



# The smooth practice of smoothing

A quantitative study of earnings management in publicly listed firms in Sweden

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## Summary

Earnings management is a fairly well-established concept in the world of business. It has been subject to a lot of research for many years, with several different aspects of the concept being investigated. The research has mainly focused on incentives for earnings management and tried to answer why it exists. In this study, we answer to what extent it exists in Sweden, a particularly unexplored market in the field. In addition to this, we link earnings management to firm value, investigating how the former affects the latter.

Sweden is a part of the European Union, who adopted the International Financial Reporting Standards (IFRS) in the beginning of the century. It went into effect in 2005, affording enough time to examine a possible difference in the prevalence of earnings management before and after the implementation. IFRS has the potential to become the global reporting standards, which is why it is a main area of interest in the study.

Previous research has been quite conclusive in proving the prevalence of earnings management. Income smoothing is one of the main aspects of earnings management, and is the focus of this study. Research has shown that firms are eager to meet or beat analyst forecasts by any means necessary, from artificial income smoothing to the adjustment of capital expenditures. Some research has looked at firm value and investor response, finding a positive relationship between smooth income and the market's valuation of firms. The research has also found that investors are sometimes either oblivious or indifferent to earnings management practices.

We use information asymmetry, agency theory, signaling theory and the efficient market hypothesis in relation to earnings management as a basis for our examination. The results of our examination on the Swedish market are consistent with the results found on other markets. Income smoothing does exist, and the investors seem to pay a premium for the smooth income streams.

Despite convincing results, we do not believe in the power of the income smoothing model used in its current state and in modern times. Its strength decreased over the years and with the implementation of IFRS. It is concluded that income smoothing can be a viable corporate strategy for firms that are able to fool the average investor and subsequently receive a higher valuation from the market.



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# Table of Contents

1. INTRODUCTION .....	1
1.1 RESEARCH QUESTION .....	3
1.2 OBJECTIVE/PURPOSE .....	3
1.3 CONTRIBUTION .....	3
2. SCIENTIFIC METHODOLOGY.....	5
2.1 AUTHORS' PREVIOUS KNOWLEDGE.....	5
2.2 EPISTEMOLOGY .....	5
2.3 ONTOLOGY .....	6
2.4 AXIOLOGY .....	7
2.5 APPROACH.....	7
2.6 RESEARCH DESIGN .....	7
2.6.1 CROSS-SECTIONAL .....	8
2.6.2 TIME-SERIES .....	8
2.6.3 PANEL DATA.....	8
2.7 LITERATURE SEARCH.....	9
2.8 SOURCE CRITICISM .....	9
3. PREVIOUS RESEARCH.....	11
3.1 EARNINGS MANAGEMENT .....	11
3.2 EARNINGS QUALITY .....	13
3.3 FIRM VALUE .....	14
3.4 ETHICALLY.....	17
3.5 IFRS.....	17
4. THEORETICAL FRAME OF REFERENCE.....	20
4.1 EFFICIENT-MARKET HYPOTHESIS .....	20
4.2 INFORMATION ASYMMETRY .....	21
4.3 AGENCY THEORY .....	22
4.4 SIGNALING THEORY .....	22
4.5 EARNINGS MANAGEMENT .....	24
4.6 MAIN HYPOTHESES .....	25
5. PRACTICAL APPROACH .....	26
5.1 DATA AND POPULATION .....	26
5.1.1 DATASTREAM.....	26
5.1.2 DELIMITATIONS .....	27
5.1.3 SURVIVORSHIP BIAS .....	28
5.2 RESEARCHING EARNINGS MANAGEMENT .....	28
5.2.1 EVENT STUDY .....	28
5.2.2 LINGUISTICS-BASED MODELS.....	29
5.3 THE MODEL .....	30
5.4 STATA .....	35
5.5 STATISTICAL TESTS .....	35
5.5.1 MULTIPLE REGRESSION ANALYSIS.....	36
5.5.2 HETEROSKEDASTICITY.....	36

