFSA / MNB). In the balance sheet, within assets and liabilities, accruals such as '*Accrued interest receivables*', '*Other accruals and other assets*', '*Accrued interest payable'* and '*Other accruals and other liabilities'* are available for testing. It is not clear what '*Other accruals and other assets', and 'Other accruals and other liabilities'* comprise.

To test accruals, this study applies Total Accruals, and is calculated as:

TAccr. $_t$ = Total Accruals in period (t) = Accrued interest receivables $_t$ + Other accruals and other assets $_t$ - Accrued interest payable $_t$ - Other accruals and other liabilities $_t$

From the sample, an assumption was made that accruals were reversed as a necessity in their required time frame. The following tables present descriptive statistics of each variable. The tested variables are: Total Accruals scaled by Total Assets (TACCR); Scaled Change in Earnings (E); Non-Discretionary Accruals, (NDA); Discretionary Accruals, (DA); Profit After Tax in period $_t$, (PAT_t); as shown in tables bellow:

Table 4.5. Descriptive Statistics of TACCR and E

	TACCR = Total Accruals divided by Total Assets	**E** = Scaled Earnings Change
Number of Observation	365	365
Mean	-.0278	.0000
Std. Error of Mean	.00853	.00154
Median	-.0144	.0015
Std. Deviation	.16288	.02941
Variance	.027	.001
Skewness	-16.894	-2.544
Std. Error of Skewness	.128	.128
Kurtosis	307.836	38.991
Std. Error of Kurtosis	.255	.255
Range	3.17	.48
Minimum	-3.00	-.27
Maximum	.16	.20

Notes: Table 4.5 presents Descriptive Statistics for **TACCR** = Scaled Total Accruals; and **E** = Earnings Change divided by Total Assets, for period 2000 - 2009. Data from 2010 to 2012 was unavailable, due to HFSA / MNB changes in the 'Golden Book', the main source of the sample. *Source:* Own calculation and presentation

Table 4.6. Descriptive Statistics of Non-Discretionary Accruals (NDA)

Year	Number of Obser-vation	Min.	Max.	Mean		Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
2012	41	0.00	12237.0	1342.9	472.1	3023.2	2.35	.37	4.66	.72
2011	41	0.00	7602.0	838.6	317.1	2030.5	2.50	.37	5.20	.72
2010	40	0.00	9029.0	851.7	309.1	1955.0	2.76	.37	8.01	.73
2009	40	0.00	97997.0	11062.7	3477.8	21995.7	2.64	.37	7.01	.73
2008	41	0.00	135433.0	12301.7	4009.0	25670.3	3.29	.37	13.02	.72
2007	40	0.00	44227.0	7190.1	1822.1	11524.3	1.84	.37	2.80	.73
2006	40	0.00	40052.0	5227.8	1367.4	8648.4	2.33	.37	6.02	.73
2005	37	8.00	64221.0	5181.7	1966.1	11959.8	3.96	.39	17.45	.75
2004	38	0.00	51029.0	5739.6	1740.2	10727.4	2.81	.38	8.74	.75
2003	38	0.00	22261.0	3712.6	884.2	5450.7	1.89	.38	3.22	.75
2002	38	0.00	12508.0	1944.1	452.0	2786.4	2.10	.38	4.77	.75
2001	40	0.00	9082.0	1470.4	337.5	2135.0	1.94	.37	3.46	.73
2000	42	0.00	10510.0	1510.2	343.0	2223.0	2.47	.36	6.63	.71
1999	43	0.00	15391.0	1680.1	453.2	2972.4	3.15	.36	11.18	.70

Notes: Table 4.6 shows Non-Discretionary Accruals (NDA) variable Descriptive Statistics calculated from the base sample for the period 1999-2012. *Source:* Own calculation and presentation

Table 4.7. Descriptive Statistics of Discretionary Accruals (DA)

Year	Number of Obser-vation	Min.	Max.	Mean		Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
2012	41	0.00	53798.0	8260.5	2252.1	14420.9	1.94	.37	2.78	.72
2011	41	0.00	49036.0	7886.1	2126.1	13613.7	1.89	.37	2.68	.72
2010	40	0.00	52613.0	7261.0	2027.9	12825.9	2.15	.37	4.21	.73
2009	40	40.00	128084.0	20198.4	5450.5	34471.9	1.78	.37	2.14	.73
2008	41	4.00	260588.0	33106.0	9404.2	60216.2	2.19	.37	4.61	.72
2007	40	6.00	229261.0	23846.9	7114.1	44993.7	2.94	.37	10.57	.73
2006	40	17.00	181826.0	23908.7	6429.4	40663.1	2.46	.37	6.57	.73
2005	37	120.00	141356.0	17300.2	4588.9	27913.4	2.82	.39	10.13	.76
2004	38	67.00	116116.0	13305.7	3640.1	22439.4	3.03	.38	11.49	.75
2003	38	37.00	90026.0	9029.2	2596.1	16003.4	3.86	.38	18.03	.75
2002	38	34.00	71770.0	9594.8	2674.5	16487.0	2.78	.38	8.14	.75
2001	40	13.00	74146.0	8489.8	2568.6	16245.3	2.84	.37	8.35	.73
2000	42	30.00	55524.0	6698.8	1751.2	11349.1	2.59	.36	7.80	.72
1999	43	34.00	51799.0	6396.4	1711.4	11222.2	2.55	.36	6.96	.71

Notes: Table 4.7 shows Discretionary Accruals (DA) variable Descriptive Statistics calculated from the base sample for the period 1999-2012. *Source:* Own calculation

Table 4.8. Descriptive Statistics of Profit After Tax (PAT)										
Year	Number of Obser-vation	Min.	Max.	Mean		Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
2012	41	-127310.0	52573.0	-4371.7	4426.3	28342.2	-2.76	.37	10.31	.72
2011	41	-147854.0	136607.0	-6889.6	6164.9	39475.1	-.60	.37	8.31	.72
2010	40	-112787.0	108964.0	-432.7	4181.4	26445.9	-.15	.37	15.34	.73
2009	40	-3059.0	102329.0	5282.7	2684.9	16981.3	5.10	.37	28.79	.73
2008	41	-5475.0	54211.0	5985.3	1739.5	11138.6	2.58	.37	8.11	.72
2007	40	-4530.0	119883.0	8421.8	3171.0	20055.7	4.67	.37	25.40	.73
2006	40	-1103.0	186187.0	9195.1	4650.9	29415.3	5.86	.37	35.96	.73
2005	37	-257.0	138346.0	9081.0	3756.8	22851.7	5.29	.38	30.35	.75
2004	38	-505.0	104818.0	7612.7	2804.8	17290.5	5.05	.38	28.53	.75
2003	38	-5506.0	71562.0	4768.4	1938.5	11949.7	4.96	.38	27.82	.75
2002	37	-82744.0	10868.0	-2005.8	2264.1	13772.3	-5.88	.38	35.52	.75
2001	40	-17093.0	2368.0	-801.7	482.0	3049.0	-4.52	.37	22.47	.73
2000	42	-3633.0	1073.0	-318.0	135.6	879.1	-2.01	.36	5.96	.71
1999	43	-7081.0	1552.0	-678.6	220.7	1447.3	-2.79	.36	9.74	.71

Notes: Table 4.8 presents Profit After Tax in period (t) variable Descriptive Statistics calculated from the base sample for the period 1999-2012. *Source:* Own calculation

Chapter 2 of this study critically reviewed earlier studies investigating Earnings Management with the Accrual approach, see for example Dechow, Sloan and Sweeney (1995); Dechow, Ge and Schrand (2010); McNichols (2000) and Dechow, Hutton, et al. (2012).

4.5.2. Regression Model 1

This study investigates if Total Accruals were used to manage earnings and classifies the Scaled Total Accruals (TACCR.) as the predictor, or the independent variable; and Scaled Earnings Change (E) as the dependent variable.

The author of this study designed the regression Model 1:

$$\mathbf{E_t = \beta_{1jt}\ (TACCR._{\ jt}) + \varepsilon_{jt}} \qquad (3)$$

Where,

$\mathbf{E_{(t)}}$ = $\Delta PAT / TA_{(t-1)}$ = Scaled Earnings change in period $_{(t)}$

$\Delta PAT_{(t)} = PAT_{(t)} - PAT_{(t-1)}$

$PAT_{(t)}$ = Profit After Tax in period $_{(t)}$

$PAT_{(t-1)}$ = Profit After Tax in period $_{(t-1)}$

$TA_{(t-1)}$ = Total Assets in period $_{(t-1)}$

$TAccr_{(t)}$ = Total Accruals in period $_{(t)}$ = Accrued interest receivables $_{(t)}$ + Other accruals and other assets $_{(t)}$ - Accrued interest payable $_{(t)}$ - Other accruals and other liabilities $_{(t)}$

TACCR. = $TAccr._{(t)} / TA_{(t-1)}$ = Total Accruals in period $_{(t)}$ divided by Total Assets in period $_{(t-1)}$

$\mathbf{B_{1jt}}$ = *j* and *t* are firm and time for the parameter

$\boldsymbol{\varepsilon_t}$ = Error term in period $_{(t)}$

4.5.3. Regression Model 2

From the sample of the Hungarian Financial Supervisory Authority, Accruals are classified, (within liabilities), as '*Accrued interest payable*' and '*Other accruals and other liabilities*'. However, it is unclear from the sample what '*Other accruals and other liabilities'* comprise.

From the sample, this study names 'Accrued interest payable' as non-discretionary accruals, or 'NDA'; and 'Other accruals and other liabilities' as discretionary accruals, or 'DA'. However, despite naming 'Other accruals and other liabilities' as 'DA', it is probable, that 'Other accruals and other liabilities' might consist of both NDA and DA accruals, as well as 'other liabilities' that do not classify accruals. This study highlights in Chapter 2, in the literature review, Healy's

(1985, p.89) definition of the non-discretionary accruals (NDA) and the discretionary accruals (DA). Accruals are the predictors and Profit After Tax (PAT) is the dependent variable. From the sample, assumptions were made that discretionary (DA) and non-discretionary (NDA) accruals were reversed as necessary in their required time frame. This study tests whether NDA and DA were used to manage earnings. The author formulated the regression Model 2. It reads as:

$$\mathbf{PAT_{(t)} = \beta_{0jt} + \beta_{1jt} (NDA_{jt}) + \beta_{2jt} (DA_{jt}) + \varepsilon_{jt}} \qquad (4)$$

Where,

$PAT_{(t)}$ = Profit After Tax in period $_{(t)}$

$NDA_{(t)}$ = Non-Discretionary Accruals $_{(t)}$ = Accrued interest payable $_{(t)}$

$DA_{(t)}$ = Discretionary Accruals $_{(t)}$ = Other accruals and other liabilities $_{(t)}$

β_{0jt}, β_{1jt} and **β_{2jt}** = *j* and *t* are firm and time for the parameters

ε_t = Error term in period $_{(t)}$

Model 1 and Model 2 were run in SPSS with 95% and 99% confidence and 0.01 and 0.05 significance levels.

4.6. The Third Empirical Approach – The Distribution of Ratios Method

4.6.1.1. Descriptive Statistics for sample used for the Third Empirical Approach

As in the First and the Second Empirical Approaches, Descriptive Statistics of the following 14 ratios are tested in the Third Empirical Approach. These are: Interest (Sales) Receivables Index

(IRI), Sales Growth Index (SGI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit Margin (PATM), Return on Assets (ROA), Return on Equity (ROE), Rate Paid on Funds (RPF), Loans to Total Assets (LTA), Loans to Deposits (LTD), Equity to Loans (ETL), Gross Yield on Earning Assets (GYEA), Equity to total Assets (EtA) and Debt to Equity (DTE).

The following Table 4.9 presents Descriptive Statistics for 14 ratios:

Table 4.9. Descriptive Statistics of 14 ratios

Ratios	Number of Obser-vation	Min.	Max.	Mean		Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
DTE	447	.12	152260.00	1602.82	388.17	8206.91	14.93	.115	260.62	.23
ETL	398	.00	9.34	0.12	0.04	0.72	10.32	.122	116.52	.24
LTD	457	.00	72149.00	262.32	162.61	3476.27	19.60	.114	403.57	.23
LTA	541	.00	53.06	0.66	0.10	2.27	22.77	.105	526.00	.21
GYEA	554	.01	13.63	0.50	0.03	0.70	12.32	.104	220.35	.21
RPF	536	-.02	19.12	0.08	0.04	0.83	22.82	.106	525.25	.21
SGI	474	.00	25.56	2.14	0.15	3.27	4.00	.112	17.83	.22
IRI	467	.01	84.31	1.23	0.18	3.93	20.34	.113	429.48	.22
GMI	471	-2.37	5.38	1.01	0.02	0.52	0.86	.113	24.90	.22
NIM	474	-.03	3.30	0.29	0.01	0.31	3.47	.112	20.97	.22
PATM	545	-118.70	324.49	0.16	0.64	14.94	17.95	.105	417.27	.21
ROE	400	-2062.00	1098.67	1.09	6.76	135.12	-8.36	.122	152.27	.24
ROA	474	-.32	.12	0.00	0.00	0.04	-3.42	.112	24.31	.22
ETA	389	.00	5.89	0.03	0.02	0.30	19.31	.124	377.82	.25

Notes: Table 4.9 presents Descriptive Statistics of the 14 ratios, namely, Interest Receivables Index (IRI), Sales Growth Index (SGI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Assets (ROA), Return on Equity (ROE), Rate Paid on Funds (RPF), Loans to Total Assets (LTA), Loans to Deposits (LTD), Equity to Loans (ETL), Gross Yield on Earning Assets (GYEA), Equity to Total Assets (EtA) and Debt to Equity (DTE) were calculated from the base sample for the period 1999-2012. *Source:* Own calculation

The following sections present four independent modelling of ratios under the Third Empirical Approach.

4.6.1.2. Testing Approach 3.1

Chapter 2 presented various approaches to achieve Earnings Management. It also critically reviewed studies of Deakin (1976), Whittington (1980), McLeay and Fieldsend (1987), McLeay and Omar (2000) who investigated correlation, normality and other properties of the distributions of financial accounting ratios. Earlier studies were focusing only on one or two variables in testing EM. However, Beneish (1999) applied data from all industries and tested several ratios from the financial statements such as days' sales in receivables, gross margin index, asset quality index, sales growth index, and other, a total of eight variables. Beneish (1999) presented a testing model and test statistics for variables and a clear evidence of earnings manipulation. Earlier studies omitted reversing accruals when applying the accrual testing method, as Dechow, Hutton, et al. (2012) point out. Furthermore, in Chapter 4, section 4.1, it was highlighted that it is difficult to see what 'Other accruals and other assets' under Assets truly consist of in the data tested in this study, due to lack of explanations in the 'Golden Book' of the HFSA / MNB pertaining published data of financial intermediaries.

Taking into account the above mentioned premises, for the distributional approach, this study follows Beneish (1999), Burgstahler and Dichev (1997) and Degeorge, Patel and Zeckhauser's (1999) methods. Furthermore, instead of the Wilcoxon test, this study applies the Kolmogorov-Smirnov one-sample test, to test hypotheses. Like Gore, Pope and Singh (2007); Shen and Chih (2005) or Degeorge, Patel and Zeckhauser (1999), this study does not test one or two variables, but investigates any possible sign of Earnings Management (EM) and it cross-examines year-end financial statements. Testing one or two variables in search of EM is not robust enough compared to the higher number of variables, which are more likely to provide statistically significant evidence in favor of, or against EM. Therefore, in search of any sign of earnings management ratios that could show evidence of EM will not be excluded, and that are available to compute from the available data, as Benish (1999), as well as Fridson and Alvarez (2002) explain ratio calculations. This study calculates: Interest (Sales) Receivables Index (IRI), Sales Growth Index (SGI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit Margin (PATM), Return on Assets (ROA), Return on Equity (ROE), Rate Paid on Funds (RPF), Loans to Total Assets (LTA), Loans to Deposits (LTD), Equity to Loans (ETL), Gross Yield on Earning Assets (GYEA), Equity to Total Assets (EtA) and Debt to Equity (DTE). In order to calculate each formula, at first, for each year, the data was used from balance sheets and profit and loss accounts from the HFSA/MNB. For example, Total Assets (TA), average total assets (calculated as TA_t + TA_{t-1})/2), total liabilities, equity, deposits, loans, accrued interest receivables, total interest income (or sales), total interest expenses, net interest income, profit or loss after tax. Formulas containing ‘t’ refer to a specific year. For example, for ‘year (t)’, data is from the base year, from where the calculation was made, that is if year (t) = 2012, then the calculation of the ratio was performed from year 2012 data. If the ratio contains year (t-1), then the data is from the previous year. For example if the base year is 2012, then (t-1) refers to the 2011 financial year. If the formula comprises year (t-2), then the data for the ratio refers to two years earlier from the base year. That is, if the base year is 2012, then (t-2) refers to the 2010 financial year.

The tested formulas are:

- *Debt to Equity (DTE)* = Total Liabilities (t) divided by Equity (t).
- *Equity to Loans (ETL)* = Average Equity (t) divided Loans (t). Where: Average Equity (t) = (Equity (t) + Equity (t-1)) / 2

- *Loans to Deposits Ratio (LTD)* = Loans (t) divided by Deposits (t).
- *Loans to Total Assets (LTA)* = Loans (t) divided by Total Assets (t).
- *Gross Yield on Earning Assets (GYEA)* = Total Interest Income (t) divided by Total Earning Assets (t).
- *Rate Paid on Funds (RPF)* = Total Interest Expenses (t) divided by Total Earning Assets (t).
- *Sales Growth Index (SGI)* = Sale (t) divided by Sales (t-1).
- *Interest (Sales) Receivables Index (IRI)* = [Accrued Interest receivables divided by sales (t)] divided by [Accrued Interest receivables divided by sales in receivables (t-1)].
- *Gross Margin Index (GMI)* = Gross Margin (t-1) divided by Gross Margin (t). Where: Gross Margin (t) = Total interest income (t) - Tot Int. expenses (t) divided by Total Interest Income (t)
- *Net interest Margin (NIM)* = Net Interest Income (t) divided by Average Earning Assets (t-1). Where: Net interest income = Total interest income (t) - Total Interest Expenses (t). Average Earning Assets correspond to all assets that earn income, that is, the sum of earning assets per number of earning assets, i.e.: securities for trade, investments; placements at banks and central bank; loans; equities and participations; accrued interest receivables; other accruals and assets.
- *Profit Margin (PATM)* = Profit After Tax (PAT) (t) divided by Net Interest (sales) (t).
- *Return on Equity (ROE)* = Profit After Tax (t) divided by Average Equity (t).
- *Return on Asset (ROA)* = Profit After Tax (t) divided by Average Total Assets (t).

  Where: Average Total Assets = (Total Assets (t) + Total Assets (t-1)) divided by 2
- *Equity to Total Assets* (EtA) = Equity (t) divided by Average Total Assets (t).

At first, search is conducted to see if earnings management is present within credit institutions trading in Hungary. This is done by visual investigation of the histograms, and additionally, with testing Hypothesis **$H0_{(a)}$:.** Secondly, possible evidence is investigated which might indicate avoidance of earnings decreases, tested with Hypothesis **$H0_{(b)}$:**. Thirdly, if there is a size firm effect to engage earnings management (EM), evidence is investigated with Hypothesis **$H0_{(c)}$:**. Fourthly, if EM was/is, or has been ongoing 'prior to', or 'after' 2008, when the financial crisis started, evidence is tested with Hypothesis **$H0_{(d)}$:**.

From the '*Credit Inst. (banks) BASE variables calculation 2012_1999.xlsx*' excel sheet for each 14 base ratio results for the whole sample period were inserted into SPSS in the observed frequency and a histogram run at median zero points. At this point, at first, only visual investigations of the ratio histograms were performed and no statistical analysis was created in the first part of *Testing Approaches 3.1.* The purpose of no statistical testing was to see if the '*properties of the distribution are symmetrical around its mean value*' – Gujarati (1995, pp.769-772). A detailed explanation of inputting ratios and creating histograms in SPSS is given in *Appendix 1*.

After the visual investigation of the ratios, histograms were performed. This study follows, as part of the *Testing Approach 3.1*, the Burgstahler and Dichev (1997, p.103) and the Degeorge, Patel and Zeckhauser's (1999, p.31) models, explained in Sections 4.4.2 and 4.4.3 respectively and uses the statistical tests approach of the Kolmogorov-Smirnov One Sample (K-S) non-parametric test to test Hypothesis **$H0_{(a)}$:**.

To summarise, Hypothesis **$H0_{(a)}$:** is tested both with the Accrual Method (*Testing Approach No. 2*), as well as with the Distribution of Ratios Method (*Testing Approach No. 3.1*).

4.6.1.3. Kolmogorov-Smirnov (K-S) test statistics

The Kolmogorov-Smirnov one sample test, *'... can be used with small sample sizes…'*, and, *'…it is more powerful than the chi-square test for any sample size',* Lilliefors (1967, p.399). It is applicable for ratio or interval data. A sample of *N* observations:

$$\mathbf{D = max\ x \in R\ |\ F\ (x) - F0\ (x)\ |} \qquad (5)$$

<u>where,</u> F (x) is the cumulative normal distribution, and F0 (x) is the sample cumulative distribution, with $\mu = \bar{x}$ sample mean and $\sigma^2 = s^2$ sample variance with denominator n-1.

H0(a,b,c,d): $F_{(x)} = F0_{(x)}$ for all x from $-\infty$ to ∞

H1(a,b,c,d): $F_{(x)} \neq F0_{(x)}$ for at least one value of x

The Kolmogorov-Smirnov one sample test (K-S) is non-parametric, a distribution-free, an exact test. Massey (1951, p.68) writes: *'...sampling distribution does not depend upon either the explicit form of, or the value of certain parameters in, the distribution of the population. Such tests have been called non-parametric or distribution-free tests.'*

The decision to choose the non-parametric test was explained by Panik (2005, p.570), where the author presents arguments for choosing the parametric or the non-parametric method of testing. The parametric method is applicable for a small sample, whereas the non-parametric is applied for small and medium sized random sample consisting of a population of $n \leq 50$, where the distribution is unknown. The non-parametric method is applied to test interval or ratio data, as it does not assume functional (i.e. normality) form. The parametric method assumes ‘some form of knowledge of the population probability distribution (normality)’.

Within the K-S test statistics this study also applies the Monte Carlo Simulation test. The Monte Carlo Experiment or *‘... simulation studies are a useful way of reinforcing or checking theoretical results*.’ – Thomas (1997, p.6). Monte Carlo simulation is defined as ‘*...process of modelling and simulating a system affected by randomness: Several random scenarios are generated, and relevant statistics are gathered in order to asses, e.g. the performance of a decision policy or the value of an assets.’* - Brandimarte (2014, p.3). As Brandimarte (2014) and Thomas (1997) pointed out, the Monte Carlo simulation test was run for results comparisons and for reinforcing the test results.

4.6.1.4. Histograms

Histograms are applied to graphically present the distribution of a variable. Histograms are a popular method in testing discontinuity of a distribution of cross-sectional data to confirm or to reject ‘statistical significance’. See for example, Burgstahler and Dichev (1997); Degeorge, Patel and Zeckhauser (1999); Dichev and Skinner (2002); Holland and Ramsay (2003); Shen and Chih (2005); Burgstahler and Eames (2006); Gore, Pope and Singh (2007); Jacob and Jorgensen (2007); Amar and Abaoub (2010); Jorgensen, Lee and Rock (2014); Li (2014); Burgstahler and Chuck (2015) and others who also apply histograms to investigate EM.

Holland and Ramsay (2003, p.47) point out, ‘*To construct a histogram, a relevant interval width must be chosen’*. Dichev and Skinner (2002, p.1108) *write, ‘Fineness demands that bin widths are sufficiently narrow to trace even subtle properties of the distribution, while precision of* *estimation demands that bin widths are sufficiently wide that idiosyncratic noise is filtered out. This means that bin width should be positively related to the variability in the data and negatively related to sample size. There is no theory that dictates the correct bin width; text discussions typically characterize these choices as rules of thumb'.*

In order to examine earnings decrease, Burgstahler and Dichev (1997, p.126) suggest that EM will occur with distributions of 'low frequencies of earnings decreases and high frequencies of earnings increases'. Furthermore, Jorgensen, Lee and Rock (2014) argued that neither sample selection nor scaling are the causes of asymmetric distribution. Burgstahler (2014) also confirmed Jorgensen, Lee and Rock's (2014) argument that sample selection and scaling is not the cause' of the discontinuity in histograms, but earnings management is.

4.6.1.5. Benchmark

Benchmark for any Hungarian credit institution should not be compared to other countries' standards due to the specifics of the Hungarian Accounting Standards (HAS), as the only reporting standard in Hungary. Comparison could have been made if the benchmarks of credit institutions were universal; however, they are not. Furthermore, despite an in-depth search, there is no evidence of a research paper(s) that specifically investigate benchmarks of credit institutions financial ratios in Hungary, or elsewhere. In other words, a table with a list of industry standards for each financial ratio for the financial industry. Papers published on benchmarking of non-financials are, for example, Kent and Routledge (2015); Sun and Rath (2012); Dechow, Ge and Schrand (2010); Crump and Teeguarden (2009); Habib (2007); Dattakumar and Jagadeesh

(2003); Yasin (2002); and Gupta and Huefner (1972). Using non-financials benchmark for the comparison of results would be of little value to this study.

In order to make a comparison, this study calculates benchmark as follows; benchmark was calculated for the Hungarian credit institutions for the sample period of 1999-2012, for each ratio, with a formula that reads as:

$$\bar{x}_{i,j} = \frac{\sum x_{i,j}}{N_{i,j}} \qquad (6)$$

Where:

$\bar{x}_{i,j}$ = Is the Mean

$\sum x_{i,j}$ = The sum of all ‘x’ values

$N_{i,j}$ = The number of ‘x’ values

i, j = Ratios and years respectively

This study tests benchmark for each ratio by applying formula (6). Results from each ratio are shown in descriptive statistics and histograms, and are presented in Chapter 5.

4.6.2. Testing Approach 3.2

Beaver, McNichols and Nelson (2007) investigate income tax and special items effect in connection with discontinuity of earnings ‘around’, and ‘at’ zero points. To see if Beaver, McNichols and Nelson’s (2007, p.540) modified model of Burgstahler and Dichev’s (1997, p.103) model has a significant difference in test results and in the distribution of the histograms, this study applied Beaver, McNichols and Nelson's (2007, p.540) modified Burgstahler and Dichev's (1997, p.103) model. Beaver, McNichols and Nelson (2007, p.540) did not explain why they modified the formula, that is, why there is an understatement of the estimated standard deviation in the Burgstahler and Dichev's (1997, p.103) model. One drawback of testing the Beaver, McNichols and Nelson's (2007, p.540) modified Burgstahler and Dichev's (1997, p.103) model in this study is that special items cannot be identified from the Hungarian credit institutions' data. Profit 'before and after tax' data, however, is available. Beaver, McNichols and Nelson (2007, p.526) argue, *'…consistent with the predictions of our model, our empirical results show that income taxes and special items contribute to a discontinuity at zero in the distribution of earnings.'*

The method of testing and calculation of the Beaver, McNichols and Nelson's (2007, p.540) model is identical as in section 4.4.2. The first difference are the variables: Scaled Earnings, or Profit after $Tax_{(t)}$ divided by Total $Assets_{(t-1)}$; and Scaled Earnings Change, or Change in Earnings divided by Total $Assets_{(t-2)}$ ratios, which were earlier calculated from the raw data used for the yearly financial statements in the '*Credit Inst. (banks) BASE variables calculation 2012_1999.xlsx*' excel file name. The second difference is the second part of the standardised difference (SDi) formula, and the third difference is that special items and tax data is included in the tests of this study due to a reason explained earlier in this section. Once the Scaled Earnings and the Scaled Earnings Change ratios were calculated in the '*Credit Inst. (banks) BASE variables calculation 2012_1999.xlsx*' excel file for the years 2000-2012 with Hungarian credit institutions data, then the results of the two ratios were imported in the '*Burgsthaler calculation method of all variables.xlsx*' excel file (where all the ratios are, and were calculated under Burgstahler and Dichev, 1997, p.103 model), then the Earnings Management Model 1, or EM1 is calculated, as per Formula (1) to test $\mathbf{H0_{(b)}}$**:**. EM1 for Scaled Earnings and for Scaled Earnings

Change ratios were calculated in an exact way, as the rest of the ratios were for EM1 model. Section 4.4.2 explains these calculations. Once the EM1 calculations were performed, the next step was to import the ratios results to SPSS to test Kolmogorov-Smirnov (K-S) test statistics. Detailed SPSS calculation for Scaled Earnings and for Scaled Earnings Change ratios of Beaver, McNichols and Nelson (2007, p.540) model is shown in *Appendix 2.3*.

Both the Holland and Ramsay (2003); and the Beaver, McNichols and Nelson (2007) papers follow and apply Burgstahler and Dichev's (1997, p.103) model with the difference that Beaver, McNichols and Nelson (2007) adjust the 'Standard Deviation of the difference, SDi' formula. Although the authors test excludes financials, the 'Standard Deviation of the difference' of the Burgstahler and Dichev (1997, p.103) model is modified per Beaver, McNichols and Nelson's (2007, p.540) model. Additionally, Holland and Ramsay (2003, p.48) do not adjust the 'Standard Deviation of the difference' formula of the Burgstahler and Dichev (1997, p.103) model whereas Beaver, McNichols and Nelson (2007, p.540) do. The difference between the two models is shown below. The Burgstahler and Dichev (1997, p.103) standard deviation of the difference model reads as:

$$SDi = [Np_i\,(1 - p_i) + \tfrac{1}{4}\,N\,(p_{i-1} + p_{i+1})\,(\mathbf{1} - p_{i-1} - p_{i+1})]\ ^{1/2}$$

where,

SDi = Standard deviation of the difference in interval (i); pi = probability of an observation will fall in interval (i); N = number of total sample; Npi = total number of estimated Standard Deviation (SD) in interval (i); pi-1 = number in interval i-1; pi+1= number in interval i+1.

Beaver, McNichols and Nelson (2007, p.540) argue that the Burgstahler and Dichev (1997, p.103) standard deviation of the difference, 'SDi', model is overstated and the EM1 is understated. Beaver, McNichols and Nelson (2007, p.540) suggest a modified standardised deviation of the difference formula:

$$SDi = [Np_i\ (1 - p_i\ ) + ¼\ N\ (p_{i-1}\ + p_{i+1}\ )\ (\mathbf{2} - p_{i-1} - p_{i+1})]\ ½$$

Where,

SDi = Standard deviation of the difference in interval (i); pi = probability of an observation will fall in interval (i); N = number of total sample; Npi = total number of estimated Standard Deviation (SD) in interval (i); pi-1 = number in interval i-1; pi+1= number in interval i+1.

The difference is in the third part of the SDi formula, or ($\mathbf{2} - p_{i-1} - p_{i+1}$), where Beaver, McNichols and Nelson (2007) instead of digit ‘1’ put digit ‘2’ to remove overstatement of the standardised deviation of the difference (SDi) formula. However, it is not clear from Beaver, McNichols and Nelson (2007) argument for overstatement, nor their reason for changing the SDi formula. Apart from statistical tests, histograms around zero for both variables were also calculated. *Appendix 2.3* explains Histograms build in SPSS. Once results in SPSS are ready with the Beaver, McNichols and Nelson (2007, p.540) model EM1 histograms, statistical and K-S tests, comparisons are made to Holland and Ramsay’s (2003, p.48) and Burgstahler and Dichev’s (1997) studies, as outlined in Chapter 5.

4.6.3. Testing Approach 3.3 with Earnings Management Model 1

Apart from ratio calculations, this study additionally investigates earnings manipulation based on assets sizes of the credit institutions for two ratios: Scaled Earnings (Profit after Tax in period (t) divided by Total Assets in period (t)); and Scaled Earnings Change (Change in Earnings divided by Total Assets in period (t-2)). By splitting companies by asset size, an opportunity is given to search for an evidence of earnings manipulation primarily by assets size. The search for earnings manipulation will be based on assets size, for Scaled Earnings and Scaled Earnings Change ratios. For example, scaled by large and small companies to test if small assets size companies manage earnings more than the large assets size companies, or vice versa, or, perhaps assets sizes do not have any impact of earnings manipulation. It is also probable that an assets size has no influence nor there is earnings management in evidence. This area is of particular interest, as, in Hungary, domestic and foreign credit institutions are trading with different assets sizes. The same testing approach was applied by Holland and Ramsay (2003).

At first the '*Credit Inst (banks) BASE variables calculation 2012_1999.xls*' excel file the Scaled Earnings and Scaled Earnings Change ratios were calculated. Then total assets (TA) were split into large (LC) and small companies (SC) based on the sample median of total assets. Once the median split is performed, the calculation of Scaled Earnings and Scaled Earnings Change follow, with Burgstahler and Dichev (1997), with Earnings Management Model 1, or EM1, as shown under formula (1), section 4.4.2, and Degeorge, Patel and Zeckhauser (1999), with Earnings Management Model 2, or EM2, shown under formula (2), section 4.4.3. Under *Testing Approach 3.3* the Kolmogorov-Smirnov one-sample test statistics is performed to test **$H0_{(c)}$:** hypothesis.

To split the sample per assets size the following action was necessary: Total Assets of each company for each year were imported from the Hungarian Financial Supervisory Authority (HFSA/MNB) Golden Book file to the '*Credit Inst (banks) BASE variables calculation 2012_1999.xls*' excel file. To calculate the median of the Total Assets for each year, the 'total assets' numbers were selected from the '*Credit Inst (banks) BASE variables calculation*

2012_1999.xls' excel file. For example, for year 2012, selecting column C numbers from the '*Credit Inst (banks) BASE variables calculation 2012_1999.xls*' excel file, and importing the selection into the SPSS Data View sheet. The same was applied for the Total Assets numbers for the rest of the years. Calculation of the Median of Total Assets in SPSS for EM1 is explained in *Appendix*, *Section 2.4*.

Once the medians of assets for each year are created, then the Scaled Earnings (Profit after Tax in period (t) divided by Total Assets in period (t)); and the Scaled Earnings Change (Change in Earnings divided by Total Assets in period (t-2)) ratios are sorted per median size for Total Assets per large and small companies. This was done by importing the total assets numbers for each year and then calculating Scaled Earnings and Scaled Earnings Change ratios for each company. The split of the assets size is in the '*TA ratios by sizes variables 2012_1999.xlsx*' excel file. In this file, it is shown, for example, for the year 2012, which is named as 2012 sheet and where there are 7 columns, where column A is only the numbering, in column B are the names of the intermediaries, in column C are the numbers of Total Assets, in column 'D' are the numbers of calculated ROA, in column F are the calculations of Scaled Earnings and in column G are the results of Scaled Earnings Change. The SPSS output for Total Assets median for year 2012 results are in Hungarian Forints, HUF 135266 million. This number of HUF 135266m for total assets is the separation or the median amount between the large and small assets sizes. Therefore, any number that is above 135266 is in the group of Large Company Sizes (LC) per Total Assets, and any number below 135266 is under the Small Company Size (SC) per Total Assets. With this approach, assets were separated per size, per LC and SC for Scaled Earnings and Scaled Earnings Change ratios for each year. The same approach was applied for each sample year per assets size, for Large Companies (LC) and Small Companies (SC).

The following step was to calculate EM1 and EM2 models per assets size for large companies (LC) and small companies (SC) for Scaled Earnings and Scaled Earnings Change ratios followed by importing the scaled sample data of LC and SC for each year. The calculation was done in the same way as in Section 4.4.2.

Tables 4.10 – 4.14 present extracts of the Actual (AO), Expected observation (EO), the Estimated (SD) Probabilities, the Standard Deviation of the Difference (SDi) and the Earnings Management Model 1:

Table 4.10. The Actual Observation (AO)

	Profit after taxes (t) by Total Assets t-1												
	Large Companies scaled by size of Total asset - Actual Observation (AO)												
	From TA ratios by sizes variables file												
	PAT / TA t-1 LARGE companies												
	2012	**2011**	**2010**	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	**2002**	**2001**	**2000**
1	0.0078	0.0220	0.0166	0.0174	0.0103	0.0268	0.0518	0.0454	0.0380	0.0299	0.00004	0.0012	0.0005
2	-0.0034	-0.0501	0.0095	0.0058	0.0057	0.0154	0.0064	0.0110	0.0158	0.0023	0.0011	-0.0139	-0.0045
3	0.0091	0.0014	0.0014	0.0001	0.0115	0.0124	0.0108	0.0114	0.0130	0.0135	-0.0016	0.0001	0.0003
4	-0.0328	-0.0405	-0.0389	0.0072	0.0002	0.0100	0.0069	0.0121	0.0133	0.0125	-0.0006	-0.0031	-0.0026

Notes: Table 4.10. presents Actual Observation (AO) for Scaled Earnings (Profit After Tax in period (t) divided by Total Assets in period (t-1)), for Large companies scaled by Total Assets - Extract. *Source*: Own calculation

Table 4.11. The Expected Observation (EO)

	Profit after taxes (t) by Total Assets t-1										
	Large Companies scaled by size of Total asset - Expected observation (EO)										
	[n(t-1) + n(t+1)]/2										
	PAT / TA t-1 LARGE companies										
	2011	**2010**	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	**2002**	**2001**
1	0.0122	0.0197	0.0134	0.0221	0.0310	0.0361	0.0449	0.0377	0.0190	0.0156	0.0003
2	0.0030	-0.0222	0.0076	0.0106	0.0060	0.0132	0.0111	0.0067	0.0084	-0.0058	-0.0017
3	0.0053	0.0007	0.0064	0.0062	0.0112	0.0119	0.0119	0.0125	0.0057	0.0068	-0.0007
4	-0.0359	-0.0167	-0.0193	0.0086	0.0036	0.0111	0.0101	0.0123	0.0064	0.0047	-0.0016

Notes: Table 4.11 shows Expected Observation (EO) for Scaled Earnings (Profit After Tax in period (t) divided by Total Assets in period (t-1)), for Large companies scaled by Total Assets - Extract. *Source:* Own calculation

Table 4.12. The Estimated (SD) Probabilities Observation

	Profit after taxes (t) by Total Assets t-1												
	Large Companies scaled by size of Total asset												
	Estimated (SD) probabilities observation "i" divided by total observation of the year i												
	2012 pi	2011 pi	2010 pi	2009 pi	2008 pi	2007 pi	2006 pi	2005 pi	2004 pi	2003 pi	2002 pi	2001 pi	2000 pi
1	0.000391	0.001099	0.000873	0.000918	0.000514	0.001490	0.002588	0.002524	0.002000	0.001663	0.000002	0.000061	0.000026
2	-0.000172	-0.002507	0.000499	0.000303	0.000285	0.000858	0.000318	0.000613	0.000832	0.000130	0.000064	-0.000696	-0.000217
3	0.000457	0.000069	0.000072	0.000006	0.000576	0.000687	0.000541	0.000634	0.000686	0.000750	-0.000096	0.000005	0.000016
4	-0.001641	-0.002025	-0.002049	0.000378	0.000011	0.000557	0.000345	0.000672	0.000702	0.000696	-0.000032	-0.000153	-0.000123

Notes: Table 4.12 presents the Estimated (SD) Probabilities Observation for Scaled Earnings (Profit After Tax in period (t) divided by Total Assets in period (t-1)), for Large companies scaled by Total Assets - Extract. *Source:* Own calculation

Table 4.13. The Standard Deviation of the Difference (SDi)

	Profit after taxes (t) by Total Assets t-1										
	Large Companies scaled by size of Total asset										
	Standard deviation of the difference (Sdi)										
	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
1	4.478465	4.371352	4.366783	4.487677	4.262121	4.49412	4.270697	4.384244	4.253757	4.136077	4.472193
2	4.480015	4.342006	4.36383	4.479565	4.245243	4.481632	4.249763	4.362382	4.248924	4.118696	4.472628
3	4.47566	4.359276	4.36351	4.475668	4.249362	4.480102	4.250276	4.367265	4.245373	4.128996	4.471565
4	4.450837	4.351578	4.343472	4.478602	4.244074	4.479895	4.248884	4.367113	4.246072	4.127271	4.471396

Notes: Table 4.13 shows The Standard Deviation of the Difference (SDi) for Scaled Earnings (Profit After Tax in period (t) divided by Total Assets in period (t-1)), for Large companies scaled by Total Assets - Extract. *Source:* Own calculation

Table 4.14. The Earnings Management model 1 - EM1

	Profit after taxes (t) by Total Assets t-1										
	Large Companies scaled by size of Total asset										
	EM1 = (AO - EO) / SDi										
	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
1	0.002183	-0.000713	0.000917	-0.002641	-0.000986	0.003479	0.000131	0.000070	0.002568	-0.003758	0.000210
2	-0.011869	0.007296	-0.000419	-0.001095	0.002216	-0.001532	-0.000014	0.002091	-0.001437	0.001669	-0.002725
3	-0.000865	0.000144	-0.001452	0.001179	0.000283	-0.000239	-0.000121	0.000131	0.001838	-0.002042	0.000169
4	-0.001038	-0.005117	0.006107	-0.001868	0.001520	-0.000927	0.000464	0.000236	0.001445	-0.001282	-0.000332

Notes: Table 4.14 presents the Earnings Management model 1 - EM1 for Scaled Earnings (Profit After Tax in period (t) divided by Total Assets in period (t-1)), for Large companies scaled by Total Assets - Extract. *Source:* Own calculation

Once all parts of Earnings Management testing Model 1, or EM1, were calculated, the EM1 was calculated for each sample year for Scaled Earnings ratio for the Large Companies. The testing approach is the same, as in Section 4.4.2. The results of EM1 for the Large Companies $PAT_{(t)}$ /

TA_{t-1} were copied and then pasted as numbers only in the next table that was named 'For SPSS calculations':

$$EM1 = (Act.\ Obser. - Espec.\ Obser.) / SD.diff.$$

The same approach was done for large companies (LC) and small companies (SC) companies for the Scaled Earnings Change ratio. For both LC and SC, this study scale all data for both ratios and import the numbers to SPSS into Data View, and in the Variable View labelling the name of the first variable as 'PAT by TA t-1 Large comp.2011-2001', the second variable as 'PAT by TA t-1 Small comp.2011-2001', the third variable as 'Delta PAT by TA t-2 Large comp. 2011-2002' and the fourth variable is labelled as 'Delta PAT by TA t-2 Small comp. 2011-2002'. Once all four variables were labelled, in SPSS One-Sample Kolmogorov-Smirnov (K-S) test statistics are calculated.

4.6.4. Testing Approach 3.3 with Earnings Management Model 2

Calculation approach was performed as in Section 4.4.3, Earnings Management Model 2, or - EM2. The only difference is the actual observation '**AO**' numbers are large '**LC**' and small '**SC**' companies by total assets size for Scaled Earnings, or earnings (Profit After Tax) in period (t) divided by Total Assets in period (t-1); and Scaled Earnings Change, or change in earnings divided by Total Assets in period (t-2) variables. The assets sizes for 'LC' and 'SC' were imported from the '*TA ratios by sizes variables 2012_1999.xlsx*' file to '*TA company by size - Degeorge model.xlsx*' file. The way the 'LC' and 'SC' were selected for the $PAT_{(t)} / TA_{t-1}$ and $\Delta PAT / TA_{t-2}$ variables was explained in Section 4.4.3.

The first sheets in '*TA company by size - Degeorge model.xlsx*' excel file is labelled as $PAT_{(t)}$ / TA_{t-1} large companies, second $PAT_{(t)}$ / TA_{t-1} small companies, third ΔPAT / TA_{t-2} large companies and the fourth sheet as ΔPAT / TA_{t-2} small companies. In each sheet the large company, 'LC' assets data goes to the labelled large assets sheet and the small company assets 'SC' into the labelled small company's sheet. This study performs the same type of calculations as in Section 4.4.3 with formula:

$$EM2 = \tau_n = [\ \Delta p_n - \text{mean}\ (\Delta pi)\ ]\ /\ \text{s.d.}\ (\Delta pi) \qquad (2)$$

where, $i \in R$, $i \neq n$. p_i is the ratio of the actual sample for year i of banks years, Δpn is the difference of p_i - p_{i-1}. Mean (Δpi) is the average of Δp but excluding pi and s.d. (Δpi) is the standard deviation of Δp, excluding Δpi.

In the first sheet '$PAT_{(t)}$ / TA_{t-1} large companies' the first table is the yearly actual figures of the large companies by assets size, for the variable Scaled Earnings. As earlier pointed out, the testing approach for the calculation of each part of the formula, i.e. 'pi', Δ_{pi}, mean and standard deviation of Δ_{pi}. The second table is the 'pi' table, the third is the Δpi, = pi - pi-1, and the fourth table is the calculation of EM2. For each large and small company, LC, SC, the same approach was applied to calculate Scaled Earnings and Scaled Earnings Change ratios. The results for 'LC' and 'SC' for both variables were imported to SPSS and the Kolmogorov-Smirnov non-parametric tests statistic's was run. Tests also include Asymptotic and Exact Sign., as well as Descriptive analysis for each variable. In the Descriptive Statistics, this study runs mean, Sd and Percentile Values of 25%, 50% (Median) and 75% split. The same Percentile Values as Holland and

Ramsay (2003) study. Calculation of the Median of Total Assets in SPSS for EM2 is explained in *Appendix*, *Section 2.4.1*.

4.6.5. Testing Approach 3.4 - Splitting Total Assets prior to and after the 2008 financial crisis

Splitting the sample per companies' assets size prior to and after the 2008 financial crisis gives an insight whether credit institutions in Hungary managed their earnings or not. That is, how banks acted when there was a smooth period, and how they did when there was a crisis, and whether there was a difference between large companies (LC) and small companies (SC) prior to and during the crisis. Testing Approach 3.4 tests:

$H0_{(d)}$:. *Credit institutions (Banks) in Hungary do not manage earnings prior to and after 2008 when the financial crisis starts.*

Earlier in Sections 4.4.2 and 4.4.3 of *Testing Approach 3.4* – the Earnings Management Model 1, or EM1, and the Earnings Management model 2, or EM2 of this study outlined the Total Assets (TA) by large and small companies for Scaled Earnings and Scaled Earnings Change ratios with Burgstahler and Dichev (1997, p.103) and Degeorge, Patel and Zeckhauser (1999, p.31) models, the same as EM1, as shown under formula (1), and EM2, shown under formula (2). The same results were applied as in the *Testing Approach 4* that are in the '*PA by TA's by sizes variables 2012_2000 using Burgstahler model*.xlsx' and '*TA company by size - Degeorge model.xlsx*' excel sheets, and splitting EM1 and EM2 data at 2008 year, when the financial crisis began. That is, splitting equal years prior to and after 2008. For example, before the financial crisis began in

2008, four year periods are selected from the EM1 results, from 2004-2007, and four year sample periods after the crisis started, from 2008-2011. The reason for the selection of four year periods is that there is an equal set of four years data prior to and after 2008, when the crisis started, and this way, there is an even number of years for testing.

Testing Approach 3.4 aims to investigate **$H0_{(d)}$:** with Scaled Earnings and Scaled Earnings Change ratios and to see if there is an earnings management (EM) 'prior to' and 'after' the 2008 financial crisis. Periods *prior to* and *after 2008* financial year consist of all assets sizes. In the *'PA by TA's by sizes variables 2012_2000 using Burgstahler model.xlsx*' excel sheet, in the last sheet named 'before and after 2008' are the results for both variables, namely Scaled Earnings and Scaled Earnings Change. The sheet 'before and after 2008' consists of all LC and SC assets sizes data for both Scaled Earnings and Scaled Earnings Change variables. For example in the 'before and after 2008' sheet in column A there is 'after the crisis', or 'AC', data for Scaled Earnings variable, whereas data in column B is 'before the crisis', or 'BC', for the same variable. In column E there is the 'after the crisis' data, or 'AC', or 2008-2011 for Scaled Earnings Change variable and in column F, the data 'before the crisis', 'BC', or 2004-2007 for the same variable. After the input of BC and AC data in SPSS, the Kolmogorov-Smirnov non-parametric tests statistics was run with the Monte Carlo simulation with a 95% and a 99% Confidence Interval level respectively.

In order to test the EM2 model, this study used an earlier calculation, namely the '*TA company by size - Degeorge model.xlsx*' excel sheet. The calculation of 'pi', 'Δpi', the mean and standard deviation of Δp. and EM2 for Total Assets sizes were earlier carried out. In the '*TA company by size - Degeorge model.xlsx*' excel sheet, the first sheet named 'PA_by_TAt_1_Large_companies' in columns BH to BL, there are the EM2 results for large companies for the period after the crisis or 2008-2011, and column BN to BR are EM2 results for large companies before the crisis or 2004-2007. The last sheet in the '*TA company by size - Degeorge model.xlsx'* file, there is a sheet named 'before and after 2008', where all the data for large and small companies are shown for '$PAT_{(t)}$ / TA_{t-1}' split into two distinct periods, i.e. for 2012-2008 in column A, for 2007-2003 in column B, the 'ΔPAT / TA_{t-2}' for 2012-2008 year in column D and the same for 2007-2003 in column E. From the '*TA company by size - Degeorge model.xlsx'* excel file 'before and after 2008' data is imported to into SPSS Data View and the variables in the Variable View named as 'Delta PAT by TA (t-2) 2012-2008' and 'Delta PAT by TA (t-2) 2007-2003'. Then, this study runs the Kolmogorov-Smirnov test statistics, as explained in the above section. The SPSS file is saved as '*TA before and after 2008 - EM2 model.sav*'. *Section 2.5 in Appendix* describes the calculation of the test statistics.

4.7. Chapter 4. Summary

Chapter 4 presents research data, the way it was gathered, and it also highlights its limitations. Additionally, it outlines reasons for choosing the three empirical testing approaches; designing the four hypotheses and applying histograms and statistics to test Hungarian credit institutions' data in an attempt to answer the research question. The author of this study highlights the models of Burgstahler and Dichev (1997, p.103); Beaver, McNichols and Nelson (2007, p.540); Degeorge, Patel and Zeckhauser (1999, p.31), and the accrual testing model that was used to test the hypotheses. Benchmark analysis was also included to test the 14 ratios. Additionally, similar tests were added, as in Holland and Ramsay's (2003, p.54) paper. Furthermore, Beaver, McNichols and Nelson's (2007, p.540) model was tested. For each empirical part, test statistics was applied. For the first and for the third empirical approach, apart from the statistical tests, this study also uses discontinuity tests in order to test the hypotheses of credit institutions' annual financial statements data.

The following Chapter 5 presents the SPSS outputs with results of each hypothesis and calculations for each empirical approach. The results are presented in tables and histograms with detailed explanations and analyses.

Chapter 5

Findings and Interpretation

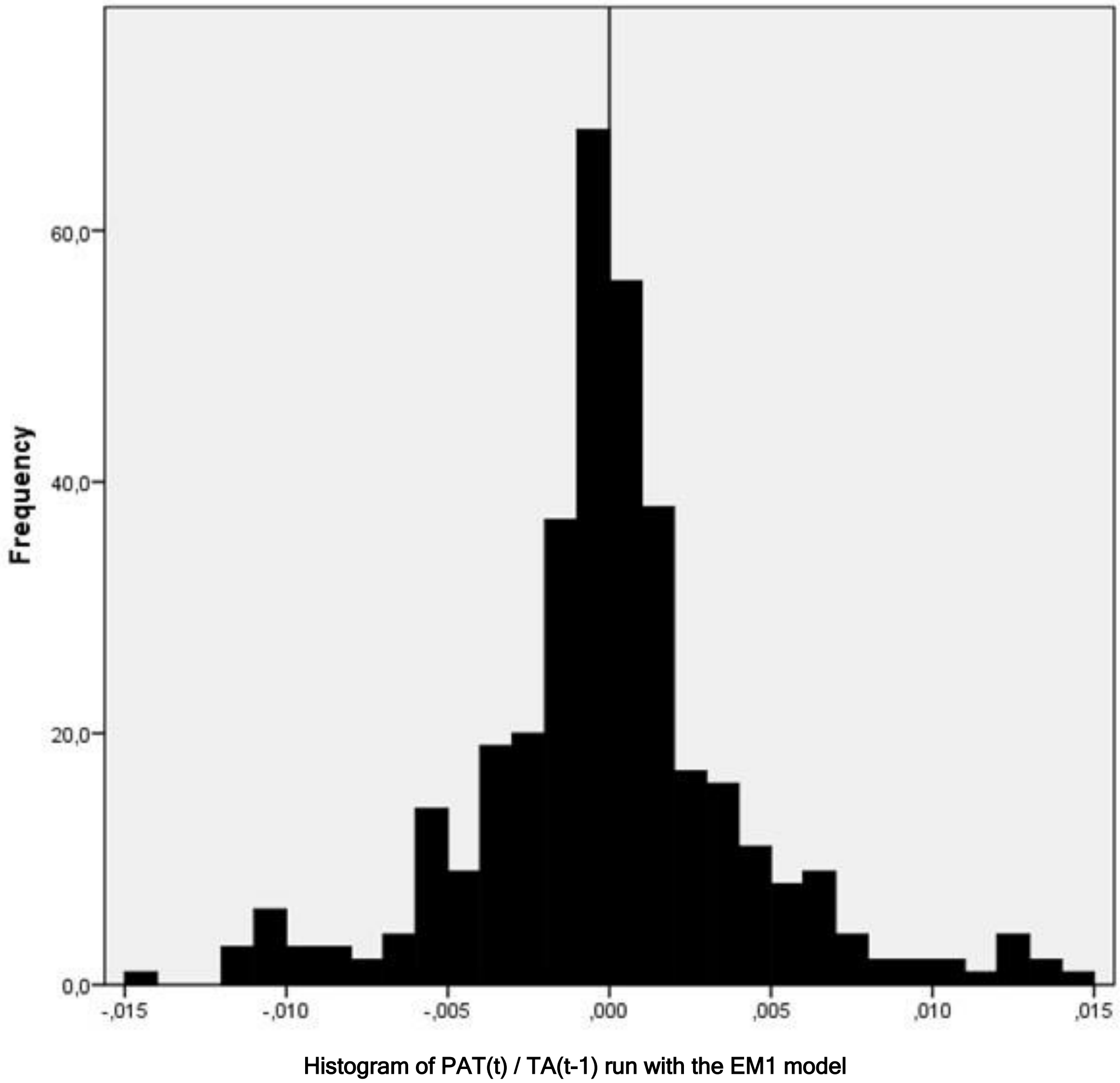
As presented in Chapter 4, this study outlines the three Empirical Methods, as well as refers to Beneish (1999); Burgstahler and Dichev's (1997); Degeorge, Patel and Zeckhauser's (1999); Gore, Pope and Singh (2007); Dechow, Ge and Schrand (2010) and other studies that were used to test the four hypotheses. Chapter 5 presents tests results of the three Epirical Testing aproaches, namely the Standard Discontinuity method, the Accrual method and the Distribution of the Financial Ratio method in an attempt to explain reasons for accepting or rejecting the hypotheses, and more importantly, to answer the research question. In Chapter 5, the results are evaluated, commented and compared to the already published, relevant studies that were critically reviewed in Chapter 2. Each empirical research approach has its own section.

5.1. Results for the First Empirical Approach – The Standard Discontinuity Method

5.1.1. Histograms of Scaled Earnings and Scaled Earnings Change tested with Earnings Management 1 and Earnings Management 2 models

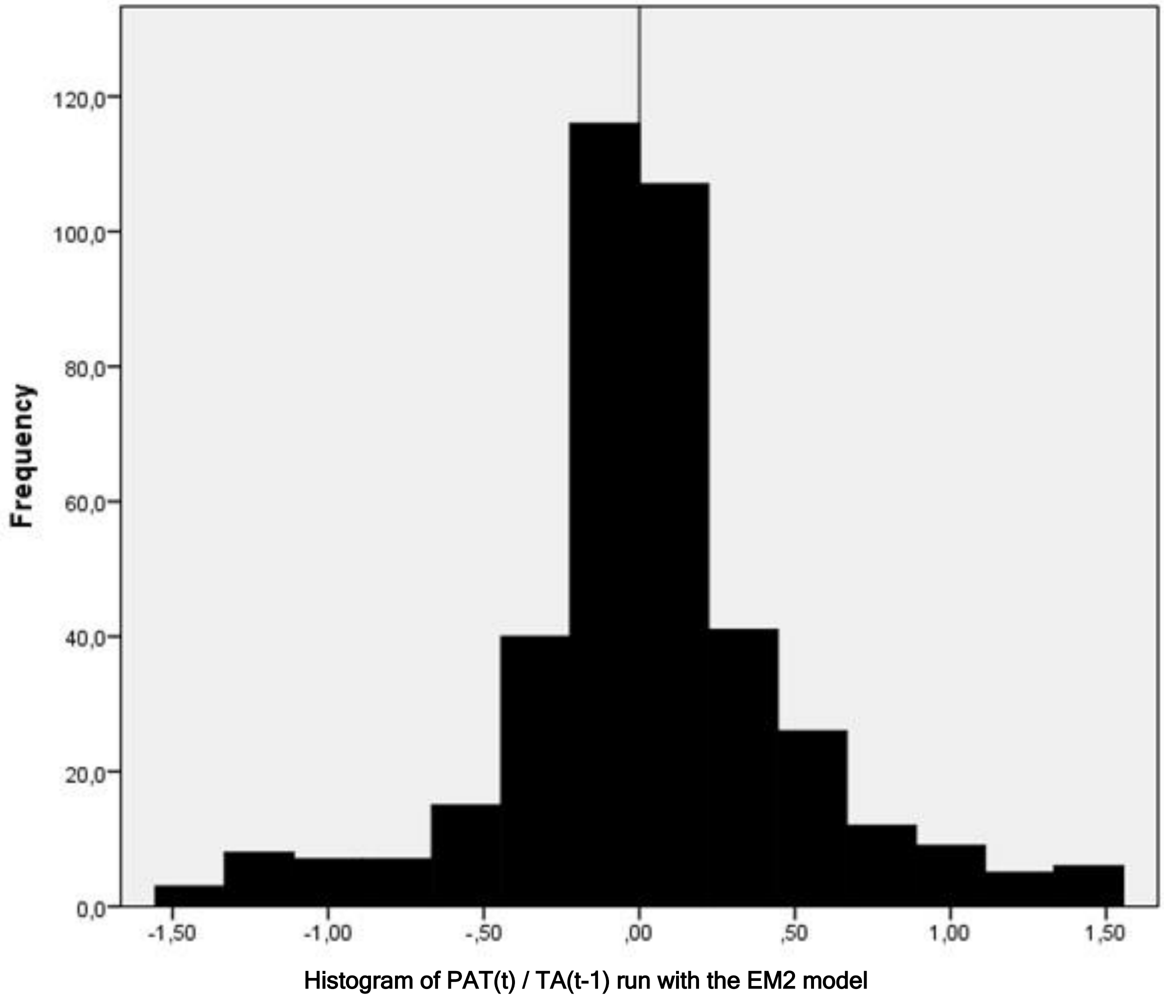
To test the distribution of Scaled Earnings (Profit after Tax in period (t) divided by Total Assets in period (t-1)); and Scaled Earnings Change (Profit After Tax in period (t)-(t-1) divided by Total Assets in period (t-2)) ratios, in order to see if earnings are managed to avoid earnings decreases, histograms were created with data calculated by Earnings Management 1 and 2 (EM1 and EM2) models. The observation sample for the EM1 and EM2 models are between 1 and 2 percent of lower and upper level. Interval widths of histograms are set to best fit visual investigation applying the 1 percent interval level:

Figure 5.1.1.: Histogram of Scaled Earnings run with the Earnings Management 1 Model



Notes: Figure 5.1.1 shows Histogram of Scaled Earnings (Profit after $Tax_{(t)}$ by Total $Assets_{(t-1)}$) run for the period 2001 – 2011 with the EM1 model explained in Chapter 4 of this study. The EM1 model applies the same approach as the Burgstahler and Dichev's (1997, p.103) study. *Source:* Own calculation and presentation.

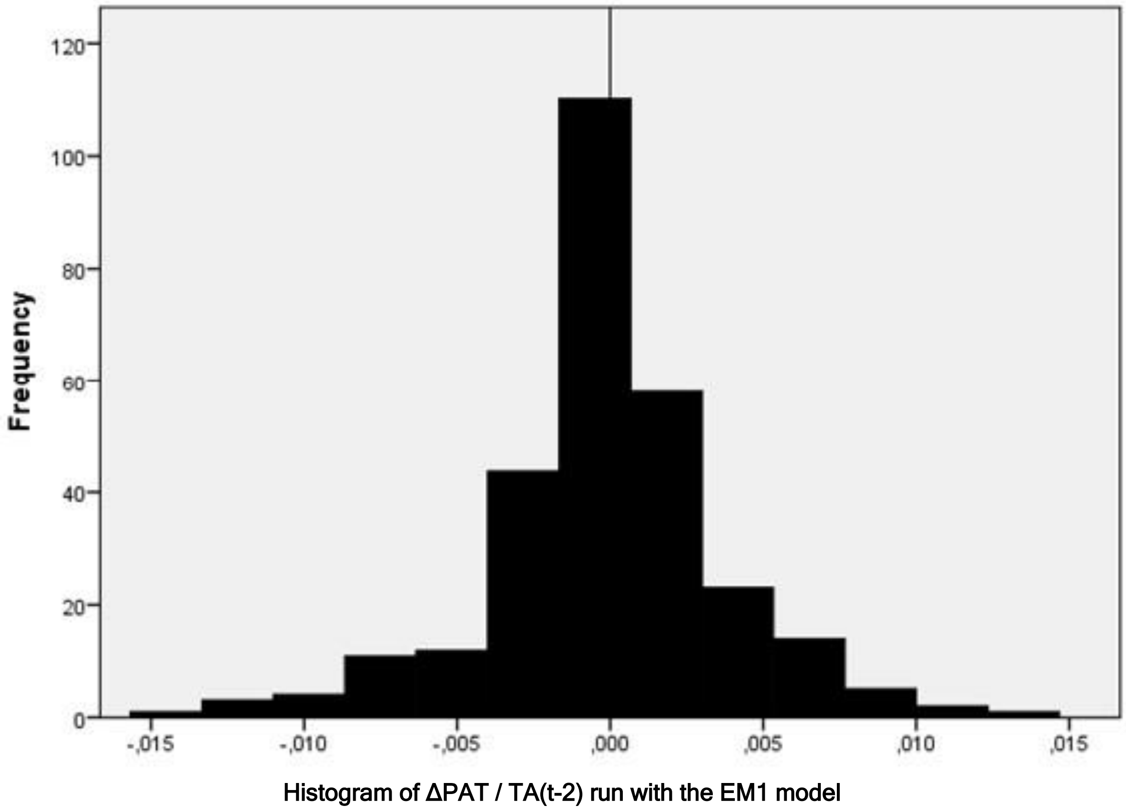
Figure 5.1.2.: Histogram of Scaled Earnings run with the Earnings Management 2 Model



Notes: Figure 5.1.2 presents Histogram of Scaled Earnings (Profit after Tax divided by Total Assets) run for the period 2001 – 2012 with the EM2 model explained in Chapter 4 of this study. The EM2 model applies the same approach as the Degeorge, Patel and Zeckhauser's (1999, p.31) study. *Source:* Own calculation and presentation.

Figures 5.1.1 and 5.1.2 for both Earnings Management 1 and 2 (EM1 and EM2) models, the Scaled Earnings have very similar discontinuity, a big jump just before zero and slightly Skewed to the right, above the zero, with a right tail distribution.

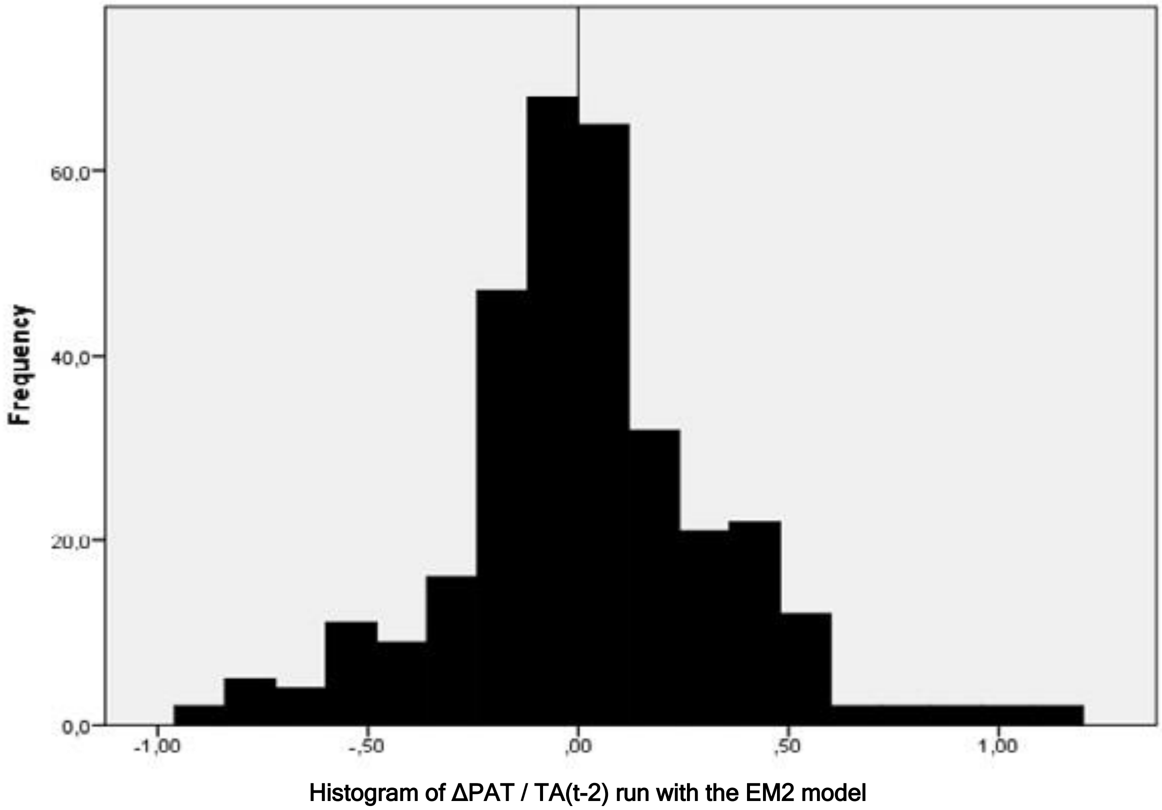
Figure 5.1.3.: Histogram of Scaled Earnings Change run with the Earnings Management 1 Model



Notes: Figure 5.1.3 shows Histogram of Scaled Earnings Change (ΔProfit after Tax) divided by Total Assets, or ΔPAT / T.A.$_{(t-2)}$ was run for the period 2001 – 2012 with the EM1 model, explained in Chapter 4 of this study. The EM1 model applies the same approach as the Burgstahler and Dichev's (1997, p.103) study. *Source:* Own calculation and presentation.

By visually examining Figures 5.1.1 – 5.1.4 it may be concluded that discontinuities have a big jump at zero points for both variables. For both earnings management testing models, namely number 1 and 2, i.e. the EM1 and EM2, distributions are slightly to the right, positively skewed, as Gujarati (1995, p.770) states *'…lack of symmetry…'.* There is a visible higher earnings frequency just above the zero in all four histograms, which suggests that earnings changes occur 'slightly more' just above the zero. Burgstahler and Dichev (1997, p.103) present a similar distribution pattern in their study, where the pattern is slightly positively skewed.

Figure 5.1.4.: Histogram of Scaled Earnings Change run with the Earnings Management Model 2:



Notes: Figure 5.1.4 presents Histogram of Scaled Change in Earnings, (ΔProfit after Tax divided by Total Assets in period t-2) ratio was run for the period 2002 – 2012 with the EM2 model, explained in Chapter 4 of this study. The EM2 model applies the same approach as the Degeorge, Patel and Zeckhauser's (1999, p.31) study. *Source:* Own calculation and presentation.

The results of this study are very similar to the histograms distributions in Holland and Ramsay's (2003, pp.53-56) study, although the authors tested non-financial companies and applied the Mann-Whitney U test, which ranks values from low to high and computes *p*-values; whereas, the Kolmogorov-Smirnov test compares the cumulative distribution of the data and then compares the *p*-values. Furthermore, as this study investigates only one country that has a small data size comparing to the US or continental countries' data, the power of the tests in this study is not the same, as for example in Burgstahler and Dichev's (1997); Degeorge, Patel and Zeckhauser's (1999); Dichev and Skinner's (2002); Holland and Ramsay's (2003) and Shen and Chih's (2005) papers. Similarly to Holland and Ramsay's (2003) and Burgstahler and Dichev (1997) papers, the next section of this study statistically tests the standard discontinuity method with Hungarian credit institutions' data, applying scaled earnings variables.

5.1.2. Results for Scaled Earnings and Scaled Earnings Change variables testing Hypothesis $H0_{(b)}$: with the Earnings Management Model 1

To test **$H0_{(b)}$:** hypothesis, calculations were performed with Scaled Earnings (Profit after Tax in period (t) divided by Total Assets in period in (t-1)); and Scaled Earnings Change (Delta Profit after Tax divided by Total Assets in period (t-2)) ratios by applying earnings management model number 1, or the **EM1** model. Chapter 4 explains the **EM1** and **EM2** models. Tested **$H0_{(b)}$:** hypothesis reads as:

> **$H0_{(b)}$:** *Credit institutions (Banks) in Hungary do not manage earnings to avoid earnings decreases*

The EM1 model calculations for Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Change in Earnings divided by Total Assets in period (t-2) ratios are in the *'Burgstahler calculation method of all variables.xlsx'* excel sheet, with an identical calculation for the EM1 model, as all 14 ratios were performed for Empirical testing Approach No. 3. Furthermore, the process of inputting and testing Scaled Earnings and Scaled Earnings Change ratios in SPSS is also identical as it was performed with the rest of the 14 ratios. The purpose of testing Scaled Earnings and Scaled Earnings Change ratios is to compare results of this study to Holland and Ramsay's (2003) and Burgstahler and Dichev's (1997) results. Descriptive statistics are presented in Table 5.1.a and Table 5.1.b calculated with the EM1 model for a sample period of 2001-2011. The observation was set between 2 percent lower and 2 percent upper bound for each year in order to have more sample data in the range, and not the 1 percent level, as Holland and Ramsay (2003) and Burgstahler and Dichev (1997) applied, who had a higher sample than this study does. Table 5.1.a and Table 5.1.b statistical results:

Table 5.1.a. Descriptive Statistics for Scaled Earnings run by the Earnings Management Model 1

	Number of Obser-vation	Mean	Standard Deviation	Percentile 25	Median	Percentile 75
2011	37	-.0003	.0095	-.0051	-.0006	.0052
2010	37	-.0014	.0090	-.0034	-.0001	.0023
2009	36	.0014	.0072	-,0022[a]	-.0001	.0031
2008	34	.0002	.0072	-.0023	.0004	.0023
2007	34	-.0018	.0099	-.0046	-.0001	.0023
2006	34	.0010	.0081	-.0015	-.0002	.0012
2005	37	.0007	.0021	-.0003	.0000	.0006
2004	33	-.0004	.0038	-.0015	.0005	.0018
2003	33	.0023	.0065	-.0005	.0013	.0035
2002	33	-.0020	.0081	-.0026	-.0008	.0002
2001	35	-.0004	.0066	-.0017	-.0001	.0008

Table 5.1.b. Descriptive Statistics for Scaled Earnings Change run by the Earnings Management Model 1

	Number of Obser-vation	Mean	Standard Deviation	Percentile 25	Median	Percentile 75
2011	35	.0003	.0048	-.0018	-.0005	.0024
2010	32	-.0019	.0070	-.0035	-.0009	.0019
2009	30	.0027	.0103	-.0016	-.0003	.0045
2008	30	-.0036	.0123	-.0015	-.0006	.0012
2007	30	.0022	.0056	.0000	.0011	.0025
2006	32	-.0005	.0032	-.0014	-.0002	.0005
2005	31	-.0009	.0047	-.0020	-.0008	.0006
2004	31	.0000	.0105	-.0030	-.0002	.0012
2003	31	.0037	.0156	-.0018	.0021	.0055
2002	31	-.0014	.0184	-.0039	-.0014	.0009

Notes: Table 5.1.a and Table 5.1.b present Descriptive Statistics for the period from 2001 to 2012 on annual base for Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period (t-1); and Change in Earnings divided by Total Assets in period (t-2) ratios results. Test results show both Table 5.1.a and Table 5.1.b with the EM1 model a slightly more positive mean, whereas median is slightly more negative, suggesting profit data is slightly more negatively skewed, when tested on the annual basis. Standard deviation, or SD, is below 0.00 for Scaled Earnings, whereas SD for Scaled Earnings Change is below 0.0. Burgstahler and Dichev (1997, p.104) report similar mean and median results and slightly higher SD statistical results. *Source:* Own calculation and presentation.

Low standard deviation, SD, suggests a tall, narrow shape for the variables distribution. Thomas (1997, p.13) writes, *'…the spread or dispersion of a probability distribution and that higher values for σ^2 imply larger spread…'.*

Chapter 2 outlined Holland and Ramsay's (2003) study, who tested an Australian industry sample, with the exclusion of financials, by applying the Burgstahler and Dichev's (1997, p.103) model. Comparing Holland and Ramsay's (2003, p.51) test results to Table 5.1.b. in this study, the length of the sample is identical, which is 10 years, but this study has significantly fewer total as well as yearly samples than they are in Holland and Ramsay's (2003) study. Analysing the results in this study in Table 5.1.a for Scaled Earnings (Profit After Tax / Total Assets), it can be seen that it has a lower mean and SD than Holland and Ramsay's (2003, p.51) results. Furthermore, the results in Table 5.1.a of this study show that 25% of the Mean values are all small and mostly negative, bellow -0.00, whereas in the Holland and Ramsay's (2003, p.51) study, the Mean values at 25% percentile are not as low, but are also all negative. Looking at the Median (50%) in Table 5.1.a in this study, it can be seen that it has more negative values, suggesting 'negative skewness in the profit data'. The same as in Holland and Ramsay's (2003, p.51) study, Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2) ratio has similar results as in Table 5.1.a and Table 5.1.b that show low, slightly more negative Mean values and positive but low SD. At 25% values have all zero values bellow 0.00, except for 2007, and more negative values at Median, suggesting more negative profits per financial years for skewness in Scaled Earnings Change.

The results in Table 5.1.a for Scaled Earnings and in Table 5.1.b for Scaled Earnings Change ratios are very similar to Holland and Ramsay's (2003, pp.51-52) results. Despite the fewer samples in this study, the results show lower results for percentiles for 25%, 50%, 75%, Std. Dev. and Mean test results than Holland and Ramsay's (2003, p.51) results. The test results in Table 5.1.a and Table 5.1.b of this study are similar to Burgstahler and Dichev's (1997, p.104) test results. The differences are as follows: the Burgstahler and Dichev's (1997) test variables boast a higher sample due to the longer length of the sample years, and also, the test was run with slightly different variables, with a change in earnings by the market value of common equity. Despite the differences in the tested variables, Descriptive statistical results of this study are similar to Burgstahler and Dichev's (1997, p.104) results.

5.1.3. Results for Scaled Earnings and Scaled Earnings Change variables testing Hypothesis $H0_{(b)}$: with the Earnings Management Model 2

Calculations for earnings management testing model number 2, the EM2 model was also performed with Scaled Earnings; and Scaled Earnings Change ratios to further test the **$H0_{(b)}$:** hypotheses. Variables Scaled Earnings; and Scaled Earnings Change were calculated in *'Degeorge et al - EM2.xlsx'* excel sheet. *Testing Approach* for the EM2 model is explained in Chapter 4.

Results of Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2) ratios are presented in Table 5.1.c and in Table 5.1.d:

Table 5.1.c. Descriptive Statistics for Scaled Earnings run by Earnings Management Model 2

Year	Number of Obser-vation	Mean	Standard Deviation	Percentile 25	Median	Percentile 75
2012	37	.1294	1.0620	-.3275	-.0165	.6565
2011	37	.0503	1.2246	-.4917	-.1296	.4053
2010	38	-.2568	.9074	-.2994	-.0166	.0682
2009	36	.0168	1.2217	-.2581	-.0544	.0802
2008	34	.0814	.8769	-.2955	.0036	.4007
2007	34	-.3037	1.7940	-.1728	.0578	.3321
2006	37	-.0834	,2428[a]	-.1286	-.0498	.0481
2005	37	.0647	.3459	-.0932	-.0213	.1010
2004	33	-.0550	.7274	-.2553	.1095	.2781
2003	33	.5010	.9997	.1222	.3173	.6454
2002	35	.0005	1.0189	-.0372	.0475	.2011
2001	39	-.1019	.6011	-.1095	.0028	.1196

Table 5.1.d. Descriptive Statistics for Scaled Earnings Change run by Earnings Management Model 2

Year	Number of Obser-vation	Mean	Standard Deviation	Percentile 25	Median	Percentile 75
2012	35	.0664	.3999	-.0308	.1032	.2505
2011	35	.1248	.5007	-.1640	.0377	.3789
2010	32	-.1576	.8395	-.2401	-.0042	.2038
2009	30	.2921	1.2340	-.1461	-.0582	.1730
2008	30	-.3438	1.0463	-.2130	-.1171	.0081
2007	32	.0397	.2622	-.0661	.0600	.1765
2006	35	-.0530	.2941	-.1644	.0057	.0661
2005	31	-.2447	.8236	-.2586	-.1335	-.0065
2004	31	-.2490	1.2377	-.4983	-.1550	.2000
2003	31	,3966[a]	1.7964	.0441	.2265	.5251
2002	35	.0998	1.3218	-.1021	-.0397	.2596

Notes: Table 5.1.c and Table 5.1.d present negative values in 25% and in Median, for sample period 2001-2012. Furthermore, half of the Mean values are negative, which suggest that half of the values are negatively skewed off the profit numbers. The results for Scaled Earnings, and Scaled Earnings Change variables run with the EM2 model are similar to the EM1 results shown in Table 5.1.a and Table 5.1.b. Burgstahler and Dichev (1997, p.126) report similar mean, median results but higher SD statistical results. *Source:* Own calculation and presentation.

In order to be more robust, additional tests were performed for Scaled Earnings; and Scaled Earnings Change ratios with the same sample and the same Earnings Management testing model numbers 1 and 2 (EM1 and EM2), as in Tables 5.1.a – d. Sample was tested with the One-Sample

Kolmogorov-Smirnov (K-S) non-parametric test, including the Exact significance. Test results are presented in Table 5.1.e and in Table 5.1.f:

Table 5.1.e. The One-Sample Kolmogorov-Smirnov Test

Tested by EM1 model (all samples for each ratio)		**Scaled Earnings**	**Scaled Earnings Change**
Number of Observation		383	313
Parameters[a,]	Mean	-.0001	.0000
	Std. Deviation	.0075	.0104
Most Extreme Differences	Absolute	.173	.226
	Positive	.159	.209
	Negative	-.173	-.226
Kolmogorov-Smirnov Z		3.390	4.006
Asymp. Sig. (2-tailed)		.000	.000
Exact Sig. (2-tailed)		.000	.000
Point Probability		.000	.000

Table 5.1.f. The One-Sample Kolmogorov-Smirnov Test

Tested by EM2 model (all samples for each ratio)		**Scaled Earnings**	**Scaled Earnings Change**
Number of Observation		430	357
Parameters[a,]	Mean	.000	.000
	Std. Deviation	1.000	1.000
Most Extreme Differences	Absolute	.206	.224
	Positive	.177	.219
	Negative	-.206	-.224
Kolmogorov-Smirnov Z		4.267	4.235
Asymp. Sig. (2-tailed)		.000	.000
Exact Sig. (2-tailed)		.000	.000
Point Probability		.000	.000

Notes: Table 5.1.e and Table 5.1.f show low *p*-values at 0.000 are statistically 'highly significant' results for both Scaled Earnings; and Scaled Earnings Change variables tested with earnings management model 1 and 2, or EM1 and EM2, for Asymptotic, Exact and Point Probability. Mean values are zero, with very low SD. *Source:* Own calculation and presentation.

Low *p*-values may suggest rejection of hypotheses **$H0_{(b)}$:** *Credit institutions (Banks) in Hungary do not manage earnings to avoid earnings decreases*. Test results for the EM1 model in Tables 5.1.a and 5.1.b, and for model EM2 in Tables 5.1.c. and 5.1.d. show similar statistical results as in the Burgstahler and Dichev's (1997, p.104) and report evidence of earnings management. Similar test results of Holland and Ramsay (2003, pp.51-52) study indicate discontinuity in earnings and changes in earnings and confirm the practice of earnings management in Australian companies to achieve positive earnings as well as to maintain positive earnings from the previous year. The authors also show signs of earnings manipulation within companies of different assets sizes. The authors admit that due to their small sample size, the power of their tests is lesser than the results of various other papers which tested an all industry sample, for example, in the US.

5.1.4. Summary of the First Empirical Approach – The Standard Discontinuity Method

This study investigates the standard discontinuity method by applying the Earnings Management 1 and 2 models, or EM1 and EM2, for two ratios, namely Scaled Earnings (Profit after Tax in period (t) divided by Total Assets in period in (t-1)); and Scaled Earnings Change (Change in Profit after Tax divided by Total Assets in period (t-2)) ratios. Histograms were run for both ratios to investigate whether the distribution has a bell-shape symmetry, that is, if histograms show a symmetrical frequency distribution. Additionally, Hypothesis **$H0_{(b)}$:** was tested with Scaled Earnings; and Scaled Earnings Change ratios by applying EM1 and EM2 models with descriptive statistics and the One-Sample Kolmogorov-Smirnov non-parametric, including the Exact significance tests. Histograms of Figures 5.1.1 – 5.1.4 show distinctive jumps at zero point to the right, that is, earnings frequencies are just above the zero in all four histograms, suggesting that earnings changes occur 'slightly more' above the zero. Evidence from histograms suggests rejecting Hypothesis **$H0_{(b)}$:.** Apart from this study, Holland and Ramsay's (2003, pp.51-52) results show similar descriptive statistical evidence, as well as statistical and frequency distribution results of Burgstahler and Dichev's (1997, p.104); and Gore, Pope and Singh's (2007, pp.130-132) study also reports evidence of earnings management. In order to avoid a *'type I error'*, a false rejection of the **$H0_{(b)}$:**, this study also presents 'statistically highly significant' evidence from the One-Sample Kolmogorov-Smirnov non-parametric test and the Exact significance test results, with *p*-values at 0.000. It may be concluded that hypothesis **$H0_{(b)}$:** may not be accepted:

> **$H0_{(b)}$:** *Credit institutions (Banks) in Hungary do not manage earnings to avoid earnings decreases.*

Hypothesis **$H0_{(b)}$:** was rejected with a significance level of *p*-values 0.000, which is far lower than a *p*-value of 0.01 as Thomas (1997, p.55) states. The likelihood of wrongly rejecting Hypothesis **$H0_{(b)}$:** is 0.000, which justifies its rejection. In statistical terms, the probability of rejecting a true hypothesis with *p*-values of 0.000 is 'extremely low'.

5.2. Results of the Second Empirical testing Approach – The Accrual Method

5.2.1. Regression Model 1

Chapter 4 outlined, under the Second Empirical Approach, the Accrual testing method. The accrual approach is one of the most used testing approaches to investigate earnings management (EM), irrespective of the industry tested. Chapter 2, the litertaure review of this study highligths papers that apply accruals in investigating EM.

Regression Model 1 was run, $\mathbf{E_t = \beta_{1jt} (TACCR._{jt}) + \varepsilon_{jt}}$ (where $\mathbf{E_t}$ = Scaled Earnings change in period (t); **TACCR.** = Total Accruals in period (t) divided by Total Assets in period (t-1); $\mathbf{\beta_{1jt}}$ = *j* and *t* are firm and time for the parameter; $\mathbf{\varepsilon_t}$ = Error term in period (t)), at 95% and 99% confidence interval levels to test Hypothesis $\mathbf{H0_{(a)}}$:. Tables 5.2.1 and 5.2.2 present results for Model 1:

Table 5.2.1. Coefficients for Regression Model 1 with a 95% Confidence Interval Level

Model 1.		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.000	.002		.103	.918	-.003	.003
	TACCR	.007	.009	.038	.730	.466	-.012	.026

a. Dependent Variable: E

Notes: Table 5.2.1 presents sample for the period 200-2009, run with the $\mathbf{E_t = \beta 1_{jt} (TACCR._{jt}) + \varepsilon_{jt}}$ regression Model 1, with a 95% confidence interval level. Et = Scaled Earnings Change in period t; and TACCR.jt = Total Accruals in period (t) divided by Total Assets in period (t-1). *Source*: Own calculation and presentation.

Table 5.2.2. Coefficients for Regression Model 1 with a 99% Confidence Interval Level

Model 1.		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.000	.002		.103	.918	-.004	.004
	TACCR	.007	.009	.038	.730	.466	-.018	.031

a. Dependent Variable: E

Notes: Table 5.2.2 sample for the period 200-2009, run with the $\mathbf{Et = \beta 1_{jt} (TACCR._{jt}) + \varepsilon_{jt}}$ regression model with a 99% confidence interval level. Et = Scaled Earnings Change in period (t); and TACCR.jt = Total Accruals in period (t) divided by Total Assets in period (t-1). *Source*: Own calculation and presentation.

The test results in Table 5.2.1. and 5.2.2 for Model 1 with confidence interval levels at 99% and 95% have almost identical results. Results for TACCR. (Scaled Total Accruals) in Table 5.2.1. and in Table 5.2.2. show statistically insignificant results for both condifence intervals of 95% and 99% levels ($p < 0.466$).

The results would suggest accepting Hypothesis **$H0_{(a)}$:,** however, by doing so, the author of this study would make a '*type II error'*, by falsely accepting Hypothesis **$H0_{(a)}$:**. The main reason for this conclusion is that the explanatory variable, the Scaled Total Accruals (TACCR.) consists of elements of both non-discretionary and discretionary accruals in Model 1. It is difficult, if not impossible, to measure the manager's action in good or in bad times, that is, the time frame of the reversal accruals for both non-discretionary and discretionary accruals. Furthermore, the sample tested for 2000-2009, the regression Model 1 does not pick up possible reversals for the TACCR. This is a typical weakness of an accrual model; the same applies for the accrual model designed in this study and the accrual testing models used in the earlier studies that were highlighted in the literature review in Chapter 2. Furthermore, in the sample tested, some firms may have more 'extreme' accruals than other firms in one year or in another, which may relate to bad or good times, as well as lack of internal control within a firm. Due to the above reasons, the author of this study concludes that the regression Model 1 may not be a relaible model to predict the dependent variable, the Scaled Change in Earnings (E). Hypothesis **$H0_{(a)}$**: would be falsely accepted. See for example Dechow, Ge and Schrand (2010, p.351) Exhibit 1 for strengths and weakneses for accruals as earnings quality proxies, and Exhibit 2, Page 359, for summary of the widely used accrual models, as well as McNichols' (2000, p.337) evidence of the Accrual testing approach.

The next sextion further analyzes the Accrual testing approach with Model 2, by applying multiple regression analysis.

5.2.2. Regression Model 2

Contrary to Model 1, Model 2 tests sample per Accrual method, where the accruals are split into discretionary (DA) and non-discretionary (NDA) accruals, as explanatory variables; whereas Profit After tax (PAT) is the dependent variable and data is tested on the annual base, rather than on all samples. The author of this study designed a multiple regression model that reads as: $\mathbf{PAT_t = \beta_{0jt} + \beta_{1jt} (NDA_{jt}) + \beta_{2jt} (DA_{jt}) + \varepsilon_{jt}}$ (where, $\mathbf{PAT_{(t)}}$ = Profit After Tax in period$_{(t)}$; $\mathbf{NDA_{(t)}}$ = Non-Discretionary Accruals$_{(t)}$ = Accrued interest payable$_{(t)}$; $\mathbf{DA_{(t)}}$ = Discretionary Accruals$_{(t)}$ = Other accruals and other liabilities$_{(t)}$; $\boldsymbol{\beta_{0jt}}$, $\boldsymbol{\beta_{1jt}}$ and $\boldsymbol{\beta_{2jt}}$ = *j* and *t* are firm and time for the parameters; and $\boldsymbol{\varepsilon_t}$ = Error term in period$_{(t)}$.

Model 2 statistical tests results are shown in Table 5.2.3 and in Table 5.2.4 in *Appendix 3*. Table 5.2.3 presents evidence for discretionary accruals (DA), or non-obligatory expenses, for 1999 and from 2002 to 2009 years, of statistically significance at a $p = 0.05$ significance level and at a 95% confidence interval. The non-discretionary (NDA) accruals show significance for years 2002, 2007, 2008 and 2012. Years 2000-2001 and 2010-2012 are statistically insignificant at $p = 0.05$. Table 5.2.4 presents test results for discretionary accruals (DA), for 1999 and from 2003 to 2009 years, of statistically significance with $p = 0.01 > 0.00$, or lower. For the rest of the years, i.e. 2000-2002 and 2010-2012, they are statistically insignificant at $p = 0.01$. By looking at non-discretionary accruals (NDA) at a significance level of 0.01, only the 2007 year sample is statistically significant, and the rest of the years fail at $p = 0.01$. Both Tables 5.2.3 and 5.2.4 show similar test results for significance levels of $p = 0.01$ and $p = 0.05$ and it may be concluded that Hypothesis $\mathbf{H0_{(a)}}$**:** fails for discretionary accruals (DA), but holds for non-discretionary accruals (NDA). The results are a mix. One explanation may be that bank managers apply non-obligatory expenses, or discretionary accruals (DA), to manage earnings for the statistically significant period, the period from 2003-2009; it is the period when the lending of loans on the annual base was increasing to households, consumers and to the corporate sector, as presented in Chapter 3, Figures 3.1 - 3.3. This leads to a possible conclusion that bank managers engage in EM in order to meet analysts' expectations and/or to meet parent companies' targets. The results are similar to Kasznik's (1999) study, which finds that managers tend to use positive discretionary accruals (DA) to report higher earnings during times their earnings fall below their earlier forecast due to overestimation.

5.2.3. Summary of the Second Emprical Approach – The Accrual Method

This study applies the accrual approach that investigates Hypothesis $\mathbf{H0_{(a)}}$**:** with the Accrual Model 1 and Model 2, by testing total accruals, as well as discretionary accruals (DA) and non-discretionary accruals (NDA). Accrual Model 1 tests total accruals (TACCR.) for the entire sample, whereas Model 2 tests discretionary accruals (DA) and non-discretionary accruals (NDA) on the annual base.

Model 1 runs regression analysis on scaled earnings, as a dependent variable, and scaled total accruals as an independent variable for the period 2000-2009. Tests results for Model 1 show *p*-values that fail to reject Hypothesis $\mathbf{H0_{(a)}}$:. However, the author of this study is cautious of the Model 1 test results, even though *p*-values suggest accepting Hypothesis, $\mathbf{H0_{(a)}}$**:**. Knowing that the testing variables consist of both DA and NDA, and the assumption that the reversals of the accruals are constant, it is simply unrealistic and it makes almost impossible to correctly run tests due to the timing effect of the reversal accruals. By assuming constant reversals of accruals, we create a possible scenario for a '*type I error*' or a '*type II error*'. Timing of the reversal accruals is crucial for the correct estimation; however, lack of an accrual reversal working model, thus estimates, the accrual testing approach of this study for Model 1 is rather weak. Chapter 2, the literature review, evaluated Baber, Kang and Li (2011); Dechow, Ge and Schrand (2010); and Dechow, Hutton, et al. (2012) studies that investigated reversal accruals and their impact on testing accuracy.

Accrual testing Model 2 tests samples differently from Model 1. In Model 2, accruals were split into non-discretionary (NDA) or 'Accrued interest payable'; and discretionary accruals (DA) or 'Other accruals and other liabilities'. Tests were performed on an annual basis, instead on all samples. The benefit of this separation is that the Accrual Model 2 test statistics shows a slightly better evidence of EM. This is due mainly to the fact that DA and NDA were tested individually and on an annual basis rather than on all samples. Test results for DA, that is, for 'Other accruals and other liabilities', are statistically significant for 9 out of 14 years at a 95% confidence level and at a 0.05 significance level, and 7 out of 14 years at a 99% confidence level for 0.01 significance levels. From the statistical results this study concludes that Hypothesis $\mathbf{H0_{(a)}}$**:** does not hold and 'may be rejected'. One possible explanation for this, i.e. for evidence of EM, is that bank managers used 'Other accruals and other liabilities' to achieve their own personal goals, or parent company objectives, or to meet analysts' predictions. The author of this study assumes that the most likely reason for EM, by Hungarian credit institutions, was to meet annual targets which were set by foreign parent companies. Despite the rejection of $\mathbf{H0_{(a)}}$**:** it was acknowledged and concluded that the testing powers of both Accrual Model 1 and Model 2 could have been influenced by timing of the reversal accruals, which is the main weakness of the accruals testing models.

Gore, Pope and Singh's (2007) testing model has a similar accrual testing approach as this study. The authors also report similar statistical results, i.e. evidence of earnings management, as this study does. However, Gore, Pope and Singh (2007) do not refer to a possible impact of the testing power due to the reversal accruals effect.

This study conlcudes that the accrual testing approach has been used to test evidence of earnings management (EM) in the past three decades; however, as it was pointed out in the Second Empirical Approach, accruals testing methods are rather weak, unrealibale (see for example McNichols's, 2000 study), outdated, and should be exluded from the research design(s) that seek evidence of earnings management until the accrual testing models are redesigned with the inclusion of all elements of the reversal accruals. A new testing approach is required.

The next section explores a new way to investigate evidence of earnings management.