5.5.3 ADJUSTED $R^2$ .....	36
5.5.4 MULTICOLLINEARITY .....	37
5.6 FULL LIST OF HYPOTHESES .....	38
<b>6. EMPIRICAL RESULTS .....</b>	<b>39</b>
6.1 SMOOTHING MODEL .....	41
6.1.1 VARIABLE RESULTS 1995-1999 .....	41
6.1.2 VARIABLE RESULTS 2000-2004 .....	42
6.1.3 VARIABLE RESULTS 2005-2009 .....	43
6.1.4 VARIABLE RESULTS 2009-2013 .....	43
6.1.5 VARIABLE RESULTS 1995-2004 .....	44
6.1.6 VARIABLE RESULTS 2005-2013 .....	45
6.1.7 VARIABLE RESULTS 1995-2013 .....	45
6.2 UNSTANDARDIZED VARIABLE RESULTS .....	46
6.3 ASSET SIZE .....	47
6.4 INDUSTRIES .....	48
6.5 YEARS .....	48
6.6 SUMMARY STATISTICS AND POST-REGRESSION TESTS .....	49
<b>7. ANALYSIS .....</b>	<b>51</b>
7.1 MODEL .....	51
7.2 HYPOTHESES .....	53
7.3 THEORETICAL ANALYSIS .....	56
7.3.1 IFRS .....	56
7.3.2 EMH .....	57
7.3.3 INFORMATION ASYMMETRY .....	57
7.3.4 AGENCY THEORY .....	58
7.3.5 EARNINGS MANAGEMENT AND SIGNALING .....	58
<b>8. CONCLUSION .....</b>	<b>62</b>
8.1 THEORETICAL AND PRACTICAL IMPLICATIONS .....	63
8.2 FUTURE RESEARCH .....	63
<b>9. CRITERIA OF TRUTH .....</b>	<b>65</b>
9.1 RELIABILITY .....	65
9.2 REPLICATION .....	65
9.3 VALIDITY .....	66
9.4 ISSUES .....	66
9.5 ETHICAL AND SOCIETAL ASPECTS .....	67
<b>REFERENCE LIST .....</b>	<b>69</b>

<b>APPENDIX 1 – DATATYPES IN DATASTREAM</b>	
<b>APPENDIX 2 - CORRELATIONS</b>	
<b>APPENDIX 3 - EQUATION 1</b>	
<b>APPENDIX 4 - REGRESSION OUTPUT FOR 1995-2013</b>	
<b>APPENDIX 5 - REGRESSION OUTPUT FOR 1995-2004</b>	
<b>APPENDIX 6 - REGRESSION OUTPUT FOR 2005-2013</b>	
<b>APPENDIX 7 - REGRESSION OUTPUT FOR 1995-1999</b>	
<b>APPENDIX 8 - REGRESSION OUTPUT FOR 2000-2004</b>	
<b>APPENDIX 9 - REGRESSION OUTPUT FOR 2005-2009</b>	
<b>APPENDIX 10 - REGRESSION OUTPUT FOR 2009-2013</b>	

**LIST OF TABLES**

<b>TABLE 3.1 - SUMMARIZED SELECT PREVIOUS RESEARCH</b>	<b>P. 19</b>
<b>TABLE 6.1 - DESCRIPTIVE STATISTICS FOR THE PERIOD 1995-2013</b>	<b>P. 39</b>
<b>TABLE 6.2 - DESCRIPTIVE STATISTICS FOR VARIABLES USED IN THE REGRESSIONS</b>	<b>P. 40</b>
<b>TABLE 6.3 - INDEPENDENT VARIABLE RESULTS FOR 1995-1999</b>	<b>P. 41</b>
<b>TABLE 6.4 - INDEPENDENT VARIABLE RESULTS FOR 2000-2004</b>	<b>P. 42</b>
<b>TABLE 6.5 - INDEPENDENT VARIABLE RESULTS FOR 2005-2009</b>	<b>P. 43</b>
<b>TABLE 6.6 - INDEPENDENT VARIABLE RESULTS FOR 2009-2013</b>	<b>P. 43</b>
<b>TABLE 6.7 - INDEPENDENT VARIABLE RESULTS FOR 1995-2004</b>	<b>P. 44</b>
<b>TABLE 6.8 - INDEPENDENT VARIABLE RESULTS FOR 2005-2013</b>	<b>P. 45</b>
<b>TABLE 6.9 - INDEPENDENT VARIABLE RESULTS FOR 1995-2013</b>	<b>P. 45</b>
<b>TABLE 6.10 - UNSTANDARDIZED COEFFICIENTS AND T-VALUES FOR LONG PERIODS</b>	<b>P. 46</b>
<b>TABLE 6.11 - UNSTANDARDIZED COEFFICIENTS AND T-VALUES FOR 5-YEAR PERIODS</b>	<b>P. 47</b>
<b>TABLE 6.12 - SYSTEMATIC DIFFERENCES BETWEEN ASSET SIZE</b>	<b>P. 47</b>
<b>TABLE 6.13 - SYSTEMATIC DIFFERENCES IN Q BETWEEN INDUSTRIES</b>	<b>P. 48</b>
<b>TABLE 6.14 - DIFFERENCES IN Q BETWEEN YEARS</b>	<b>P. 48</b>
<b>TABLE 6.15 - REGRESSION- AND POST-REGRESSION TEST RESULTS</b>	<b>P. 49</b>