5.3. Results from the Third Empirical testing Approach – The Distribution of Ratios Method

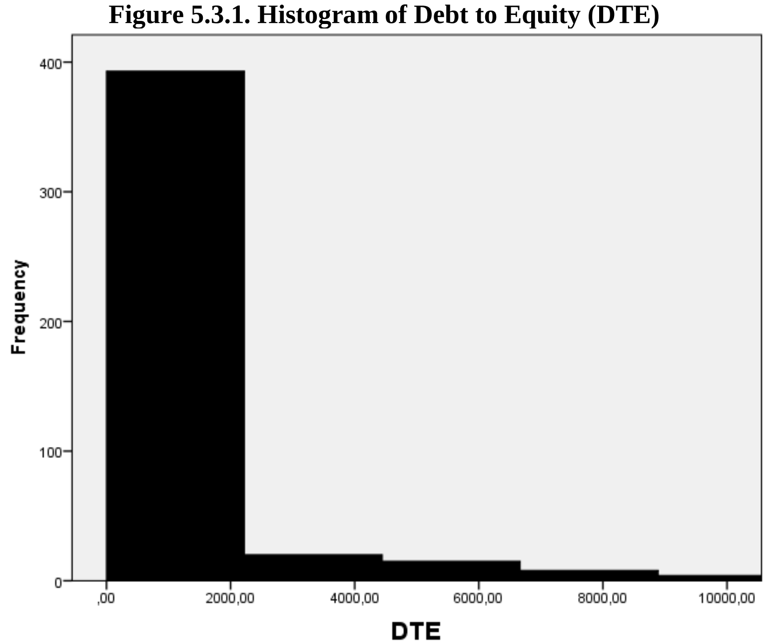
5.3.1.1. Visual Investigation

Section 5.1 and 5.2 of Chapter 5 presented test results from the first, the Standard Discontinuity Method and the second, the Accrual Method testing approaches. The Third, the Distribution of the Ratios Method tests the Hungarian credit institutions sample with a new approach.

To start with, this study visually investigates the 14 ratios frequency distribution from the base sample calculation in search of an evidence of skewness and peakedness within the ratios' histograms. Once all necessary data was imported from financial statements for each financial year, base ratios were calculated in Excel for the period 1999-2012. Then, histograms were run in SPSS from the base results. Once histograms were created for all ratios in SPSS, the distribution of each histogram was visually examined as shown in Figures 5.3.1 – 5.3.14 without statistical testing. Gujarati (1995, p.770) shows graphical examples of distribution histograms and their skewness or '*…lack of symmetry…'*, i.e. right skewed or left skewed. Skewness shows *'…symmetry of a distribution…'*, whereas Kurtosis measures *'…peakedness'*, Thomas (1997, p.371). The vertical line presents zero on the horizontal axis.

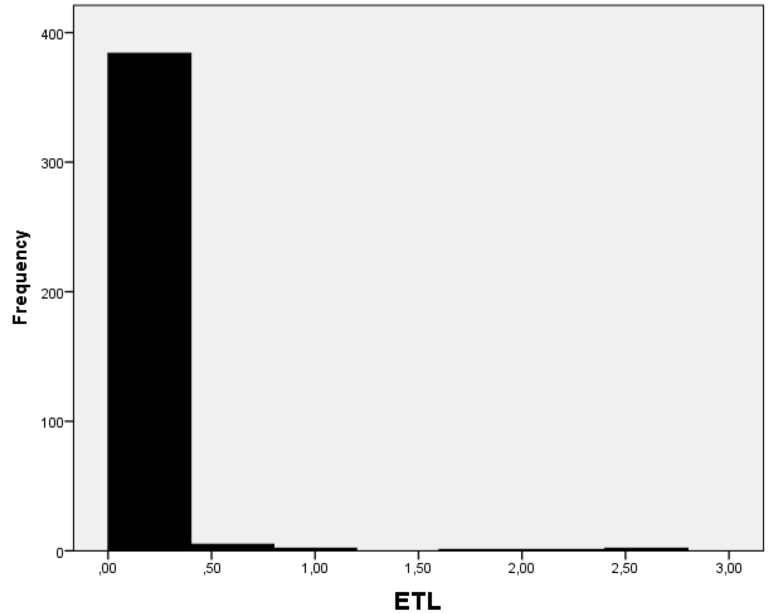
The figures below represent the output of the 14 histograms without any modelling and testing:

Figure 5.3.1. Histogram of Debt to Equity (DTE)



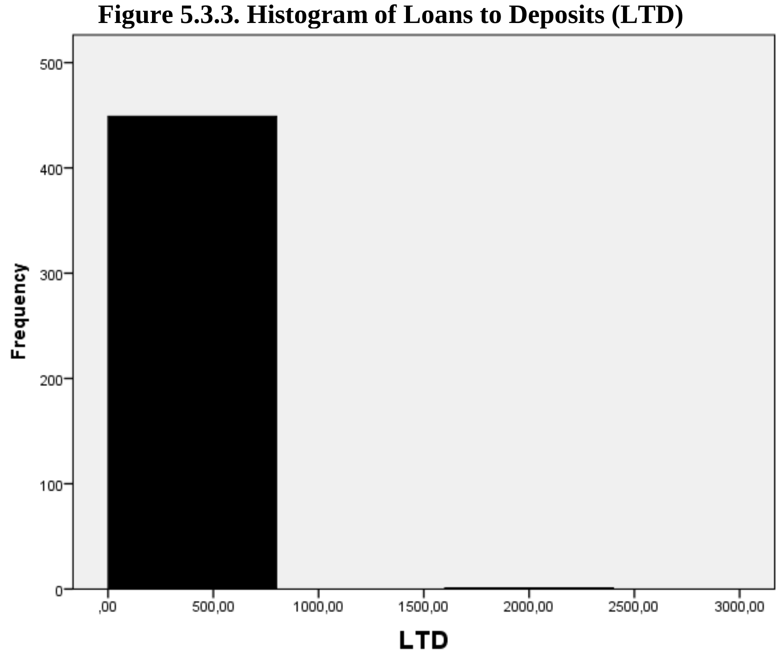
Notes: Figure 5.3.1 presents histogram of Debt to Equity (DTE) ratio, with a huge increase after zero threshold point, which points towards the company's inability to finance its operations from own assets. The histogram is not a bell-shaped curve, there a visible shift to the right, a positive skew within the histogram. Watts and Zimmerman (1990, p.139) write, '*companies with higher debt to equity ratio have higher probability to engage in EM'*. *Source:* Own calculation and presentation.

Figure 5.3.2. Histogram of Equity to Loans (ETL)



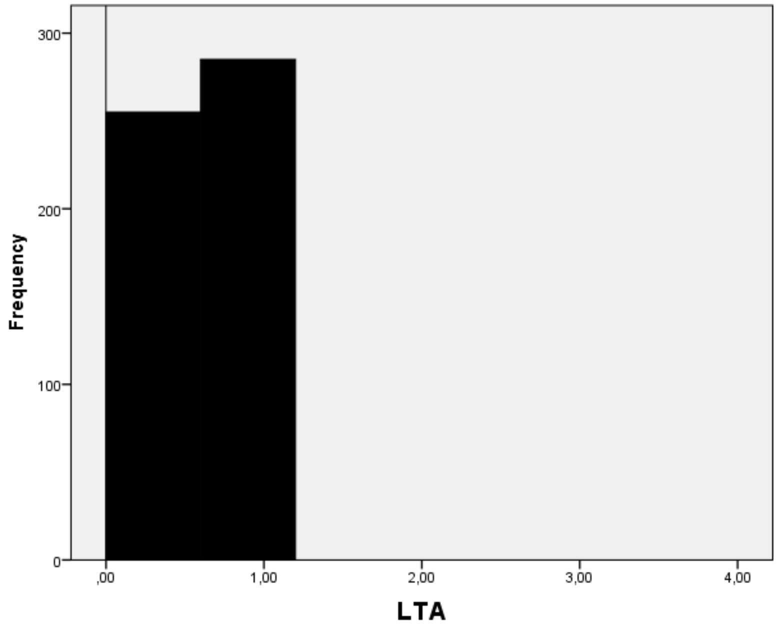
Notes: Figure 5.3.2 presents the histogram of Equity to Loans (ETL) ratio. It does not have a bell-shape curve, but a positive skew to the right within the histogram. It has a visible jump at zero threshold point with the majority of low ratios. A low ratio indicates higher outstanding loans than equity. *Source:* Own calculation and presentation.

Figure 5.3.3. Histogram of Loans to Deposits (LTD)



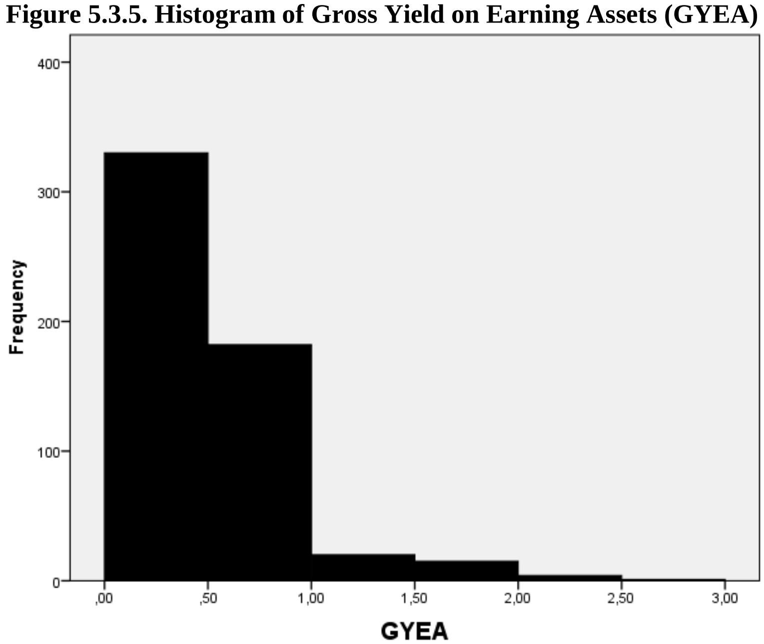
Notes: Figure 5.3.3 shows the histogram of Loans to Deposits (LTD) ratio, the histogram shows discontinuity, i.e. there is a positive skew within the histogram. The ratio is increasing, which confirms/indicates more dependence on borrowed money. *Source:* Own calculation and presentation.

Figure 5.3.4. Histogram of Loans to Total Assets (LTA)



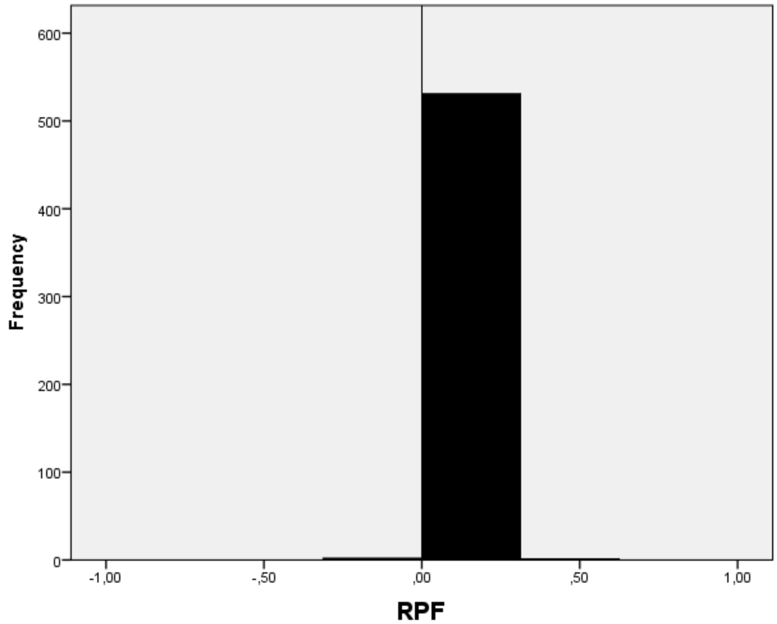
Notes: Figure 5.3.4 presents the histogram of Loans to Total Assets (LTA) with a huge increase from zero points indicating that banks have too many outstanding loans, which result in poor liquidity. *Source:* Own calculation and presentation.

Figure 5.3.5. Histogram of Gross Yield on Earning Assets (GYEA)



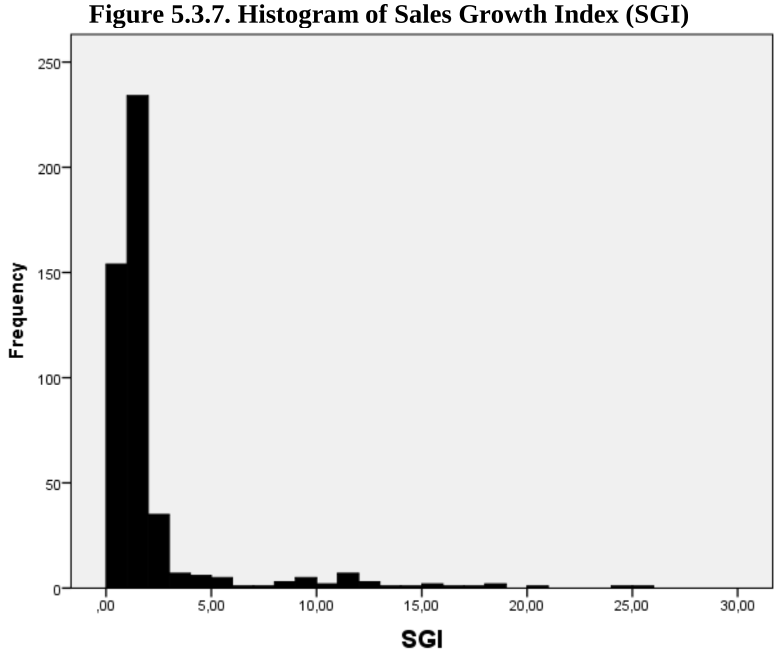
Notes: Figure 5.3.5 presents the histogram of Gross Yield on Earning Assets (GYEA), the histogram shows discontinuity, and it does not have a bell-shaped curve but a positive skew within the histogram. It indicates low sales from earnings assets. *Source:* Own calculation and presentation.

Figure 5.3.6. Histogram of Rate Paid on Funds (RPF)



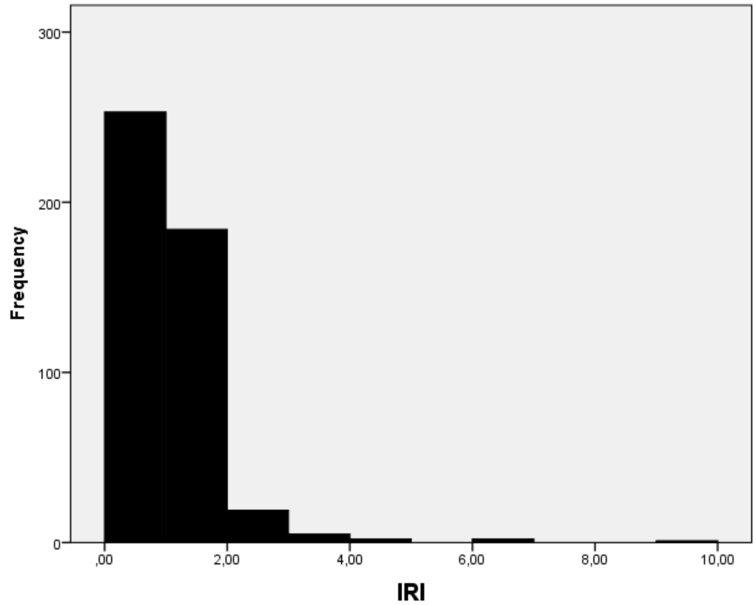
Notes: Figure 5.3.6 presents the histogram of Rate Paid on Funds (RPF). RPF histogram distribution is the highest at zero point and shifts to the right, a positive skew within the histogram. This indicates an increase in interest expenses, and a decrease in total earning assets. Rates payable on funds became more expensive, a clear sign of the company's financial troubles. *Source:* Own calculation and presentation.

Figure 5.3.7. Histogram of Sales Growth Index (SGI)



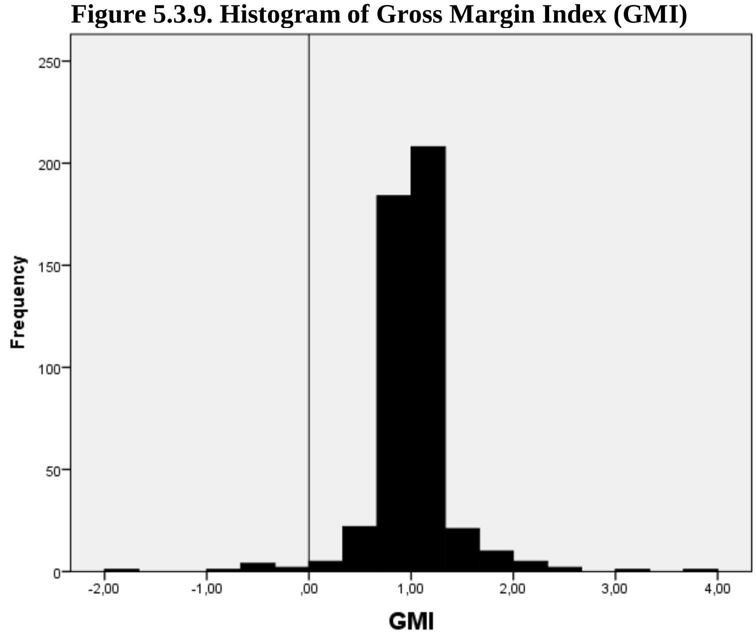
Notes: Figure 5.3.7 shows the histogram of Sales Growth Index *(SGI)*. The SGI histogram shows a positive skew within the distribution. A clear sign of low sales and poor growth increase, hence suggesting smoothing. Beneish (1999, p.27) writes: *'Growth does not imply manipulation, but growth companies are viewed by professionals as more likely than other companies to commit financial statement fraud, because their financial positions and capital needs put pressure on managers to achieve earnings targets'*. *Source:* Own calculation and presentation.

Figure 5.3.8. Histogram of Interest (Sales) Receivables Index (IRI)



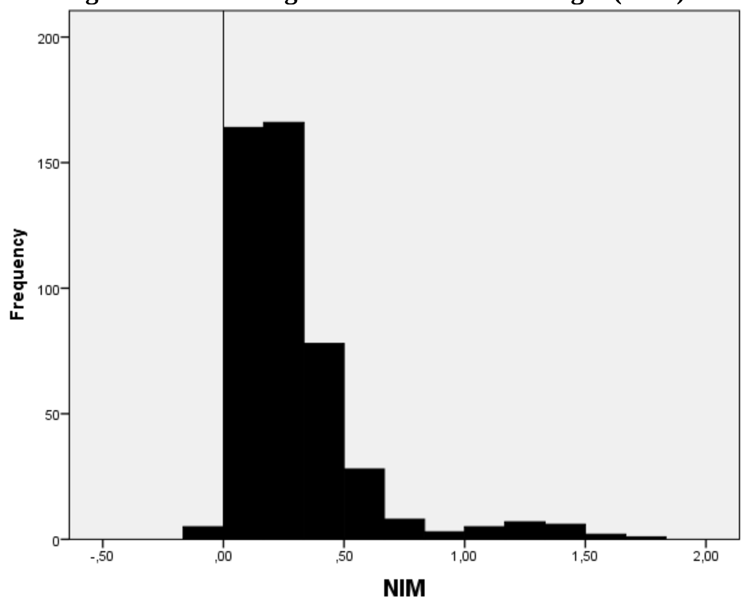
Notes: Figure 5.3.8 presents the histogram of Interest (Sales) Receivables Index (IRI). IRI histogram shows a positive skew. A big increase in receivables in sales would suggest that IRI is out of balance, hence confirming the smoothing of earnings. *Source:* Own calculation and presentation.

Figure 5.3.9. Histogram of Gross Margin Index (GMI)



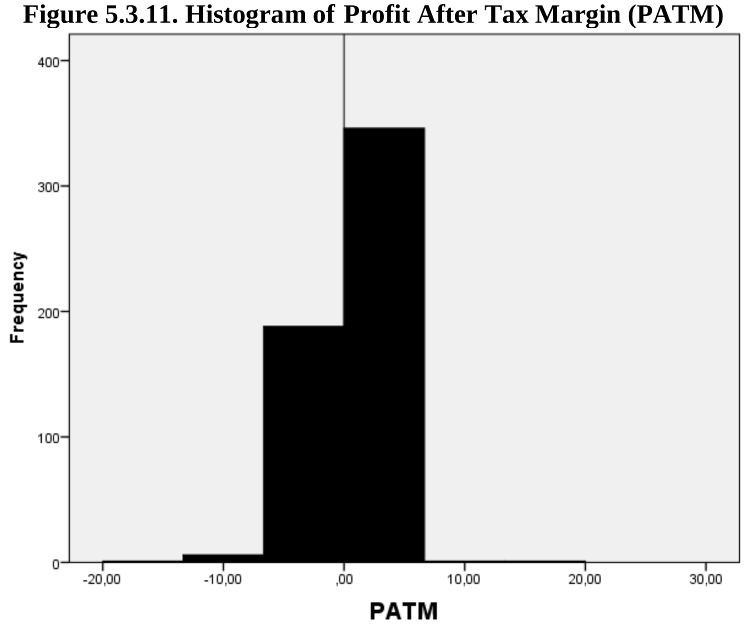
Notes: Figure 5.3.9 presents the histogram of Gross Margin Index (GMI). It shows discontinuity, there is a big jump at and above 1, thus giving a signal of the company's bad performance and indicating earnings smoothing. *Source:* Own calculation and presentation.

Figure 5.3.10. Histogram of Net interest Margin (NIM)



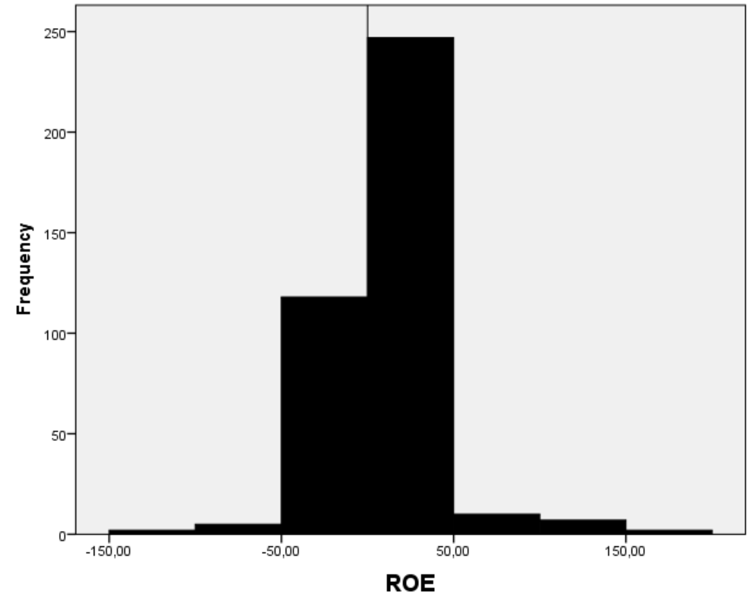
Notes: Figure 5.3.10 presents the histogram of Net interest Margin (NIM), and shows a positive skew. As it has negative values, it indicates that interest expenses were higher. There is also a visible big jump around zero points. It indicates a lower interest income and higher interest expenses, suggesting that companies are poorly managing their assets and are, in fact, losing money. *Source:* Own calculation and presentation.

Figure 5.3.11. Histogram of Profit After Tax Margin (PATM)



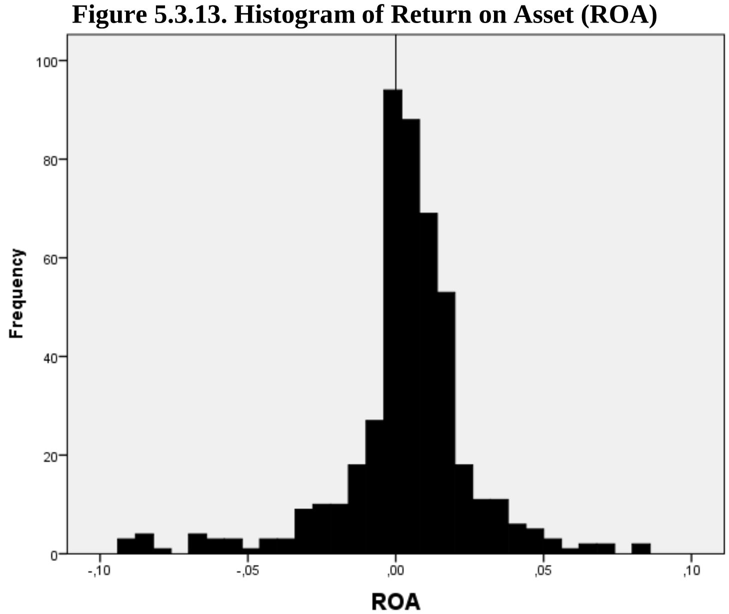
Notes: Figure 5.3.11 shows Profit After Tax Margin (PATM), or Earnings, the histogram distribution has a dramatic jump just before and after the zero point. Skewness is slightly more negative from the zero point, indicating a decline in sales and inefficiencies in controlling costs. A big positive jump at the zero point in the PATM distribution is similar to the one in Figure 3. Burgstahler and Dichev (1997, p.109), and in Figure 1.B to Shen and Chih (2005, p.2677). *Source:* Own calculation and presentation.

Figure 5.3.12. Histogram of Return on Equity (ROE)



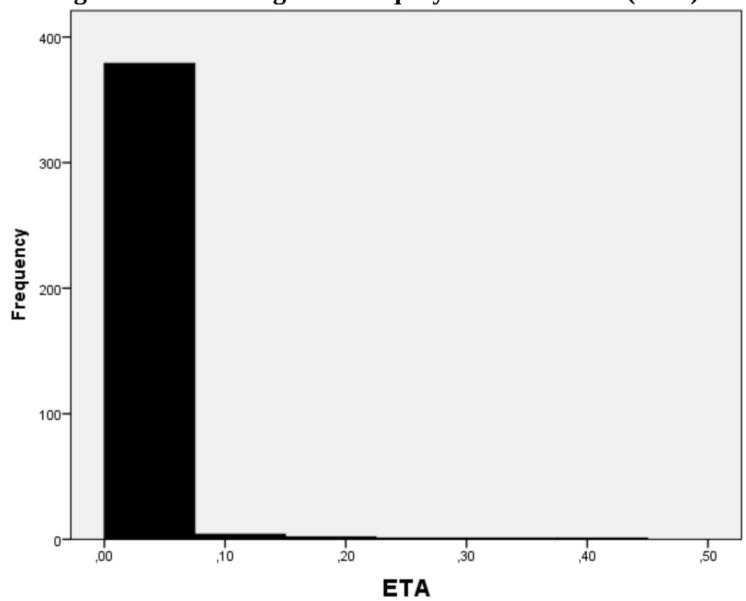
Notes: Figure 5.3.12 presents the Return on Equity (ROE) histogram. It has negative values and a big jump before and after the zero point, which is an overall ‘indicator of low’ i.e. poor profitability. *Source:* Own calculation and presentation.

Figure 5.3.13. Histogram of Return on Asset (ROA)



Notes: Figure 5.3.13 shows the Return on Asset (ROA) the histogram distribution. It shows slightly more negative discontinuity and has a big jump at, before and after zero points. It indicates difficulties and poor ability to generate profits from assets. Low % value shows that less money is made from company assets. In Chapter 3, section 3.2, it was pointed out that in 1999, Hungarian banks ROA was 0.49%, in 2001 ROA was 1.6%, in 2005 ROA increased to 2.5%, and in 2008 ROA declined to 1%, whereas in December 2011, it was in the region of 0.3% and increased to 0.5% in 2012. *Source:* The Central Bank of Hungary, MNB. Own calculation and presentation.

Figure 5.3.14. Histogram of Equity to Total Assets (ETA)



Notes: Figure 5.3.14 presents Equity to Total Assets (ETA), the histogram has a big jump immediately at zero points, showing the overall poor capital adequacy of the companies. *Source:* Own calculation and presentation.

The above analysis of each ratio's histogram in Figures 5.3.1 – 5.3.14 show that the distributions of the mean values are asymmetrical, that is, they do not have a bell-shaped curve. The presence of discontinuities in the 14 histograms can be linked to the ROE and the ROA ratios of the banks' operations between 2003 and 2012, as in Chapter 3, Section 3.2. Figure 3.1 demonstrates the banks' aggressive lending policy to households, where the trend starts in 2003 and ends in (Q3) quarter three, 2011. Figure 3.2 presents banks' lending to consumers indicating a gradual increase of loans from 2003 to Q1 2009. The Same trend of lending is also visible in Figure 3.3 that shows lending to the corporate sector. Várhegyi (2008) points out that in 2001, loans to households, as a percentage of the GDP, represented 4%, and while in 2007, they added up to 21%.

Shen and Chih (2005) similarly investigate distributions of net income of banks in 48 countries and show similar results of asymmetric distribution as this study for the PATM (Profit After Tax Margin) ratio. Furthermore, Shen and Chih (2005, p.2678) point out that banks are highly regulated firms and argue that *'... in order to keep depositors from losing confidence in banks, banks have strong incentive to prevent their earnings from being negative.',* and, '... *earnings management is one of the management skills that banks adopt to avoid violating regulations'*.

The results presented in Figures 5.3.1 – 5.3.14 suggest further investigation of the 14 ratios by applying the Burgstahler and Dichev's (1997, pp.103) earnings management testing Model 1, or EM1, as it was explained in Chapter 4, subsection 4.4.2, and by applying the Degeorge, Patel and Zeckhauser's (1999, p.31) earnings management testing Model 2, or EM2, as explained in Chapter 4, subsection 4.4.3. However, prior to statistical testing, this study makes a Benchmark comparison of the 14 ratios, as discussed in the next section.

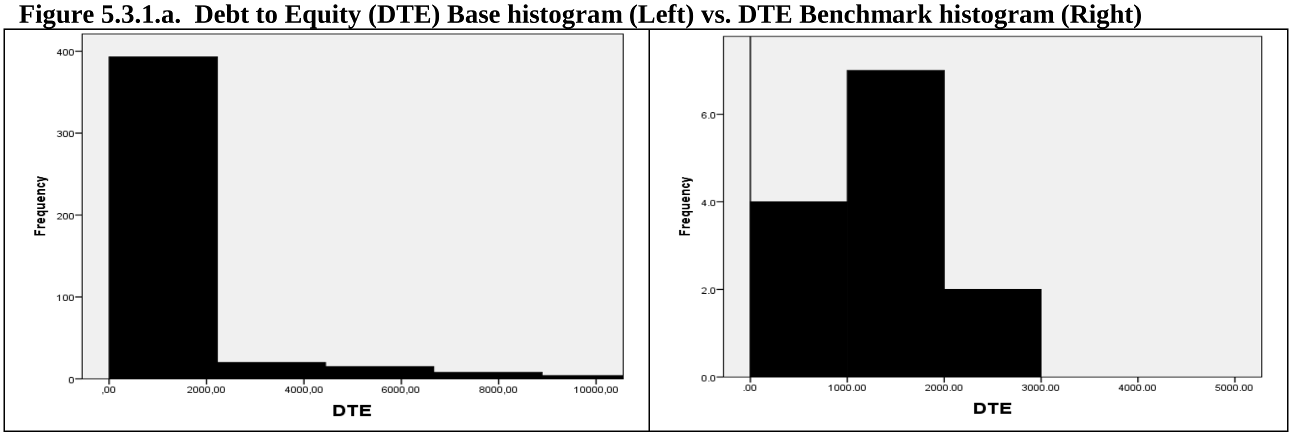
5.3.1.2. Benchmark Comparison

Dechow, Ge and Schrand (2010, p.351) show benchmark as part of 'earnings quality proxies'. This study examined not only earnings as a quality proxy, but a total of 14 ratios to test evidence of earnings management. Due to specifics of the Hungarian Accounting Standards, benchmark comparisons cannot be made to foreign countries' credit institutions. Furthermore, there is no evidence that the benchmarks for the ratios tested in this study had ever been investigated prior to this study for financials, and/or for credit institutions. In fact, there is no evidence of a published quality research paper that examines ratios for credit institutions of a foreign country, or credit institutions in Hungary. Section 4.6.1.5, in Chapter 4 outlines the benchmark calculation approach.

This study calculates benchmark for the 14 ratios, namely Interest (Sales) Receivables Index (IRI), Sales Growth Index (SGI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit after Tax Margin (PATM), Return on Assets (ROA), Return on Equity (ROE), Rate Paid on Funds (RPF), Loans to Total Assets (LTA), Loans to Deposits (LTD), Equity to Loans (ETL), Gross Yield on Earning Assets (GYEA), Equity to total Assets (EtA) and Debt to Equity (DTE). For each benchmark ratio, histogram and descriptive statistics were run, and they were compared to each base ratio histograms, as shown and analyzed in Figures 5.3.1 – 5.3.14.

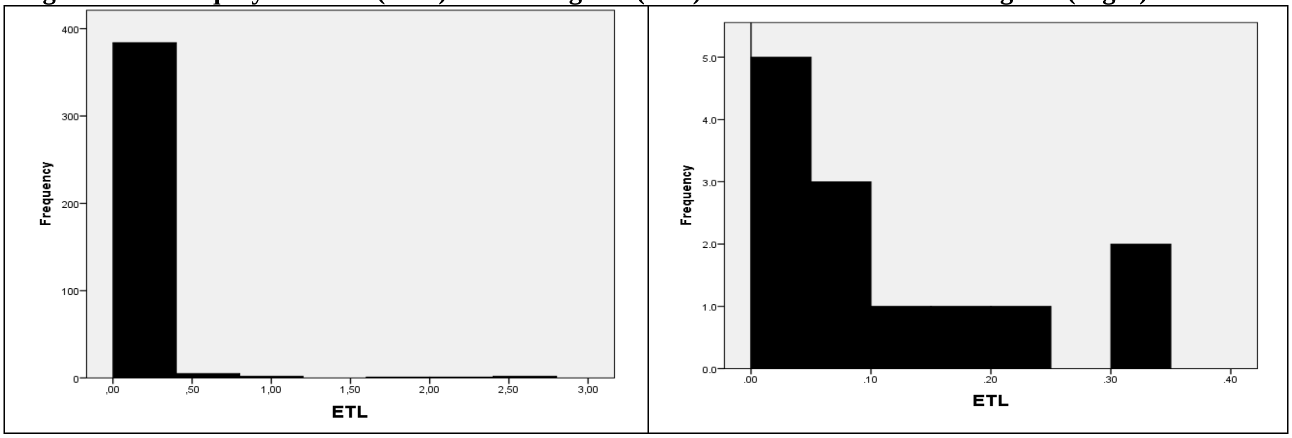
For benchmark comparisons Figures 5.3.1.a – 5.3.14.a present the Hungarian credit institutions' Base ratio histograms on the left side, and the Benchmark ratio histograms on the right side of the table:

Figure 5.3.1.a. Debt to Equity (DTE) Base histogram (Left) vs. DTE Benchmark histogram (Right)



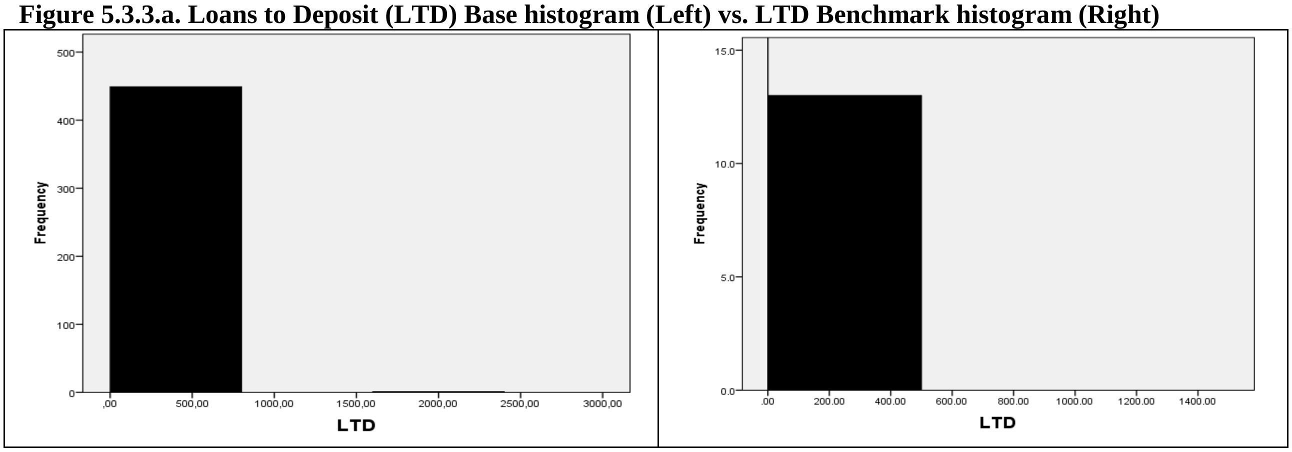
Notes: Figure 5.3.1.a presents the Base histogram of the Debt to Equity (DTE) ratio on the left side and the Benchmark ratio histogram on the right side of the table. By examining the Base and the Benchmark for the Debt to Equity (DTE) ratio, it may be concluded, that the Base ratio histogram significantly differs from the Benchmark ratio histogram. One possible reason may be that under Benchmark, companies have lower debt and higher equity, which means, companies are able to finance themselves, from their own operations, which is not the case for the Base DTE ratio. *Source:* Own calculation and presentation.

Figure 5.3.2.a. Equity to Loans (ETL) Base histogram (Left) vs. ETL Benchmark histogram (Right)



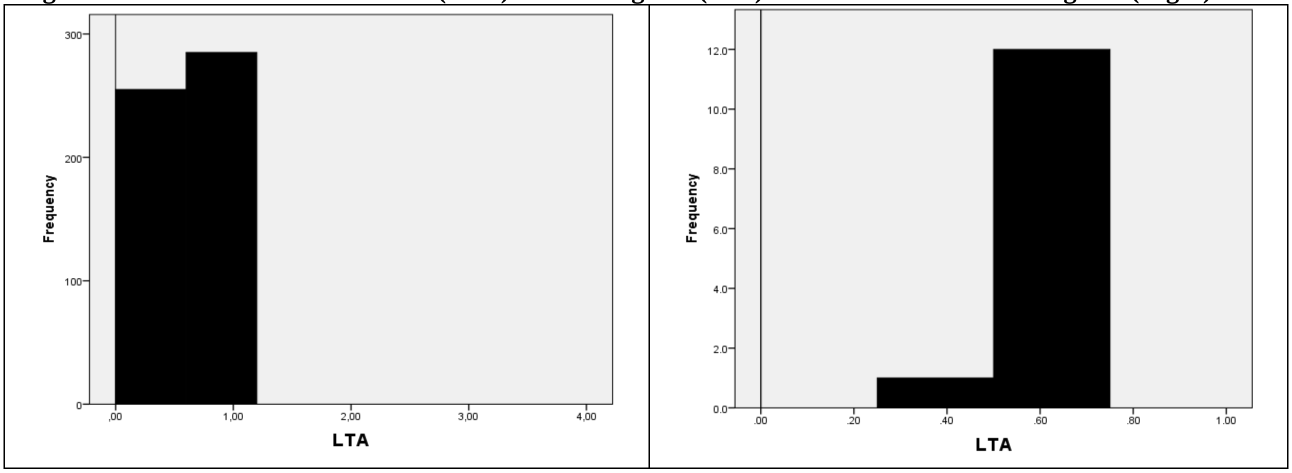
Notes: Figure 5.3.2.a presents the Base ratio histogram for Equity to Loans (ETL) on the left side and the Benchmark ratio histogram of ETL on the right side of the table. The ETL Base ratio histogram has a visible huge jump just after the zero, whereas from 0.50, low frequency distributions occur. Low ratio suggests more outstanding loans than equity. Examining the ETL for Benchmark shows a contrast, where frequency distributions are not as low as for the base ETL histogram, that is, the benchmark ETL histogram shows a more balanced, higher frequency distribution just after zero, than the base ETL ratio. *Source:* Own calculation and presentation.

Figure 5.3.3.a. Loans to Deposit (LTD) Base histogram (Left) vs. LTD Benchmark histogram (Right)



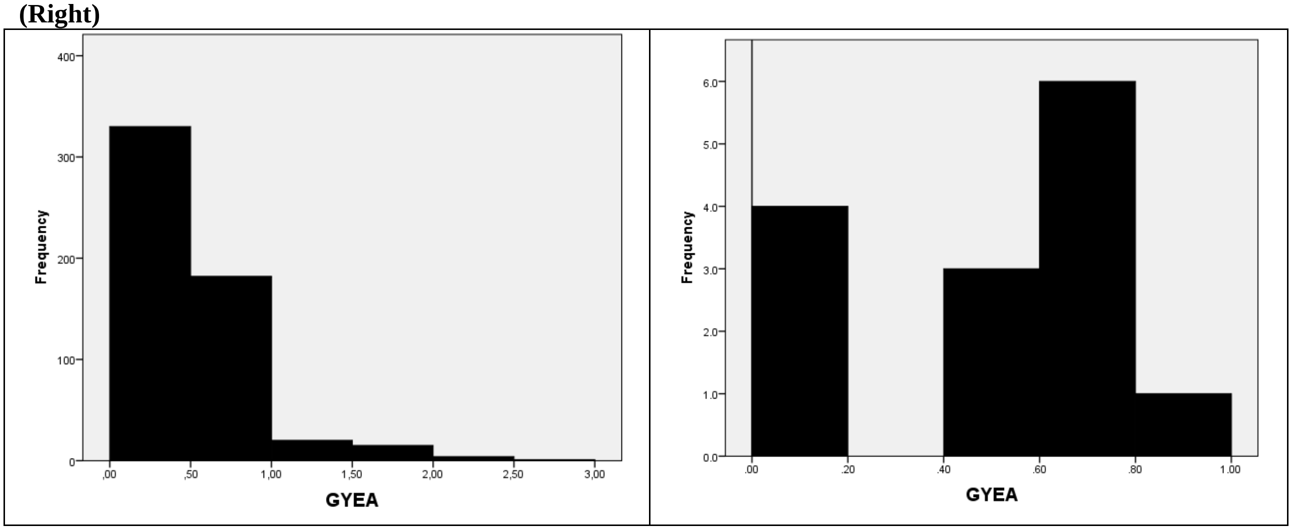
Notes: Figure 5.3.3.a shows the Base ratio histogram for Loans to Deposit (LTD) on the left side and the Benchmark LTD ratio histogram on the right side of the table. The Base Loans to Deposit (LTD) histogram has similar frequency distribution as the Benchmark LTD histogram. This would suggest a general trend of dependence on borrowed money in the banking industry. *Source:* Own calculation and presentation.

Figure 5.3.4.a. Loans to Total Assets (LTA) Base histogram (Left) vs. LTA Benchmark histogram (Right)



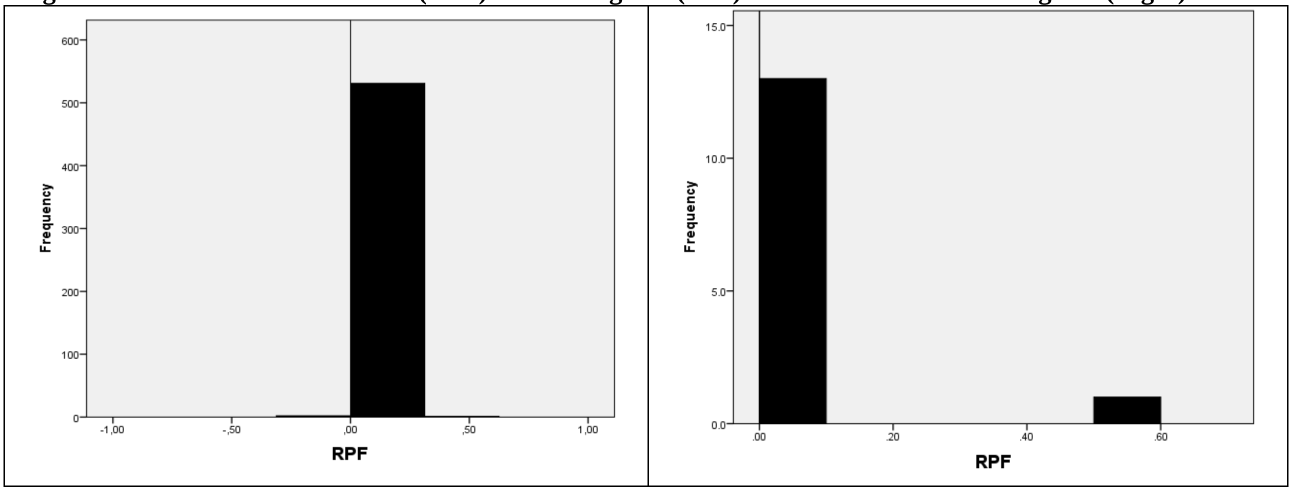
Notes: Figure 5.3.4.a presents the Base ratio histogram for Loans to Total Assets (LTA) on the left side and the Benchmark LTA ratio histogram on the right side of the table. The Base LTA histogram has a slightly higher frequency jump just after the zero point, compared to the Benchmark LTA ratio histogram, suggesting higher outstanding loans and poorer liquidity. *Source:* Own calculation and presentation.

Figure 5.3.5.a. Gross Yield on Earning Assets (GYEA) Base histogram (Left) vs. GYEA Benchmark histogram (Right)



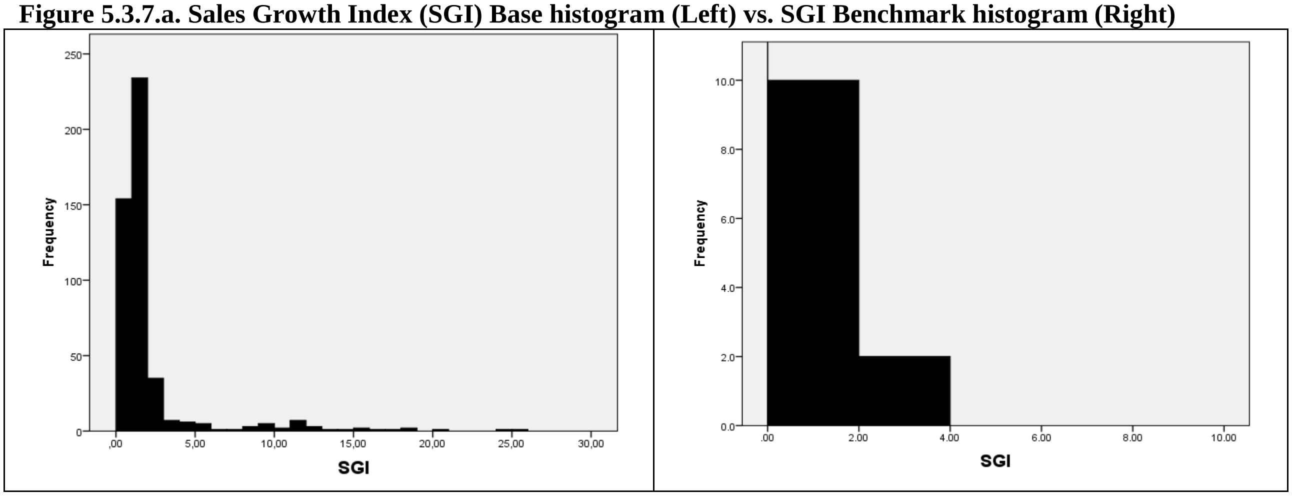
Notes: Figure 5.3.5.a shows the Base ratio histogram for Gross Yield on Earning Assets (GYEA) on the left side and the GYEA Benchmark histogram on right side of the table. The Base GYEA ratio histogram shows low yield on returning assets, that is, the Base GYEA histogram shows low sales in connection to funds on loan. That is, loans are not performing in a profitable way. Base GYEA low yield on returning assets indicates low income, which is the result of poor investment policies, and a high risk of insolvency. The Benchmark GYEA ratio shows a more balanced histogram than the Base GYEA histogram. *Source:* Own calculation and presentation.

Figure 5.3.6.a. Rate Paid on Funds (RPF) Base histogram (Left) vs. RPF Benchmark histogram (Right)



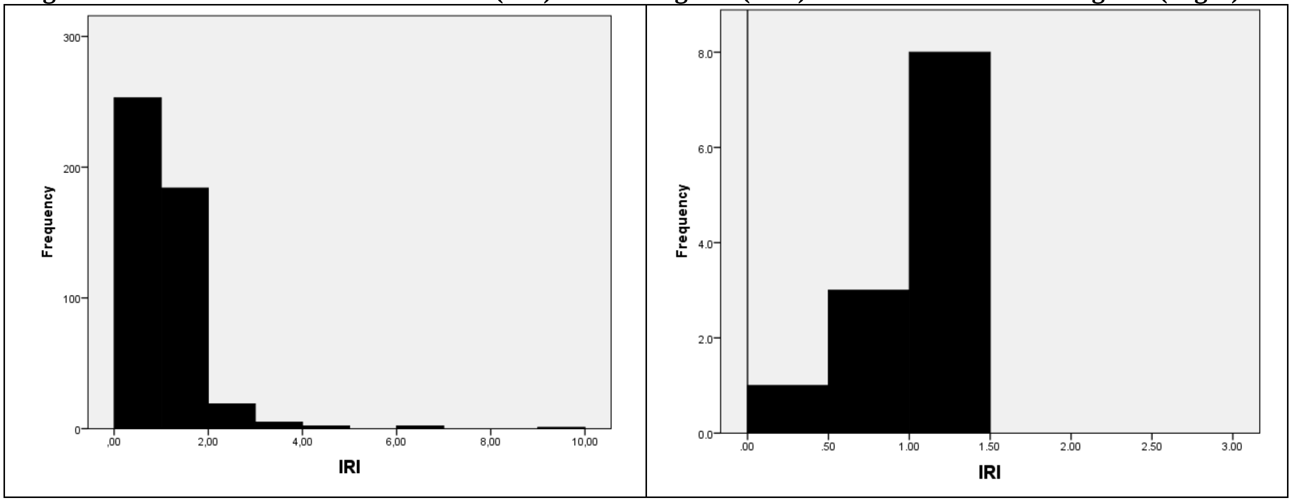
Notes: Figure 5.3.6.a histogram presents the Base histogram for Rate Paid on Funds (RPF) on the left side and the RPF Benchmark histogram on the right side of the table. A Base RPF histogram frequency distribution has a small negative frequency distribution just before the zero and a huge jump from the zero. The Base RPF histogram shows negative rates and a huge jump from the zero, suggesting unfavourable rates and financial difficulties for banks. The Benchmark RPF has a similar frequency distribution, without negative rates though. *Source:* Own calculation and presentation.

Figure 5.3.7.a. Sales Growth Index (SGI) Base histogram (Left) vs. SGI Benchmark histogram (Right)



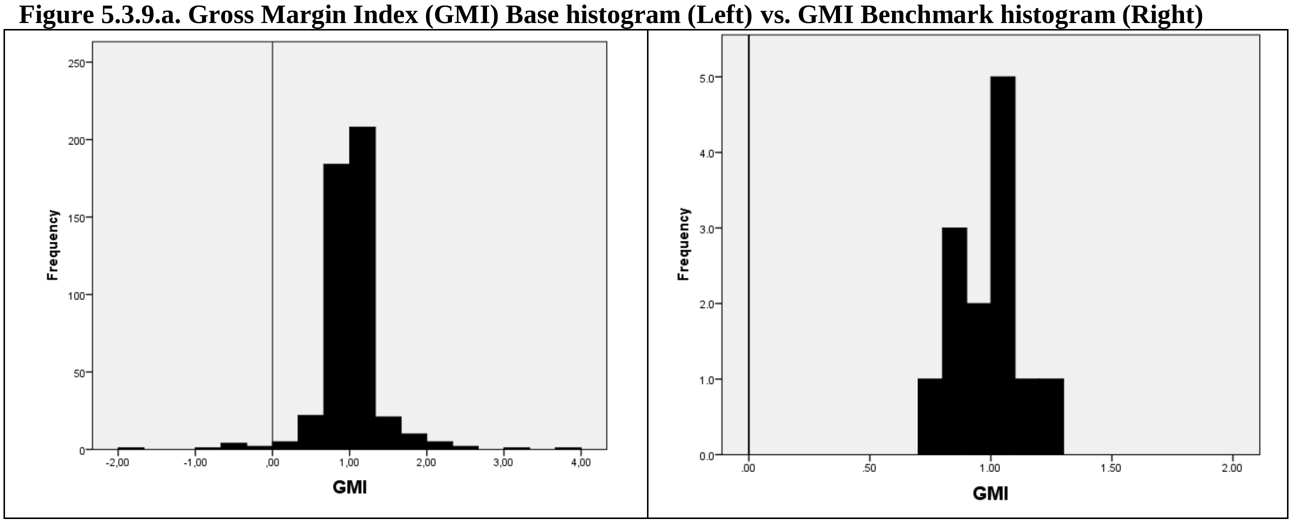
Notes: Figure 5.3.7.a presents the Base ratio histogram for Sales Growth Index (SGI) on the left side and the SGI Benchmark histogram on the right side of the table. The Base ratio SGI histogram frequency distribution has a huge jump just after the zero, an indication of low sales. The Benchmark SGI histogram shows a similar distribution. *Source:* Own calculation and presentation.

Figure 5.3.8.a. Interest Receivables Index (IRI) Base histogram (Left) vs. IRI Benchmark histogram (Right)



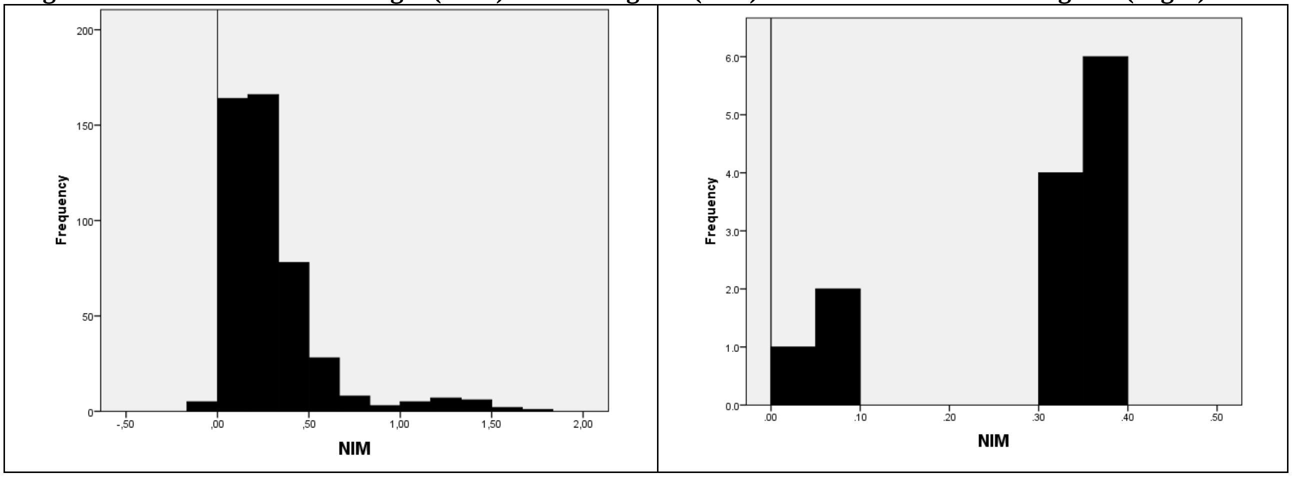
Notes: Figure 5.3.8.a shows the Base ratio histogram for Interest (Sales) Receivables Index (IRI) on the left of the table shows a big jump at zero point with a gradual distribution frequency decrease. Frequency distribution on the right of the table, for the IRI Benchmark histogram shows gradual increase from the zero point, an opposite frequency distribution than for the IRI Base histogram. This would suggest that the Base IRI ratio is not in balance. *Source:* Own calculation and presentation.

Figure 5.3.9.a. Gross Margin Index (GMI) Base histogram (Left) vs. GMI Benchmark histogram (Right)



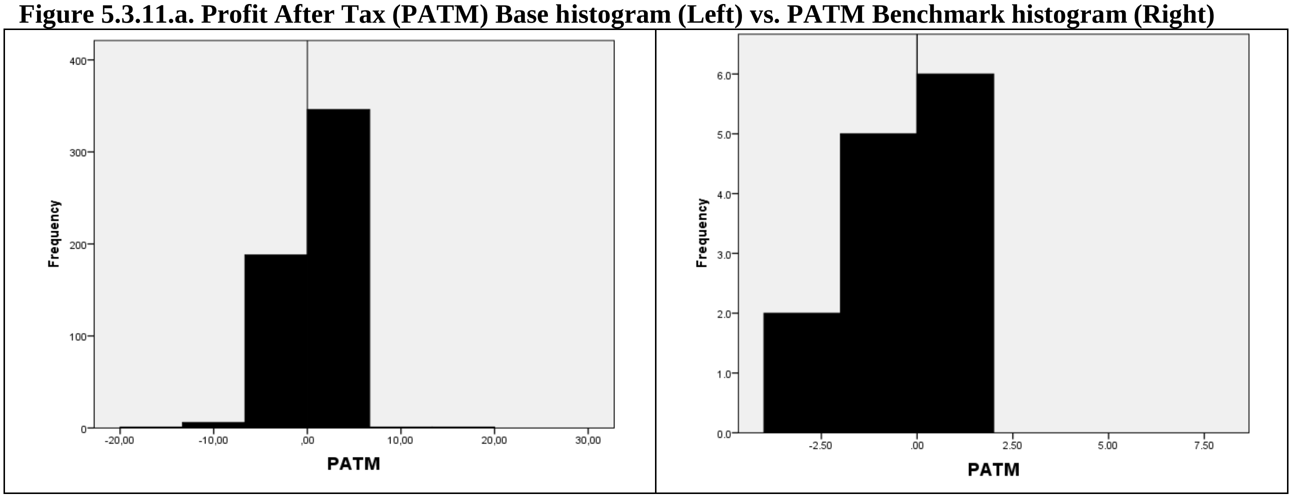
Notes: Figure 5.3.9.a. presents the Base ratio for Gross Margin Index (GMI) on the left side and the GMI Benchmark histogram on the right side of the table. Comparing the Base and the Benchmark histograms, there is a visible difference between the two, where the Base GMI histogram is narrower with a big jump at 1, as well as negative frequency distributions. The Benchmark GMI histogram on the other hand shows distributions at and around 1 and its distribution is not as spread as the Base GMI histogram. *Source:* Own calculation and presentation.

Figure 5.3.10.a. Net interest Margin (NIM) Base histogram (Left) vs. NIM Benchmark histogram (Right)



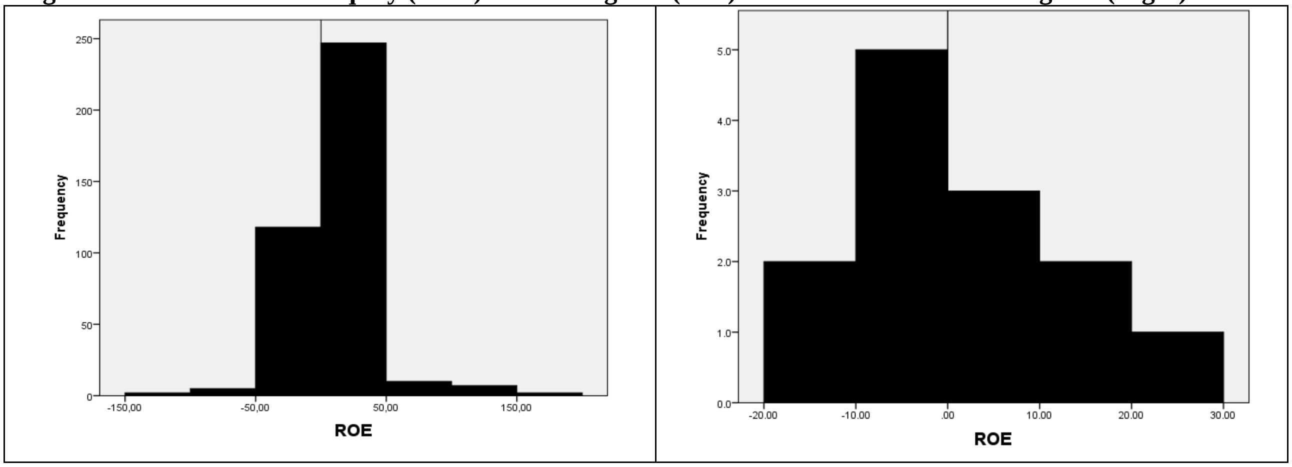
Notes: Figure 5.3.10.a presents the Base ratio histogram for the Net interest Margin (NIM) on the left and the NIM Benchmark histogram on right side of the table. The Base NIM histogram shows a negative frequency distribution, a sign of losing money due to higher expenses. Additionally, the Base NIM histogram has a larger spread of the frequency distribution at and from zero point than the Benchmark NIM histogram. The Benchmark NIM shows a max of 0.40 on the horizontal axis of the histogram, whereas the Base NIM histogram has frequencies above 1.5 on the horizontal axis. This would suggest that banks' NIM dramatically changed and displays a significant difference compared to the Benchmark NIM histogram. *Source:* Own calculation and presentation.

Figure 5.3.11.a. Profit After Tax (PATM) Base histogram (Left) vs. PATM Benchmark histogram (Right)



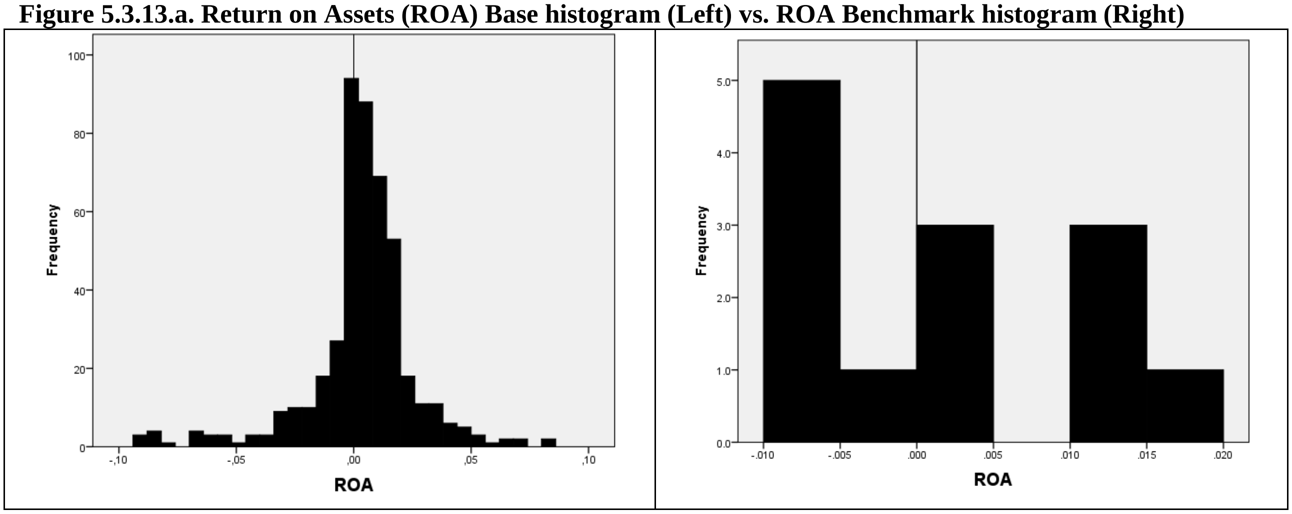
Notes: Figure 5.3.11.a shows the Profit After Tax Margin (PATM) Base ratio histogram on the left and the PATM Benchmark ratio histogram on the right side of the table. Both PATM histograms show similar patterns, except that the Benchmark PATM frequency distribution is not spread as widely as the Base PATM ratio, that is, the Benchmark PATM does not indicate inefficiency in controlling costs. The Base PATM histogram, however, does suggest decline of sales and lack of control in costs. *Source:* Own calculation and presentation.

Figure 5.3.12.a. Return on Equity (ROE) Base histogram (Left) vs. ROE Benchmark histogram (Right)



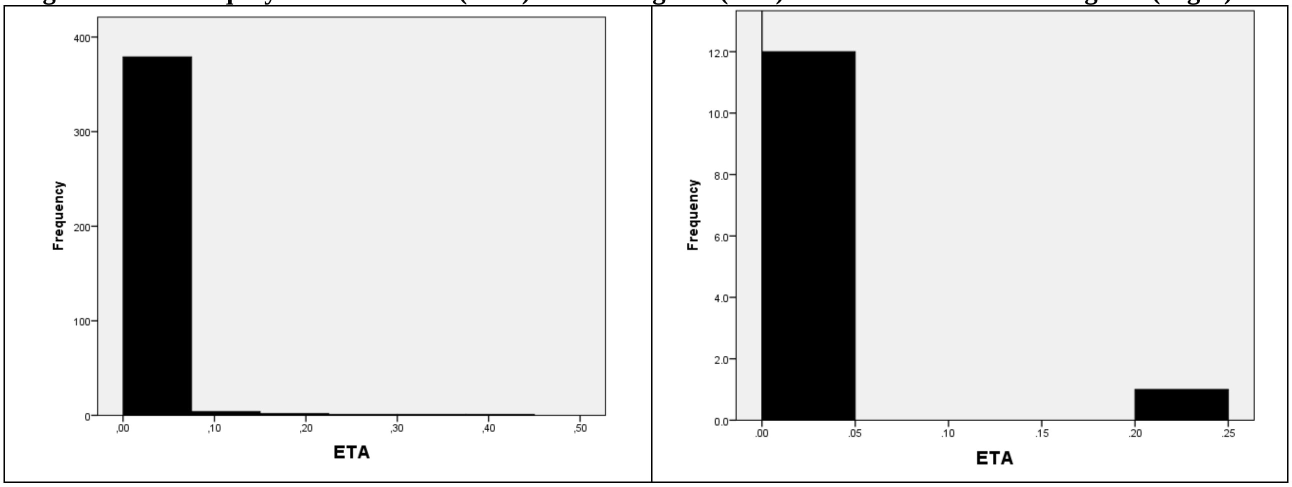
Notes: Figure 5.3.12.a presents the Return on Equity (ROE) Base histogram on the left and the ROE Benchmark histogram on the right of the table. The Base ROE histogram shows higher frequency distribution below zero than the Benchmark ROE histogram. Low Base ROE suggests low profitability, whereas negative Base ROE ratio should be interpreted with caution. Negative ROE should not be interpreted nor compared without taking into account the cash flow level of a company. By comparing the Base ROE to the Benchmark ROE, we might come to an erroneous conclusion. *Source:* Own calculation and presentation.

Figure 5.3.13.a. Return on Assets (ROA) Base histogram (Left) vs. ROA Benchmark histogram (Right)



Notes: Figure 5.3.13.a shows the Return on Assets (ROA) Base histogram on the left and the ROA Benchmark histogram on the right of the table. The Base ROA has higher negative frequency distribution than the Benchmark ROA, which would suggest that the number of companies from the sample do not create profits from their assets; in other words, the higher the ROA the better. The Base ROA's overall performance is below the Benchmark ROA. As banks' Return on Assets (ROA) performance varies by year, detailed reasons for banks' poor ROA performance was explained in Chapter 3, section 3.2. *Source:* Own calculation and presentation.

Figure 5.3.14.a. Equity to Total Assets (ETA) Base histogram (Left) vs. ETA Benchmark histogram (Right)



Notes: Figure 5.3.14.a presents the Equity to Total Assets (ETA) Base histogram on the left and the ETA Benchmark histogram on the right of the table. The Base ETA ratio histogram shows higher a concentration of frequency distribution just after the zero point, suggesting that companies are risky and that investors are unwilling to finance companies. The Histogram highlights the financial difficulties the banks had from 2008, as outlined in Chapter 3. The higher the ETA ratio, the better it is. Higher ETA ratios are indicative of the willingness of investors to finance a company. The Benchmark ETA ratio shows similar histogram patterns and this is because benchmark data was calculated from the same sample as the Base ratios were. *Source:* Own calculation and presentation.

Chapter 4 outlined that there is no evidence of benchmark industry standards for Hungarian credit institutions. This study calculates benchmark from the Hungarian credit institutions' sample period of 1999-2012, which is the same sample as the one used for the calculation of the 14 base ratios. Therefore, it is probable that some benchmark ratio histograms show very similar or even identical frequency distributions as the base ratio histograms, namely the Equity to Total Assets (ETA), the Rate Paid on Funds (RPF) and the Loans to Deposit (LTD) ratios.

Apart from histogram analysis, descriptive statistics were also run for the Base ratios for the sample period 1999-2012, as well as for the Benchmark ratios on an annual basis for the period of 1999-2012. Tables 5.3.1 and 5.3.2 present descriptive statistics for the Base and for the Benchmark ratios respectively:

Table 5.3.1. Descriptive Statistics of Base Ratios

	Number of Observation	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
DTE	447	.12	152260.00	1602.82	388.17	8206.91	14.93	.12	260.62	.23
ETL	398	.00	9.34	.12	.04	.72	10.32	.12	116.52	.24
LTD	457	.00	72149.00	262.32	162.61	3476.27	19.60	.11	403.57	.23
LTA	541	.00	53.06	.66	.10	2.27	22.77	.11	526.00	.21
GYEA	554	.01	13.63	.50	.03	.70	12.32	.10	220.35	.21
RPF	536	-.02	19.12	.08	.04	.83	22.82	.11	525.25	.21
SGI	474	.00	25.56	2.14	.15	3.27	4.00	.11	17.83	.22
IRI	467	.01	84.31	1.23	.18	3.93	20.34	.11	429.48	.23
GMI	471	-2.37	5.38	1.01	.02	.52	.86	.11	24.90	.22
NIM	474	-.03	3.30	.29	.01	.31	3.47	.11	20.97	.22
PATM	545	-118.70	324.49	.16	.64	14.94	17.95	.10	417.27	.21
ROE	400	-2062.00	1098.67	1.09	6.76	135.12	-8.36	.12	152.27	.24
ROA	474	-.32	.12	.00	.00	.04	-3.42	.11	24.31	.22
ETA	389	.00	5.89	.03	.02	.30	19.31	.12	377.82	.25

Notes: Descriptive Statistics of Base Ratios calculated for all sample period (1999-2012). *Source:* Own calculation and presentation.

Table 5.3.2. Descriptive Statistics of Benchmark Ratios

	Number of Observation	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
DTE	14	419.44	6023.57	1644.81	375.55	1405.19	2.60	.60	7.90	1.15
ETL	13	.02	.32	.12	.03	.10	1.12	.62	.09	1.19
LTD	14	1.41	1807.57	228.22	125.20	468.44	3.37	.60	12.02	1.15
LTA	14	.45	1.85	.64	.09	.35	3.64	.60	13.48	1.15
GYEA	14	.07	.96	.50	.08	.29	-.58	.60	-.93	1.15
RPF	14	.00	.53	.07	.04	.13	3.50	.60	12.69	1.15
SGI	13	.92	12.51	2.26	.86	3.12	3.46	.62	12.21	1.19
IRI	13	.19	3.04	1.16	.18	.64	2.15	.62	7.31	1.19
GMI	13	.78	1.25	.99	.04	.13	.21	.62	-.09	1.19
NIM	13	.05	.40	.29	.04	.13	-1.28	.62	-.12	1.19
PATM	14	-3.54	8.87	.26	.73	2.72	2.55	.60	9.02	1.15
ROE	13	-19.87	23.54	1.00	3.33	11.99	.25	.62	-.28	1.19
ROA	13	-.01	.02	.00	.00	.01	.38	.62	-1.54	1.19
ETA	13	.01	.22	.03	.02	.06	3.54	.62	12.66	1.19

Notes: Descriptive Statistics of Benchmark Ratios calculated on annual base, for period (1999-2012),. *Source:* Own calculation and presentation.

Comparing Descritptives for the Base ratios in Table 5.3.1 to Table 5.3.2 for the Benchmark ratios, it may be concluded, that the

Base ratio statistics for all ratios differ from the Benchmark ratios, especially Skewness and Kurtosis, as well as the Mean and Std. Deviation. The results are in line with the expectations. However, Benchmark ratio histograms and statistical results should be interpreted with caution. Benchmark, as a proxy, has its own weaknesses as Dechow, Ge and Schrand (2010, p.351) argue, '*In addition to statistical validity issues, evidence that kinks represent opportunistic earnings management is mixed, with credible alternative explanations including non-accounting issues. It is difficult to distinguish firms that are at kinks by chance versus those that have manipulated their way into the benchmark bins'*.

Furthermore, Sun and Rath (2012); or Gore, Pope and Singh (2007) looked at earnings benchmark only in respect to earnings management. It can be argued that researching only one variable Benchmark instead of investigating a larger number of benchmark ratios is not robust enough for identifying earnings management.

It may be concluded that there is a shortage of quality research papers on Benchmark comparisons in the financial sector, and no evidence of Benchmark ever being used for credit institutions in Hungary. It is probable, though, that credit institutions have benchmark data, but they treat them as internal confidential information. There is, however, a very basic statistical material overview published by the European Central Bank (www.ecb.europa.eu), which is applicable only for general, informational purposes, and it is irrelevant for this research study. Due to the lack of quality research papers on benchmark for financials, an opportunity to research Benchmark for credit institutions, as well as for non-financials, is literally presenting itself to researchers.

The following section investigates the ratio analyses with statistical modeling.

5.3.1.3. Statistical Testing of the Base Ratios with the Earnings Management 1 and Earnings Managamenet 2 models

Due to limited information from the Hungarian Financial Authority's 'Golden Book', which serves as the main source of data for the financial statements of credit institutions, it is unclear how reversal accruals influenced ratios if part of the formula contained total assets, or 'other accruals and other assets' and 'accrued interest receivables'. Some ratios contain total assets, such as Return on Assets (ROA), Loans to Total Assets (LTA), Net Interest Margin (NIM), Interest Receivable Index (IRI), Equity to Total Assets (EtA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Scaled Earnings, or Profit After Tax (t) divided by Total Assets in period (t-1); and Scaled Earnings Change, or change in earnings divided by total assets in the period (t-2). Baber, Kang and Li (2011) argue that earnings management level depends on the speed reversal of (discretionary) accruals, whereas Dechow, Hutton, et al. (2012) point out that reversal accruals should not be omitted when testing variables as it may reduce the testing power as well as influence the test results; when accruals are booked in a period, they should be reversed to the next. This study acknowledges that reversal accruals could not have been identified in the sample used in this study; therefore, it is probable that for ratios containing accruals as components (for example in Total Assets), the power of the test, and thus its results, might have suffered to an extent.

Due to the inconsistencies between the results of the Debt to Equity (DTE) ratio, in the standard deviation of the difference and the results of Earnings Management model 1, or the EM1 formula, formula, DTE was excluded from EM1 testing. The recalculation of the 13 ratios with the EM1 formula with the Burgstahler and Dichev's (1997, p.103) model, and with the Earnings

Management model 2, or the EM2, with the Degeorge, Patel and Zeckhauser's (1999, p.31) model applying the Non-parametric One-Sample Kolmogorov-Smirnov (K-S) test with Monte Carlo simulation. Statistical tests were run at 95% and 99% confidence interval levels with *p*–value(s) of 5% and 1% respectively. The results for both models, Model 1 and Model 2, are very similar. The *p*-value was defined in *Appendix 2.1*. Applying the testing approach with EM1 and EM2 methods was earlier done by Shen and Chih (2005, p.2684), who also tested Burgstahler and Dichev (1997, p.103) and Degeorge, Patel and Zeckhauser's (1999, p.31) model, but with a different statistical approach. Shen and Chih (2005, p.2684) use multiple regression analysis, hypothesizing that *'…there is no earnings management in the banking industry…'.*

Table 5.3.3 presents the test statistics of the Earnings Management model 1, or the EM1, of the Non-parametric One-Sample Kolmogorov-Smirnov (K-S) test with Monte Carlo simulation, run for each of the 13 ratios with a 99% confidence interval level. Table 5.3.3 shows Asymp. Sig (2-tailed); *p*-values are below 0.01 for all ratios, except the Loan to Total Asset (LTA) *p*–value with 0.025 holds to $\mathbf{H0_{(a)}}$**:** at a 99% confidence interval level. It can be concluded that LTA is normally distributed, but has a weak result of 0.025 that is greater than $p = 0.01$ ($p < 0.025$), but inferior to $p = 0.05$ ($p > 0.025$). Apart from Loans to Total Assets (LTA), the rest of the 12 ratios' *p*-values are lower than 0.01 ($p < 0.01$). They are statistically significant at a 99% confidence interval level.

Table 5.3.3. One-Sample Kolmogorov-Smirnov (K-S) Test of Base ratios run with EM1 model at 99% Confidence Interval Level

		ETL	LTD	LTA	GYEA	RPF	SGI	IRI	GMI	NIM	PATM	ROE	ROA	ETA
Number of Observation		320	327	394	421	404	374	367	373	372	402	218	379	305
Mean		.002	.026	.002	.003	.005	.079	.001	.002	.002	.022	-.653	.000	.001
Std. Deviation		.144	.430	.048	.151	.232	.887	.130	.097	.056	.325	4.870	.006	.077
Absolute		.407	.223	.074	.273	.463	.306	.095	.148	.179	.252	.321	.186	.441
Positive		.407	.223	.056	.273	.463	.306	.095	.148	.179	.252	.268	.153	.441
Negative		-.390	-.163	-.074	-.248	-.450	-.177	-.079	-.140	-.141	-.236	-.321	-.186	-.422
Kolmogorov-Smirnov Z		7.287	4.038	1.479	5.596	9.314	5.915	1.828	2.861	3.454	5.054	4.735	3.618	7.699
Asymp. Sig. (2-tailed)		0.000	0.000	.025	0.000	0.000	0.000	.002	.000	0.000	0.000	0.000	0.000	0.000
Monte Carlo Sig. (2-tailed)		.000	.000	.023	.000	.000	.000	.003	.000	.000	.000	.000	.000	.000
99% Confidence Interval	Lower Bound	0.000	0.000	.017	0.000	0.000	0.000	.001	0.000	0.000	0.000	0.000	0.000	0.000
	Upper Bound	.001	.001	.028	.001	.001	.001	.005	.001	.001	.001	.001	.001	.001

Notes: Table 5.3.3 presents One-Sample Kolmogorov-Smirnov (K-S) test statistics of the Base ratios, namely for Equity to Loans (ETL), Loans to Deposits (LTD), Loans to Total Assets (LTA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Sales Growth Index (SGI), Interest (Sales) Receivables Index (IRI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Equity (ROE), Return on Assets (ROA), Equity to Total Assets (ETA) ratios run with the EM1 model at 99% Confidence Interval Level. *Source:* Own calculation and presentation.

By analysing Table 5.3.3, it can be concluded that *'p-values'* or '*Asymp. Sig. (2-tailed)'* values for all variables results are 0.000. Apart from the Loan to Asset (LTA), the two-tailed probability value, Asymp. Sig. (2-tailed), is 0.025 and for the Interest (Sales) Receivables Index (IRI), it is 0.002. Part of the K-S test is the Monte Carlo Sig. (2-tailed) Sig. test. Monte Carlo Sig. (2-tailed) Sig. test calculates Lower and Upper Bounds, at a 99% confidence interval. For the 13 ratios, the result are 0.000, except for the LTA ratio for the Upper Bound level which is 0.028 and for the Lower Bound level, it is 0.017. As for the IRI, the Upper Bound is 0.005 and the

Lower Bound is 0.001, still below the 0.01 significance level. In Table 5.3.3 low mean values suggest that in a set of values, they are next to the central point, i.e. next to the axis. A slightly higher but still low Standard Deviation values indicate that they are not widely spread, in other words, they are spread around the mean (Abbott, 2014). When results are *'... highly statistically significant…'*, '*By this they usually mean that when they reject the null hypothesis, the probability of committing a Type I error (i.e., α) is a small number, usually 1 percent.*' – Gujarati (1995, p.123). Gujarati (1995, p.123) also points out that researchers make the decision '*whether a statistical finding is significant, moderately significant or highly significant*'.

Table 5.3.4 presents Descriptive statistics results for the 13 ratios calculated with the EM1 model for all sample, at a 99% confidence interval for the mean. Table 5.3.4 is shown in *Appendix 4*. The results confirm that low *p*-values equal, or are below 1%, and it may be concluded that the results are statistically highly significant. Part of Table 5.3.4 shows the Skewness and Kurtosis results in column two and three, and they are not equal or approximate to zero for all ratios. Column two presents the Statistics of Skewness and Kurtosis where all the ratios are higher than 1 except for Loan to Asset (LTA), its Statistics of Skewness is 0.036 and its Kurtosis is 0.873, which indicates that only the LTA test has a normal distribution.

The third column in Table 5.3.4 shows the results for Standard Error or 'Std. Error' of each ratio for Mean, as well as for Skewness and Kurtosis. For all ratios, Std Error is below 0.0 whereas Std Error for Mean for ROE is 0.32985. Std error for all ratios for Skewness is 0.165 and for Kurtosis it is 0.328. Std. Error results show the 'accuracy' of the statistical sample. 'Std Error' is *'... a distribution of the set of values of the estimator obtained from all possible samples of the same size from a given population.*', Gujarati (1995, pp.70-71).

The results from Tables 5.3.3 and 5.3.4, at a 99% confidence interval, were calculated per EM1 model, for hypothesis, **H0$_{(a)}$:** *Credit institutions (Banks) in Hungary do not manage earnings*, 'may' be rejected. The 'may' term is taken from Gujarati (1995, p.129) who is suggesting, '... *in accepting a null hypothesis we should always be aware that another null hypothesis may be equally compatible with the data. It is therefore preferable to say that we* ***may*** *accept the null hypothesis rather than we (do) accept it.'*

Same as for the 99% Confidence level, Table 5.3.5 presents test statistics of the earnings management (EM1) model of the Non-parametric One-Sample Kolmogorov-Smirnov (K-S) test with Monte Carlo simulation, run for each of the 13 ratios with a 95% confidence interval level:

Table 5.3.5. One-Sample Kolmogorov-Smirnov (K-S) Test of Base ratios run with the EM1 model at 95% Confidence Interval Level

		ETL	LTD	LTA	GYEA	RPF	SGI	IRI	GMI	NIM	PATM	ROE	ROA	ETA
Number of Observation		320	327	394	421	404	374	367	373	372	402	218	379	305
Mean		.002	.026	.002	.003	.005	.079	.001	.002	.002	.022	-.653	.000	.001
Std. Deviation		.144	.430	.048	.151	.232	.887	.130	.097	.056	.325	4.870	.006	.077
Absolute		.407	.223	.074	.273	.463	.306	.095	.148	.179	.252	.321	.186	.441
Positive		.407	.223	.056	.273	.463	.306	.095	.148	.179	.252	.268	.153	.441
Negative		-.390	-.163	-.074	-.248	-.450	-.177	-.079	-.140	-.141	-.236	-.321	-.186	-.422
Kolmogorov-Smirnov Z		7.287	4.038	1.479	5.596	9.314	5.915	1.828	2.861	3.454	5.054	4.735	3.618	7.699
Asymp. Sig. (2-tailed)		0.000	0.000	.025	0.000	0.000	0.000	.002	.000	0.000	0.000	0.000	0.000	0.000
Monte Carlo Sig. (2-tailed)		.000	.000	.023	.000	.000	.000	.003	.000	.000	.000	.000	.000	.000
95% Confidence Interval	Lower Bound	.000	.000	.020	.000	.000	.000	.002	.000	.000	.000	.000	.000	.000
	Upper Bound	.000	.000	.026	.000	.000	.000	.004	.000	.000	.000	.000	.000	.000

Notes: Table 5.3.5 shows Kolmogorov-Smirnov (K-S) test statistics at 95% confidence interval level for Equity to Loans (ETL), Loans to Deposits (LTD), Loans to Total Assets (LTA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Sales Growth Index (SGI), Interest (Sales) Receivables Index (IRI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Equity (ROE), Return on Assets (ROA), Equity to Total Assets (ETA) ratios. *Source:* Own calculation and presentation.

Examining the Monte Carlo Sig. (2-tailed) results in Table 5.3.5 Lower and Upper Bound for 95% Confidence Interval level for all 11 ratios *p*-values are 0.000. As for the LTA for the Upper Bound level, the *p*-value is 0.026 and for the Lower Bound level, the *p*-value is 0.020. As for the Interest (Sales) Receivables Index (IRI) Upper Bound Confidence Interval, the *p*-value of 0.004 is below 0.05 and Lower Bound of the 95% Confidence Interval, the *p*-value of 0.002 is also bellow 0.05. Monte Carlo simulation tests results are statistically significant at a 95% Confidence Interval for both Lower and Upper Bound levels. It may be concluded that the results in Table 5.3.5 at a 95% Confidence Interval of the 13 ratios are not normally distributed. In Table 5.3.5, the mean values for all ratios are low, below zero values, suggesting that in a set of values they are next to the central point, i.e. next to the axis. A slightly higher, but still low Standard Deviation values indicate that they are not widely spread, that is, they are spread around the mean. Analysing Asymp. Sig. (2-tailed), a two-tailed probability value or *p*–value, in Table 5.3.5., only the Loan to Asset (LTA), out of the 13 ratios, has a *p*–value of 0.025 and the IRI has a *p*–value of 0.002 and fails **H0(a):** the hypothesis at a 95% confidence interval. The Loan to Assets (LTA) and the Interest (Sales) Receivables Index (IRI) are not normally distributed, as both the LTA and the IRI are inferior to $p = 0.05$ value, and are in the critical or rejection region. The rest of the 11 ratio *p*-values are 0.000 and lower than 0.05 ($p < 0.05$) and are statistically significant at a 95% Confidence Interval. It may be concluded that in Table 5.3.5, all the 13 ratios are statistically significant at a 95% Confidence Interval Level.

Table 5.3.6 shown in *Appendix 4*, presents Descriptive statistics calculated for all ratios, for all sample, tested with earnings management model 1, EM1, at a 95% Confidence Interval to examine 'Skewness and Kurtosis' as well as the 'Std. Error'. In Table 5.3.6, column two shows the Statistics of Skewness and Kurtosis, where all ratios are higher than 1 except the Loan to Total Assets (LTA), where LTA has a Skewness of 0.036 and a Kurtosis of 0.873, which suggests that the 'Skewness and Kurtosis' results for the LTA test have a normal distribution. The third column shows results for Standard Error or 'Std. Error' of each ratio for Mean, as well as for Skewness and Kurtosis. For all ratios, the Mean Std. Error is below 0.0 whereas the Std. Error of the Mean for the ROE is 0.32985. Std error for all ratios for Skewness is 0.165 and for Kurtosis, it is 0.328. The standard error of the mean is *'... a distribution of a set of values of the estimator obtained from all possible samples of the same size from a given population.'* - Gujarati (1995, p.70). Table 5.3.6 presents the 95% Confidence Interval that yields the same results for

Std Error as well as for ‘Skewness and Kurtosis’ as in case of the 99% Confidence Interval, see Table 5.3.4. Therefore ‘accuracy’ of the statistical sample for the 95% Confidence Interval is the same as for the 99% Confidence Interval.

Thomas (1997, p.55) writes *...smaller the level of significance at which we can reject H_0, the stronger is the rejection. For example, a rejection of H_0 at the 0.01 level of significance is a stronger rejection than one at only the 0.05 level, because the chance of error is smaller'.* For example rejecting H_0: when it is actually true, is referred to as a *‘Type I error’* and when accepting H_0: when it is false, is referred to as a *‘Type II error’*, see Thomas (1997, p.58).

It may be concluded from the test results for Earnings Management testing Model 1, **EM1,** which was run at a 95% and a 99% Confidence Interval and Significance levels of 5% and 1% respectively, that the hypothesis:

$H0_{(a)}$: *Credit institutions (Banks) in Hungary do not manage earnings*

‘may’ be rejected.

The same as in the case of EM1 model, test statistics were run for the Earnings Management model 2, or EM2, with 99% and 95% confidence internal levels. Chapter 4, Subsection 4.4.3 explains the **EM2** model and the Degeorge, Patel and Zeckhauser’s (1999, p.31) formula.

Table 5.3.7 presents test statistics of the EM2 model for each of the 14 ratios with a 99% confidence interval for Monte Carlo Sig. run under the One-Sample Kolmogorov-Smirnov (K-S) test. The results are as follows:

Table 5.3.7. One-Sample Kolmogorov-Smirnov(K-S) Test of Base ratios run with EM2 model at 99% Confidence Interval Level

		DTE	ETL	LTD	LTA	GYEA	RPF	SGI	IRI	GMI	NIM	PATM	ROE	ROA	ETA
Number of Observation		408	356	402	492	507	489	422	414	420	420	492	359	424	343
Mean		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Std. Deviation		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	1.000	1.000	1.000	1.000
Absolute		.380	.406	.256	.086	.258	.452	.291	.368	.158	.171	.192	.359	.196	.431
Positive		.372	.398	.256	.086	.238	.451	.267	.368	.158	.170	.188	.350	.185	.419
Negative		-.380	-.406	-.225	-.086	-.258	-.452	-.291	-.367	-.157	-.171	-.192	-.359	-.196	-.431
Kolmogorov-Smirnov Z		7.685	7.664	5.129	1.914	5.815	9.994	5.988	7.493	3.229	3.494	4.256	6.799	4.034	7.990
Asymp. Sig. (2-tailed)		0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Monte Carlo Sig. (2-tailed)		.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
99% Confidence Interval	Lower Bound	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Upper Bound	.000	.000	.000	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Notes: Table 5.3.7. presents K-S test statistics for EM2 model, for all sample, for Debt to Equity (DTE), Equity to Loans (ETL), Loans to Deposits (LTD), Loans to Total Assets (LTA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Sales Growth Index (SGI), Interest (Sales) Receivables Index (IRI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Equity (ROE), Return on Assets (ROA), Equity to Total Assets (ETA) ratios. *Source:* Own calculation and presentation.

After examining Asymp. Sig. (2-tailed), a two-tailed probability value, or *p*-value, it can be concluded that all ratios have *p*-values lower than 0.000, except the Loan to Total Assets (LTA) ratio, which has a *p*-value of 0.001. These results are much lower than the significance level of 0.01, which means that they are not normally distributed; therefore, *p*-values show test results of statistically high significance. Analysing the Monte Carlo Sig. (2-tailed) results, this study concludes that all ratios have lower *p*-values of 0.000, except the Loan to Total Assets (LTA) ratio which has a 0.000 *p*-value at Lower Bound and a 0.002 *p*-values at Upper Bound. The Monte Carlo results confirm the Asymp. Sig. (2-tailed) results.

Table 5.3.8, shown in *Appendix 4*, presents the Descriptive statistics output for EM2 at a 99% confidence interval level, run in SPSS to examine each ratios Std. Error of Skewness and Kurtosis. The statistical results for Skewness and Kurtosis are shown in column two, and are not equal or approximate to zero for all ratios. Loan to Total Assets (LTA) shows a Skewness of 0.084 and a Kurtosis of 0.379 suggesting that it is normally distributed. The rest of the ratios do not have normal distribution values. The third column in Table 5.3.8 shows the results of each ratio. Standard Error or 'Std. Error' for all ratios is at a 99% confidence interval for Mean. For all ratios, Std Error is below 0.0, which confirms the 'accuracy' of the statistical sample.

After examining descriptive and Kolmogorov-Smirnov (K-S) test statistics at the 99% confidence interval level, the next table, Table 5.3.9, analyzes K-S statistics at a 95% confidence interval level in combination with Monte Carlo tests with the EM2 model. The output of the K-S test is shown in Table 5.3.9:

Table 5.3.9. One-Sample Kolmogorov-Smirnov (K-S) Test of Base ratios run with EM2 model at 95% Confidence Interval Level

		DTE	ETL	LTD	LTA	GYEA	RPF	SGI	IRI	GMI	NIM	PATM	ROE	ROA	ETA
Number of Observation		408	356	402	492	507	489	422	414	420	420	492	359	424	343
Mean		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Std. Deviation		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	1.000	1.000	1.000	1.000
Absolute		.380	.406	.256	.086	.258	.452	.291	.368	.158	.171	.192	.359	.196	.431
Positive		.372	.398	.256	.086	.238	.451	.267	.368	.158	.170	.188	.350	.185	.419
Negative		-.380	-.406	-.225	-.086	-.258	-.452	-.291	-.367	-.157	-.171	-.192	-.359	-.196	-.431
Kolmogorov-Smirnov Z		7.685	7.664	5.129	1.914	5.815	9.994	5.988	7.493	3.229	3.494	4.256	6.799	4.034	7.990
Asymp. Sig. (2-tailed)		0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Monte Carlo Sig. (2-tailed)		.000	.000	.000	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
95% Confidence Interval	Lower Bound	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Upper Bound	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Table 5.3.9 presents K-S test statistics, for all sample, for Debt to Equity (DTE), Equity to Loans (ETL), Loans to Deposits (LTD), Loans to Total Assets (LTA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Sales Growth Index (SGI), Interest (Sales) Receivables Index (IRI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Equity (ROE), Return on Assets (ROA), Equity to Total Assets (ETA) ratios. *Source:* Own calculation and presentation.

By examining Asymp. Sig. (2tailed), a two-tailed probability value in Table 5.3.9, it was noticed that only Loan to Total Assets (LTA) has probability values, *p*-value of 0.001, whereas for the rest of the ratios, *p*-values are 0.000 or lower. The *p*-value results would suggest that the K-S test at a 95% confidence interval is lower than the 0.05 significance level, that is 0.05 > 0.001 and 0.05 > 0.000, which suggests a conclusion that *p*-values are highly significant. In other words, test statistics are in the critical region. By analyzing Mean and Standard Deviation (SD) it can be shown that low mean values of 0.000 suggest that in a set of values, and that they are next to the central point, i.e. next to the axis. SD values of 1 for all ratios, while slightly higher, they are still low values for Standard Deviation indicating that they are not widely spread, but spread around the mean. Monte Carlo Sig. (2-tailed) *p*-values with

Upper and Lower Bound, the *p*-value for Loans to Total Assets (LTA) is 0.002, still below significance level of 0.05 that is, 0.05 > 0.002 for LTA. Monte Carlo Sig. (2-tailed) *p*-values with Upper and Lower Bound are 0.000, except for LTA, which has *p*-values between 0.001 for Lower and 0.003 for Upper Bound. The Monte Carlo Experiment *p*-values confirm the Asymp. Sig. (2-tailed) result. It may be concluded that the Kolmogorov- Smirnov (K-S) test results for a 95% Confidence Interval are highly significant with *p*-values of 0.000, Loan to Total Assets (LTA) being an exception with a *p*-value of 0.001, but still within statistically highly significant result.