**LIST OF FIGURES**

<b>FIGURE 1: THE PROCESS OF DEDUCTION</b>	<b>P. 7</b>
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**LIST OF EQUATIONS**

<b>EQUATION 1: FIRM VALUE</b>	<b>P. 35</b>
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## 1. INTRODUCTION

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*In this chapter, we introduce you to the concept of earnings management. We focus on the aspect of earnings management referred to as income smoothing, and lay a foundation for an empirical examination of the concept and its implications. The chapter is concluded with the formulation of our research question and a clarification of the objective and contribution of our study.*

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Earnings management (EM) can be defined as “the choice by a manager of accounting policies so as to achieve specific objectives” (Johnson et al., 2012, p. 910). It can be classified as either accounting related or operations related where the first often takes the form of manipulating accounting records and the second relates to the timing of certain investments that in turn have an effect on earnings (Johnson et al., 2012, p. 910). Earnings management is a subject that has been frequently debated in regard to ethics. EM resulting in personal gains for a manager has been considered unethical in previous research while earnings management done in favor of business related goals have had mixed responses (Johnson et al., 2012, p. 910-911).

Healy and Wahlen (1999, p. 368) define earnings management slightly different than Johnson et al. (2012). According to them, “earnings management occurs when managers use judgment 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”. There are many judgmental decisions managers have to take that can have an impact on earnings (Healy & Wahlen, 1999, p. 369). We believe this definition to be more in line with our perception of earnings management, since we believe the objective of earnings management is to mislead at least some of the stakeholders about the real underlying economic performance of the firm.

Firms have a tendency towards manipulating earnings ahead of an earnings report with the aim to match or beat analysts’ forecasts. The reason for doing so is because managers want smooth earnings over the years due to them perceiving that this is something investors want. Smooth earnings can send a signal of stability, which would put stakeholders at ease. The pressure from the forecasts incline the managers to use short-term accounting practices that may end up being detrimental in the long-run (Healy & Wahlen, 1999, p. 371). But is this really a viable practice, and does it have a relationship with firm value?

It has been found that managers can have several incentives to manage earnings upwards. A typical example is before an initial public offering, where managers will try to manage earnings upwards in attempt to increase offer price (Healy & Wahlen, 1999, p. 374). Other reasons can be to increase management compensation, to reduce likelihood of violating debt covenants and to avoid regulatory interventions (Healy & Wahlen, 1999, p. 380).

Previous research on earnings management has only focused on foreign markets and we therefore believe there is a need to aim further study at the Swedish market, specifically the Nasdaq OMX Stockholm. The Nasdaq OMX group is the largest exchange company in the world. Securities trading on the Swedish Stock Exchange have been automated

since 1990 when the SAX (Stockholm Automated eXchange) was implemented (Nasdaq OMX, 2015). Information gathered in the study can help not only investors, but also legal institutions in future decision making processes. Previous research is also done mainly on markets using GAAP as their financial reporting standards, while this research will be done on firms using IFRS, giving us a niche and filling an important gap in the field. Even though the U.S. GAAP is also principles-based, it does contain significantly more application guidance, i.e. rules, compared to the IFRS (Mirza & Holt, 2011, p. 2). The report could also be useful to decision-making accounting bodies if any such conclusions can be drawn concerning principles- vs. rules-based accounting. For instance, the U.S. GAAP contains over 20,000 pages of accounting literature while the IFRS only contains a mere 2,000 to 3,000 (Mirza & Holt, 2011, p. 2) According to Bao and Bao (2004, p. 1526), current research methodology is not particularly effective at identifying firms managing earnings. In the same paper, income smoothing is defined as “the process of manipulating the time profile of earnings or earnings reports to make the reported income stream less variable, while not increasing reported earnings over the long run” (Bao & Bao, 2004, p. 1527).

Gavious et al. (2002, p. 1) explain the two types of well-known income smoothing. They are real smoothing and artificial smoothing. Real is when management takes production and/or investment decisions that purposefully reduce actual earnings’ variability over the years. Artificial is altering the reported earnings through accounting choice, well after the economic earnings have been realized. Since myopic management is the process of cutting R&D and marketing spending, it falls under the investment decision category, and is therefore real income smoothing.