Descriptive Statistics for all ratios were tested with EM2 model, ratios for Skewness and Kurtosis at a 95% Confidence Interval level, and results are presented in Table 5.3.10 in *Appendix 4*. Skewness and Kurtosis results are in column two, and they are not equal or approximate to zero for all ratios. The same as in the case of the 99% Confidence Interval level, the results are presented in Table 5.3.8. The Loan to Total Assets (LTA) shows Skewness of 0.084 and Kurtosis of 0.379 values and a normal distribution at a 95% Confidence Interval level in Table 5.3.10. The rest of the ratios do not display normal distribution values. The third column shows the results of each ratio's Standard Error or 'Std. Error' for all ratios at a 95% confidence interval for Mean. For all ratios, Std Error is below 0.0. This confirms the 'accuracy' of the statistical sample at a 95% Confidence Level.

5.3.1.4. Summary of the Visual Investigation of the 14 Ratios and Statistical testing with the Earnings Management 1 and Earnings Management 2 models

Section 5.3.1 outlined *Testing Approach 3.1*, which consists of both visual and additional statistical test results of the 14 ratios: Interest (Sales) Receivables Index (IRI), Sales Growth

Index (SGI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Assets (ROA), Return on Equity (ROE), Rate Paid on Funds (RPF), Loans to Total Assets (LTA), Loans to Deposits (LTD), Equity to Loans (ETL), Gross Yield on Earning Assets (GYEA) and Debt to Equity (DTE) with Earnings Management testing Model 1 and Model 2, EM1 and EM2. Tests were run in SPSS with Kolmogorov-Smirnov, and comprised Descriptive tests at a 95% and a 99% confidence interval levels, in order to test Hypothesis, **$H0_{(a)}$:**.

Section 5.3.1.3 outlines the results of the 14 ratios and they are presented in Tables 5.3.3 to 5.3.10 all being tested per EM1 and EM2 models. In Asymp. Sig. (2-tailed), a two-tailed probability value, *p-v*alues, tested per EM1 and EM2 models, for all 13 ratios *p*-value results are 0.00 or lower, with *p*-values significance level of 0.01 or 0.05 and Confidence Interval levels of 99% and 95%. The results confirm that they are statistically significant. Monte Carlo Sig. (2-tailed) results also show *p*-values of 0.00 or lower. Thomas, (1997, p.6) states, *'Monte Carlo Experiment reinforces the results'*. However, the only ratio out of 14, namely the Loans to Total Assets (LTA) ratio, calculated with the EM1 model, LTA with a *p*–value of 0.025 holds to **$H0_{(a)}$:** at a 99% confidence interval level. Therefore, it can be concluded that LTA is normally distributed, but with weak results of 0.025 that are greater than $p = 0.01$ ($p < 0.025$). The LTA results fail at the 95% confidence interval level, as a *p*–value of 0.025 is smaller than the significance level of $p = 0.05$, or $p > 0.025$ as calculated under the EM1 model. However, Loan to Total Assets, LTA, ratio *p*–value results of 0.001, calculated with the EM2 model, fails both the 99% and the 95% Confidence Interval levels, for both 0.01 and 0.05 significance levels. Monte Carlo Sig. (2-tailed) results also show *p*-values of 0.00 or lower, thus reinforcing the statistical results. Test results confirm the banks' corporate dealings. For example, by examining their lending policy for years from 2003 to 2013 as shown in Figure 3.1, Figure 3.2, Figure 3.3 in Chapter 3, this study concludes that there was an increasing and continuous aggressive lending policy in place. Furthermore, in Chapter 3, Figure 3.4 analyzes Changes in Credit Conditions and Figure 3.5 presents outstanding corporate loans. Both Figures 3.4 and 3.5 from Chapter 3 show that changes in credit conditions and a decline in corporate loans from 2008 were gradually altered but were not eliminated, due to the worldwide financial crisis that began in 2008. This might explain why the Loan to Total Assets (LTA) ratio has normal distribution results for the EM1 model and only at a 99% Confidence Interval level.

The significance level is the probability of committing true or false hypothesis acceptance. Gujarati, (1995, pp.132-133) writes that The Exact Level of Significance: The *p*-value, also known as *'... the observed or exact level of significance or the exact probability of committing a Type 1 error'*. Thomas (1997, p.55) writes *'...smaller the level of significance at which we can reject H_0, the stronger is the rejection. For example, a rejection of H_0 at the 0.01 level of significance is stronger rejection than one at only the 0.05 level, because the chance of error is smaller'.* For example rejecting an H0: when it is actually true, it is called a *'Type I error'* and when accepting H0:, when it is false, it is called a *'Type II error'*, Thomas (1997, p.58). It was concluded that from the 14 tested ratio results for EM1 and EM2 models, for a 95% and a 99% Confidence Interval testing levels, and with 0.05 and 0.01 significance levels, hypothesis **$H0_{(a)}$:**: *Credit institutions (Banks) in Hungary do not manage earnings,* 'may' be rejected.

Similarly to this study, earnings management was investigated by Shen and Chih (2005), and the authors report earnings management in their banking sample for nearly all sampled countries, a total of 48, including European banks, but excluding Eastern European banks. The authors find evidence of earnings management almost in all sampled countries. The authors tested banking data with a risk-return model of Fiegenbaum (1990), and also applied Burgstahler and Dichev's (1997, p.103) model, and additionally tested Degeorge, Patel and Zeckhauser's (1999, p.31) model too. Shen and Chih (2005, p.2696) conclude, *'... it is striking that stricter law enforcement contrarily results in more earnings management, since managers feel the need to avoid earnings decreases; thus possibly lowering the quality of financial reports of the banking industry'.*

5.3.2. Results of Testing Approach 3.2

It was highlighted that Beaver, McNichols and Nelson (2007) investigate income tax and special items effect in connection with discontinuity of earnings around and at zero point. It is of interest to test Hypothesis $\mathbf{H0_{(b)}}$**:** with earnings management 1 model, or EM1, of this study with Beaver, McNichols and Nelson's (2007, p.540) model, applying Hungarian credit institutions data of this study, and to see if there is a significant difference in test results as well as in the distribution of histograms. Beaver, McNichols and Nelson (2007, p.540) modify the last part of the Burgstahler and Dichev (1997, p.103) model, and argue that Burgstahler and Dichev's (1997, p.103) model standard deviation of the difference 'SDi' model is overstated and the EM1 is understated. Furthermore, Beaver, McNichols and Nelson (2007, p.526) claim that, '…*income tax and special items contribute to a discontinuity at zero in the distribution earnings'.*

Calculations under the Beaver, McNichols and Nelson's (2007, p.540) model were done in *'Burgstahler calculation method of all variables - with Beaver - Mcnichols model of sd.xlsx'* excel sheet for both scaled earnings, and scaled earnings change variables. To test the model of Beaver, McNichols and Nelson (2007, pp.535-536), only the modified part of the standard deviation of the difference formula was applied in this study, as it is stated in the footnote of the Beaver, McNichols and Nelson (2007, p.540) study. The reason for doing this was to verify whether the formula modification makes a significant difference in the test statistics. This study does not exclude tax and special items for testing discontinuity.

Test statistics was performed in SPSS for Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or change in earnings divided by Total Assets in period (t-2) ratios, applying the Kolmogorov-Smirnov tests statistics with a 95% and a 99% confidence interval level. Descriptive test statistics was also calculated with 25, 50 and 75 percentile values for EM1 under the modified Beaver, McNichols and Nelson's (2007, p.540) standard deviation of the difference 'SDi' model. Histograms for both scaled earnings, and scaled earnings change variables are, as expected, asymmetric.

The One-Sample Kolmogorov-Smirnov test statistics tables for the 95% and the 99% Confidence intervals, with the modified Beaver, McNichols and Nelson's (2007, p.540) Standard Deviation of the difference formula for scaled earnings are presented below:

Table 5.3.11. Test statistics of Scaled Earnings run with modified Beaver et al. 2007 model

			Scaled Earnings
Number of Observation			383
Normal Parameters	Mean		-.0001
	Std. Deviation		.0075
Most Extreme Differences	Absolute		.174
	Positive		.160
	Negative		-.174
Kolmogorov-Smirnov Z			3.399
Asymp. Sig. (2-tailed)			0.000
Monte Carlo Sig. (2-tailed)	Sig.		.000
	95% Confidence Interval	Lower Bound	0.000
		Upper Bound	.008

Notes: 5.3.11 presents test statistics of Scaled Earnings, or Profit after Tax divided by Total $\text{Assets}_{(t-1)}$ run with EM1 model, with modified Beaver et al. 2007 model, with One-Sample Kolmogorov-Smirnov test and with 95% Confidence Interval level, for the period 2001-2011. *Source:* Own calculation and presentation.

Table 5.3.12. Test statistics of Scaled Earnings run with modified Beaver et al. 2007 model

			Scaled Earnings
Number of Observation			383
Normal Parameters	Mean		-.0001
	Std. Deviation		.0075
Most Extreme Differences	Absolute		.174
	Positive		.160
	Negative		-.174
Kolmogorov-Smirnov Z			3.399
Asymp. Sig. (2-tailed)			0.000
Monte Carlo Sig. (2-tailed)	Sig.		.000
	99% Confidence Interval	Lower Bound	0.000
		Upper Bound	.012

Notes: Table 5.3.12 shows test statistics of Scaled Earnings, or Profit after Tax divided by Total $\text{Assets}_{(t-1)}$ run with the modified Beaver et al. 2007 model and with the One-Sample Kolmogorov-Smirnov test with a 99% Confidence Interval level, for the period 2001-2011. *Source:* Own calculation and presentation.

By examining Table 5.3.11 and Table 5.3.12 for the Asymp. Sig. (2-tailed), we see that a two-tailed probability value, or *p*-values are 0.000, which are 'highly' significant results and are far below the 0.01 or 0.05 and even 0.001 *p*-values. The lower the *p*-values, the lower the probability to 'commit a *Type I error – a probability of rejecting the true H0: hypothesis',* Gujarati (1995, p.787). In both tables the Standard deviation, SD, is 0.0075, a low value, which would suggest that the SD does not 'deviate' from the mean, or in other words, distribution with a low SD would suggest a tall, narrow shape. See Thomas (1997, p.13).

The following tables, Table 5.3.13 and Table 5.3.14 show test statistics of the One-Sample Kolmogorov-Smirnov test statistics tables for the 95% and 99% Confidence intervals, with a modified Beaver, McNichols and Nelson (2007, p.540) Standard Deviation of the difference formula for the scaled earnings change:

Table 5.3.13. Test statistics of Scaled Earnings Change run with the modified Beaver et al. 2007 model

			Scaled Earnings Change
Number of Observation			313
Normal Parameters	Mean		.0001
	Std. Deviation		.0104
Most Extreme Differences	Absolute		.226
	Positive		.210
	Negative		-.226
Kolmogorov-Smirnov Z			3.997
Asymp. Sig. (2-tailed)			0.000
Monte Carlo Sig. (2-tailed)	Sig.		.000
	99% Confidence Interval	Lower Bound	0.000
		Upper Bound	.015

Notes: Table 5.3.13 presents test statistics of Scaled Earnings Change, or Change in Earnings divided by Total $Assets_{(t-2)}$ run with the modified Beaver et al. 2007 model and with the One-Sample Kolmogorov-Smirnov test with a 99% Confidence Interval level, for the period 2002-2011. *Source:* Own calculation and presentation.

Table 5.3.14. Test statistics of Scaled Earnings Change run with the modified Beaver et al. 2007 model

			Scaled Earnings Change
Number of Observation			313
Normal Parameters	Mean		.000059
	Std. Deviation		.0103874
Most Extreme Differences	Absolute		.226
	Positive		.210
	Negative		-.226
Kolmogorov-Smirnov Z			3.997
Asymp. Sig. (2-tailed)			0.000
Monte Carlo Sig. (2-tailed)	Sig.		.000
	95% Confidence Interval	Lower Bound	0.000
		Upper Bound	.010

Notes: Table 5.3.14 shows test statistics of Scaled Earnings Change, or Change in Earnings divided by Total Assets$_{(t-2)}$ run with modified Beaver et al. 2007 model and with the One-Sample Kolmogorov-Smirnov test with a 95% Confidence Interval level, for the period 2002-2011. *Source:* Own calculation and presentation.

By comparing test statistics in Table 5.3.13 and in Table 5.3.14, with both Confidence Interval levels, it can be seen that they have similar results for scaled earnings change to Table 5.3.11 and Table 5.3.12 for scaled earnings ratio results. Tables 5.3.11 to 5.3.14 with Confidence Interval levels of 99% and 95% have very low Mean and low Standard deviations, in both cases bellow 0.0, whereas *p*-values for Asymp. Sig. (2-tailed) for both 95% and 99% confidence interval levels is below 0.000, a statistically highly significant result. Monte Carlo Sig. (2-tailed) test results of Sig. *p*-values of 0.000 confirm the statistical results for Tables 5.3.11 to 5.3.14.

Apart from statistical tests, histograms were created to investigate the distribution and the shape of Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2) ratios.

Figure 5.3.2.1. Histogram of Scaled Earnings run with the Beaver et al. modified model

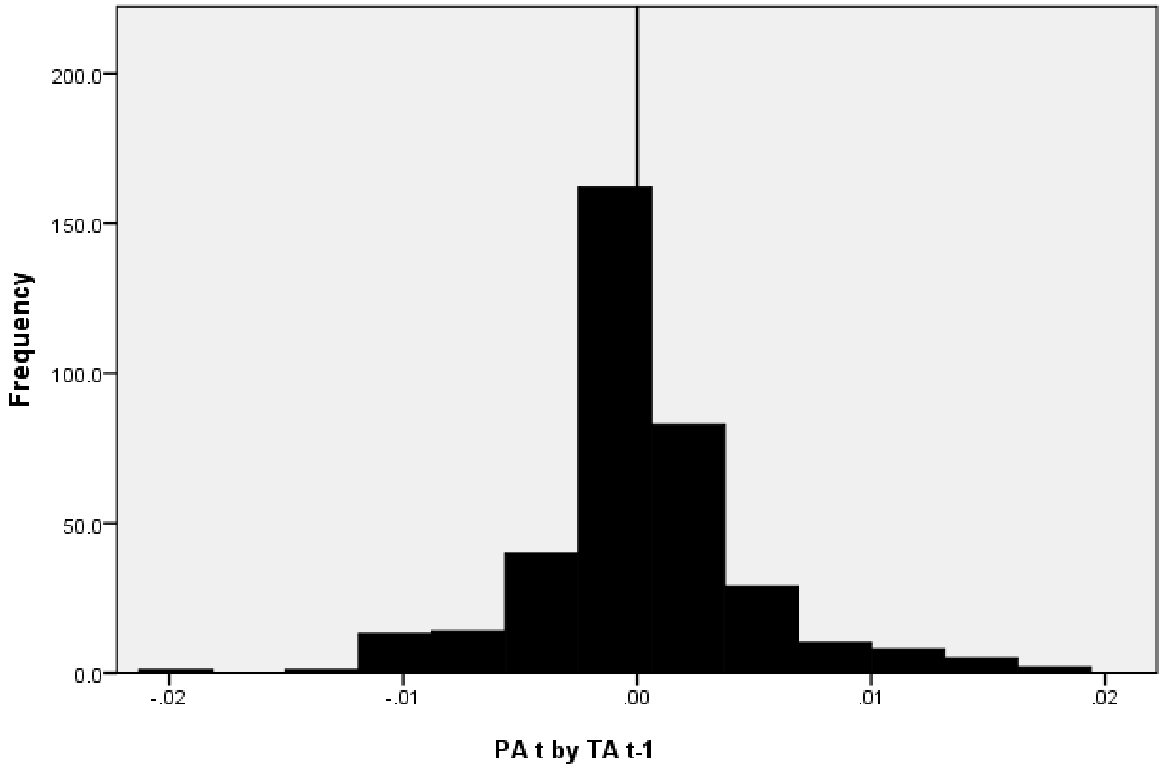
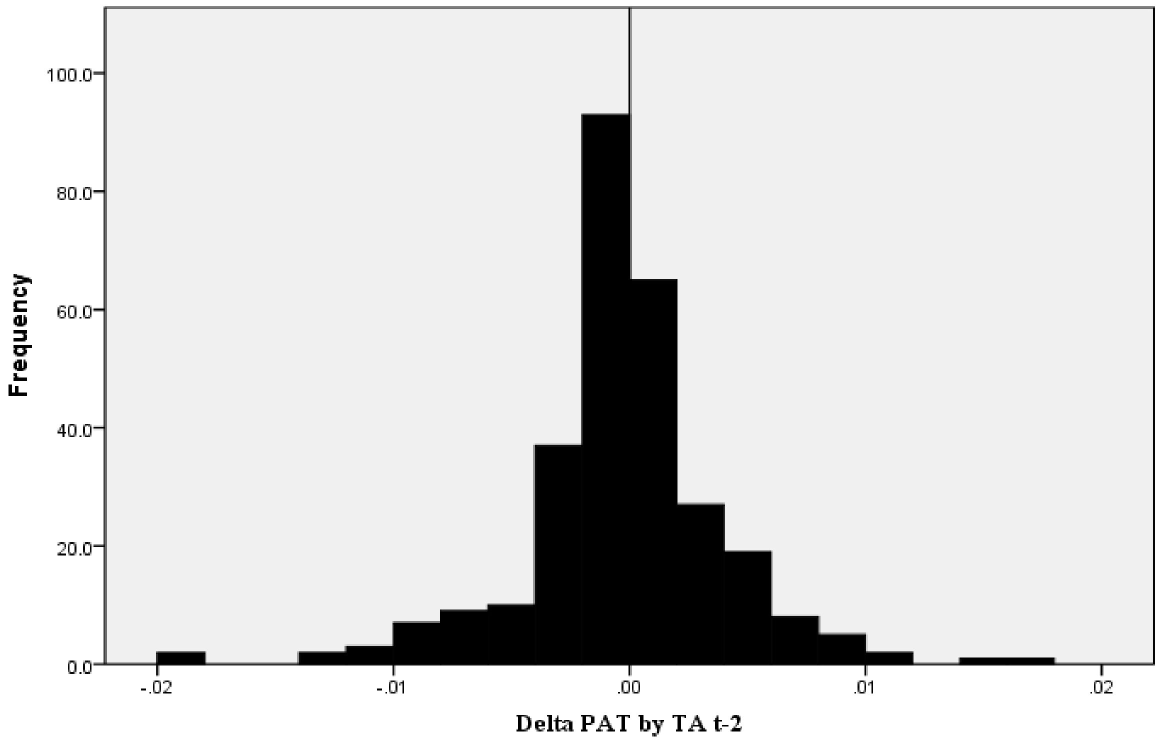


Figure 5.3.2.2. Histogram of Scaled Earnings Change run with the Beaver et al. modified model



Notes: Figure 5.3.2.1 and Figure 5.3.2.2 show histograms for Scaled Earnings for the period of 2001-2011, and Scaled Earnings Change for the period of 2002-2011. Both histograms bin size were set to 0.01 with -0.02 minimum and 0.02 maximum scales. Histogram distributions have an asymmetrical shape, a huge jump just before and at zero and are slightly skewed to the right with visibly high peakedness. *Source:* Own calculation and presentation.

Skewness and Kurtosis for Scaled Earnings and Scaled Earnings Change variables are confirmed in test statistics and are shown in Table 5.3.15:

Table 5.3.15. Descriptive test statistics run with the Beaver et al. 2007 model

		Scaled Earnings	Scaled Earnings Change
Number of Observation		383	313
Mean		-.0001	.0001
Std. Deviation		.0075	.0104
Skewness		-.8791	.9332
Std. Error of Skewness		.1247	.1378
Kurtosis		10.33	14.60
Std. Error of Kurtosis		.2487	.2747
Percentiles	25	-.0018	-.0020
	50	-.0001	-.0002
	75	.0019	.0020

Notes: Table 5.3.15 presents Descriptive Statistics run for the Beaver et al. 2007 model for the period of 2001-2011. *Source:* Own calculation and presentation.

Beaver, McNichols and Nelson's (2007, p.540) modified Burgstahler and Dichev's (1997, p.103) model of the modified standard deviation of the difference 'SDi' model fails to uphold the **$H0_{(b)}$:** with the **EM1** model with Beaver, McNichols and Nelson's (2007, p.540) modified Burgstahler and Dichev's (1997, p.103) model. Comparison is made between Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or change in Earnings divided by Total Assets in period (t-2) ratios histograms from Figure 5.3.2.1 and Figure 5.3.2.2 that were run with Beaver, McNichols and Nelson's (2007, p.540) model, to Figure 5.1.1 and Figure 5.1.3 histograms that were run with the Burgstahler and Dichev's (1997, p.103) model. It was observed that distributions of histograms show discontinuity and are almost identical in Figures 5.3.2.1 and 5.3.2.2 with the modified and also with Figures 5.1.1 and 5.1.3 with the non-modified Burgstahler and Dichev's (1997, p.103) models. Histograms also confirm test statistics results for both the modified and the non-modified models. Tests results and histograms of this study for Beaver, McNichols and Nelson's (2007, p.540) model fail to reject the Burgstahler and Dichev's (1997, p.103) model test results in respect to the modified standard deviation of difference, or 'SDi'. Burgstahler and Chuck (2015, p.10) point out with regard to special items that, *'... evidence that removing a component of earnings eliminates the discontinuity in earnings distribution is not evidence of unique role for that component, but rather evidence that the component plays a role similar to other non-trivial components of earnings'*. Burgstahler and Chuck (2015, p.10) argue, *'...differential tax rate explanation is limited strictly to discontinuities where the tax rate for earnings immediately above the benchmark is substantially higher than the tax rate immediately below the benchmark'*. (Differential tax rate refers to different tax rates, for example, preference to Capital gain tax rather than to dividend tax rate). Additionally, Burgstahler and Chuck (2015, p.11) outline, *'... there is no reason to believe that tax rates are markedly higher for increase in earnings than for decreases in earnings or for positive earnings surprises than for negative earnings surprises…'*.

It may be concluded that statistical tests and histogram results in this study run with the modified 'SDi' for Scaled Earnings and Scaled Earnings Change ratios with the Hungarian credit institution data do not support Beaver, McNichols and Nelson's (2007, p.540) tests results, which support the claim that income tax and special items influence discontinuity for zero earnings. The results of this study reject Beaver, McNichols and Nelson's (2007, p.526) claim that *'…income tax and special items contribute to a discontinuity at zero in the distribution earnings'*. It is, however, a fact that Beaver, McNichols and Nelson (2007, p.540) tested the same variables and the same sample industries as Burgstahler and Dichev (1997). It should additionally be pointed out that Beaver, McNichols and Nelson (2007) use different approaches to statistical testing, including regression analysis, from the ones applied in this study.

5.4. Results of Testing Approach 3.3

In the search for earnings manipulation, Hungarian credit institutions' data was further tested per asset size. For testing purposes, the Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2) ratios were tested, for both large (LC) and small companies (SC). The tests were performed per Earnings Management testing model number 1 and 2, namely the EM1 and EM2 models. Holland and Ramsay (2003, p.54) test data on assets size with the same variables as it was done in this study.

5.4.1. Results of Testing Approach 3.3 – Tested with the Earnings Management 1 model

Calculation of Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2) ratios were performed for large and small companies with the Burgstahler and Dichev's (1997, p.103) Earnings Management testing model 1, or the EM1 model and the Degeorge, Patel and Zeckhauser's (1999, p.31) Earnings Management testing model 2, i.e. the EM2 model. Test statistics of the Kolmogorov-Smirnov one-sample test statistics (K-S) were run in SPSS to test the **$H0_{(c)}$:** hypothesis which reads as: **$H0_{(c)}$:** *Large and Small Credit institutions (Banks) scaled by median of Total Assets in Hungary do not manage earnings to avoid earnings decreases.*

Test results of K-S for *Testing Approach 3.3* are presented in Table 5.4.1 with a 99% Confidence Interval level and Table 5.4.2 with a 95% Confidence Interval level:

Table 5.4.1. Total Assets (TA) scaled by Large (LC) and Small (SC) companies with EM1 model

			Scaled Earnings		Scaled Earnings Change	
			L.C.	S.C.	L.C.	S.C.
Number of Observation			198	179	179	129
Normal Parameters	Mean		-.0001	-.0002	-.0002	.0007
	Std. Deviation		.0067	.0177	.0133	.0167
Most Extreme Differences	Absolute		.213	.203	.279	.193
	Positive		.213	.192	.272	.193
	Negative		-.210	-.203	-.279	-.162
Kolmogorov-Smirnov Z			2.992	2.716	3.737	2.193
Asymp. Sig. (2-tailed)			.000	.000	0.000	.000
Monte Carlo Sig. (2-tailed)	Sig.		,000	,000	,000	,000
	99% Confidence Interval	Lower Bound	.000	.000	.000	.000
		Upper Bound	.007	.007	.007	.007

Notes: Table 5.4.1 presents Total Assets (TA) scaled by Large (LC) and Small (SC) companies tested with EM1 model, with the Kolmogorov-Smirnov test statistics with a 99% Confidence Interval level for Scaled Earnings and Scaled Earnings Change ratios for the period 2002-2011. *Source:* Own calculation and presentation.

Table 5.4.2. Total Assets (TA) scaled by Large (LC) and Small (SC) companies with EM1 model

			Scaled Earnings		Scaled Earnings Change	
			L.C.	S.C.	L.C.	S.C.
Number of Observation			198	179	179	129
Normal Parameters	Mean		-.0001	-.0002	-.0002	.0007
	Std. Deviation		.0067	.0177	.0133	.0167
Most Extreme Differences	Absolute		.213	.203	.279	.193
	Positive		.213	.192	.272	.193
	Negative		-.210	-.203	-.279	-.162
Kolmogorov-Smirnov Z			2.992	2.716	3.737	2.193
Asymp. Sig. (2-tailed)			.000	.000	0.000	.000
Monte Carlo Sig. (2-tailed)	Sig.		,000	,000	,000	,000
	95% Confidence Interval	Lower Bound	.000	.000	.000	.000
		Upper Bound	.004	.004	.004	.004

Notes: Table 5.4.2 shows Total Assets (TA) scaled by Large (LC) and Small (SC) companies tested with EM1 model, with the Kolmogorov-Smirnov Test with a 95% Confidence Interval level for the period 2011-2002 for Scaled Earnings and Scaled Earnings Change ratios. *Source:* Own calculation and presentation.

By examining Table 5.4.1, Asymp. Sig. (2-tailed), it can be seen that they are 0.000 for *p*-values for both Scaled Earnings; and for Scaled Earnings Change ratios for both large (LC) and small (SC) companies. The same *p*-values of 0.000 are shown under Monte Carlo Sig. (2-tailed). Lower and Upper level of the *p*-values, at a 99% Confidence Interval level, are lower than *p*-value = 0.01. Upper level *p*-values of the Monte Carlo test statistics are 0.007 for all four ratios, which is still below 0.01, or 0.01 > 0.007. The Monte Carlo test results confirm the statistical tests.

Test results in Table 5.4.2 show almost identical *p*-values at a 95% Confidence Interval as in Table 5.4.1. Only a slight difference is at the Monte Carlo Upper Bound level, where *p*-values are 0.004 for all four ratios, but still below 0.05, even below 0.01. Therefore *p*-values at a 95% Confidence Interval are 0.05 > 0.004 and 0.05 > 0.000, that is, they are 'statistically highly significant'. The sample period is 10 years for large (LC) and small (SC) companies, the same as in Holland and Ramsay's (2003, p.50) study. In both tables, the results of Mean are negative with less than -0.000 values for large companies (LC) and small companies (SC) for both variables. Except for Scaled earnings Change, Mean has a positive value with the lesser amount of 0.00, but still very low. Std. Deviation values are lower than 0.0 in both tables for both variables and for both LC and SC, suggesting that distribution is not 'dispersed'.

Table 5.4.3 shows descriptive statistics for total assets (TA) scaled by large (LC) and small (SC) companies of Mean, Sd. Deviation, and percentiles with 25%, 50% and 75% of the sample observation:

Table 5.4.3. Descriptive Statistics of Total Assets scaled by Large (LC) and Small (SC) companies

EM1 model	Number of Observation	Mean	Std. Deviation	Percentiles		
				25th	50th (Median)	75th
Scaled Earnings. Large Companies	198	-.0001	.0067	-.0016	.0000	.0015
Scaled Earnings. Small Companies	179	-.0002	.0177	-.0037	-.0002	.0040
Scaled Earnings Change. Large Comp.	179	-.0002	.0133	-.0020	-.0001	.0021
Scaled Earnings Change. Small Comp.	129	.0007	.0167	-.0046	-.0005	.0045

Notes: Table 5.4.3 presents Descriptive Statistics of Total Assets (TA) scaled by Large (LC) and Small (SC) companies for Scaled Earnings for the period 2001-2011; and Scaled Earnings Change for period 2002-2011, run with the EM1 model. *Source:* Own calculation and presentation.

Table 5.4.3 results for Mean are negative for all ratios, except for the Scaled Earnings Change ratio for Small Companies (SC). Percentiles for 25% and 50% show negative zero values for all large companies (LC) and small companies alike (SC) for both ratios. In the case of small companies (SC), Scaled Earnings ratio and large companies (LC) for Scaled Earnings Change show a small loss. The results in Table 5.4.3 of this study show overall small negative profits for Scaled Earnings; and Scaled Earnings Change ratios for both large (LC) and small companies (SC), for 25% and 50% Percentiles. Only at 75% percentiles, they show a small profit for both ratios for both SC and LC. Furthermore, the tested sample size in this study is low comparing to Holland and Ramsay's (2003) study. Holland and Ramsay (2003, p.54) test results show that large companies (LC) are '*on average profitable*', whereas in this study companies report a small loss.

Results from Tables 5.4.1 and 5.4.2 present *p*-values of 0.000 for a 95% and a 99% Confidence Interval level, that is, *p*-values of 0.000 are lower than the 0.01 significance level, i.e. 0.01 > 0.000. Statistical results from Tables 5.4.1 to 5.4.3 were tested with the **EM1** model, and confirm that hypothesis, $\mathbf{H0_{(c)}}$**:** '*Large and small Credit institutions (Banks) scaled by median of Total Assets in Hungary do not manage earnings to avoid earnings decreases*', 'may' be rejected.

5.4.2. Results of Testing Approach 3.3 – Tested with the Earnings Management 2 model

Testing Approach 3.3 for Total Assets (TA) scaled by large (LC) and small companies (SC) was also run for the EM2 model. Table 5.4.4 presents the Kolmogorov-Smirnov test statistics at a 99% Confidence Interval level for Scaled Earnings, and Scaled Earnings Change ratios with LC and SC with the Degeorge, Patel and Zeckhauser (1999, p.31), with the earnings management model 2, or EM2. The test results are as follows:

Table 5.4.4. Total Assets (TA) scaled by Large (LC) and Small (SC) companies with the EM2 model

			Scaled Earnings		Scaled Earnings Change	
			L.C.	S.C.	L.C.	S.C.
Number of Observation			223	204	199	152
Normal Parameters	Mean		.000	.000	.000	.000
	Std. Deviation		1.000	1.000	1.000	1.000
Most Extreme Differences	Absolute		.209	.194	.280	.193
	Positive		.207	.194	.267	.193
	Negative		-.209	-.184	-.280	-.186
Kolmogorov-Smirnov Z			3.115	2.774	3.949	2.375
Asymp. Sig. (2-tailed)			.000	.000	.000	.000
Monte Carlo Sig. (2-tailed)	Sig.		.000	.000	.000	.000
	99% Confidence Interval	Lower Bound	.000	.000	.000	.000
		Upper Bound	.006	.006	.006	.006

Notes: Table 5.4.4 presents Total Assets scaled by Large (LC) and Small (SC) companies tested with EM2 model, with the Kolmogorov-Smirnov test statistics for the period 2001-2012 for Scaled Earnings, and Scaled Earnings Change ratios with a 99% Confidence Interval level. *Source:* Own calculation and presentation.

Examining Table 5.4.4 i.e. *p*-values of Scaled Earnings, and Scaled Earnings Change ratios for two-tailed probability values, or Asymp. Sig. (2-tailed), it can be seen that they are 0.000 for both Large (LC) and Small companies (SC). The values are lower than the 0.01 significance level, i.e. 0.01 > 0.000. The same *p*-values of 0.000 are for Monte Carlo Sig. (2-tailed) Sig. Only Upper Bound of the 99% Confidence Interval is 0.006 for all LC and SC ratios, but still below the 0.01 significance level. Mean values for LC and SC are 0.000 with Std. Deviation of 1. Despite the low sample, the results are statistically highly significant.

Table 5.4.5 presents the Kolmogorov-Smirnov test results with the EM2 model at a 95% Confidence Interval for Scaled Earnings and Scaled Earnings Change ratios for all LC and SC companies:

Table 5.4.5. Total Assets (TA) scaled by Large (LC) and Small (SC) companies with EM2 model

			Scaled Earnings		Scaled Earnings Change	
			L.C.	S.C.	L.C.	S.C.
Number of Observation			223	204	199	152
Normal Parameters	Mean		.000	.000	.000	.000
	Std. Deviation		1.000	1.000	1.000	1.000
Most Extreme Differences	Absolute		.209	.194	.280	.193
	Positive		.207	.194	.267	.193
	Negative		-.209	-.184	-.280	-.186
Kolmogorov-Smirnov Z			3.115	2.774	3.949	2.375
Asymp. Sig. (2-tailed)			.000	.000	.000	.000
Monte Carlo Sig. (2-tailed)	Sig.		.000	.000	.000	.000
	95% Confidence Interval	Lower Bound	.000	.000	.000	.000
		Upper Bound	.004	.004	.004	.004

Notes: Table 5.4.5 shows Total Assets (TA) scaled by Large (LC) and Small (SC) companies tested with EM2 model, with the Kolmogorov-Smirnov test statistics for the period 2001-2012 for Scaled Earnings, and Scaled Earnings Change, with a 95% Confidence Interval level. *Source:* Own calculation and presentation.

Table 5.4.5 statistical results show almost identical *p*-values as in Table 5.4.4. The only difference being that Table 5.4.5 is under Monte Carlo Sig. (2-tailed) 95% Confidence Interval Upper Bound, for all ratios for both Large (LC) and Small (SC) companies, where *p*-values are 0.004. *P*-values in Table 5.4.4 are 0.000 for Asymp. Sig. (2-tailed) and Monte Carlo Sig. (2-tailed) Sig. Mean has a value of 0.000 while Std. Deviation has a value of 1 for LC and SC ratios. Table 5.4.5 test results for Asymp. Sig. (2-tailed) as well as for Monte Carlo are below *p*-values of 0.05 for given significance levels, i.e. 0.05 > 0.000. It may be concluded that the statistical results in Table 5.4.5 are statistically highly significant.

Table 5.4.6 shows Descriptive Statistics for Scaled Earnings, and Scaled Earnings Change, or ratios with large companies (LC) and small companies (SC):

Table 5.4.6. Descriptive Statistics of Total Assets scaled by Large (LC) and Small (SC) companies

EM2 model	Number of Observation	Mean	Std. Deviation	Percentiles		
				25th	50th (Median)	75th
Scaled Earnings. Large Companies	223	.000	1.000	-.1820	.0012	.2106
Scaled Earnings. Small Companies	204	.000	1.000	-.1992	.0268	.2486
Scaled Earnings Change. Large Comp.	199	.000	1.000	-.1391	-.0187	.1046
Scaled Earnings Change. Small Comp.	152	.000	1.000	-.2437	-.0175	.2537

Notes: Table 5.4.6 presents Descriptive Statistics, run with the EM2 model, for Total Assets (TA) scaled by Large (LC) and Small (SC) companies for scaled earnings, and for scaled earnings change ratios, for the period 2001-2012. *Source:* Own calculation and presentation.

Mean values are 0.000 for all 4 ratios with Std. Deviation of 1. Percentiles of the 25^{th}, 50^{th} and 75^{th} show mixed results. Results for scaled profits for SC and LC at the 25^{th} percentile are almost identical and show a small loss, whereas at 50% and 75% percentile they show small profits. For changes in scaled profits for small (SC) and large companies (LC), results at 25% and 50% show a small loss and at 75% Percentiles show a small profit. SC sample for scaled profits shows a significant 2.6% discontinuity at zero earnings. The results are significant at 0.01 as well as at the 0.05 level.

Tables 5.4.4 to 5.4.6 present results of testing with the earnings management model 2 (EM2) and they confirm that hypothesis, **$H0_{(c)}$:** *Large and small Credit institutions (Banks) scaled by median of Total Assets in Hungary do not manage earnings to avoid earnings decreases*, 'may' be rejected. The results in this study for *Testing Approach 3.3* are similar to Holland and Ramsay's (2003, p.54) with the difference that the sample data used in this study represent merely 1/10 of Holland and Ramsay's (2003) sample for both variables for both large (LC) and small (SC) companies.

5.4.3. Summary of Results of Testing Approach 3.3 - Tested with the Earnings Management 1 and Earnings Management 2 models

In section 5.4 *Testing Approach 3.3* was used in order to rank each year's data on asset size to test whether Hungarian credit institutions manage earnings to avoid earnings decreases. As in Holland and Ramsay's (2003, p.54) study, Total Assets (TA) were split into large (LC) and small (SC) companies based on the sample median of the total assets and then, Scaled Earnings, and Scaled Earnings Change ratios were calculated with Burgstahler and Dichev's (1997, p.103) EM1 model and with Degeorge, Patel and Zeckhauser's (1999, p.31) EM2 model. Additionally, the Kolmogorov-Smirnov (K-S) one sample test statistics was used to test $\mathbf{H0_{(c)}}$**:**. The K-S tests were run with 95% and 99% Confidence Interval levels, and with a Monte Carlo simulation, plus Descriptive Statistics were run to test the hypothesis $\mathbf{H0_{(c)}}$**:**. The results are shown in Tables 5.4.1 to 5.4.6 and present statistically highly significant results of a two-tailed probability value, or Asymp. Sig. (2-tailed) Sig. and Monte Carlo Sig. (2-tailed) Sig. *p*-values of 0.000 for both Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2) ratios for both large (LC) and small companies (SC).

Furthermore, by examining year-end profit after tax results in the '*Credit Inst (banks) BASE variables calculation 2012_1999.xlsx*' excel sheet, the company results for both small and large banks are in line with the statistical results in section 5.4. In other words, Hungarian banks on average report small losses and small profits in the year-end financial statements. This would suggest, as outlined in Chapter 3, that the presence of foreign banks in Hungary serves only one purpose, namely, to generate wealth for the parent company's. For example, Return on Equity (ROE) and Return on Assets (ROA) percentage of the banks trading in Hungary were almost twice as high as those of their foreign counterparts, as the Central bank of Hungary reports (August 2013). However, this study also reports, in Chapter 3, that ROA was on the rise from 1.6% in 2001 to 2.5% in 2005, and then gradually dropped to 1% in 2008 and to 0.5% in 2012. Furthermore, in Chapter 3, Figure 3.1, Figure 3.2 and Figure 3.3 show a visible uptrend of banks' lending policy from 2003 to 2008, and from 2008 to 2013 there is an obviously continuous lending policy. One explanation could be that banks tend to maintain their lending policy in order to avoid earnings decreases for both LC and SC.

The results of this study are similar to Holland and Ramsay's (2003, p.54) results. It should also be mentioned that Holland and Ramsay (2003) tested a larger sample, and they used a sample made up of all the Australian companies listed on the Australian Stock Exchange, with the exclusion of financials. From the results in section 5.4, it was concluded that hypothesis, **$H0_{(c)}$:** *Large and small Credit institutions (Banks) scaled by median of Total Assets in Hungary do not manage earnings to avoid earnings decreases*, 'may' be rejected.

5.5. Results of Testing Approach 3.4

5.5.1. Results of Testing Approach 3.4 – Tested with the Earnings Management 1 model

This study further investigates if there is evidence of earnings management 'Prior to' and 'After' the 2008 financial crisis. A sample of Total Assets (TA) was split into two parts, namely, 'prior to' and 'after' 2008, when the financial crisis started. The purpose of this split was to test the data with the EM1 and EM2 models in order to answer the hypothesis **$H0_{(d)}$:**, that reads:

$H0_{(d)}$: *Credit institutions (Banks) in Hungary do not manage earnings 'prior to' and 'after' 2008, when the financial crisis starts.*

The Kolmogorov-Smirnov (K-S) and Monte Carlo Simulation a with a 95% and a 99% Confidence Interval test statistics were run, for Scaled Earnings, and Scaled Earnings Change ratios for the EM1 model so as to test **H0$_{(d)}$:**. Table 5.5.1 and Table 5.5.2 represent total assets scaled 'Prior to' (for years 2004-2007) and 'After' 2008 (for years 2008-2011) when the worldwide financial crisis started. Table 5.5.1 and Table 5.5.2 show test statistics of K-S with a Monte Carlo simulation at 95% and 99% Confidence Interval levels for the EM1 model:

Table 5.5.1. Prior to and After the 2008 financial crisis tested with a 95% Confidence Interval level

EM1 model			Scaled Earnings		Scaled Earnings Change	
			2004-2007	2008-2011	2004-2007	2008-2011
Number of Observation			136	141	121	127
Normal Parameters	Mean		.0001	-.0001	.0002	-.0009
	Std. Deviation		.0135	.0146	.0096	.0126
Most Extreme Differences	Absolute		.261	.219	.225	.228
	Positive		.239	.219	.225	.183
	Negative		-.261	-.209	-.193	-.228
Kolmogorov-Smirnov Z			3.043	2.604	2.480	2.566
Asymp. Sig. (2-tailed)			.000	.000	.000	.000
Monte Carlo Sig. (2-tailed)	Sig.		.000	.000	.000	.000
	95% Confidence Interval	Lower Bound	.000	.000	.000	.000
		Upper Bound	.006	.006	.006	.006

Notes: Table 5.5.1 shows 'Prior to' and 'After' the 2008 financial crisis, tested with the Kolmogorov-Smirnov test statistics with a 95% Confidence Interval level with EM1 model for Scaled Earnings, and Scaled Earnings Change. Tested periods consist of equal 4 years for 'Prior to' and 'After' 2008. *Source:* Own calculation and presentation.

Test results in Table 5.5.1 show that *p*-values are 0.000 for the two-tailed probability value, or Asymp. Sig. (2-tailed), for all four tested variables and they also show that there is a visible similarity in results for both Scaled Earnings 'Prior to' and 'After' 2008, and for Scaled Earnings Change, 'Prior to' and 'After' 2008. Mean values are very low, with negative values of -0.0001 for Scaled Earnings ratio. For Scaled Earnings Change ratio, Mean values are -0.0009 for 'After' 2008, whereas Prior to' 2008 they are positive and equal

0.0002. Std. Deviation values for all four variables are also small, bellow 0.0. The Monte Carlo Sig. (2-tailed) Sig. with the 95% Confidence Interval *p*-values also has a value of 0.000. The Monte Carlo Sig. (2-tailed) Sig. Lower Bound has *p*-values 0.000 and Upper Bound 0.006. Upper Bound is still below 0.05, i.e. 0.05 > 0.006. It may be concluded that the *p*-values in Table 5.5.1 are 'statistically highly significant'.

Next Table 5.5.2 presents K-S test statistics with a 99% confidence interval level.

Table 5.5.2. Prior to and After the 2008 financial crisis tested with a 99% Confidence Interval level

EM1 model			**Scaled Earnings**		**Scaled Earnings Change**	
			2004-2007	2008-2011	2004-2007	2008-2011
Number of Observation			136	141	121	127
Normal Parameters	Mean		.0001	-.0001	.0002	-.0009
	Std. Deviation		.0135	.0146	.0096	.0126
Most Extreme Differences	Absolute		.261	.219	.225	.228
	Positive		.239	.219	.225	.183
	Negative		-.261	-.209	-.193	-.228
Kolmogorov-Smirnov Z			3.043	2.604	2.480	2.566
Asymp. Sig. (2-tailed)			.000	.000	.000	.000
Monte Carlo Sig. (2-tailed)	Sig.		.000	.000	.000	.000
	99% Confidence Interval	Lower Bound	.000	.000	.000	.000
		Upper Bound	.009	.009	.009	.009

Notes: Table 5.5.2 presents 'Prior to' and 'After' the 2008 financial crisis, tested with the Kolmogorov-Smirnov Test and with a 99% Confidence Interval level for Scaled Earnings, and Scaled Earnings Change ratios, with EM1 model. Tested periods consist of 4 equal years for 'Prior to' and 'After' 2008. *Source:* Own calculation and presentation.

Table 5.5.2 shows test results for Asymp. Sig. (2-tailed) Sig. and the Monte Carlo Sig. (2-tailed) Sig. at a 99% Confidence Interval level, including for Lower Bound level, and they are low at 0.000, which is 'statistically highly significant'. In the case of the Monte Carlo Sig. (2-tailed) Sig. at a 99% Confidence Interval level for Upper Bound level, *p*-values are 0.009 for all four ratios, which are still below 0.01, i.e. 0.01 > 0.009. Both Tables 5.5.1and 5.5.2 show that *p*-values are 'statistically highly significant'.

The next section presents test results calculated with the earnings management model 2, or EM2.

5.5.2. Results of Testing Approach 3.4 – Tested with the Earnings Management 2 model

Data divided into 'Prior to' and 'After' the 2008 financial crisis were tested with the EM2 model for the same variables as for Earnings Management 1 model, the EM1, for Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1), and Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2) ratios. Test results for a 99% and 95% Confidence Interval levels are shown in Table 5.5.3 and in Table 5.5.4 respectively:

Table 5.5.3. Prior to and After the 2008 financial crisis tested with a 99% Confidence Interval level

EM2 model			Scaled Earnings		Scaled Earnings Change	
			2003-2007	2008-2012	2003-2007	2008-2012
Number of Observation			171	180	154	162
Normal Parameters	Mean		.0703	-.0393	-.0105	-.0038
	Std. Deviation		.9945	.9781	1.1057	.8019
Most Extreme Differences	Absolute		.210	.162	.274	.198
	Positive		.199	.162	.274	.190
	Negative		-.210	-.147	-.241	-.198
Kolmogorov-Smirnov Z			2.741	2.167	3.399	2.523
Asymp. Sig. (2-tailed)			.000	.000	.000	.000
Monte Carlo Sig. (2-tailed)	Sig.		.000	.000	.000	.000
	99% Confidence Interval	Lower Bound	.000	.000	.000	.000
		Upper Bound	.007	.007	.007	.007

Notes: Table 5.5.3 shows 'Prior to' and 'After' the 2008 financial crisis, tested with the Kolmogorov-Smirnov Test and with a 99% Confidence Interval level for Scaled Earnings, and Scaled Earnings Change ratios, with the EM2 model. Tested periods consist of 5 equal years for 'Prior to' and 'After' 2008. *Source: Source:* Own calculation and presentation.

Test results show *p*-values for Asymp. Sig. (2-tailed) Sig. and the Monte Carlo Sig. (2-tailed) Sig. at a 99% Confidence Interval level, including for Lower Bound level and they are identical for Table 5.5.1., and it is low at 0.000, which is a 'statistically highly significant' result. Only Upper Bound under Monte Carlo Sig. *p*-values are 0.007 for all four ratios, and are still below the 0.01 significance level, i.e. 0.01 > 0.007. Mean values are low and negative for all ratios, they are positive only for Scaled Earnings for ‘prior to 2008’, but still lower in value to 0.0. Std. Deviation is low at around 1, indicating that they are not widely spread, but spread around the mean.

Table 5.5.4. Prior to and After the 2008 financial crisis tested with a 95% Confidence Interval level

EM2 model			Scaled Earnings		Scaled Earnings Change	
			2003-2007	2008-2012	2003-2007	2008-2012
Number of Observation			171	180	154	162
Normal Parameters	Mean		.0703	-.0393	-.0105	-.0038
	Std. Deviation		.9945	.9781	1.1057	.8019
Most Extreme Differences	Absolute		.210	.162	.274	.198
	Positive		.199	.162	.274	.190
	Negative		-.210	-.147	-.241	-.198
Kolmogorov-Smirnov Z			2.741	2.167	3.399	2.523
Asymp. Sig. (2-tailed)			.000	.000	.000	.000
Monte Carlo Sig. (2-tailed)	Sig.		.000	.000	.000	.000
	95% Confidence Interval	Lower Bound	.000	.000	.000	.000
		Upper Bound	.004	.004	.004	.004

Notes: Table 5.5.4 presents ‘Prior to’ and ‘After’ the 2008 financial crisis, tested with the Kolmogorov-Smirnov Test and with a 95% Confidence Interval level for Scaled Earnings, and Scaled Earnings Change ratios, with the EM2 model. *Source:* Own calculation and presentation.

The tests results for the EM2 model with a 95% Confidence Interval level for Monte Carlo Sig., and the results for Asymp. Sig. (2-tailed) Sig. show the same *p*-values as Table 5.5.3. Only Monte Carlo Sig. Upper Bound level *p*-values are 0.004 for all ratios, but still below the 0.01 significance level. Mean and Std. Deviation results are also very similar to the ones in Table 5.5.3. Upon examining Tables 5.5.3 and 5.5.4, it was decided that the *p*-values are ‘statistically highly significant’.

5.5.3. Summary of Results of Testing Approach 3.4 – Tested with the Earnings Management 1 and Earnings Management 2 models

Section 5.5 presents evidence of the EM1 and EM2 models ‘Prior to’ and ‘After’ the 2008 financial crisis, with a split of the sample of Total Assets into prior to and after 2008, when the financial crisis started. All Tables 5.5.1 to 5.5.4 in section 5.5 present *p*-values of 0.000 that are below 0.01 and below the 0.05 significance level.

In Chapter 3, section 3.2.2, it was pointed out that Return on Asset (ROA) shows gradual increase in 1999 from 0.49% to 1.6% in 2001 and to 2.5% in 2005, and when the economic crisis started in 2008, ROA dropped to 1%, whereas at the end of 2011 ROA was below 0.3%, while in 2012 ROA increased above 0.5%. Banks trading in Hungary had one of the highest, almost double the ROA in the region in 2005, but certainly the highest comparing to banks trading in Germany, Belgium, Austria or Italy (Banai, Király and Nagy, 2010). One possible explanation for earnings management (EM) prior to and after the 2008 financial crisis is that as the banks' earnings and liquidity was in decline between 2001 and 2009, that is, banks enjoyed strong growth until 2005 while after 2006, and especially after 2008, the banks' earnings were in decline. It is also probable that, due to the fact that banks could not generate profits from their assets after the financial crisis began, bank managers engaged in EM, for example as Banai, Király and Nagy (2010) show, ROE and ROA for banks was in an uptrend from 1999 to 2007, and then in a downtrend up till 2009. Another explanation for why bank managers engaged in EM was to meet their foreign parent companies' targets set for Hungarian entities before and after the financial crisis. Furthermore, in Chapter 3, Figure 3.5 of this study shows a change in outstanding corporate loans for the period from 2008 to 2013. It can be seen that in Hungary corporate lending did not drop dramatically, only around 13% which suggests that banks were trying to maintain their lending policy so as to avoid a liquidity trap, as Banai, Király and Nagy (2010) write. Additionally, Figure 3.6 in Chapter 3 of this study shows that credit conditions slightly tightened in the first half of 2008, but banks started to ease their lending conditions from the second half of 2008. Easing and tightening lending conditions are also forms of earnings management in the interest of higher profits.

Shen and Chih (2005) point out that banks might have become illiquid, or had liquidity difficulties in performing their banking operations. In order to maintain confidence in their operations without losing customers, *'…banks have strong incentives to prevent their earnings from being negative'.* – Shen and Chih (2005, p.3)

The conclusion which can be drawn from the results of section 5.5 is that hypothesis, **$H0_{(d)}$:** *Credit institutions (Banks) in Hungary do not manage earnings prior to and after 2008, when the financial crisis starts*, 'may' be rejected.

5.6. Summary of Chapter 5.

Chapter 5 presents the results of the three main empirical testing approaches, which were used to test the Standard Discontinuity method, the Accrual method and the Distribution of Ratios method from the financial statements obtained from the Hungarian Financial Supervisory Authority, or the HFSA/MNB. As part of the Distribution of Ratios method, this study applies a non-conventional approach, a more hands-on analysis, due to its practicality. Earlier related papers used only a handful, no more than four variables to test data for any earnings anomalies, whereas this study presents test results of 14 ratios, a new approach in researching Earnings Management.

With the Standard Discontinuity method this study tested hypothesis **$H0_{(b)}$:**, with ratios of scaled earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and scaled change earnings, or change in earnings divided by Total Assets in period (t-2), by applying Earnings Management testing model number 1 and 2, the EM1 and EM2 models. Descriptive Statistics were run to test percentiles for 25%, 50% and 75% with Mean and SD. The results are presented in Tables 5.1.a to 5.1.d; Scaled Earnings and Scaled Earnings

Change ratios show low, negative Mean and low SD. Comparing the results in Table 5.1.a and 5.1.b to Holland and Ramsay's (2003) and to the Burgstahler and Dichev's (1997) results, it was concluded that the results are very similar. Both Holland and Ramsay's (2003) and Burgstahler and Dichev's (1997) results were based on non-financials and on a much larger sample. The One-Sample Kolmogorov-Smirnov non-parametric test was applied to test scaled earnings and scaled earnings change ratios with the EM1 and EM2 models. The results are presented in Tables 5.1.e and 5.1..f showing low *p*-values of 0.000, statistically 'highly significant' results for both variables, for Asymptotic, Exact and Point Probability. Such low *p*-values suggest the rejection of the hypotheses **H0$_{(b)}$:** *Credit institutions (Banks) in Hungary do not manage earnings to avoid earnings decreases*. Histograms for Scaled Earnings and Scaled Earnings Change ratios were created, and are shown in Figures 5.1.1 to 5.1.4 where there can be seen visible discontinuities of the distributions slightly to the right, i.e. positively skewed, with big jumps at zero points, for both variables. For all four histograms there is a visible higher earnings frequency just above the zero in Figures 5.1.1 to 5.1.4, which would suggest earnings occurrence just above the zero. This pattern of the frequency distribution in all four histograms, as well as the statistical test results suggest avoidance of earnings decreases, and thus confirm the rejection of **H0$_{(b)}$:.** The results of this study are similar to the Holland and Ramsay's (2003), and to the Burgstahler and Dichev's (1997) results, despite testing different variables in non-financial industries.

With the Second Empirical testing Approach, this study applies the widely used Accrual Method to investigate Earnings Management. Two regression models test Hypothesis **H0$_{(a)}$**:, with all sample, with 95% and 99% confidence interval levels. Test results with the accrual method are rather conflicting. Regression Model 1 results for both 95% and 99% confidence interval levels would suggest accepting Hypothesis **H0$_{(a)}$:.** However, Regression Model 1 consists of Scaled Total Accruals (TACCR.) which have elements of both non-discretionary and discretionary accruals that also contain reversal accruals. There is no evidence, as of writing this study, of a working model that would precisely measure the timing of the reversal accruals within non-discretionary and discretionary accruals. Therefore, by accepting Hypothesis **$H0_{(a)}$:**, this study would make a '*type II error'*. This is the main weakness of the regression Model 1, or of a similar accrual testing model for that matter. Regression Model 2 however splits accruals between discretionary (DA) and the non-discretionary (NDA) accruals, as explanatory variables and tests the sample on an annual basis. The multiple regrresion Accrual Model 2 test results are mix, as statistical signifiance values differ on annual bases. Discretionary accruals (DA) are overall statistically significant for 9 out of 14 years at a 95% confidence level and at a 0.05 significance level, and 7 out of 14 years at a 99% confidence level for 0.01 significance levels, whereas non-discretionary accruals (NDA) overall are statistically insignificant. It may be concluded that Hypothesis **$H0_{(a)}$:** fails for discretionary accruals (DA), but holds for non-discretionary accruals (NDA). From the test results of this study, and from the prior research papers, this study concludes that the Accrual testing method should not be applied to test Earnings Management due to its severe weaknesses, namely the timing of the reversal accruals which has a significant impact on testing accuracy. See for example the studies of Dechow, Ge and Schrand (2010); McNichols (2000); Baber, Kang and Li (2011) and Dechow, Hutton, et al. (2012).

This study discussed the Standard Discontinuity Method and the Accrual Method test results, previously applied by various research papers discussed earlier in this study.

The Third Empirical testing method, the Distribution of Ratios Method, is a new appraoch in investigating Earnings Management (EM). The Distribution of Ratios Method investigates 14 ratios with four testing approaches, namely, visual, statistical, per asset size and 'Prior to' and

'After' the 2008 financial crisis. This study also performs benchmark comparisons of the 14 base ratios. Under *Testing Approach 3.1*, at first, the 14 ratios were calculated from the audited financial statements of the Hungarian credit institutions in order to visually investigate distributions of each ratio's histogram, as shown in Figures 5.3.1 – 5.3.14. The purpose of visual investigation was to analyse how each ratio distribution behaves from only a ratio point of view, without applying any statistical modelling. Therefore, with *Testing Approach 3.1*, the 14 histograms in question were not tested at all, their sole purpose was to visually investigate their curve, shapes, and to visually examine if there was any discontinuity in evidence, or whether histograms had bell-shaped forms, as presented in Thomas (1997, p.22), the shape of a Standard Normal Distribution.

By visually investigating all 14 histograms, an asymmetric behaviour of each histogram's mean value was evident, that is, none of the histograms showed a bell shape, i.e. they were not normally distributed. A similar visual investigation was done of the earnings distributions' histograms, but only for the net income variable, by Shen and Chih (2005). Taking 48 countries into account, Shen and Chih (2005) show similar results for earnings to this study's results, namely the Profit After Tax Margin or PATM results in Figure 5.3.11. The 14 histograms' results in Figure 5.3.1 – 5.3.14 prompted further statistical testing with the EM1 and EM2 models. However, prior to statistical testing of the 14 ratios, this study performed benchmark comparisons of the 14 base ratios. Comparison was conducted without any statistical testing, that is, at first, 14 Benchmark ratio histograms were run and then compared to the 14 Base ratios' histograms, as shown under Figures 5.3.1.a – 5.3.14.a. The differences between the 14 Base ratios' histograms to Benchmark ratios' histograms were analyzed in detail in section 5.3.1.2. Benchmark comparison was also conducted with descriptive statistics. Table 5.3.1 with Table 5.3.2 present the statistics for the Base and Benchmark ratios. However, benchmark comparisons should be interpreted with caution. It is probable that bank managers engage in manipulation to beat, or to meet analysts' or parent companies' expectations as well as to meet benchmarks, as Dechow, Ge and Schrand (2010) point out. Following visual investigation and benchmark comparison, this study statistically tests 13 ratios that comprise the Burgstahler and Dichev's (1997, p.103) model, the EM1 model, and the EM2 model, with the Degeorge, Patel and Zeckhauser's (1999, p.31) model. In terms of test statistics, the Non-parametric One-Sample Kolmogorov-Smirnov test with Monte Carlo simulation was used with a 99% and a 95% confidence interval, as shown in Tables 5.3.3 and in Table 5.3.5, it was tested with 0.05 and 0.01 significance levels in order to achieve more rigorous testing. Test results are highly significant with *p*-values that are lower than 0.01 ($p < 0.01$) and are statistically significant at a 99% confidence interval level. Only Loan to Assets, the LTA ratio, at a 99% confidence interval has a *p*–value of 0.025, and it is greater than $p = 0.01$ ($p < 0.025$), but fails at $p = 0.05$, ($p > 0.025$). Tests result for all ratios gave an indication that bank managements engaged in earnings management.

It was also of relevant interest to inspect the Skewness and Kurtosis test results of the 13 ratios. The reader will find that evidence in Table 5.3.4 and in Table 5.3.6 at 99% and 95% confidence interval levels and they confirm earlier results. The results for the earnings management model 1, or the **EM1,** for *Testing Approach 3.1*, 13 ratios were tested with 95% and 99% confidence interval levels, and they present evidence supporting the rejection of **$H0_{(a)}$**: which states that '*Credit institutions (Banks) in Hungary do not manage earnings*'.

In order to test the hypothesis with the earnings management model 2, or the **EM2**, calculated per Degeorge, Patel and Zeckhauser's (1999, p.31) model, statistical tests were created to test **$H0_{(a)}$:**, the same as for the EM1 model, the Kolmogorov-Smirnov and Descriptive tests were run in SPSS at a 95% and a 99% confidence interval. The results are presented in Tables 5.3.7 and 5.3.9 and show highly significant *p*-values of 0.00 for all ratios, which is smaller than the 0.01 level of significance. Based on the **EM2** model results, it was decided to reject

H0$_{(a)}$: which states that '*Credit institutions (Banks) in Hungary do not manage earnings*'. The **EM2** model results confirm the EM1 results; therefore, for both testing models EM1 and EM2 for **H0$_{(a)}$:** it was decided that there was a small possibility of *p*-values being lower than 0.00 and that the true hypothesis might be wrongly rejected and a *Type I error* made. It was concluded that hypothesis **H0$_{(a)}$:** *Credit institutions (Banks) in Hungary do not manage earnings,* 'may' be rejected.

Additionally, Beaver, McNichols and Nelson (2007, p.540) investigate Burgstahler and Dichev's (1997, p.103) model, but the authors also modify the Burgstahler and Dichev's (1997, p.103) model, the standard deviation of the difference, SDi, which is the last section of the Burgstahler and Dichev's (1997, p.103) SDi formula. This study tests only the modified part of the standard deviation of the difference formula that Beaver, McNichols and Nelson (2007, p.540) apply. This study does not remove special items or tax to test discontinuity with the EM1 model with Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2) ratios with the Hungarian credit institutions sample. This study sought to compare whether the modified SDi part of the formula had an effect on test results with respect to the non-modified version of the Burgstahler and Dichev (1997, p.103) model.

Tests were run with Scaled Earnings and Scaled Earnings Change variables with the One-Sample Kolmogorov-Smirnov test statistics tables for 95% and 99% Confidence intervals. Tables 5.3.11 and 5.3.12 present test statistics with Mean below -0.000, SD below 0.00 and *p*-values for Asymp. Sig. (2-tailed) for both confidence interval levels which are also below 0.000 for Scaled Earnings ratio. Tables 5.3.11 and 5.3.12 show positive low Mean of 0.0001, SD 0.01 and *p*-values of 0.000 for Scaled Earnings ratio for both confidence interval levels. The results show similar test statistics for both ratios for both confidence intervals. Apart from test statistics, histograms were also created for both ratios. Figure 5.3.2.1 and Figure 5.3.2.2 show asymmetrical distributions skewed to the right for both variables. The results from Tables 5.3.11 to 5.3.15, as well as from Figure 5.3.2.1 and Figure 5.3.2.2 present clear evidence that Beaver, McNichols and Nelson's (2007, p.540) modified Burgstahler and Dichev (1997, p.103) SDi formula fails to uphold the **$H0_{(b)}$:** hypothesis. Beaver, McNichols and Nelson (2007) argue that income tax and special items influence discontinuity for zero earnings; notwithstanding, statistical results of his study do not confirm Beaver, McNichols and Nelson's (2007, p.526) claim, '…*income tax and special items contribute to a discontinuity at zero in the distribution earnings'.*

It was concluded that *Testing Approach 3.2* with the Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2) ratios, applying Earnings Management testing model 1, or EM1, and Earnings Management testing model 2, or the EM2 model, with evidence of statistical tests and histograms, hypothesis, **$H0_{(b)}$:** 'may' be rejected with significance level *p*-values of 0.000. *P*-values of 0.000 are lower than the 0.01 testing significance level with a 99% and a 95% confidence interval level. Furthermore, distribution of the scaled earnings and scaled earnings change variables are asymmetrical in all cases, which confirms discontinuity.

As part of *Testing Approach 3.3*, companies were split by asset size based on the sample median of their total assets. With the help of this division, small (SC) and large (LC) company assets sizes were created. Scaled Earnings and Scaled Earnings Change ratios were applied to statistically test SC and LC with EM1 and EM2 models in order to test the **$H0_{(c)}$:** hypothesis. Holland and Ramsay's (2003, p.54) study also tested the Australian data per assets size, but excluding financial firms. For statistical testing, the Kolmogorov-Smirnov (K-

S) test statistics was applied with 95% and 99% Confidence Interval levels. Additionally, a Monte Carlo simulation was performed to confirm the statistical test results, and also Descriptive Statistics was applied in order to test **$H0_{(c)}$:**. The tests results are presented in Tables 5.4.1 to 5.4.6 and show statistically highly significant results of Asymp. Sig. (2-tailed) Sig. and Monte Carlo Sig. (2-tailed) Sig. *p*-values of 0.000 for both Scaled Earnings and Scaled Earnings Change variables for LC and SC. The results of this study are very similar to Holland and Ramsay's (2003, p.54) results, who use the same testing approach and show evidence of discontinuity in the distribution of reported earnings. From the tests results of this study, it was concluded that hypothesis, **$H0_{(c)}$:** *Large and small Credit institutions (Banks) scaled by a median of Total Assets in Hungary do not manage earnings to avoid earnings decreases,* 'may' be rejected.

Testing Approach 3.4 tests **$H0_{(d)}$:** hypothesis**,** examining whether earnings management was present 'Prior to' and 'After' the 2008 financial crisis. The hypothesis was tested with Scaled Earnings, or Profit after Tax in period (t) divided by Total Assets in period in (t-1); and Scaled Earnings Change, or change in earnings divided by Total Assets in period (t-2) ratios for the EM1 and EM2 models. A sample of Total Assets was split into 'Prior to' and 'After' 2008 when the financial crisis started. The Kolmogorov-Smirnov One-Sample with Monte Carlo Simulation tests statistics were performed with a 95% and a 99% Confidence Interval to tests both ratios, namely, 'Prior to' and 'After' 2008. The results show the two-tailed probability value, the Asymp. Sig. (2-tailed) Sig., with *p*-values of 0.000 in all Tables 5.5.1 to 5.5.4. After 2008, Mean is negative and very low for both ratios, with low SD and *p*-values bellow 0.01, suggesting that bank managers engaged in earnings smoothing to maintain previous years' earnings. From the statistical tests results, it was concluded that bank managers engaged in earnings smoothing, both prior to and after 2008; therefore, it may be concluded that hypothesis, **$H0_{(d)}$:** *Credit institutions (Banks) in Hungary do not manage earnings prior to and after 2008, when the financial crisis starts*, 'may' be rejected.

This study statistically tested four hypotheses in an attempt to answer the research question:

> '***Did credit institutions trading in Hungary avoid earnings decreases for the period of 1999-2012?'***

Apart from statistical tests, histograms were created to investigate discontinuity of distribution of reported earnings, and distribution comparisons were drawn between this and other studies, namely, studies by Burgstahler and Chuck (2015), Holland and Ramsey (2003), Beaver, McNichols and Nelson (2007) and Burgstahler and Dichev (1997). However, as Dechow, Hutton, et al. (2012) argue, accruals booked in a period should be reversed to the next. The effect of reversal accruals is not unambiguous in this study due to limited information from the 'Golden Book', the main source of data for the credit institutions' financial statements, specifically 'other accruals and other assets', or 'accrued interest receivables'. However, despite significant limitations of the accrual testing methods, as highlighted earlier, this study tested the 14 ratios with two accrual regression models.

In this study, it is assumed that reversal accruals are part of the total assets. Therefore, it is probable that some ratios' results, which comprise 'other accruals and other assets', or 'accrued interest receivables' in the formula, for example, Loans to Assets, Interest Receivables Index, Return on Asset, Equity to total Assets, Profit after Tax by Total Assets in period t-1 and Change in Earnings by Total Assets in t-2 period, may have lower testing power. Earlier studies on accruals (for example Dechow, Sloan and Sweeney, 1995; Beatty, Chamberlain and Magliolo, 1995; Sloan, 1996; Charitou and Vafeas, 1998; Gore, Pope and

Singh, 2007 and others) do not refer to the impact of reversal accruals, nor to the possible lower power of their tests results. The first study that presents a testing model for reversal (discretionary) accruals is by Baber, Kang and Li (2011).

Based on the evidence presented in this study, all four hypotheses were rejected, which leads us to a conclusion that properly answers the research question, '*Did credit institutions trading in Hungary avoid earnings decreases for the period of 1999-2012?*', and the conclusion is yes. Substantial evidence in this study confirms that 'Credit institutions trading in Hungary avoided earnings decreases for the period of 1999-2012'.

The percentage level of Return on Assets (ROA) also confirms this conclusion. In comparison with western banking counterparts, Hungary had the highest ROA percentage in the region for the period of 1998-2008, (Banai, Király and Nagy, 2010). Another possible explanation for high ROA is that bank managers engaged in an earnings smoothing strategy with Loan Loss Provision (LLP) to fulfil their parent companies' earnings expectations. In other words, with low LLP, expenses are also lower, hence, earnings are increasing. However, when positive earnings are no longer possible, managers engage in the 'big bath' effect, that is, they report losses all at once. The same technique was also pointed out by Cohen, Cornett, et al. (2014) in their study of USA banks, and they additionally concluded that earnings management was higher before the financial crisis than during the crisis. The author's evidence of earnings management before the financial crisis is similar to the evidence put forth in this study.

The next chapter, Chapter 6 outlines the conclusion, as well as the limitations and strengths of this study.

Chapter 6

Conclusion

6.1. Introduction

Chapter 6 concludes this study with the main findings that were arrived at on the basis of empirical results derived from the hypotheses which attempted to answer the research question. Additionally, apart from its strengths, its limitations were also considered, and propositions were made for further research on a comparable academic level.

The aim of this study was to investigate credit institutions in Hungary in search of evidence supporting the presence (or absence) of earnings management. Evidence on earnings management is widely available for western European and Asian countries as well as for companies in the USA, for example, Burgstahler and Dichev (1997), Holland and Ramsey (2003), Shen and Chih (2005), Gore, Pope and Singh (2007), Burgstahler and Chuck (2015), have all investigated the banking and other industries, which was reviewed in Chapter 2. Evidence suggests that foreign and domestic banks trading in Hungary were not investigated for their earnings anomalies, most notably, their engagement in earnings management. Therefore, this study set to answer the research question:

> ‘**Did credit institutions trading in Hungary avoid earnings decreases for the period of 1999-2012?’**

In an attempt to answer the research question, four hypotheses were formulated:

$H0_{(a)}$: Credit institutions (Banks) in Hungary do not manage earnings.

$H0_{(b)}$: Credit institutions (Banks) in Hungary do not manage earnings to avoid earnings decreases

$H0_{(c)}$: Large and small Credit institutions (Banks) scaled by median of Total Assets in Hungary do not manage earnings to avoid earnings decreases.

$H0_{(d)}$: Credit institutions (Banks) in Hungary do not manage earnings before and after 2008 when the financial crisis starts.

6.2. Empirical findings

The main empirical scrutiny and its subsequent findings were presented in Chapter 4 and Chapter 5. Prior to statistical tests, a specific and characteristic form of each of the 14 ratios distribution was examined, and it was concluded that ratios show discontinuities with left or right skewed distributions, which provided a basis for further statistical testing's of the four hypotheses. This evidence of discontinuity is shown in Figures 5.1.1 to 5.1.4, and in Figures 5.3.1 to 5.3.14.

Section 6.2 combines empirical findings for each of the four hypotheses that were tested in an attempt to answer the research question:

*A) **$H0_{(a)}$: Credit institutions (Banks) in Hungary do not manage earnings.***

Hypothesis **$H0_{(a)}$:** was investigated with two empirical approaches, namely the Accrual Method and the Distribution of Ratios Method. The Second *Empirical Testing Approach* - The Accrual Method described in Chapter 5, Section 5.2 presents mixed results of the

Regression Model 1 and the Multiple Regression Model 2. The Regression Accrual Model 1 suggests accepting **$H0_{(a)}$:** however, by accepting it, this study would make a *'type II error'* due to the timing effect of the reversal accruals and the lack of a workable reversal accrual model. The Multiple Regression Model 2 results reject **$H0_{(a)}$:**. Despite this cautious rejection of **$H0_{(a)}$:** with Accrual Models 1 and 2**,** this study could have made a **'***type I error'* or a '*type II error*'. Baber, Kang and Li (2011) and Dechow, Hutton, et al. (2012) studies investigated reversal accruals and their testing accuracy. Due to the accrual models' low testing power, this study argues that the accrual testing approach should be avoided while investigating evidence of earnings management. A new approach is recommended instead, as outlined under *The Third Empirical Testing Approach,* in Chapter 4.

The Third Empirical Testing Approach, Testing Approach 3.1, the distribution and statistical testing of 14 ratios in Chapter 5 presents results of the earnings management model 1, EM1, and earnings management model 2, EM2, with a 95% and a 99% confidence interval level with a significance *p*-value level of 0.00 and with confirmation of *p*-values of 0.00 or lower for Monte Carlo Sig. (2-tailed), which altogether represent significant evidence confirming the presence of earnings management in credit institutions trading in Hungary. Chapter 3 of this study points out that Hungarian banks were generally engaged in aggressive lending practices. Following a period of gradual growth, from 1999 to 2005, banks confronted a trend shift. Histograms in Figures 5.3.1 to 5.3.14 of the 14 ratios confirm that Hungarian banks faced financial difficulties during the tested period with heavy dependence on borrowed money, outstanding loans, low sales, higher costs, low profitability and poor capital adequacy, which 'may' have led to smoothing, and thus to earnings management.

Additionally, this study makes benchmark comparisons of the 14 ratios. Fourteen histograms were run and comparisons were made between base and benchmark histograms. Additionally, descriptive statistics were run for both base and benchmark ratios. The Base ratio statistics for all 14 ratios differ from the Benchmark ratios, namely in the Skewness and Kurtosis, as well as in the Mean and the Std. Deviation. However, as Dechow, Ge and Schrand (2010, p.351) point out that benchmark analyses should be used with caution; they emphasize the fact that as it is difficult to separate managers' intentional action from a genuine good business performance, it is clear that either of the two may lead to the attainment of the desired benchmark level.

B) ***$H0_{(b)}$: Credit institutions (Banks) in Hungary do not manage earnings to avoid earnings decreases.***

Hungarian banks' yearly earnings were both increasing and decreasing, as Chapter 3 of this study highlights. Evidence of this decrease and increase is presented in the *First Empirical Approach* – The Standard Discontinuity Method (Chapter 5, Subsection 5.1). Figures 5.1.1 to 5.1.4 show distributions for ratios of Scaled Earnings, or Profit after Tax (t) divided by Total Assets in period (t-1), and Scaled Earnings Change, or Change in Earnings divided by Total Assets in period (t-2), a visible discontinuity with a slightly more positive high-frequency distribution for the earnings management 1 and 2 models. These changes occur when earnings are managed to avoid earnings decreases. The One-Sample Kolmogorov-Smirnov Asymp. Sig. (2-tailed) test statistics, with significance *p*-value level of 0.000, confirms the evidence of earnings management for the earnings management 1 and 2 models. Hypothesis, **$H0_{(b)}$:**, the results of this study are consistent with Burgstahler and Dichev's (1997, pp.103-

105) and Holland and Ramsay's (2003, pp.51-52) work, whose studies report on engagement in earnings management in order to avoid earnings decreases.

Additionally, under the Third Empirical Approach, the Distribution of Ratios Method with the *Testing Approach 3.2* (Chapter 5, Subsection 5.3.2), this study tests the Beaver, McNichols and Nelson's (2007, p.540) modified Burgstahler and Dichev (1997, p.103) model. Statistical and distributional results do not confirm evidence that special items and tax contribute to discontinuity in earnings with the modified SDi (standard deviation of difference). The One-Sample Kolmogorov-Smirnov tests statistics provide evidence whit *p*-values of 0.000 in favour of rejecting Beaver, McNichols and Nelson's (2007) claim. In addition, Burgstahler and Chuck (2015) test and reject Beaver, McNichols and Nelson's (2007) evidence of special items and taxes.

C) ***$H0_{(c)}$: Large and small Credit institutions (Banks) scaled by median of Total Assets in Hungary do not manage earnings to avoid earnings decreases.***

By applying *Testing Approach 3.3,* which is part of the Third Empirical Approach, namely the Distribution of Ratios Method, this study also tests banks per asset sizes, for both large and small banks. Similarly to this study, Holland and Ramsay (2003, p.54) investigated large and small companies in their study. The results of the One-Sample Kolmogorov-Smirnov and Descriptive tests statistics for the earnings management 1 and 2 models of this study show that the large companies are slightly more profitable than the small companies.

One explanation for this small profit for the sample period of 2001-2012 is that the profitability of large companies was influenced by the financial crisis arising in 2008. Despite the crisis, statistical evidence stemming from the One-Sample Kolmogorov-Smirnov tests confirms that banks engaged in avoiding earnings decreases by perpetuating their lending policy (as Chapter 3 outlines), thus engaging in earnings management. Holland and Ramsay's (2003) study reports similar test results as this study, for both large and small companies. Detailed analysis of **$H0_{(c)}$:** is shown in Chapter 5, Section 5.4.

D) ***$H0_{(d)}$: Credit institutions (Banks) in Hungary do not manage earnings prior to and after 2008, when the financial crisis starts.***

Hungarian banks were also impacted by the 2008 financial crisis. Prior to 2008, banks enjoyed relatively high-level earnings, especially from 2001-2005. The banks' earnings level after 2005 started to decline, especially after 2008, amidst the financial crisis. The banks tried to maintain their earnings level by restricting and easing their lending policy, as Figures 3.1, 3.2 and 3.3 in Chapter 3 suggest. Under the Third Empirical Approach, *Testing Approach 3.4* of the Distribution of Ratios Method, tests were performed with the earnings management models 1 and 2 with the One-Sample Kolmogorov-Smirnov and Monte Carlo Sig. test statistics. Test results confirmed evidence of earnings management with 0.000 *p*-values significance for both the 95% and the 99% confidence interval. A detailed explanation of **$H0_{(d)}$:** hypothesis is shown in Chapter 5, Section 5.5.

6.3. Limitations and strengths of the study

This study has its own limitation; due to the lack of cash flow analysis, the power of tests is not the same as in the case of comparable EU, USA and AUS studies. One limitation of this study is that it suffers from the same lack of cash flow testing as Degeorge, Patel and Zeckhauser's (1999) study. Furthermore, this study points out that it could not differentiate reversal accruals from the banks' yearly balance sheets. Dechow, Hutton, et al. (2012) state that reversal accruals might hold in the testing and thus limiting testing power. This study takes into account that reversal accruals might have influenced the power of tests results for ratios such as Return on Asset (ROA), Net interest Margin (NIM), Interest Receivable Index (IRI), Loans to Total Assets (LTA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Equity to total Assets (EtA), Profit After Tax in period (t) divided by Total Assets in period (t-1); and Change in Earnings divided by Total Assets in period (t-2). That is 9 out of the 16 ratios' power of testing might be somewhat lower.

Nevertheless, this study has its strengths. Earlier studies tested two to five variables, namely: Earnings; Return on Asset; Loan Loss Provisions; Return on Equity and Discretionary Accruals by applying the Accrual or the Standard Discontinuity method. This study cross-examined the credit institutions' financial statements and statistically tested a total of 16 ratios in a search of earnings management by applying *The Standard Discontinuity Method, The Accrual Method and The Distribution of Ratios Method*. Additionally, as part of *The Distribution of Ratios Method,* tests were performed for benchmarks, by the banks' asset size, and prior to and after the 2008 financial crisis in order to examine whether there was evidence of earnings management in Hungarian credit institutions' financial statements. If I were to do the thesis again, I would use the same testing approaches, with the addition of cash flow analysis, providing data were available.

6.4. Conceptual conclusions and contribution to knowledge

6.4.1. Conceptual conclusions

This study attempted to fill a research gap by investigating earnings management of credit institutions trading in Hungary for the period from 1999 to 2012. This study applies three empirical testing approaches, namely, *The Standard Discontinuity Method, The Accrual Method* and *The Distribution of Ratios Method* which are different from the previous studies that tested Earnings Management of credit institutions or financials. Earlier studies also applied the Burgstahler and Dichev (1997, p.103) and/or the Degeorge, Patel and Zeckhauser (1999, p.31) models of financials and non-financial industries and investigated evidence of earnings management (EM). However, these studies, for example Holland and Ramsay's (2003); Shen and Chih's (2005); Gore, Pope and Singh's (2007); Charoenwong and Jiraporn's (2008); Amar and Abaoub's (2010); and Hamdi and Zarai's (2012) applied a different statistical testing approach in combination with 2-5 variables. Additionally, studies investigating EM of financial companies by applying the Loan Loss Provision (LLP) variable, and they were conducted, for example, by Kwak, Lee and Eldridge (2009), by Wang, Chen, et al. (2012), by Balboa, López-Espionosa and Rubia (2013), by Norden and Stoian (2014) and by Cohen, Cornett, et al. (2014). The outlined studies in financials and non-financials industries, despite applying both the Burgstahler and Dichev's (1997, p.103) and the Degeorge, Patel and Zeckhauser's (1999, p.31) models, or either one of the two, did not apply additionally *The Distribution of Ratios* research design as this study did, that is, none of the earlier studies tested the same or a similar number of ratios in combination with the Kolmogorov-Smirnov One-Sample (K-S) non-parametric, Monte-Carlo Method and distributional tests. For comparability, this study applies benchmark comparisons of the 14 ratios to the base ratios.

Furthermore, 9 out of 16 ratios might suffer from the effect of the reversal accruals, as the 9 ratios that contain accruals might also contain reversal accruals. As Dechow, Hutton, et al. (2012) point out, reversal accruals may reduce testing power as well as the power of test results. The 9 banks-specific ratios that might contain reversal accruals are Return on Assets (ROA), Loans to Total Assets (LTA), Interest Receivable Index (IRI), Equity to Total Assets (EtA), Net Interest Margin (NIM), Rate Paid on Funds (RPF), Gross Yield on Earning Assets (GYEA), Profit After Tax (t) divided by Total Assets in period (t-1); and Change in Earnings divided by Total Assets in period (t-2). These 9 ratios show statistically significant evidence of earnings management. However, it is unclear to what extent do reversal accruals influence the testing power of these 9 variables. Reversal accruals and their effect on testing powers within earnings management studies are relatively new in the body of literature and there is limited evidence of their influence on the power of tests. The rest of the 7 ratios are exempt from the possible accruals and reversal accruals effect and all the 16 ratios provide statistically significant evidence of earnings management, as shown and explained in detail in Chapter 5, Section 5.3.

Apart from this study, there is no evidence of any other study in Eastern or Western Europe, or elsewhere, applied specifically to the bank industry, with the same or a similar number of ratio analyses and with the combination of statistical and distributional approaches. This study extends the body of knowledge and contributes to the literature in four ways:

1. By applying banking industry specific data, a total of 16 ratios in combination with the Kolmogorov-Smirnov (K-S) One Sample non-parametric, Monte-Carlo Method and distributional tests, this study ventures to suggest *the Distribution of Ratios*

Method, a new method of approach to investigating the earnings management phenomena in the banking industry.

2. Additionally, 7 out of the 16 tested ratios do not contain total assets (including accruals) in their formula, thus, they do not suffer from a possible reversal accruals effect. By applying non-accruals base ratios for testing, we may improve the testing power. However, all 16 ratios show statistically significant evidence of earnings management. A further study may encompass reversal accruals and their impact on the power of tests.
3. This study confirms the low testing power of the Accrual method and highlights the limitations of benchmarks comparisons.
4. This study argues that the Accrual approach for testing earnings management should be avoided.

6.4.2. Contribution to knowledge

Chapter 6 presented empirical findings, the limitations and the strengths of this study, as well as recommendations for future research, with possible implications for the Hungarian Financial Supervisory Authority, or HFSA/MNB. Additionally, conceptual conclusions having been outlined, we come to the final part of this chapter, in which it is stated why this study has contributed to the current state of knowledge and where it actually stands in contemporary research literature in Hungary or on an international level no less.

This study differs from earlier studies published in Hungary, or elsewhere. Earlier studies were mainly investigating USA, Western European and Asian banks, predominantly testing on Loan Loss Provisions, Return on Assets and Net Earnings. These studies are different from this study, as there is no evidence, as of writing this study that a similar study was, or is being researched in post-communist European countries or elsewhere, on the subject of earnings management of credit institutions trading in Hungary. Existing contemporary studies published in Hungary mainly deal with mergers, acquisitions, takeovers, as Neale and Bozsik (2001) write, or analyse the Macroeconomic performance of banks, as Várhegyi (2008) points out. Chapter 3 outlines these and similar studies on the earnings performance of banks, but none of these studies specifically investigated earnings management of the credit institutions in Hungary. In fact, there is no evidence of a similar study ever being published highlighting earnings management practices of Hungarian banks, either in Hungary, or elsewhere.

This study fills this gap in contemporary literature as it provides explanations for statistical findings, as well as explanations justifying the rejection of certain hypotheses, and possible reasons why Hungarian banks managed earnings as pointed out in Section 6.4.1 in Chapter 6. An earlier study by Shen and Chih (2005) investigated investor protection, prospect theory and earnings management in the banking industry in 48 countries, but excluding Hungary and other Eastern European countries. The authors applied the Burgstahler and Dichev (1997) and the Degeorge, Patel and Zeckhauser (1999) models. However, Shen and Chih's (2005) statistical design substantially differs from the one adopted in this study. Hamdi and Zarai (2012) also applied the Burgstahler and Dichev (1997) and the Degeorge, Patel and Zeckhauser (1999) model for testing earnings management in the banking industry, and they investigated earnings management specifically in Islamic banks, and reported evidence of earnings management. Hamdi and Zarai's (2012) study differs from this study as the authors tested countries where Islamic banks conducted business applying the rules of Sharia'ah, the Islamic 'jurisprudence', and neither the number of ratios nor the statistical tests were as rigorous as the ones presented in this study. Cohen, Cornett, et al. (2014) point out that most studies on earnings management (for example, Healy, 1985; Dechow, Sloan and Sweeny, 1995; and others) were based on manipulating accruals. Additionally, Beatty, Ke and Petroni's (2002); Kwak, Lee and Eldridge's (2009); Wang, Chen, et al.'s (2012); Norden and Stoian's (2014) and Cohen, Cornett, et al.'s (2014) studies investigated earnings management of banks on a specific country level, and applied the Loan Loss Provision or the Net Earnings or the Return on Assets variables for testing.

This study's research design differs from the design of the above mentioned studies by the three main empirical testing approaches, by the types of variables tested, by the statistical tests applied, and also by the types of data and the countries that were being investigated. The highlighted studies which investigated Earnings Management in the banking industry have only one thing in common with this study; namely, all of them come to the same conclusion that there is earnings management in the banking industry.

Additionally, investigation of non-financials companies on a country level is mainly based on the accruals approach, as for example, Gore, Pop and Singh (2007), who study UK data, while Holland and Ramsay (2003) study Australian data with reported earnings. Amar and Abaoub (2010) study Tunisian data and report similar test results to the results of this study. All three studies apply the Burgstahler and Dichev (1997) model applying the statistical and distributional approach, and they report evidence of earnings management. Earlier studies examining banking industries all have unique testing approaches and all are different from the one applied in this study. As outlined in Chapter 6, by comparing evidence from this study to existing published studies on an international level, it may be concluded that this study contributes new evidence to the existing literature and extends existing knowledge on earnings management.

This study presents results, as well as an explanation why and in what way it fills the gap in contemporary literature. This study makes a claim that it constitutes a significant contribution to knowledge, that:

1. There is no evidence that earnings management of credit institutions trading in Hungary had ever been investigated prior to this study.
2. There is no evidence that a similar study, either in Hungary or internationally, applying the same testing approaches and using Hungarian credit institutions' data, had investigated the presence of earnings management in Hungary for the period of 1999-2012, or for other periods.
3. There is no evidence that a similar study of the banking industry of a certain country had been undertaken with either a similar or with a larger number and type of ratio analyses, in combination with the same or similar statistical and discontinuity testing approaches.
4. It provides evidence of statistically significant test results and detailed arguments why the hypotheses were rejected, which paired the original research question with an alternative answer.
5. In contrast with earlier research papers, this study acknowledges the possible impact of reversal accruals on 9 out of the 16 ratios, and their possible impact on testing power, as it was highlighted in Chapter 5, Section 5.6.

This study makes an attempt to fill a research gap by investigating the subject in question and by answering the research question that reads:

> ***'Did credit institutions trading in Hungary avoid earnings decreases for the period of 1999-2012?'***

Statistical and distributional results provide evidence which do not support the four hypotheses and claims an alternative answer to the research question, that:

> ***'Credit institutions trading in Hungary avoided earnings decreases for the period of 1999-2012.'***

This study fills the gap in knowledge by presenting new evidence of earnings management by credit institutions trading in Hungary, an ex-communist country in Eastern Europe, and a transitional economy, thus adding new evidence to the existing literature on earnings management.

6.5. Implications

The findings of this study have shown statistical and discontinuity evidence of earnings management of credit institution trading in Hungary for the period 1999-2012, as well as evidence of earnings management prior to and after the 2008 financial crisis, including evidence per assets size. In accordance with the evidence presented in this study, the author wishes to prompt the Hungarian Financial Supervisory Authority (HFSA/MNB) to revise their controlling approaches and to take into account the testing approaches of this study in the interest of a more rigorous control of credit institutions' trading practices in Hungary. This way, the HFSA/MNB would have an early warning mechanism enabling it to act in a timely manner and to prevent credit institutions from managing earnings, and hence, to stop any possible financial crises of credit institutions in the future. The implications of this study's research design would highlight credit institutions, if any, which engage in earnings management, and prompt possible action from the side of the Hungarian Financial Supervisory Authority, or HFSA/MNB, to hold credit institution(s) as well as their managers accountable for their actions.

6.6. Recommendation for future research

Tendeloo and Vanstraelen's (2005); Gore, Pope and Singh's (2007); Sun and Rath's (2009); Abed, Al-Attar and Suwaidan's (2012) studies apply the accrual based model for testing, such as Jones's (1991) model, but only two studies took into account the reversal accrual effect in their tests, namely Baber, Kang and Li (2011) and Dechow, Hutton, et al. (2012). This study argues that the past accrual based models (see for example Jones, 1991; Dechow, Sloan and Sweeney 1995; McNichols, 2000) should be avoided for testing until a working model of the reversal accruals is incorporated into the accrual model(s). Reversal accruals are still new and still an unexplored way of examining evidence of earnings management. Additionally, benchmark comparisons should be further researched in Hungary as well on an international level within the financial industry. Despite the benchmark calculations' simplicity and their weaknesses (see Dechow, Ge and Schrand, 2010), benchmarks are of significant importance for comparisons in the case of financials, or for any industry.

Beatty and Harris (2001) published one of the first studies investigating earnings management in the financial industry. Research studies in the financial industry are relatively recent, compared to studies that investigated all industries with the exclusion of financials, such as credit institutions, investment funds, insurance companies and others. A further examination of the Hungarian financial industry, and additionally, an all industry study with the addition of cash flow analysis in both cases, would be of great interest conducted with research methods applied in this study.

References

Abed, S., Al-Attar, A. and Suwaidan. M., 2012. *Corporate Governance and Earnings Management: Jordanian Evidence*. [pdf] Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.461.1230&rep=rep1&type=pdf> [Accessed 7 August 2014].

Abbott, M. L., 2014. *Understanding Educational Statistics Using Microsoft Excel and SPSS.* [e-book] Hoboken: Wiley. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 2 April 2015].

Ábel, I. and Szakadát, L., 1997. *A bankrendszer átalakulása Magyarországon 1987-1996 között.* [pdf] Available at: <http://epa.oszk.hu/00000/00017/00029/pdf/abelszakadat.pdf> [Accessed 19 June 2011].

Al-Farah, A.R., Abbadi , S. and AL Shaar, E., 2015. *The Accounting and Auditing Profession in Jordan: Its origin and Development*. [pdf] Available at: <www.iiste.org/Journals/index.php/DCS/article/download/22050/22528> [Accessed 27 October 2015].

Amar, A.B. and Abaoub, E., 2010. *Earnings Management Thresholds: The case in Tunisia*. [pdf] Available at: <http://web.usm.my/journal/aamjaf/vol%206-2-2010/6-2-3.pdf> [Accessed 2 July 2012].

Aman, A., Iskandar, T., Pourjalali, H. and Teruya, J., 2006. *Earnings Management in Malaysia: A Study on Effects of Accounting Choices*. [pdf] Available at: <http://ir.uitm.edu.my/273/1/Pages_from_Vol.5_No._1-_185_to_209.pdf> [Accessed 1 May 2011].

A Magyar Országos Levéltár Segédletei 26. 2009. *A Magyar Nemzeti Bank és Jogelődei Repertóriuma 1851 – 1953.* [online] Available at: <http://library.hungaricana.hu/hu/view/MolDigiLib_MOLsegedl_26/?pg=5&layout=s> [Accessed 11 April 2012].

Ardalan, K., 2008. *On the Role of Paradigms in Finance*. [e-book] Aldershot, Hampshire, U.K., and Burlington, Vermont, U.S.A. Ashgate Publishing Group, Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 7 August 2014].

Baber, W. R., Kang, S.H. and Li Y., 2011. Modeling discretionary accrual reversal and the balance sheet as an earnings management constraint, *Accounting Review.* [e-journal] Vol. 86 (4), pp. 1189-1212. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 2 May 2013].

Balatoni A., 2008. Monetáris politika Magyarországon. 1987 – 2007. *Ecostat Műhely.* Február (in Hungarian), pp. 1-16.

Balboa, López-Espinosa and Rubia, 2013. Nonlinear dynamics in discretionary accruals: An analysis of bank loan-loss provisions. *Journal of Banking and Finance,* [e-journal]

Vol.37(12), pp. 5186-5207. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 28 March 2014].

Balogh, L. 2010. *20 éves a pénzügyi rendszer, hány éves a felügyelet, merre a jövő? Fejezetek a felügyelés történetéből.* [online] Available at: <http://www.slideserve.com/major/20-ves-a-p-nz-gyi-rendszer-h-ny-ves-a-fel-gyelet-merre-a-j-vo> [Accessed 5 June 2012].

Ball, R. and Brown, P., 1968. An Empirical Evaluation of Accounting Income Numbers. *Journal of accounting research*, [e-journal] Vol. 6 (2), pp. 159-178. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 January 2012].

Banai, Á., Király, J. and Nagy, N., 2010. *Az aranykor vége Magyarországon*. [pdf] Available at: <http://epa.oszk.hu/00000/00017/00167/pdf/1_banai-kiraly-nagy.pdf> [Accessed 25 April 2011].

Barcsay, T., 1991. *Banking in Hungarian Economic Development. 1867-1919.* [pdf] Available at: <http://www.thebhc.org/sites/default/files/beh/BEHprint/v020/p0216-p0225.pdf> [Accessed 25 April 2011].