In modern times, the ever increasing globalization is something to be recognized, thus, a need for internationally accepted financial reporting standards has arisen (Mirza & Holt, 2011, p. 1). It is likely that the IFRS might be the single standard over the entire globe in a not too distant future (Mirza & Holt, 2011, p. 1). Mirza and Holt (2011, p. 2) also argue that since accounting is the language of business, companies in a globalized world cannot afford to speak different languages to each other and must thus use the same accounting standards. Since 2005, all listed companies in the EU are required to use IFRS for their consolidated statements and have replaced the national accounting standards (Mirza & Holt, 2011, p. 3). We will therefore hereafter view Sweden as a country subject to mandatory adoption of the IFRS (IFRS, 2013). Many other nations around the globe have also adopted the IFRS in recent times and the most significant nation not yet using it is, of course, the United States. The IFRS are being considered for adoption there too however, and the SEC has dropped their previous requirement for non U.S. companies attempting to raise capital in the U.S. to consolidate their statements to the U.S. GAAP and they are also considering whether or not to allow U.S. companies to use IFRS instead of GAAP (Mirza & Holt, 2011, p. 3). This leads us to believe that the IFRS might actually become the single accounting standard around the globe.

The IFRS might allow for a larger amount of smaller types of income manipulation but it has previously been shown that “loopholes” in rules-based standards such as the GAAP can impact massively on results if they are abused. A good example of this is the Enron scandal in 2001 where the company used special purpose entities (SPE) in order to inflate their earnings through loans, without any loans actually showing up on the

main firm. After the scandal, GAAP standard setters took drastic procedures in order to reduce this kind of behavior in the future (Economist, 2002).

In regards to income smoothing under the IFRS, Gebhardt and Novotny-Farkas (2011, p. 1) found that the restriction to only recognize incurred losses under IAS 39 had significantly reduced income smoothing, suggesting that the IFRS could indeed have an impact on income smoothing policies within companies. Further, the IAS 39.59 does not allow for recognizing losses that are expected in the future (Gebhardt & Novotny-Farkas, 2011, p. 2). We consider the IAS 39 to be a fairly clear statement on IFRS policy versus income smoothing, thus, the IFRS attempts to reduce income smoothing and will continue to do so in the future. A study by Veri W et al. (2014, p. 1) suggested that IFRS implementation does not have an effect on income smoothing but that the stock price was the determining factor for whether or not a company would smooth income, where a high stock price meant that they were less likely to use income smoothing procedures and vice versa. Also, accountants in different countries tend to adopt different approaches, depending on cultural and societal differences and their respective accounting sub culture. In Sweden, accountants are independent professionals who present a true and fair view of a company's financial position rather than implementing detailed legal requirements (Bao & Bao, 2004, p. 1527).

It has to be mentioned that, during the period we plan to investigate, one of the worst financial crises in history has taken place. This is something that is obvious to affect results in some way and it will be interesting to see if there are any possible conclusions to draw from this (Reuters, 2009).

However, we are investigating one of the countries which are the least impacted by the crisis worldwide and unlike other countries which are still impacted by the crisis from 2008, Sweden had more or less fully recovered already and was perhaps the fastest nation to do so (Irwin, 2011).

### 1.1 RESEARCH QUESTION

Is earnings management prevalent on the Swedish stock market, and if so, how does it affect firm valuation?

### 1.2 OBJECTIVE/PURPOSE

The study aims to investigate if earnings management exists among firms listed on the Swedish stock exchange. Further, it aims to explore how the market reacts to this kind of practice in terms of firm value. We will also examine whether IFRS has had an impact on earnings management practices, or if it is essentially the same as before its implementation.

### 1.3 CONTRIBUTION

Different research seems to indicate a lot of different things and it is hard for researchers to reach a consensus, which is why we feel that our study could contribute to the field. The main focus of research has been on identifying whether and when earnings management actually takes place. The evidence is rather consistent that earnings management does take place (Healy & Wahlen, 1999, p. 366), which is a

reason why we think it might be important to further investigate how earnings management will affect firm value. Furthermore, it is common knowledge that earnings management does happen but it has been difficult to provide convincing evidence of it (Healy & Wahlen, 1999, p. 370). This means that additional evidence is needed and we hope to be able to contribute to already existing research by further investigating whether earnings management exists. The theoretical contribution can thus be summarized to be increased knowledge regarding earnings management in a setting that has not been widely examined previously.