Barth, M.E., Landsman, W.R. and Lang, M.H., 2008. International Accounting Standards and Accounting Quality. *Journal of Accounting Research.* [e-journal] Vol. 46 No. 3, pp. 467-498. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 22 January 2011].

Barton, J. and Simko, P.J., 2002. The Balance Sheet as an Earnings Management Constraint. *The Accounting Review*. [e-journal] VOL. 77. Suppl S, pp. 1-27. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 8 February 2011].

Beaver W.H, McNichols M.F. and Nelson K.K., 2007. An Alternative Interpretation of the Discontinuity in Earnings Distributions. *Review of Accounting Studies*, [e-journal] Vol 12, (4), pp. 525-556. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 8 February 2011].

Beaver, W.H., 1981. Market Efficiency. *The Accounting Review*, [e-journal] Vol. 56 (1), pp. 23-37. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 8 February 2011].

Bebchuk, L.A. and Fried, J.M., 2003. Executive Compensation as an Agency Problem. *Journal of Economic Perspectives*, [e-journal] Vol. 17 (3), pp. 71-92. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 8 February 2011].

Beatty, A., Chamberlain, A. and Magliolo, J., 1995. Managing Financial Reports of Commercial Banks: The Influence of Taxes, Regulatory Capital, and Earnings. *Journal of Accounting Research*, [e-journal] Vol. 33 (2), pp. 231-261. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 February 2011].

Beatty, A., Ke, B. and Petroni, K. 2002. Earnings Management to Avoid Earnings declines across Publicly and Privately Held Banks. *The Accounting Review*, [e-journal] Vol. 77. No 3, pp. 547-570. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 February 2011].

Beatty, A. and Harris, D., 2001. Intra-Group, Interstate Strategic Income Management for Tax, Financial Reporting, and Regulatory Purposes. *The Accounting Review*, [e-journal] Vol. 76 (4), pp. 515-536. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 February 2011].

Bedard, J.C. and Johnston, K.M., 2004. Earnings Manipulation Risk, Corporate Governance Risk, and Auditors' Planning and Pricing Decisions. *The Accounting Review,* [e-journal] Vol. 79 (2), pp. 277-304. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 18 February 2011].

Beidleman, C.R., 1973. Income Smoothing: The Role of Management. *The Accounting Review*, [e-journal] Vol. 48 (4), pp. 653-667. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 18 February 2011].

Beneish, M.D., 1999. The Detection of Earnings Manipulation. *Financial Analyst Journal,* [e-journal] Vol. 55 (5), pp. 24. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 18 February 2011].

Beretka, E., 2011. *Earnings Management around Threshold: The case of the financial sector in Hungary.* Chelmsford, 2011. Fifth Annual Research Student Conference. Chelmsford, England. 17 June 2011. Chelmsford: Anglia Ruskin University.

Beretka, E., 2013. *Earnings Management around Threshold: The case of the financial sector in Hungary*. Bristol, 2013. 17th Annual Conference on Financial Reporting and Business Communication Research Unit. Bristol, England, 4-5 July 2013. Bristol: University of Bristol.

Bergstresser, D. and Philippon, T., 2006. CEO Incentives and Earnings Management. *Journal of Financial Economic,* [e-journal] Vol. 80 (3), pp. 511-529. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 February 2011].

Bettis, R.A. and Mahajan, V., 1985. Risk / Return performance of diversified firms. *Management Science*, [e-journal] Vol. 31 (7), pp. 785-799. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 15 February 2011].

Bierman, H. 2008. *Accounting/Finance Lessons of Enron: A Case Stud*y. [e-book] Singapore: World Scientific Publishing Company. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 1 February 2011].

Black F. and Scholes M., 1973. The Pricing of Options and Corporate Liabilities. *The Journal of Political Economy,* [e-journal] Vol. 81, No. 3, pp. 637-654. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 15 February 2011].

Bracken, S., 2010, *Discussing the importance of ontology and epistemology awareness in practitioner research.* [pdf] Available at:

<http://www.worc.ac.uk/edu/documents/FinalSBrackenPractitionerResearch.pdf> [Accessed 11 February 2015].

Brandimarte, P., 2014. *Handbook in Monte Carlo Simulation Applications in Financial Engineering, Risk Management, and Economics*. [e-book] Hoboken: Wiley. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 29 August 2015].

Burgstahler, D. and Chuck, E., 2015. *What Have We Learned About Earnings Management? Integrating Discontinuity Evidence*. [pdf] Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1866008> [Accessed 4 May 2015].

Burgstahler, D., 2014. Discussion of 'The Shapes of Scaled Earnings Histograms are Not Due to Scaling and Sample Selection: Evidence from Distributions of Reported Earnings Per Share'. *Contemporary Accounting Research*, [e-journal] Vol. 31, No. 2, pp. 522–530. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 29 May 2015].

Burgstahler, D. and Eames, M., 2006. Management of Earnings and Analysts' Forecasts to Achieve Zero and Small Positive Earnings Surprises. *Journal of Business Finance and Accounting*, [e-journal] Vol. 33 (5-6), pp. 633-652. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 1 May 2015].

Burgstahler, D. and Dichev I., 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics*, [e-journal] Vol.24 (1), pp. 99-126. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 March 2011].

Callao, S. and Jarne, J.I., 2010. Have IFRS Affected Earnings Management in the European Union? *Accounting in Europe*, [e-journal] Vol. 7, No. 2, pp. 159–189. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 17 April 2013].

Capkun, V., Collins, D.W. and Jeanjean, T., 2013. *The Effect of IAS/IFRS Adoption on Earnings Management (Smoothing): A Closer Look at Competing Explanations.* [pdf] Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1850228> [Accessed 7 August 2013].

Charitou, A. and Clubb, C., 1999. Earnings, Cash Flows and Security returns Over Long Intervals: Analysis and UK Evidence. *Journal of Business Finance & Accounting*, [e-journal] Vol. 26, pp. 283-312. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 17 April 2013].

Charitou, A. and Vafeas, N., 1998. The association between operating cash flows and dividend changes: An empirical investigation. *Journal of Business Finance and Accounting.* [e-journal] Vol. 25, pp. 225-249. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 11 April 2013].

Charenwong, C. and Jiraporn, P., 2009. Earnings Management to exceed Threshold: Evidence from Singapore and Thailand. *Journal of Multinational Financial Management.* [e-journal] Vol. 19 (3), pp. 221-236. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 11 April 2013].

Cohen, L.J., Cornett, M.M., Marcus A.J. and Tehranian, H. 2014. Bank Earnings Management and Tail Risk during the Financial Crisis. *Journal of Money, Credit and Banking*, [e-journal] Vol. 46, No. 1, pp. 171-197. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 2 December 2015].

Copeland, R.M., 1968. Income Smoothing. *Journal of Accounting Research.* [e-journal] Vol. 6, pp. 101-116. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 11 April 2013].

Cooke, T.E. and Sawa, E., 1998. Corporate Governance Structure in Japan - form and reality, *Corporate Governance: An International Review*, [e-journal] Vol. 6 (4), pp. 217-223. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 4 April 2013].

Coppens, L. and Peek, E., 2005. An analysis of earnings management by European private firms. *Journal of International Accounting, Auditing & Taxation*, [e-journal] Vol.14(1), pp.1-17. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 13 February 2011].

Cornett, M.M., McNutt, J.J. and Tehranian H., 2009. Corporate governance and earnings management at large U.S. bank holding companies. *Journal of Corporate Finance*, [e-journal] Vol.15 (4), pp. 412-430. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 February 2012].

Crocker, K.J. and Slemrod, J., 2007. The economics of earnings manipulation and managerial *compensation. RAND Journal of Economics*. [e-journal] Vol. 38 (3), pp. 698-713. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 February 2012].

Crowther, D. and Lancaster, G. 2012. *Research Methods*, [e-book] Hoboken: Taylor & Francis. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 1 March 2014].

Crump, K. S. and Teeguarden, J. G. 2009. Benchmark calculations from summarised data: an example. *Environmental and Ecological Statistics.* [e-journal] Vol.16(1), pp.13-24, Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 February 2015].

Dattakumar, R. and Jagadeesh, R. 2003. A review of literature on benchmarking. *Benchmarking: An International Journal*. [e-journal] Vol.10(3), pp.176-209. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 January 2016].

Deakin, E. B., 1976. Distributions of Financial Accounting Ratios: Some Empirical Evidence. *The Accounting Review*, [e-journal] Vol. 51 (1), pp. 90-96. Available through:

Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 January 2016].

Deangelo, L.E., 1986. Accounting Numbers as Market Valuation Substitutes: A Study of Management Buyouts of Public Stockholders. *The Accounting review*, [e-journal] Vol. 61 (3), p. 400. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 1 March 2014].

Dechow, P.M. and Dichev, I.D. 2002. The Quality of Accruals and Earnings: The Role of Accruals Estimation Errors. *The Accounting Review*, [e-journal] Vol.77, pp. 35-59, 61-69. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 5 March 2011].

Dechow, P.M., Hutton, A.P., Kim, J.H. and Sloan, R.G., 2012. Detecting Earnings Management: A New Approach. *Journal of Accounting Research*, [e-journal] Vol. 50 (2), pp. 275-334. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 22 November 2013].

Dechow, P.M. and Skinner, D.J., 2000. Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators. *Accounting Horizons*, [e-journal] Vol. 14 (2), pp. 235-250. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 22 November 2013].

Dechow, P.M., Sloan, R.G. and Sweeney, A.P., 1995. Detecting Earnings Management. *The Accounting Review*, [e-journal] Vol. 70 (2), pp. 193(33). Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 13 December 2011].

Dechow, P.M., Sloan, R.G. and Sweeney, A.P., 1996. Causes and Consequences of Earnings Manipulation: An Analysis of Firms subject to Enforcement Actions by the SEC. *Contemporary Accounting Research*, [e-journal] Vol. 13 (1), pp. 1-36. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 13 December 2011].

Dechow, P.M., Ge, W. and Schrand, C., 2010. Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting & Economics,* [e-journal] Vol. 50, pp. 344-401. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 19 May 2016].

Dechow, P.M., 1994. Accounting earnings and cash flows as a measure of firm performance: The role of accounting accruals. *Journal of Accounting & Economics*, Volume 18, Issue 1, July, pp. 3–42

Degeorge, F., Patel, J. and Zeckhauser, R., 1999. Earnings Management to Exceed Threshold. *Journal of Business*, [e-journal] Vol.72(1), p.1-33. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 December 2011].

Deutsche Bank. 2010. *Tail Risk Hedging: A Roadmap for Asset Owners*. [pdf] Available at: <http://allaboutalpha.com/blog/wp-content/uploads/2010/05/Tail-Risk-Hedging-May2010.pdf> [Accessed 23 November 2014].

Dichev, D. and Skinner, D., 2002. Large-Sample Evidence on the Debt Covenant Hypothesis. *Journal of Accounting Research*, [e-journal] Vol. 40 (4), pp. 1091-1123. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 December 2011].

Dhaliwal, D.S., Gleason, C.A. and Mills, L.F., 2004. Last-Chance Earnings Management: Using the Tax Expense to Meet Analysts' Forecasts. *Contemporary Accounting Research*, [e-journal] Vol. 21 (2), pp. 431-459. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 December 2011].

Donley, A. 2012. *Student Handbook to Sociology: Research Methods*. (e-book] New York: Infobase Publishing. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 20 January 2014].

Doupnik, T.S. and Salter S.B., 1993. An Empirical Test of a Judgmental International Classification of Financial Reporting Practices, *Journal of International Business Studies*, [e-journal] Vol. 24 (1), pp. 41. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 22 January 2011].

Duncan, J. C. , 1908. A Definition of Accounting. *American Economic Association Quarterly*, [e-journal] 3rd Series, Vol. 10, No. 1, pp. 75-84. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 22 January 2011].

Durtschi, C. and Easton, P., 2005. Earnings management? The shapes of the frequency distributions of earnings metrics are not evidence ipso facto. *Journal of Accounting Research*, [e-journal] Vol. 43 (4), pp. 557-592. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 29 January 2011].

Durtschi, C. and Easton, P., 2009. Earnings Management? Erroneous Inferences Based on Earnings Frequency Distributions. *Journal of Accounting Research,* [e-journal] Vol. 47 (5), pp. 1249-1281. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 29 January 2011].

Enomoto, M., Kimura, F. and Yamaguchi, T., 2013. *Accrual-Based and Real Earnings Management: An International Comparison for Investor Protection*. [pdf] Available at: <http://www.rieb.kobe-u.ac.jp/academic/ra/dp/English/DP2012-13.pdf> [Accessed 13 January 2014].

Ernst and Young, 2011. *IASB issues three new standards: Consolidated Financial Statements, Joint Arrangements, and Disclosure of Interest in Other Entities*. [pdf] Available at:
<http://www.ey.com/Publication/vwLUAssets/IFRS_Developments_Issue1_0511/$FILE/IFRS%20Developments%20Issue1%200511.pdf> [Accessed 22 September 2012]

Ewert, R. and Wagenhofer, A., 2005. Economic Effects of Tightening Accounting Standards to Restrict Earnings Management. *The Accounting Review,* [e-journal] Vol. 80 (4), pp. 1101-1124. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 29 January 2011].

Fama, E.F. and MacBeth, J.D. 1973. Risk, Return, and Equilibrium: Empirical Tests. *Journal of Political Economy,* [e-journal] Vol. 81, No. 3, pp. 607-636. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 29 January 2011].

Fiegenbaum, A., 1990. *Prospect Theory and the Risk-Return Association, An empirical Examination in 85 industries*. [pdf] Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.465.4364&rep=rep1&type=pdf> [Accessed 1 February 2011]

Fischer, M. and Rosenzweig, K., 1995. Attitudes of Students and Accounting Practitioners Concerning The Ethical Acceptability of Earnings Management, *Journal of Business Ethics 14(6) June 1995.* [e-journal] Vol. 14 (6), pp. 433. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 29 January 2011].

Financial Accounting Standards Board, 2008. Statement of Financial Accounting Concepts No. 1., *Journal of Accountancy*, [e-journal] Vol. 147 (2), pp. 90. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 29 January 2011].

Financial Accounting Standards Board, 1985. *Statement of Financial Accounting Concepts No. 6*. [pdf] Available at:

<http://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1218220132802&acceptedDisclaimer=true> [Accessed 29 January 2011].

Financial Accounting Standards Board (FASB) - *Statement of Financial Accounting Standards No. 109 (SFAS No.109)* [pdf] Available at: <http://www.fasb.org/summary/stsum109.shtml> [Accessed 02 April 2012]

Francis, J. and Schipper, K., 1999. Have Financial Statements Lost Their Relevance, *Journal of Accounting Research*, [e-journal] Vol. 37 (2), pp. 319. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 29 January 2011].

Francis, J., 2001. Discussion of empirical research on accounting choice. *Journal of Accounting and Economics*, [e-journal] Vol. 31 (1), pp. 309-319. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 21 January 2011].

Fridson, M. and Alvarez, F., 2002. *Financial Statement Analysis – A Practitioner's Guide*. [e-book]. Hoboken, N.J.: Wiley. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 15 May 2013].

Gerakos, J. 2012. Discussion of Detecting Earnings Management: A New Approach. *Journal of Accounting Research,* [e-journal] Vol. 50 (2), pp. 335-347. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 11 May 2014].

Gore, P., Pope, P. and Singh A.K., 2007. Earnings management and the distribution of earnings relative to targets: UK evidence. *Accounting and Business Research,* [e-journal]

Vol. 37 (2), pp. 123-149. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 May 2014].

Grossman, S.J. and Stiglitz, J.E., 1980. On the Impossibility of Informationally Efficient Markets. *The American Economic Review*, [e-journal] Vol. 70 (3), pp. 393-408. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 December 2010].

Guerrien B. and Gun. O., 2011. *Efficient Market Hypothesis: What are we talking about?* [pdf] Available at: <http://www.paecon.net/PAEReview/issue56/GuerrienGun56.pdf> [Accessed 10 November 2013].

Gujarati, D.N., 1995. *Basic Econometrics*. McGraw-Hill Inc.

Gupta, M. C. and Huefner, R. J. 1972. A Cluster Analysis Study of Financial Ratios and Industry Characteristics. *Journal of Accounting Research*. [e-journal] Vol. 10, No. 1, pp. 77-95. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 31 November 2015].

Habib, A. 2007. *Benchmark Beating' as Evidence of Earnings Management: Review of the Literature*. [pdf] Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1866008> [Accessed 4 December 2015].

Hamdi, F.M. and Zarai, M.A. 2012. *Earnings Management to Avoid Earnings Decreases and Losses: Empirical Evidence from Islamic Banking Industry*. [pdf] Available at: <http://pakacademicsearch.com/pdffiles/ech/519/88106%20Vol%203,%20No%203%20(2012).pdf> [Accessed 18 November 2010].

Hartzell, J.C. and Starks, L.T., 2003. Institutional Investors and Executive Compensation. *Journal of Finance,* [e-journal] Vol.58(6), pp.2351-2374. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 October 2010].

Hayn, C., 1995. The information content of losses, *Journal of Accounting and Economics,* [e-journal] Vol. 20 (2), pp. 125-153. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 10 October 2010].

Healy, P.M., 1985. *The Effect of Bonus Schemes on Accounting Decisions*. [pdf] Available at: <http://econ.au.dk/fileadmin/Economics_Business/Education/Summer_University_2012/6308_Advanced_Financial_Accounting/Advanced_Financial_Accounting/4/Healy_JAE_1985.pd> [Accessed 10 October 2010].

Healy, P.M. and Wahlen, J.M., 1999. A Review of the Earnings Management Literature and its Implications for Standard Setting. *Accounting Horizons,* [e-journal] Vol. 13 (4), pp. 365-383. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 5 December 2010].

Healy, P.M. and Palepu, K.G. 2001. Information asymmetry, corporate disclosure and capital markets: A review of the empirical disclosure literature. *Journal of Accounting & Economics,* [e-journal] Vol. 31 (1), pp. 405-440. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 5 December 2010].

Healy, P.M. and Wahlen, J.M.,1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, [e-journal] Vol.13 (4), pp. 365-383. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 5 December 2010].

HFSA (PSZÁF), 2001. *Annual Report of the Hungarian Financial Supervisory Authority*. [pdf] Available at: <http://alk.mnb.hu/data/cms1290540/report_2001annualreport.pdf>, (Accessed on 03.04.2011)

Higson A., 2003. *Corporate Financial Reporting: Theory and Practice*. [e-book] London: Sage Publications. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 22 January 2011].

Hirst, D.E. and Hopkins, P.E., 1998. Comprehensive income reporting and analysts valuation judgmenets. *Journal of Accounting Research*, [e-journal] Vol. 36, pp. 47-75. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 22 January 2011].

Holland, D. and Ramsay, A., 2003. Do Australian companies manage earnings to meet simple earnings benchmarks?, *Accounting and Finance*, [e-journal] Vol.43 (1), pp. 41-62. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 22 January 2011].

Hunton, J., Libby, R. and Mazza, C., 2006. Financial Reporting Transparency and Earnings Management. *The Accounting Review,* [e-journal] Vol. 81 (1), pp. 135-157. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 25 January 2011].

Hu, J. and Noe, T.H., 2001. Insider trading and managerial incentives. *Journal of Banking and Finance,* [e-journal] Vol. 25 (4), pp. 681-716. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 25 January 2011].

International Financial Reporting Standards. 2015. *Mission Statement*, [online] Available at: < http://www.ifrs.org/About-us/Pages/IFRS-Foundation-and-IASB.aspx> [Accessed on 17 July 2015]

Jacob, J. and Jorgensen, B.N. 2007. Earnings Management and Accounting Income Aggregation. *Journal of Accounting and Economics,* [e-journal] Vol .43 (2), pp. 369-390. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 2 May 2013].

Jaffe, J.F. 1974. Special Information and Insider Trading. *Journal of Business,* [e-journal] Vol. 47 (3), pp. 410. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 28 June 2011].

Jarva, H and Lantto, A.M., 2011. *Information Content of IFRS versus Domestic Accounting Standards: Evidence from Finland.* [online] Availble at: <http://ssrn.com/abstract=1588087> [Accessed 3 July 2013]

Jiang, J.(X)., Petroni, K.R. and Wang, I.Y., 2010. CFOs and CEOs: Who have the most influence on earnings management? *Journal of Financial Economics,* [e-journal] Vol. 96 (3), pp. 513-526. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 3 July 2013]

Jogtár, 2000. *Act C of 2000 On Accounting*. [online] Available at: <http://net.jogtar.hu/jr/gen/hjegy_doc.cgi?docid=A0000100.TV> in Hungarian [Accessed 20 July 2012]

Jones, J.J., 1991. Earnings Management During Import Relief Investigation. *Journal of Accounting research*, [e-journal] Vol. 29 (2), pp. 193-228. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 28 June 2011].

Jones, M. 2011. *Creative Accounting, Fraud and International Accounting Scandals*. [e-book] Chichester: Wiley. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 3 August 2014].

Jorgensen, B., Lee, Y. G. and Rock, S. 2014. The Shapes of Scaled Earnings Histograms are Not Due to Scaling and Sample Selection: Evidence from Distributions of Reported Earnings Per Share. *Contemporary Accounting Research*, [e-journal] Vol. 31 (2), pp. 498-521. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 8 March 2015].

Kanagaretnam, K., Lim, C.Y. and Lobo, G.J., 2010. *Auditor Reputation and Earnings Management: International Evidence from the Banking Industry.* [online] Available at: <http://ssrn.com/abstract=1568866> [Accessed 27 December 2010]

Kálniczkyné, V.K., at al.,2009. *A Magyar Nemzeti Bank és Jogelődei Repertóriuma 1851-1953.* [online] Available at: <http://library.hungaricana.hu/hu/view/MolDigiLib_MOLsegedl_26/?pg=4&layout=s> [Accessed 9 November 2011]

Kahneman, D. and Tversky, A., 1979. Prospect Theory: An Analysis of Decision under Risk. E*conometrica*, [e-journal] Vol. 47 (2), pp. 263-291. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 March 2011].

Kasznik, R., 1999. On the Association between Voluntary Disclosure and Earnings Management. *Journal of Accounting research,* [e-journal] Vol. 37 (1), pp. 57-81. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 15 March 2011].

Kent, R. and Routledge, J. 2015. Use of benchmarks in predicting earnings management? *Accounting and Finance.* [e-journal], pp. 1-22. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 27 December 2015].

Kirschenheiter, M. and Melumad, N.D., 2002. Can ‘Big Bath’ and Earnings Smoothing Co-exist as Equilibrium Financial Reporting Strategies? *Journal of Accounting Research*, [e-journal] Vol. 40 (3), pp. 761-796. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 15 March 2011].

Krishnan, G.V., 2003. Does Big 6 Auditor Industry Expertise Constrain Earnings Management? *Accounting Horizons,* [e-journal] Vol.17, pp. 1. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 20 May 2011].

Kwak, W., Lee, H-Y. and Eldridge, S.W., 2009. Earnings Management by Japanese Bank Managers Using Discretionary Loan Loss Provisions. *Pacific Basin Financial Markets and Policies,* [e-journal] Vol.12 (01), pp. 1-26. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 5 December 2011].

Larcker, D.F. and Richardson, S.A., 2004. Fees Paid to Audit Firms, Accrual Choices, and Corporate Governance. *Journal of Accounting Research,* [e-journal] Vol.42 (3), pp. 625-658. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 5 December 2011].

Leuz, C., Nanda, D. and Wysocki, P.D., 2003. Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, Vol 69, Issue 3, pp. 505–527.

Lev, B., 1989. On the Usefulness of Earnings and Earnings Research: Lessons and Directions from Two Decades of Empirical Research. *Journal of Accounting Research,* [e-journal] Vol.27, pp. 153-192. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 5 December 2011].

Lev, B. and Zarowin, P., 1999. The boundaries of financial reporting and how to extend them. *Journal of Accounting Research,* [e-journal] Vol. 37 (2), pp. 353. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 6 December 2011].

Li, W. 2014. A Theory on the Discontinuity in Earnings Distributions. *Contemporary Accounting Research,* [e-journal] Vol. 31. No. 2. pp. 469-497. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 1 March 2015].

Lifschutz, S., 2002. *The Effect Of SFAS 115 On Earnings Management In The Banking Industry.* [online] Available at: <http://www.cluteinstitute.com/ojs/index.php/JABR/article/view/2124/2101> [Accessed 9 March 2011].

Lilliefors, H., (1967), On the Kolmogorov-Smirnov Test for Normality with Mean and Variance Unknown. *Journal of the American Statistical Association*, [e-journal] Vol. 62, No. 318, pp. 399-402. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 16 May 2012].

Liu, Q. and Lu, Z.(J)., 2007. Corporate governance and earnings management in the Chinese listed companies: A tunneling perspective. *Journal of Corporate Finance,* [e-journal] Vol 13, n. 5, pp. 881-906. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 17 May 2012].

Lo, K., 2008. Earnings Management and Earnings Quality. *Journal of Accounting & Economics*, [e-journal] Vol. 45 (2), pp. 350-357. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 3 May 2012].

Malkiel, B.G., 2009. The Efficient Market Hypothesis and Its Critics. *Journal of Economic Perspectives*, [e-journal] Vol 17. Number 1. pp. 59-82. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 3 May 2012].

Majnoni, G., Shankar, R. and Várhegyi, É., 2003.*The Dynamics of Foreign Bank Ownership: Evidence from Hungary.* [pdf] Available at: < http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2003/09/16/000094946_03082804014224/Rendered/PDF/multi0page.pdf> [Accessed 3 May 2012].

Marnet, O., 2005. Behavior and Rationality in Corporate Governance. *Journal of Economic Issues*, [e-journal] Vol.39 (3), pp. 613-632. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 3 May 2012].

Martin, W. E. and Bridgmon, K. D. 2012. *Quantitative and Statistical Research Methods from Hypothesis to Results.* [e-book] Chichester, Wiley. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 3 March 2014].

Matsuura, S., 2008. On the Relation between Real Earnings Management and Accounting Earnings Management: Income Smoothing Perspective. *Journal of International Business Research*, [e-journal] Vol.7 (3), pp. 63(15). Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 27 February 2012].

Massey, F., 1951. The Kolmogorov-Smirnov Test for Goodness of Fit. *Journal of the American Statistical Association*, [e-journal] Vol.46 (253), pp. 68-78. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 27 February 2012].

McKee, T.E., 2005. *Earnings Management: An Executive Perspective.* Thomson

McLeay, S. and Fieldsend, S. 1987. Sector and Size Effects in Ratio Analysis: An Indirect Test of Ratio Proportionality. *Accounting and Business* research, [e-journal] Vol.17 (66), pp. 133-140. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 2 May 2016].

McLeay, S. and Omar, A. 2000. The Sensitivity of Prediction Models to the Non-Normality of Bounded and Unbounded Financial Ratios. *British Accounting Review*, [e-journal] Vol.32, pp. 213–230. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 2 May 2016].

McNeill, P. and Chapman, S. 2005. *Research Methods*. [e-book] Routledge. London and New York. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 27 February 2012].

McNichols, M.F., 2000. Research design issues in earnings management studies. *Journal of Accounting and Public Policy*, [e-journal] Vol.19 (4), pp. 313-345. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 27 February 2012].

McNichols, M.F., 2002. Discussion of The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. The Accounting Review, [e-journal] Vol.77 Suppl S, pp.61-69. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 8 March 2012].

Mehta, C.R. and Patel, N. R. 2012. *IBM SPSS Exact Tests*. [pdf] Available at: <http://www.sussex.ac.uk/its/pdfs/SPSS_Exact_Tests_21.pdf> [Accessed 12 November 2011].

Miyashita, K. and Russell, D., 1994. *Keiretsu: Inside the Hidden Japanese Conglomerates*. New York London McGraw-Hil. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 1 April 2012].

Mkansi, M. and Acheampong, E. A., 2012, Research Philosophy Debates and Classifications: Students' Dilemma, *The Electronic Journal of Business Research Methods*, [e-journal]

Vol.10 (2), pp. 132-140. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 11 June 2014].

Molnár, J., Nagy, M. and Horváth, Cs., 2007. *A Structural Empirical Analysis of Retail Banking Competitions: the case of Hungary.* [pdf] Available at: < https://www.mnb.hu/letoltes/wp2007-1.pdf> [Accessed 1 July 2011].

Morgan, D.P., 2002. Rating Banks: Risk and Uncertainty in an Opaque Industry. *The American Economic Review,* [e-journal] Vol.92 (4), pp. 874-888. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 7 January 2011].

Moses, O.D., 1987. Income Smoothing and Incentives: Empirical Tests Using Accounting Changes. *The Accounting Review*. [e-journal] Vol. LXII, No. 2. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 9 January 2011].

Moshinsky, B., 2015. *The CEO of Credit Suisse nailed the banking industry's biggest problem in a sentence.* [online] Available at: <http://www. http://uk.businessinsider.com/credit-suisse-tidjane-thiam-on-return-on-equity-2015-11> [Accessed 4 November 2015]

Neale, C.W. and Bozsik, S., 2001. How the Hungarian State-owned Banks were Privatised. *Post-Communist Economies,* [e-journal] Vol.13 (2), pp. 147-169. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 9 January 2011].

Nelson, M.W., Elliott J.A. and Tarpley, R.L., 2003. How Are Earnings Managed? Examples from Auditors. *Accounting Horizons.* [e-journal] Vol.17, pp. 17. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 9 February 2011].

Norden, L. and Stoian, A., 2014. *Bank earnings management through loan loss provisions: A double-edged sword?* [online] Available at: <SSRN:http://ssrn.com/abstract=2369798> [Accessed 3 June 2014].

Othman, H.B. and Zeghal, D., 2006. A study of earnings-management motives in the Anglo-American and Euro-Continental accounting models: The Canadian and French cases. *The International Journal of Accounting*, Vol 41, Issue 4, pp.406–435.

Panik, M. J. 2015. *Advanced Statistics from an Elementary Point of View*. [e-book] Burlington: Elsevier Science. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 28 August 2015].

Phillips, J., Pincus, M. and Rego, S.O.,2003. Earnings Management: New Evidence Based on Defferred Tax Expense. *The Accounting Review.* [e-journal] Vol. 78, No. 2 2003 pp.491-521. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 2 July 2012].

Prawitt, D.F., Smith, J.L. and Wood, D.A., 2009. Internal Audit Quality and Earnings Management. *The Accounting Review*, [e-journal] Vol.84(4), pp.1255(26). Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 2 July 2012].

PricewaterhouseCoopers, 2009. *IFRS adoption by country*. [pdf] Available at: <http://www.pwc.com/us/en/cfodirect/assets/pdf/pwc-ifrs-by-country-2015.pdf> [Accessed 13 October 2012].

Pourjalali, H., Darrough, M.N. and Saudagaran, S., 1998. Earnings Management in Japanese Companies. *International Journal of Accounting*, [e-journal] Vol. 33 (3), pp. 313-334. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 1 March 2014].

Remenyi, D. 1996. *So you want to be an academic researcher in business and management studies!* [pdf] Available at: <http://core.ac.uk/download/files/141/13925.pdf> [Accessed 13 October 2012].

Ronen, J. and Yaari, V., 2008. *Earnings Management: Emerging Insights in Theory, Practice, and Research*. New York, NY: Springer.

Rózsa, I., 2011. *Consultant at RIBZ Consulting.* [online] Available at: <www.ribz-consulting.com> [Accessed 27 March 2011]

Rudra, T. and Bhattacharjee, CA.D., 2012. *Does IFRs Influence Earnings Management? Evidence from India.* [online] Available at: <http://www.macrothink.org/journal/index.php/jmr/article/viewFile/849/771> [Accessed 14 May 2013]

San-Jose, L., Retolaza, J.L., Urionabarrenetxea, S., Ruiz-Roqueñi, M. and Azkunaga, J.A. 2013. *The New Paradigm of Corporate Finance: Ethics in Finance, ICTs, Financial Globalization and Stakeholder Responsibility*. [pdf] Available at: <http://www.internationalresearchjournaloffinanceandeconomics.com/ISSUES/IRJFE_103_15.pdf> [Accessed 19 December 2014]

Saunders, M., Lewis P. and Thornhill, A. 2012. *Research methods for business students*. [e-book] Harlow: Pearson Education. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 12 July 2014].

Schipper, K., 1989. Commentary on Earnings Management, *Accounting Horizons.* 3(4) December. pp.91-102.

Schrand, C.M. and Wong, M.H.F., 2003. Earnings Management Using the Valuation Allowance for Deferred Tax Assets under SFAS No. 109. *Contemporary Accounting Research*, [e-journal] Vol.20(3), pp.579-611. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 19 October 2011].

Shen, C.H. and Chih, H.L., 2005. Investor protection, prospect theory and earnings management: An international comparison of the banking industry. *Journal of Banking & Finance*, [e-journal] Vol.29(10), pp.2675-2697. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 20 October 2011].

Shuto, A., 2007. Executive compensation and earnings management: Empirical evidence from Japan. *Journal of International Accounting. Auditing and Taxation*, [e-journal]

Vol.16(1), pp.1-26. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 1 March 2011].

Sloan, R.G., 1996. Do Stock Prices Fully Reflect Information in Accruals and cash Flows About Future Earnings. *The Accounting Review*, [e-journal] Vol.71(3), pp.289-315. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 11 January 2011].

Smith, A., 1776. *Inquiry into the Nature & Causes of the Wealth of Nations.* [pdf] Available at: <http://www.ifaarchive.com/pdf/smith_-_an_inquiry_into_the_nature_and_causes_of_the_wealth_of_nations%5B1%5D.pdf> [Accessed 26 January 2011]

Smith, C.W.Jr. and Warner, J.B., 1979. ON FINANCIAL CONTRACTING: An Analysis of Bond Covenants. *Journal of Financial Economics* Vol.7. pp.117-161.

Sterling, R.R.,1967. A Statement of Basic Accounting Theory: A Review Article - *Journal of Accounting Research,* [e-journal] Vol. 5, No. 1, pp. 95-112. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 26 January 2011].

Suda, K. and Shuto, A., 2005. *Earnings Management to avoid earnings decreases and losses: Empirical evidence from Japan.* [online] Available at: <http://ssrn.com/abstract=701525> [Accessed 26 January 2011].

Sun, L. and Rath, S., 2009. *An Empirical Analysis of Earnings Management in Australia.* [pdf] Available at: <http://waset.org/publications/12185/an-empirical-analysis-of-earnings-management-in-australia> [Accessed 26 January 2011].

Sun, L. and Rath, S., 2012, Pre Managed Earnings Benchmarks and Earnings Management of Australian Firms. *Australasian Accounting Business and Finance Journal*, [e-journal] Vol.6(1), pp.29-56. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 26 January 2011].

Szapáry, Gy., 2001. *Banking Sector Reform in Hungary: Lessons Learned, Current Trends and Prospects.* [pdf] Available at: <http://www.hnb.hr/dub-konf/7-konferencija-radovi/szapary-banking-sector-reform.pdf> [Accessed 28 January 2011]

Taktak, N.B., Shabou, R. and Dumontier, P., 2010. Income Smoothing Practices: Evidence from Banks Operating in OECD Countries. *International Journal of Economics and Finance.* [e-journal] Vol. 2, No. 4; November. Vol.2(4), pp.140-150. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 13 April 2012].

Tendeloo, B., and Vanstraelen A., 2008. Earnings Management and Audit Quality in Europe: Evidence from the Private Client segment Market. *European Accounting Review.* [e-journal] Vol.17(3), pp.447-469. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 13 April 2012].

Tendeloo, B. and Vanstraelen, A., 2005. Earnings Management under German GAAP versus IFRS. *European Accounting Review*, [e-journal] Vol.14(1), pp.155-180. Available through:

Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 30 April 2012].

The Austrian National Bank. 2012. *The Austro-Hungarian Bank*, [online] Available at: <https://www.oenb.at/en/About-Us/200th-anniversary-of-the-OeNB/History/1878-1922.html>, [Accessed on 07.02.2012].

The Central Bank of Hungary. History of the Hungarian Central Bank (CBH). [online] Available at: <http://www.mnb.hu/a-jegybank/az-mnb-tortenete>, [Accessed on 7 February 2012].

The Central Bank of Hungary. 2012. Supervision. *The Golden Book*. [online] Available at: <https://www.mnb.hu/en/supervision/time-series/golden-books> [Accessed 2 March 2013].

The Central Bank of Hungary. 2013. *Annex 1: Charts on Developments in Loan Portfolios and Answers to the Questionnaire*, [pdf] Available at: <https://www.mnb.hu/letoltes/slo-abrakeszlet-201311-en.pdf>, [Accessed 15 November 2013]

The Central Bank of Hungary. 2012. 5 *Annex: Charts and tables*, [pdf] Available at: <https://www.mnb.hu/letoltes/risk-report-may-2012-annex.pdf>, [Accessed 15 November 2013]

The Central Bank of Hungary. 2013. 5 *Annex: Charts and tables*, [pdf] Available at: < https://www.mnb.hu/letoltes/risk-report-june-2013-annex.pdf>, [Accessed 12 December 2014]

The Central Bank of Hungary. 2012. *Annual Report 2012*. [pdf] Available at: <http://www.mnb.hu/letoltes/eves-jelentes-2012-en-1.pdf>, [Accessed 15.11.2013]

The Central Bank of Hungary. 2014. *Reports,* [online] Available at: <https://www.mnb.hu/en/publications/reports>, [Accessed 15 November 2015].

The Central Bank of Hungary, 2013. *Trends in lending, August 2013*. [pdf] Available at: <http://www.mnb.hu/letoltes/hitelezesi-folyamatok-201308-en.pdf>, [Accessed on 15 November 2013]

The European Parliament and the Council of the European Union, 2008. *Regulation (ec) no 1606/2002 of the European Parliament and of the Council.* [pdf] Available at: <http://www.iasplus.com/en/binary/europe/0811ifrsconsolidated_en.pdf> [Accessed 22 June 2012]

Thomas, R.L., 1997. *Modern Econometrics,* Addison-Wesley.

Tokuga, Y. and Tanaka, S., 2011. *The Relationship between R&D Spending and the Earnings Management of Japanese Electronics Companies - A case of earnings management through real management activity.* [pdf] Available at: < http://www.econ.kyoto-u.ac.jp/~chousa/WP/125.pdf> [Accessed 3 March 2013]

Tucker, J.W. and Zarowin, P.A., 2006. Does Income Smoothing Improve Earnings Informativeness? *The Accounting Review,* [e-journal] Vol.81(1), pp.251-270. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 23 January 2011].

Várhegyi, É., 2004. Bank Competition in Hungary. *Acta Oeconomica*, Vol. 54 (4), pp. 403–424.

Várhegyi, É., 2001. *Külföldi tulajdon a magyar bankrendszerben*, *Közgazdasági Szemle.* [pdf] Available at: <http://epa.niif.hu/00000/00017/00073/pdf/Varhegyi.pdf> [Accessed 30 January 2011]

Várhegyi, É., 2008. *The Hungarian Banking System 20 years After Modernisation*, [online] Available at: <http://www.akademiai.com/doi/abs/10.1556/AOecon.58.2008.4.2> [Accessed 30 January 2011]

Walliman, N. S. R., 2011. *Research Methods: The Basics*. Routledge, London.

Walton, P., Haller, A. and Raffournier, B., 2003. *International Accounting.* [e-book], London: Thomson. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 2 May 2012].

Wang, Y. and Campbell, M., 2012. Earnings Management Comparison: IFRS vs. China GAAP. *International Management Review,* [e-journal] Vol.8(1), pp. 5-11,81. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 15 March 2013].

Wang, C.Y., Chen, M.C., Lee, C.C. and Shyu, S.D., 2012. Income Smoothing and Earnings Management in the Banking Industry: Evidence in Asian Countries. *International Research Journal of Finance and Economics.* Issue 99, pp. 37-52.

Watts, R.L. and Zimmerman, J.L.,1990. Positive Accounting Theory: A Then Year Perspective. *The Accounting Review*. January, [e-journal] Vol.65. No.1. pp. 131-156. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 20 January 2011].

Watts, R.L. and Zimmerman, J.L.,1978. Towards a Positive Theory of the Determination of Accounting Standards. *The Accounting Review,* [e-journal] Vol.53(1), pp. 112-134. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 20 January 2011].

Whittington, G. 1980. Some Basic Properties of Accounting Ratios. *Journal of Business Finance and Accounting*, [e-journal] Vol.7 (2), pp. 219-232. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 20 April 2016].

Wiggins, R., Piontek, T., Metrick, A., 2014. *The Lehman Brothers Bankruptcy A:[1] Overview*. [pdf] Available at: <http://som.yale.edu/sites/default/files/files/001-2014-3A-V1-LehmanBrothers-A-REVA.pdf> [Accessed 11 June 2015].

World Bank, 2004. *Report on the Observance of Standards and Codes (ROSC) - Hungary,* [pdf] Available at: <http://www- http://www.worldbank.org/ifa/rosc_aa_hun.pdf> [Accessed 18 February 2013]

Wu, M.C., Huang, Y.T. and Chen, Y.I., 2012. Earnings Manipulation, Corporate Governance and Executive Stock Option Grants: Evidence from Taiwan. *Asia-Pacific Journal of Financial Studies*, [e-journal] Vol.41 (3), pp. 241-257. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 20 March 2013].

Yasin, M. M. 2002. The theory and practice of benchmarking: then and now. *Benchmarking: An International Journal*. [e-journal] Vol.9(3), p.217-243 Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 25 November 2015].

Yu, Q., Du, B. and Sun, Q., 2006. Earnings management at rights issues threshold – Evidence from China. *Journal of Banking and Finance.* [e-journal] Vol.30 (12), pp. 3453-3468. Available through: Anglia Ruskin University Library website <http://libweb.anglia.ac.uk> [Accessed 20 March 2013].

Appendix

1. Additional explanation for SPSS input

The input of variables in SPSS for histogram creation comes first. For example, for DTE for the 1999-2012 period samples, the calculated results were inserted into the SPSS 20 Data Editor. The first column in SPSS was allocated a name, as a DTE variable. The same procedure was performed for all ratios while importing the ratios' results into SPSS. Once the naming of the columns with the ratios' variable names was completed the Graphs tab in SPSSS was pressed and the Chart builder was run. In the Chart Builder, by highlighting all the ratios' names in the Variables box and also under the Gallery tab; then, by selecting the Histogram option and pressing the 'OK', this study ran the Chart Builder. Separate SPSS windows pop up with the ratios' Histogram diagrams.

2.1. Explanation of Earnings Management 1 model calculation in Excel

Chapter 4 presented Earnings Management Model 1, (EM1), which is equal to the actual observation (AO) in period (i) minus the expected observation (EO) in period (i). The result of the actual observation minus the expected observation is then divided by the standard deviation (SD) of the difference in period (i). The Standard deviation of the difference (SDi) reads as:

$$SDi = [Np_i (1 - p_i) + \frac{1}{4} N (p_{i-1} + p_{i+1}) (1 - p_{i-1} - p_{i+1})]^{\frac{1}{2}}$$

The SDi is the difference between the actual and the expected observation in interval (i), where *Npi* is the total number of *pi* (estimated) observations in interval (i); *N* is the number of total samples; *pi* is the proportion of the actual observation that falls within the interval (i), also called the Estimated probability observation; *pi-1* is the estimate in interval i-1; *pi+1* is the estimate in interval i+1. SD is the Standard Deviation and it is defined as *'…of a probability distribution as the positive square root of the variance*'. (Thomas, 1997, p.13)

Calculations were performed for each base variable, then the results of each variable were imported in the *'Burgstahler calculation method of all variables.xlsx'* excel sheet. The input of results follows, for each column representing a particular fiscal year for the 1999-2012 period, and each variable obtained from the base ratio (ratios were calculated for the same companies for a year (t) for the sample period in question, namely, from 1999 to 2012. For example, the formula consists of a company 'z' in the year (t) and then, it is calculated for the same company 'z' in the year (t-1) or in (t-2)). These are the actual observations, or 'AO'. For example for Equity to Loans, or ETL, the data was imported from the BASE file ratio calculation, the ETL ratio variables for each company, and this way we got a total of 33 ratio variables for the 2012 year, 30 variables for the 2011 year, and so on. In this way, a table of variables per periods was formed for ETL, where the columns represent specific years comprise the total of periods from 2000 to 2012. For every column (Year) this study calculates the number of total variables per year, using the formula '=COUNT(B5:B48)'. The results are shown at the bottom of each year. For example, for 2012 there are 33 ratio variables, while for the year 2011, there are 30 variables, as stated above. Additionally, the total number of variables was calculated for the sample period of 2000-2012, with the formula '=COUNT(B5:N48)'. For Equity to Loan, or ETL, the total number of variables is 402. As earlier pointed out, this table is the actual observation or 'AO'.

In the same ETL sheet, next to the AO table, the expected observation calculations were prepared in a separate table. The same procedure was applied as for the 'AO', the next table was for expected observation, or (EO), where the columns were labelled as years with the results of each column referring to a particular year. The Expected observation (EO) formula is (ni-1 + ni+1) / 2, where (n_{i-1}) stands for the previous year from the base year and (n_{i+1}) stands for the following year from the base or actual observation. For example, if the base year is 2011, then for the (ni-1), it is 2010, and for (ni+1), it is 2012. By adding the 2010 and 2012 variables and dividing the result by 2, we get the average or the expected observation for the ETL variable. For the rest of the years, EO is calculated for 2011 – 2001 periods, the same as for 2011. In case data is missing in AO in (ni-1) or in (ni+1), then, the calculation is omitted, leading to the elimination of false results. For example, for the year 2011 taken as a base year, there are 37 expected observations for ETL ratio, whereas for the 2010 base year, there are 36 observations.

After the input of the actual observation (AO) data and the calculation of the expected observation (EO), the next step is to calculate the estimated probabilities of the observation in the year (i) or the (SD). In order to calculate these, the first number of the actual observation (AO) variable in the interval (i), or year (i), is divided it by the total number of variables (observation) in the year (i). For example, in the '*Burghstahler method of calculation of all variables.xlsx*' excel workbook, in the ETL sheet, for the year 2012, the total number of observations is 33 and it is displayed in cell B49 in the ETL sheet. The first actual observation (variable) is in the B5 cell. Therefore, the first AO observation in cell B5 is divided by the total number of AO observations in cell B49. The second AO observation is in cell B6, divided by the total number of AO observation in B49, and so on for every number of observation in 2012 or in the year (i).The results of SD_i for the first sample for the 2012 year are in cell AD5. In order to make sure that for 2012, it uses the total number of observations in cell B49, clicking on the AD5 cell and highlighting the B49 and then pressing F4. In this way, B49 will have the dollar sign '$' next to letter B and 49. In this way, the total number of observations for a year (i) becomes an absolute reference, i.e. it is 'locked' in the formula. The same is done for another total number of observations for a year (i) when calculating the SDi for each observation in the year (i). Once the Estimated (SD) probabilities observation variables in the year (i) have been calculated, the next step is to calculate the total number of observations per year (i). For example, for the year 2012, which is in column AD for the ETL ratio, specifically in cell AD49, writing the formula =COUNT(AD5:AD47), which counts the number of frequencies in column AD. For the 2012 period, for example, NPi adds up to 33 observations. Similarly, for the 2011 period, which is in column AE, NPi is calculated by applying the same method that is described above for the year 2012. In the same way, for 2011, the Npi is 30. For the rest of the periods, this study follows suit to calculate the Npi.

As the Estimated (SD) probabilities observations were calculated, the next step is to calculate the Standard deviation of the difference by applying the formula SDi = $[Np\ i\ \ (1- p_{i}) + ¼\ N\ (p_{i-1} + p_{i+1})\ (1- p_{i-1} - p_{i+1})]^{½.}$ using the previously mentioned file, the '*Burghstahler method of calculation of all variables excel*' workbook, in the ETL sheet, in which we can find all the elements of the SDi formula that were calculated earlier and where ni-1 = number in base year – 1 year, and ni+1= number in base year + 1 year. For example, if the base year is 2011, the interval i+1 is the next year, or for the 2012, the interval i-1 is the previous year, i.e. 2010. Npi equals the total number of estimated SDs in interval (i). In order to calculate the SD of the difference bearing in mind that the data for testing is for the period 1999-2012, the first year that can be calculated is 2011, which is the base year, or n_{2011+1} is 2012 year and n_{2011-1} is 2010. At first, the calculation was performed by applying the first part of the formula: Npi $(1- p_{i})$, which is for example, for the ETL ratio, and the base year of 2011 in column AE and AE49 and represent the sum of the numbers for the year 2011. The results are multiplied by the difference, or 1 minus the first number in the AE column, for the year 2011, in this case, the cell AE5, or $AE$49*(1-AE5). The second part of the formula is ¼ N $(p_{i-1}$ +

p_{i+1}) (1– p_{i-1} – p_{i+1})], for the base year of 2011, or the total sample N multiplied by the total sum of numbers of the years 2010+2012 and then multiplied with the results of 1 minus number of 2010 minus the 2012 number, or 0.25*$C$52*(AF5+AD5)*(1-AF5-AD5). The complete formula, for the ETL ratio, for the first SDi number calculation, for the base year 2011 is:

$SD_{2011} = [Np_{2011} * (1- p_{2011}) + ¼ N * (p_{2010} + p_{2012}) * (1- p_{2010} - p_{2012})]^{½}$

or

=SQRT($AE$49*(1-AE5)+0.25*$C$52*(AF5+AD5)*(1-AF5-AD5)).

The ¼ term arises because of the ½ in front of the sum of the numbers of observations in intervals i-1 and i+1, where the ½ is there to compute the average. The SDi is calculated for the rest of the data for all periods.

Once the Estimated (SD) probabilities observations have been calculated, the next step is to calculate the EM1 = (AOi - EOi) / SDi. These are given in a separate table (i.e. is the ETL ratio), the columns representing the periods, for example, in the first column we have the results for the year 2011 results. Specifically, in cell BD5, the EM1 is calculated as:

EM1 = (AOi - EOi) / SDi or $EM1_{2011} = (AO_{2011} - EO_{2011}) / SD_{2011}$ or the formula in question is as follows: $EM1_{2011}$=(C5-P5)/AR5. The same approach was applied to calculate all the variables for the 2011 period, as well as for all the periods from 2001 to 2011. Once EM1 was calculated for ETL, the EM1 results were copied and pasted in a separate table, without formulas, for the SPSS calculation. For example, for the EM1 SPSS analysis, a table was designed for the ETL ratio on a yearly basis, as well as for the whole sample period of 2001-2011. Apart from the ETL ratio, the EM1 model approach was performed for all ratios. Then, the results are entered into the SPSS for a *p*-values analysis. Gujarati (1995, p.132) writes, '*… the p-value (i.e. probability value) also known as the observed or exact level of* *significance or the exact probability of committing a Type I error.',* and, *'… the p-value is defined as the lowest significance level at which a null hypothesis can be rejected'.*

2.1.1. Explanation of Earnings Management 1 model calculation in SPSS

The input variables in SPSS for statistical testing follows. For example, for the ETL ratios, data from column CD in excel were copied and pasted in the SPSS in the Data View sheet under the VAR00001 column. After pasting data in SPSS in the Data Sheet, the VAR00001 was labelled as ETL in the Variable View sheet, as it represents the ETL ratio. The same method of copying and pasting from Excel to SPSS was performed for all the ratios, as it was for the ETL. For example, VAR00002 is the second column in the DATA View (SPSS), while in the Variable View sheet (SPSS), it was labelled as an LTD variable. The same procedure as for the LTD in the EM1 in the excel calculations, in the 'Burghstahler method of calculation of all variables excel' workbook.

Once all the ratios are in SPSS and properly labelled, analysis was performed by choosing in SPSS under the Analyze tab the Non-Parametric test, then the Legacy Dialogs and then selecting the '1-Sample-KS…', which refers to the One-Sample Kolmogorov-Smirnov Test. Once the One-Sample Kolmogorov-Smirnov Test was selected, a separate box pops up and enabling the selection of all the variables on the left so as to move them into the 'Test Variable List'. This is required in order to perform test statistics. After moving the ratios into the test Variable list, the next step is to select the Exact button in order to open the exact test box and thus to choose the Monte Carlo method with a Confidence level of 99%. After pressing the Continue button, it puts me back to the One-Sample Kolmogorov-Smirnov Test box, and by choosing the Options button, it leads to the One-Sample Kolmogorov-Smirnov Options box and by selecting the descriptive box in order to use the Descriptive test statistics.

Once the Options are selected and the OK button pressed in the One-Sample Kolmogorov-Smirnov Test box, a separate SPSS output displays the One-Sample Kolmogorov-Smirnov Test with all the ratios results. The One-Sample Kolmogorov-Smirnov Test result shows such parameters such parameters as Mean, Std Deviation Extreme Differences, Kolmogorov-Smirnov, Asymp. Sig (2-tailed) and Mote Carlo Sig. for all the ratios for the EM1 model.

2.2. Earnings Management Model 2

In the '*Degeorge et al – EM2.xlsx*' excel sheet, for each year for the DTE variable, data is processed for a number of variables with the formula: '=COUNT(B3:B42)'. The other years in question are also calculated in the same way, by using the same formula. The results are at the bottom of each year's column. For example, for the DTE ratio, for the year 2012, a total number of observations is 32, and it is shown in cell B43. For the year 2011, the number is 32 shown in cell C42, for the year 2010, it is 29 in cell D29, and so on.

The next step is to calculate the 'pi'. 'pi' is the ratio of the sample of the year i. For example, for the DTE ratio, for the year 2012, 'pi' is calculated by dividing the first sample number in the year 2012 by the total amount of samples in 2012. The formula reads as '=B3/$B$43', where B3= is the first data in the year 2012 and the $B$43 is the total number of samples in the year 2012. The dollar sign refers to absolute values, for all sample numbers for that year are used in the formula. When calculating the second sample number 'pi' for the year 2012, the number in B4 is applied and then, it is by $B$43. The third sample number, which is in B5, is divided by $B$43, and so on. The same applies for the year 2011, where the first sample number, in C3, is divided by $C$43. The second sample number, in cell C4, is divided by $C$43, and so on. In this way, the calculation is performed for all sample years from 2012 to 1999.

Once all the calculations for ‘pi’ for all sample years have been finished, the next step is to calculate the Δpi, which represents the difference of ‘pi’ – ‘p_{i-1}’, or the difference of ‘pi’ between the years 2012 and 2011. For example, to calculate the Δp_{2012} as the first ‘pi’ number, we take ‘pi’ in the year 2012 minus first ‘pi’ number in 2011 or p_{i-1}. The formula reads as: Δp_{2012}=Q3-R3, where Q3 is the first ‘pi’ number in 2012 minus R3 being the first ‘pi’ number in 2011, which is actually the p_{i-1} element in the formula. In order to obtain the second Δp_{2012} sample number, this study calculates the second ‘pi’ number in 2012 minus p_{i-1} or ‘pi’ in 2011. The formula for the second sample number for Δp_{2012} is ‘=Q4-R4’. The same calculation method is implemented for each Δp_{2012} sample year. For the following year Δp_{2011}, the ‘pi’ is 2011 and ‘p_{i-1}’ is 2010. For the Δp_{2011}, first variable number formula reads as =R3-S3, the second =R4-S4 and son on. The same method is used for Δp_{2010}, for Δp_{2009} up to Δp_{2000}. As the formula for Δpi is Δpi = pi - p_{i-1}, the last sample year is the year 2000 where p_{i-1} is 1999, as data is available until 1999.

The following step is to calculate EM2, or EM2 = (Δpi – Mean (Δp)) / SD (Δp). After Δpi for each sample years has been calculated, the next step is to calculate the Mean (Δ p) or the average of $\Delta p_{2012\text{-}2000}$ and standard deviation or SD (Δ p) of $\Delta p_{2012\text{-}2000}$. Mean (Δ p) is calculated in the same ‘*Degeorge et al – EM2.xlsx*’ excel sheet, at the bottom of the Δpi table, in cell AG46, by writing the mean formula for the whole sample between 2012 and 2000. The Mean $\Delta p_{2012\text{-}2000}$ formula reads: ‘=AVERAGE(AF3:AR42)’. By selecting all samples for all years for Δp data, this study calculates the mean. The same is done for standard deviation or SD (Δp), for which the formula reads: ‘=STDEV(AF3:AR36)’. The calculations of Mean and SD were also performed in SPSS as a cross check and the results were the same. Once Mean and SD calculations completed, the next step is to calculate the EM2 formula: EM2 = (Δpi – Mean (Δp)) / SD (Δp). For the EM2 calculation, this study creates a table for the EM2 calculation. In the first column (column AT for DTE variable) in cell AT3, this study selects a cell in the Δpi table for the year 2012, the first number less the Mean $\Delta p_{2012\text{-}2000}$ and all divided by the SD $\Delta p_{2012\text{-}2000}$. Or as per formula: '=(AF3-$AG$46)/$AG$47', where the dollar sign '$' refers to an absolute value. The same procedure for the second number in the year 2012, where the formula reads '=(AF4-$AG$46)/$AG$47', and so on. The same is performed for all the numbers for the year 2012 as well as for all the sample years. Once the results for EM2 calculated for each sample years, the EM2 results are copied into another table, which is next to the EM2 table and where the copied data represent only numbers without formulas, in order to import the EM2 data into SPSS for further statistical analysis. The EM2 data without formulas table is between columns BN and BZ for the DTE ratio. This study also creates all sample data from the EM2 table by simply copying and pasting each sample year into one column, in the CC column, as the all sample for EM2 data for the DTE ratio will be needed for a further SPSS analysis. The same method is applied for the calculations of the EM2 model for all the ratios, i.e. ETL, LTD, LTA, GYEA, and the same procedure for the rest of the ratios for the purpose of performing the One-Sample Kolmogorov-Smirnov test in SPSS.

2.3. Testing Approach No. 3.2 – Earnings Management 1 model

The EM1 calculations of the modified Burgstahler and Dichev (1997, p.103) model in SPSS follows. In the 'Data View' $PAT_{(t)}$ by $TA_{(t-1)}$ and ΔPAT by $TA_{(t-2)}$ data were imported and named under the 'Variable View' tab. After saving the SPSS data file as 'Delta PAT by T.A..sav' file, this study ran, in SPSS, the One-Sample Kolmogorov-Smirnov Test for both ratios and also select the Monte Carlo simulation for a 95 and a 99% Confidence Interval. Apart from the K-S test, this study also ran Descriptive tests selected from the Analyse tab from the 'Delta PAT by T.A..sav' file. After selecting the Analyse tab, by selecting

Descriptive Statistics, then Frequencies and then the Frequencies box pops up. In the Frequencies box, this study selects the variables on the left and moves it into the right box. Then by pressing the Statistics button and under 'Central Tendency' selecting Mean, while in the 'Dispersion' this study selects SD, and under 'Percentile Values' selecting 'Percentiles' and add the '5, 50 and 75' values for the percentiles. By pressing Continue under the 'Chart' button, and selecting Chart type 'None'. For the Frequencies format choosing Ascending values and under the Multiple Variables, choosing 'Compare variables', and then selecting the continue button. The 'Bootstrap' button is left untouched. By un-clicking the 'Display Frequency tables' and pressing the OK button, a separate SPSS window opens with the descriptive statistics results. Tests were done for both ratios for Mean, SD and also for percentiles of 25%, 50% and 75% on a yearly base.

In order to calculate histograms, the EM1 results for scaled earnings, or $PAT_{(t)}$ / $TA_{(t-1)}$ and scaled earnings change, or ΔPAT / $TA_{(t-2)}$ variables for all sample period were imported into a 'Data View' sheet in SPSS. Variables were named in the 'Variable View' tab. Then, by pressing the Graphs button (or the Graphs tab), and selecting the 'Chart Builder', followed by the Histogram from the 'Choose from:', then selecting the first option of Histogram type, which is 'Simple Histogram', this study dragged it to *'Chart preview uses example data'*. From the 'Variables:' by selecting one variable i.e. Profit After Tax divided by Total Assets in period (t-1), or PAT / $TA_{(t-1)}$ and pull it to the '*Chart preview uses example data*'. In the 'Edit Properties of:' choosing 'Display normal curve', and then pressing 'Apply' and then 'OK', at which point a separate SPSS window pops up with the Histogram Graph result. By double clicking the histogram graph, the 'Chart Editor' pops up. In the Chart Editor, pressing the 'Add a reference line to the X axis' button, to add the line at the 0, on the X axis. After double clicking the Chart Editor on the histogram and the 'Properties' box pops up, selecting the 'Scale' tab and setting the Range from -0.02 for Minimum and to 0.02 for Maximum. The purpose of this pre-set range is to investigate the histogram just before and after the zero point. The Same approach is applied to create a histogram for change in earnings divided by Total Assets in period (t-2), or $\Delta PAT / TA_{(t-2)}$ ratio.

2.4. Calculations of Median of Total Assets in SPSS for Earnings Management 1 model

After all the numbers were imported into SPSS, in the Data View sheet, labelling each variable name with reference to its related year in the Variable View sheet. For example, VAR00001 is labelled as 2012, which refers to year: 2012. After this, by pressing 'Analyse', then by pressing 'Descriptive Statistics' and then selecting frequencies, at which point a Frequencies box pops up; this study selects all the variables and import them into the 'Variable(s)' box. The 'Display frequencies tables' needs to be unchecked, as only the median of the yearly sample is calculated, and then, by pressing the 'Statistics' button and under which the 'Frequencies:, a statistics' box pops up, and under the 'Central Tendency' option, the Median box is checked. Then by pressing 'Continue' and clicking OK, an output is presented with the median for Total Assets for each year.

In order to run the K-S test in SPSS, under the Data View sheet pressing the Analyse tab, then selecting 'Nonparametric Tests', then 'Legacy Dialogs' and the '1-Sample K-S'. A 'One-Sample Kolmogorov-Smirnov Test' box pops up, where this study selects all four variables and moves them to the 'Test Variable List'. The next step is to press the 'Exact Tests' and select 'Exact' then check the 'Time limit per test box with a value of 5 minutes'. The reason for this 5 minute limit is to make sure the test is performed within a 5 minutes' time frame. Then, by pressing the 'Continue' button, the 'One-Sample Kolmogorov-Smirnov Test' box reapers, where by selecting 'Options' and under 'Statistics' choosing the

'Descriptive' box. After pressing continue, in the 'One-Sample Kolmogorov-Smirnov Test' box and then by pressing the OK button, a separate SPSS Viewer pops up with the results.

2.4.1. Calculations of Median of Total Assets in SPSS for Earnings Management 2 model

Calculations of Mean and SD in SPSS were done in the following way: by selecting all the numbers in the Δpi table, for example, for the DTE ratio, and after that this study imports them into SPSS the 'Data View', while all of them are named in the 'Variable View' as DTE. The same procedure is done for all variables. Once all the variables have been imported into SPSS and named, then, under the 'Analyze tab', choosing 'Descriptive Statistics', then selecting 'Frequencies', then the DTE ratio into the Variable(s) box, and finally selecting 'Statistics'. In the 'Statistics' box, this study selects Mean and SD, then Continue and finally pressing the OK button to run the analysis. In a separate SPSS Viewer, the Mean and SD results are shown for the DTE variable. The same process is done for all the ratios. Once all Mean and SD calculations have been performed, the next step is to compare the obtained results to the ones calculated in excel. They all match.

2.5. Testing Approach No. 3.4

Importing these four columns into SPSS into the Data View and in the Variable View and labelling the variables as '$PAT_{(t)}$ by $TA_{(t-1)}$ AC', '$PAT_{(t)}$ by $TA_{(t-1)}$ BC', 'Delta PAT / $TA_{(t-2)}$ AC' and 'ΔPAT / $TA_{(t-2)}$ BC' are the first steps. As mentioned above, 'AC' and 'BC' refers to after and before the crisis. This study performs the analysis by selecting in SPSS the 'Analyse' tab then 'Nonparametric test' then 'Legacy Dialogs' at which point the 1-Sample K-S test and the One-Sample Kolmogorov-Smirnov test boxes pop up. All four variables are moved into the Test variables List, then selecting the 'Exact Test' and limit the time frame for each test to 5 minutes. By pressing the Options and by selecting the Descriptive Statistics, as well as the Exclude cases test–by test option and pressing the OK button, this study runs the test. A separate box, namely, the SPSS viewer, pops up with the results.

3. Accrual Model 2 Test Statistics of Table 5.2.3 and Table 5.2.4

Table 5.2.3 For Profit After Tax, Discretionary and Non-Discretionary Accruals. Coefficients[a]

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2012	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-2632.67	4917.53		-.535	.596	-12587.68	7322.34
	NDA	-4.533	1.981	-.484	-2.288	.028	-8.544	-.522
	DA	.526	.415	.268	1.267	.213	-.314	1.367

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2011	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-5044.75	7318.83		-.689	.495	-19860.94	9771.45
	NDA	.630	3.984	.032	.158	.875	-7.436	8.696
	DA	-.301	.594	-.104	-.506	.615	-1.504	.902

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2010	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-5243.65	4692.61		-1.117	.271	-14751.79	4264.48
	NDA	3.484	2.498	.258	1.395	.171	-1.577	8.544
	DA	.254	.381	.123	.667	.509	-.517	1.025

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2009	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-1856.79	2228.86		-.833	.410	-6372.89	2659.30
	NDA	.040	.181	.052	.222	.826	-.327	.407
	DA	.331	.116	.673	2.870	.007	.097	.566

Table 5.2.3 Cont.

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2008	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	1005.41	1297.91		.775	.443	-1622.08	3632.90
	NDA	.138	.057	.318	2.412	.021	.022	.254
	DA	.099	.024	.536	4.058	.000	.050	.149

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2007	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-318.99	3086.81		-.103	.918	-6573.46	5935.47
	NDA	.651	.242	.374	2.696	.010	.162	1.141
	DA	.170	.062	.382	2.749	.009	.045	.296

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2006	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-3133.89	4544.28		-.690	.495	-12341.48	6073.70
	NDA	.422	.460	.124	.916	.366	-.511	1.354
	DA	.424	.098	.585	4.326	.000	.225	.622

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2005	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-2631.99	2263.13		-1.163	.253	-7231.21	1967.24
	NDA	-.188	.163	-.098	-1.156	.256	-.519	.143
	DA	.733	.070	.896	10.517	.000	.592	.875

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2004	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-545.45	1680.19		-.325	.747	-3956.43	2865.52
	NDA	-.242	.146	-.150	-1.654	.107	-.539	.055
	DA	.717	.070	.931	10.262	.000	.576	.859

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2003	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-637.05	1064.08		-.599	.553	-2797.24	1523.14
	NDA	-.291	.184	-.133	-1.585	.122	-.664	.082
	DA	.718	.063	.962	11.477	.000	.591	.846

Table 5.2.3 Cont.

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2002	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-207.74	2612.98		-.080	.937	-5517.95	5102.46
	NDA	-2.944	1.176	-.604	-2.503	.017	-5.335	-.554
	DA	.410	.199	.498	2.063	.047	.006	.814

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2001	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-206.30	578.68		-.357	.723	-1378.83	966.22
	NDA	-.402	.344	-.282	-1.169	.250	-1.099	.295
	DA	-.001	.045	-.003	-.011	.991	-.092	.091

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
2000	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-214.77	166.19		-1.292	.204	-550.93	121.39
	NDA	-.030	.111	-.076	-.272	.787	-.255	.194
	DA	-.009	.022	-.111	-.396	.695	-.053	.035

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
1999	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-375.12	234.76		-1.598	.118	-849.59	99.35
	NDA	.138	.110	.284	1.259	.215	-.084	.360
	DA	-.084	.029	-.650	-2.879	.006	-.143	-.025

Notes: Table 5.2.3 presents test resulst for Accrual Model 2 with a 95% Confidence Interval level, for formula $\mathbf{PAT_t = \beta_{0jt} + \beta_{1jt} (NDA_{jt}) + \beta_{2jt} (DA_{jt}) + \varepsilon_{jt}}$, where PAT_{tj} = Profit After Tax in period $_{(t)}$, $\mathbf{NDA_t}$ = Non-Discretionary Accruals $_{(t)}$ = Accrued interest payable $_{(t)}$, $\mathbf{DA_t}$ = Discretionary Accruals $_{(t)}$ = Other accruals and other liabilities $_{(t)}$, for the period 1999-2012. *Source:* Own calculation and presentation.

Table 5.2.4. For Profit After Tax, Discretionary and Non-Discretionary Accruals. Coefficients[a]

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2012	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-2632.67	4917.53		-.535	.596	-15966.83	10701.48
	DA	.526	.415	.268	1.267	.213	-.600	1.653
	NDA	-4.533	1.981	-.484	-2.288	.028	-9.906	.839

Table 5.2.4 Cont.

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2011	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-5044.75	7318.83		-.689	.495	-24890.17	14800.68
	NDA	.630	3.984	.032	.158	.875	-10.174	11.434
	DA	-.301	.594	-.104	-.506	.615	-1.912	1.310

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2010	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-5243.65	4692.61		-1.117	.271	-17986.01	7498.70
	NDA	3.484	2.498	.258	1.395	.171	-3.298	10.266
	DA	.254	.381	.123	.667	.509	-.780	1.288

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2009	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-1856.79	2228.86		-.833	.410	-7909.05	4195.47
	NDA	.040	.181	.052	.222	.826	-.451	.532
	DA	.331	.116	.673	2.870	.007	.018	.645

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2008	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	1005.41	1297.91		.775	.443	-2513.95	4524.78
	NDA	.138	.057	.318	2.412	.021	-.017	.293
	DA	.099	.024	.536	4.058	.000	.033	.165

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2007	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-318.99	3086.81		-.103	.918	-8700.93	8062.94
	NDA	.651	.242	.374	2.696	.010	-.005	1.307
	DA	.170	.062	.382	2.749	.009	.002	.338

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2006	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-3133.89	4544.28		-.690	.495	-15473.47	9205.69
	NDA	.422	.460	.124	.916	.366	-.828	1.671
	DA	.424	.098	.585	4.326	.000	.158	.689

Table 5.2.4 Cont.

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2005	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-2631.99	2263.13		-1.163	.253	-8806.69	3542.72
	NDA	-.188	.163	-.098	-1.156	.256	-.632	.256
	DA	.733	.070	.896	10.517	.000	.543	.924

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2004	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-545.45	1680.19		-.325	.747	-5121.97	4031.06
	NDA	-.242	.146	-.150	-1.654	.107	-.640	.157
	DA	.717	.070	.931	10.262	.000	.527	.908

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2003	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-637.05	1064.08		-.599	.553	-3535.39	2261.29
	NDA	-.291	.184	-.133	-1.585	.122	-.792	.209
	DA	.718	.063	.962	11.477	.000	.548	.889

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2002	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-207.74	2612.98		-.080	.937	-7336.97	6921.48
	NDA	-2.944	1.176	-.604	-2.503	.017	-6.153	.265
	DA	.410	.199	.498	2.063	.047	-.132	.952

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2001	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-206.30	578.68		-.357	.723	-1777.67	1365.06
	NDA	-.402	.344	-.282	-1.169	.250	-1.336	.532
	DA	-.001	.045	-.003	-.011	.991	-.123	.122

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
2000	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-214.7696	166.1947		-1.292	.204	-664.8104	235.2713
	NDA	-.030	.111	-.076	-.272	.787	-.331	.270
	DA	-.009	.022	-.111	-.396	.695	-.067	.050

Table 5.2.4 Cont.

	Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
1999	a. Dependent Variable: E	B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	-375.12	234.76		-1.598	.118	-1010.02	259.79
	NDA	.138	.110	.284	1.259	.215	-.159	.436
	DA	-.084	.029	-.650	-2.879	.006	-.163	-.005

Notes: Table 5.2.4 presents test resulst for Accrual Model 2 with a 99% Confidence Interval Level, for the formua $\mathbf{PAT_t = \beta_{0jt} + \beta_{1jt} (NDA_{\ jt}) + \beta_{2jt} (DA_{\ jt}) + \varepsilon_{jt}}$, where $\mathbf{PAT_{tj}}$ = Profit After Tax in period $_{(t)}$, $\mathbf{NDA_{(t)}}$ = Non-Discretionary Accruals$_{(t)}$ = Accrued interest payable$_{(t)}$, $\mathbf{DA_{(t)}}$ = Discretionary Accruals$_{(t)}$ = Other accruals and other liabilities$_{(t)}$, for the period 1999-2012. *Source:* Own calculation and presentation.

4. *Descriptive statistics run with Earnings Management 1 and 2 models at 99% and 95% Confidence Interval Levels*

4.1. **Table 5.3.4: Descriptive statistics run with EM1 model at a 99% Confidence Interval Level**

		Statistic	Std. Error	Bootstrap			
				Bias	Std. Error	99% Confidence Interval	
						Lower	Upper
ETL	N	218		0	0	218	218
	Mean	.001011	.0066628	.000004	.006664	-.015395	.020662
	Std. Deviation	.0983755		-.0035768	.0253418	.0342708	.1605079
	Skewness	2.227	.165	-.810	4.366	-9.562	11.096
	Kurtosis	54.866	.328	-2.387	22.627	19.831	147.838
LTD	N	218		0	0	218	218
	Mean	.039763	.0301660	.000111	.030298	-.034152	.122960
	Std. Deviation	.4453956		-.0040624	.0539001	.3043611	.5823664
	Skewness	2.396	.165	-.137	.505	.577	3.414
	Kurtosis	10.284	.328	-.703	2.920	3.546	19.017
LTA	N	218		0	0	218	218
	Mean	.002537	.0030972	-.000033	.003090	-.005473	.010841
	Std. Deviation	.0457295		-.0001666	.0026083	.0389652	.0524187
	Skewness	.036	.165	-.005	.185	-.425	.492
	Kurtosis	.873	.328	-.021	.317	.168	1.830
GYEA	N	218		0	0	218	218
	Mean	.004188	.0137884	-.000051	.014000	-.026029	.046374
	Std. Deviation	.2035833		-.0129302	.0704264	.0690813	.3684194
	Skewness	7.726	.165	-3.700	4.899	-4.749	11.652
	Kurtosis	101.101	.328	-37.645	38.443	5.075	158.741

Table 5.3.4 Cont.

RPF	N	218		0	0	218	218
	Mean	.014942	.0207904	.000160	.021102	-.020894	.081706
	Std. Deviation	.3069669		-.0460922	.1619637	.0063067	.5999402
	Skewness	13.087	.165	-7.979	9.934	-14.404	14.755
	Kurtosis	190.451	.328	-52.314	58.137	8.526	217.800
SGI	N	218		0	0	218	218
	Mean	.020582	.0153097	-.000099	.015233	-.019246	.060181
	Std. Deviation	.2260451		-.0036201	.0357894	.1448985	.3206813
	Skewness	2.227	.165	-.328	1.583	-2.215	4.931
	Kurtosis	21.524	.328	-3.546	7.574	3.815	38.406
IRI	N	218		0	0	218	218
	Mean	.005958	.0088286	.000069	.008862	-.014997	.029865
	Std. Deviation	.1303525		-.0012861	.0178548	.0891135	.1770936
	Skewness	2.043	.165	-.303	1.042	-.894	3.876
	Kurtosis	14.626	.328	-2.267	5.602	3.089	26.893
GMI	N	218		0	0	218	218
	Mean	.002616	.0041606	-.000004	.004265	-.007991	.013520
	Std. Deviation	.0614301		-.0002522	.0051003	.0476683	.0749977
	Skewness	.832	.165	-.036	.411	-.383	1.738
	Kurtosis	4.217	.328	-.166	1.020	1.794	7.211
NIM	N	218		0	0	218	218
	Mean	.001194	.0041184	-.000038	.004108	-.008563	.012443
	Std. Deviation	.0608072		-.0010461	.0095840	.0405297	.0872436
	Skewness	2.745	.165	-.531	1.304	-.662	4.585
	Kurtosis	20.518	.328	-4.964	9.022	2.323	36.675
PATM	N	218		0	0	218	218
	Mean	.023489	.0227703	-.000743	.022902	-.026678	.089819
	Std. Deviation	.3361989		-.0155832	.0926123	.1282845	.5498122
	Skewness	6.368	.165	-1.529	3.023	-3.756	9.730
	Kurtosis	62.307	.328	-10.277	24.081	7.087	125.442
ROE	N	218		0	0	218	218
	Mean	-.6533	.32985	-.0065	.3289	-1.6492	.0764
	Std. Deviation	4.87015		-.11019	1.04676	2.31135	7.56970
	Skewness	-4.966	.165	.672	1.469	-7.461	.602
	Kurtosis	39.106	.328	-6.456	14.188	8.655	81.817
ROA	N	218		0	0	218	218
	Mean	-.000024	.0004911	-.000006	.000495	-.001338	.001216
	Std. Deviation	.0072512		-.0000807	.0009732	.0048288	.0098236
	Skewness	-1.099	.165	.206	1.212	-3.569	2.035
	Kurtosis	13.743	.328	-1.562	4.353	3.179	24.643

Table 5.3.4 Cont.

ETA	N	218		0	0	218	218
	Mean	-.000095	.0003734	-.000009	.000375	-.001020	.000914
	Std. Deviation	.0055131		-.0001085	.0010973	.0032024	.0083503
	Skewness	2.532	.165	-1.125	2.610	-3.013	5.880
	Kurtosis	35.383	.328	-9.042	13.791	2.389	61.298

Notes: Table 5.3.4. 'N' stands for Number of Observation. Descriptive Statistics calculated for Equity to Loans (ETL), Loans to Deposits (LTD), Loans to Total Assets (LTA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Sales Growth Index (SGI), Interest (Sales) Receivables Index (IRI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Equity (ROE), Return on Assets (ROA), Equity to Total Assets (ETA) ratios per Earnings Management model 1, or EM1, at a 99% confidence interval level and for all samples. *Source:* Own calculation and presentation.

4.2. **Table 5.3.6: Descriptive statistics run at a 95% Confidence Interval Level run with EM1 model**

		Statistic	Std. Error	Bootstrap			
				Bias	Std. Error	95% Confidence Interval	
						Lower	Upper
ETL	N	218		0	0	218	218
	Mean	.001011	.0066628	.000146	.006456	-.011339	.014404
	Std. Deviation	.0983755		-.0033369	.0250997	.0441853	.1423901
	Skewness	2.227	.165	-.612	4.240	-7.016	8.824
	Kurtosis	54.866	.328	-2.748	21.828	24.139	111.884
LTD	N	218		0	0	218	218
	Mean	.039763	.0301660	.000212	.030207	-.017752	.101441
	Std. Deviation	.4453956		-.0030111	.0528633	.3375424	.5471505
	Skewness	2.396	.165	-.118	.492	1.184	3.140
	Kurtosis	10.284	.328	-.641	2.884	4.782	16.065
LTA	N	218		0	0	218	218
	Mean	.002537	.0030972	.000051	.003107	-.003427	.008713
	Std. Deviation	.0457295		-.0001646	.0026537	.0402932	.0507422
	Skewness	.036	.165	-.001	.187	-.337	.401
	Kurtosis	.873	.328	-.023	.313	.299	1.504
GYEA	N	218		0	0	218	218
	Mean	.004188	.0137884	-.000111	.013686	-.020315	.033120
	Std. Deviation	.2035833		-.0125426	.0687086	.0835329	.3192493
	Skewness	7.726	.165	-3.591	4.877	-4.207	10.828
	Kurtosis	101.101	.328	-36.903	38.337	12.866	142.082
RPF	N	218		0	0	218	218
	Mean	.014942	.0207904	-.000286	.020957	-.014577	.061215
	Std. Deviation	.3069669		-.0501381	.1629337	.0138826	.5240006
	Skewness	13.087	.165	-8.397	10.104	-14.090	14.714
	Kurtosis	190.451	.328	-52.535	56.986	45.687	217.011

Table 5.3.6 Cont.

SGI	N	218		0	0	218	218
	Mean	.020582	.0153097	-.000017	.015340	-.008497	.051980
	Std. Deviation	.2260451		-.0032645	.0356026	.1587728	.2956397
	Skewness	2.227	.165	-.296	1.605	-1.376	4.582
	Kurtosis	21.524	.328	-3.324	7.777	5.267	33.934
IRI	N	218		0	0	218	218
	Mean	.005958	.0088286	-.000351	.008614	-.011117	.023028
	Std. Deviation	.1303525		-.0022287	.0172996	.0961433	.1640833
	Skewness	2.043	.165	-.360	1.041	-.426	3.388
	Kurtosis	14.626	.328	-2.430	5.593	4.121	23.029
GMI	N	218		0	0	218	218
	Mean	.002616	.0041606	-.000026	.004112	-.005582	.010744
	Std. Deviation	.0614301		-.0004753	.0052154	.0509322	.0715532
	Skewness	.832	.165	-.037	.418	-.080	1.558
	Kurtosis	4.217	.328	-.142	1.045	2.298	6.332
NIM	N	218		0	0	218	218
	Mean	.001194	.0041184	-.000001	.003997	-.006410	.009365
	Std. Deviation	.0608072		-.0008755	.0094070	.0438366	.0794957
	Skewness	2.745	.165	-.508	1.302	-.135	4.212
	Kurtosis	20.518	.328	-4.763	8.976	3.112	31.332
PATM	N	218		0	0	218	218
	Mean	.023489	.0227703	-.000017	.022839	-.017573	.072492
	Std. Deviation	.3361989		-.0134374	.0917579	.1501514	.5034629
	Skewness	6.368	.165	-1.385	2.948	-2.933	8.963
	Kurtosis	62.307	.328	-9.389	24.566	9.865	113.066
ROE	N	218		0	0	218	218
	Mean	-.6533	.32985	.0011	.3313	-1.3599	-.0480
	Std. Deviation	4.87015		-.11828	1.04806	2.85241	6.83999
	Skewness	-4.966	.165	.720	1.458	-6.599	-.881
	Kurtosis	39.106	.328	-6.965	14.215	10.815	65.117
ROA	N	218		0	0	218	218
	Mean	-.000024	.0004911	.000006	.000488	-.001008	.000914
	Std. Deviation	.0072512		-.0000992	.0009510	.0053530	.0090966
	Skewness	-1.099	.165	.233	1.229	-3.034	1.613
	Kurtosis	13.743	.328	-1.541	4.326	4.572	20.919
ETA	N	218		0	0	218	218
	Mean	-.000095	.0003734	.000004	.000372	-.000797	.000678
	Std. Deviation	.0055131		-.0001138	.0010948	.0035152	.0076415
	Skewness	2.532	.165	-1.040	2.595	-2.632	5.408
	Kurtosis	35.383	.328	-8.631	14.064	4.825	53.209

Notes: Table 5.3.6. 'N' is Number of Observation. Descriptive Statistics calculated per EM1 model at a 95% confidence interval level for Equity to Loans (ETL), Loans to Deposits (LTD), Loans to Total Assets (LTA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Sales Growth Index (SGI), Interest (Sales) Receivables Index (IRI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Equity (ROE), Return on Assets (ROA), Equity to Total Assets (ETA) ratios. *Source:* Own calculation and presentation.

4.3. **Table 5.3.8. Descriptive Statistics run at a 99% Confidence Interval Level with EM2 model**

		Statistic	Std. Error	Bootstrap			
				Bias	Std. Error	99% Confidence Interval	
						Lower	Upper
DTE	N	343		0	0	343	343
	Mean	-.003955	.0587862	.000976	.058549	-.161295	.146653
	Std. Deviation	1.0887351		-.0521860	.3443900	.2669927	1.8634801
	Skewness	-4.581	.132	3.120	7.492	-15.975	13.483
	Kurtosis	125.706	.263	-15.104	50.031	30.087	281.033
ETL	N	343		0	0	343	343
	Mean	.006720	.0545462	.001384	.055730	-.138953	.153566
	Std. Deviation	1.0102095		-.0195939	.2328367	.3368684	1.5545301
	Skewness	-1.628	.132	.617	4.799	-11.348	11.654
	Kurtosis	68.577	.263	4.660	30.465	29.424	199.143
LTD	N	343		0	0	343	343
	Mean	.006166	.0577162	.000874	.057485	-.129225	.158938
	Std. Deviation	1.0689181		-.0111813	.1910633	.6364149	1.5633930
	Skewness	4.610	.132	-.647	1.592	-.991	6.372
	Kurtosis	42.713	.263	-5.913	13.049	6.445	70.395
LTA	N	343		0	0	343	343
	Mean	-.064529	.0564761	-.000529	.057551	-.216561	.089067
	Std. Deviation	1.0459527		-.0023141	.0439212	.9268358	1.1585715
	Skewness	.084	.132	-.001	.111	-.215	.366
	Kurtosis	.379	.263	-.003	.217	-.118	.983
GYEA	N	343		0	0	343	343
	Mean	-.047920	.0643677	-.001471	.063455	-.220467	.117314
	Std. Deviation	1.1921069		-.0551903	.3293300	.4808906	1.8920120
	Skewness	.050	.132	-.116	6.077	-10.659	10.775
	Kurtosis	96.997	.263	-13.175	40.329	3.499	169.916
RPF	N	343		0	0	343	343
	Mean	-.002452	.0644935	-.000184	.064854	-.182415	.179750
	Std. Deviation	1.1944364		-.1210792	.5013033	.0336680	2.2248807
	Skewness	-.004	.132	.006	11.429	-18.476	18.474
	Kurtosis	168.133	.263	15.202	100.040	5.788	341.958
SGI	N	343		0	0	343	343
	Mean	-.044693	.0576534	-.002225	.057514	-.194826	.102548
	Std. Deviation	1.0677565		-.0046738	.0898688	.8304541	1.2972658
	Skewness	-.160	.132	-.027	.577	-1.703	1.258
	Kurtosis	7.546	.263	-.067	1.475	4.365	12.294
IRI	N	343		0	0	343	343
	Mean	.006954	.0590932	-.000297	.060398	-.164065	.168682
	Std. Deviation	1.0944217		-.0889000	.4331671	.1364960	2.0191776
	Skewness	-1.337	.132	.926	10.449	-17.687	17.617
	Kurtosis	163.922	.263	-5.701	102.923	4.083	322.693

Table 5.3.8 Cont.

GMI	N	343		0	0	343	343
	Mean	-.041510	.0516323	.000802	.051971	-.174691	.096834
	Std. Deviation	.9562438		-.0093164	.1104514	.6570551	1.2353612
	Skewness	.335	.132	.064	1.317	-2.954	3.260
	Kurtosis	17.465	.263	-.720	3.147	6.052	25.522
NIM	N	343		0	0	343	343
	Mean	-.025643	.0582048	.000161	.058487	-.175587	.128930
	Std. Deviation	1.0779680		-.0059650	.1092843	.8071481	1.3633029
	Skewness	.258	.132	-.059	1.060	-2.144	2.680
	Kurtosis	12.106	.263	-1.257	3.931	2.828	20.472
PATM	N	343		0	0	343	343
	Mean	-.095885	.0426518	-.000035	.041989	-.210118	.014304
	Std. Deviation	.7899220		-.0195984	.1618895	.3816945	1.1894158
	Skewness	-1.854	.132	.434	3.502	-8.362	6.480
	Kurtosis	54.718	.263	-4.721	17.524	9.607	112.309
ROE	N	343		0	0	343	343
	Mean	-.00076	.055235	-.00015	.05491	-.15480	.14057
	Std. Deviation	1.022968		-.033966	.236039	.410218	1.599794
	Skewness	-.036	.132	-.012	4.755	-11.097	10.948
	Kurtosis	71.249	.263	-1.420	27.030	28.867	179.826
ROA	N	343		0	0	343	343
	Mean	-.026525	.0550494	-.000296	.055012	-.166873	.118164
	Std. Deviation	1.0195283		-.0089800	.1296263	.7378363	1.3751059
	Skewness	-1.917	.132	.424	1.408	-4.335	1.580
	Kurtosis	21.436	.263	-4.023	8.844	3.859	37.208
ETA	N	343		0	0	343	343
	Mean	.000000	.0539958	-.000986	.053303	-.153901	.147531
	Std. Deviation	1.0000163		-.0831471	.4152141	.0677927	1.8590332
	Skewness	-.027	.132	.075	10.845	-18.263	18.255
	Kurtosis	167.462	.263	1.272	105.848	22.583	337.672

Notes: Table 5.3.8 presents Descriptive Statistics of Skewness, Kurtosis and Std. Error results for all samples at a 99% Confidence Interval level for Debt to Equity (DTE), Equity to Loans (ETL), Loans to Deposits (LTD), Loans to Total Assets (LTA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Sales Growth Index (SGI), Interest (Sales) Receivables Index (IRI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Equity (ROE), Return on Assets (ROA), Equity to Total Assets (ETA) ratios. 'N' stands for number of observation. *Source:* Own calculation and presentation.

4.4. **Table 5.3.10. Descriptive Statistics run at a 95% Confidence Interval Level with EM2 model**

		Statistic	Std. Error	Bootstrap[a]			
				Bias	Std. Error	95% Confidence Interval	
						Lower	Upper
DTE	N	343		0	0	343	343
	Mean	-.003955	.0587862	-.000793	.059180	-.133457	.107918
	Std. Deviation	1.0887351		-.0585991	.3428303	.3606256	1.6729049
	Skewness	-4.581	.132	2.942	7.501	-14.270	11.107
	Kurtosis	125.706	.263	-13.931	50.206	42.535	245.673

Table 5.3.10 Cont.

ETL	N	343		0	0	343	343
	Mean	.006720	.0545462	.000892	.054681	-.103902	.112514
	Std. Deviation	1.0102095		-.0311820	.2339411	.4963590	1.4214510
	Skewness	-1.628	.132	.532	4.936	-9.532	9.777
	Kurtosis	68.577	.263	6.367	31.533	35.136	158.560
LTD	N	343		0	0	343	343
	Mean	.006166	.0577162	.000114	.058161	-.102976	.128873
	Std. Deviation	1.0689181		-.0186818	.1908883	.6870120	1.4396751
	Skewness	4.610	.132	-.697	1.639	-.332	5.923
	Kurtosis	42.713	.263	-6.115	13.456	7.582	59.410
LTA	N	343		0	0	343	343
	Mean	-.064529	.0564761	.000439	.055735	-.173505	.045256
	Std. Deviation	1.0459527		-.0023282	.0427638	.9572726	1.1251418
	Skewness	.084	.132	-.001	.110	-.139	.293
	Kurtosis	.379	.263	-.002	.214	-.003	.827
GYEA	N	343		0	0	343	343
	Mean	-.047920	.0643677	-.000629	.064043	-.177351	.076175
	Std. Deviation	1.1921069		-.0492521	.3260041	.5325820	1.7545010
	Skewness	.050	.132	-.039	6.064	-9.862	9.921
	Kurtosis	96.997	.263	-12.546	39.791	8.678	157.556
RPF	N	343		0	0	343	343
	Mean	-.002452	.0644935	-.002109	.064467	-.137810	.133198
	Std. Deviation	1.1944364		-.1024817	.4955081	.0801613	1.8845064
	Skewness	-.004	.132	-.302	11.320	-18.287	18.276
	Kurtosis	168.133	.263	14.630	98.513	54.311	341.694
SGI	N	343		0	0	343	343
	Mean	-.044693	.0576534	.000671	.058208	-.158349	.067347
	Std. Deviation	1.0677565		-.0023758	.0886739	.8921776	1.2375778
	Skewness	-.160	.132	.006	.591	-1.336	.951
	Kurtosis	7.546	.263	-.082	1.492	4.921	10.775
IRI	N	343		0	0	343	343
	Mean	.006954	.0590932	-.000507	.058655	-.115082	.125829
	Std. Deviation	1.0944217		-.0919011	.4313247	.1516102	1.7311011
	Skewness	-1.337	.132	.994	10.682	-17.522	17.416
	Kurtosis	163.922	.263	-1.025	104.867	8.109	319.552
GMI	N	343		0	0	343	343
	Mean	-.041510	.0516323	.000778	.051880	-.141321	.062715
	Std. Deviation	.9562438		-.0094014	.1116162	.7303914	1.1707187
	Skewness	.335	.132	.074	1.297	-2.136	2.891
	Kurtosis	17.465	.263	-.829	3.138	10.677	23.037

Table 5.3.10 Cont.

NIM	N	343		0	0	343	343
	Mean	-.025643	.0582048	-.000220	.058095	-.139941	.086799
	Std. Deviation	1.0779680		-.0080951	.1060602	.8792219	1.2861040
	Skewness	.258	.132	-.070	1.051	-1.755	2.206
	Kurtosis	12.106	.263	-1.310	3.951	3.369	18.240
PATM	N	343		0	0	343	343
	Mean	-.095885	.0426518	-.001083	.042919	-.182730	-.015939
	Std. Deviation	.7899220		-.0110092	.1609111	.4658713	1.0919404
	Skewness	-1.854	.132	.427	3.517	-7.343	5.596
	Kurtosis	54.718	.263	-4.948	17.007	20.215	89.532
ROE	N	343		0	0	343	343
	Mean	-.00076	.055235	.00065	.05555	-.10796	.10887
	Std. Deviation	1.022968		-.030958	.233637	.513638	1.434417
	Skewness	-.036	.132	-.052	4.741	-8.703	8.480
	Kurtosis	71.249	.263	-1.784	25.994	35.051	131.700
ROA	N	343		0	0	343	343
	Mean	-.026525	.0550494	.000461	.054732	-.137202	.081515
	Std. Deviation	1.0195283		-.0094873	.1313263	.7883543	1.2903749
	Skewness	-1.917	.132	.429	1.434	-3.832	1.063
	Kurtosis	21.436	.263	-3.963	8.983	4.902	33.136
ETA	N	343		0	0	343	343
	Mean	.000000	.0539958	.000725	.053169	-.112682	.112584
	Std. Deviation	1.0000163		-.0843793	.4154244	.0834750	1.5762603
	Skewness	-.027	.132	.476	10.774	-18.101	18.117
	Kurtosis	167.462	.263	-.089	105.466	27.556	334.627

Notes: Table 5.3.10 shows Descriptive Statistics results, for all samples at a 95% Confidence Interval level for Debt to Equity (DTE), Equity to Loans (ETL), Loans to Deposits (LTD), Loans to Total Assets (LTA), Gross Yield on Earning Assets (GYEA), Rate Paid on Funds (RPF), Sales Growth Index (SGI), Interest (Sales) Receivables Index (IRI), Gross Margin Index (GMI), Net Interest Margin (NIM), Profit After Tax Margin (PATM), Return on Equity (ROE), Return on Assets (ROA), Equity to Total Assets (ETA) ratios. *Source:* Own calculation and presentation.