Our research can be interesting for accounting standard setters due to the fact that they have demonstrated an interest in earnings management used to circumvent regulation by the use of fair value accounting and increased risk related disclosure requirements (Healy & Wahlen, 1999, p. 377). Standard setters could use the results of this study to support their decision-making processes. Further, it might be useful to investors and other stakeholders, as well as firms themselves.

## 2. SCIENTIFIC METHODOLOGY

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*The study utilizes a quantitative method with a deductive approach. This chapter outlines the design of the study and the perspectives of the authors from a scientific point of view. We gather relevant theories on earnings management and the relationship between firm and stakeholder, allowing us to formulate testable hypotheses that will help answer the underlying research question: Is earnings management prevalent on the Swedish stock market, and if so, how does it affect firm valuation?*

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In order to investigate the magnitude of earnings management on the Swedish stock market, a quantitative method with a deductive approach has been chosen. The deductive approach uses an established theoretical frame of reference and then deduces one or several hypotheses to test. The deduction requires some skill in the creation of hypotheses and their translation to operational terms (Bryman, 2008, p. 26). Quantitative data in the form of financial numbers will be gathered through a large database and then analyzed following the chosen theoretical point of view.

### 2.1 AUTHORS' PREVIOUS KNOWLEDGE

The authors have mainly acquired knowledge regarding the subject through studies at the Umeå School of Business. One of the authors has studied business and economics with focus on accounting and the other has studied business and economics with focus on finance. Both of the authors have studied business administration with subjects such as finance, management, accounting and finance during their first semesters. One of the authors spent the 5th and 6th semester studying mainly C-level accounting, finance and law while the other spent these two semesters abroad at the University of California, Los Angeles Extension where he studied finance and investing. During the 7th semester, one of the authors studied Accounting Auditing and Control while the other studied Financial Management, both D-level courses.

Since the authors have knowledge mainly encompassing accounting and finance, investigating the impact that earnings management has on firm value felt like an interesting choice of topic. Studies within earnings management will generally require knowledge within both accounting and finance.

The previous knowledge of the authors is something that is likely to have a major impact on the study itself. There are quite obviously things that have been previously learned within the subject, which will cause the authors to expect certain results. For instance, we will be biased towards the view that earnings management will affect firm value, since previous literature supports that thesis. However, by acknowledging this pre-understanding, one becomes aware of the possible biases and in turn is able to take it into account and consider it when evaluating the results.

### 2.2 EPISTEMOLOGY

The central question in epistemology is what should be regarded as acceptable knowledge within a certain discipline. An important issue in the context of social science is whether or not the same principles as for natural science should apply. Positivism is a position within epistemology, which argues that the methods of natural

science should be applied to social science as well (Bryman & Bell, 2011, p. 15). Positivism assumes that a higher status is granted to observation rather than theory and argues that theoretical terms, which cannot be directly observed, are not considered scientific, as they must be observable (Bryman & Bell, 2011, p. 15).

The contrasting epistemology to positivism is hermeneutics. These are the two main positions within epistemology. In social sciences, positivism tries to explain human behavior while hermeneutics attempts to understand it, thus, there is a clash between understanding and explaining (Bryman & Bell, 2011, p. 16).

This study aims to investigate whether or not earnings management will have an effect on firm value. It attempts to explain managerial behavior in an earnings management setting and investors' subsequent response, and why managers choose to manage earnings in the first place. Therefore, the study has positivistic elements and should be treated as such.

The subject is rather well documented in previous research and we have thus made use of previous knowledge in order to test whether the same conclusions can be drawn from our particular study. A deductive approach will be used which means that certain hypotheses will be established and tested (Bryman & Bell, 2011, p. 12). Positivism further means that the research should be free from the possible social biases of the authors and as a result should be objective (Bryman, 2008, p. 30). Our aim is thus to be as objective and free from bias as we possibly can in our study. The conclusion from this chapter is that a position of positivism will be used in this study.

### 2.3 ONTOLOGY

Ontology has the primary concern of whether a given social entity should be considered an objective entity that is independent from social actors, or whether it should be considered a social construction dependent on social actors to exist. This results in the two positions of ontology, which are objectivism and constructionism respectively (Bryman & Bell, 2011, p. 20). Saunders et al. (2012, p. 132) associates constructionism with subjectivism, in that social phenomena are created from the perceptions and actions of social actors.

In this study the aim is to examine if earnings management will affect firm value and we therefore conclude that the choice of ontological viewpoint should be an objective one. Our intent is not to simply answer why earnings management exists, but how it affects firm value. This will be done by gathering data and then analyzing using a statistical program. Given these circumstances, it is quite clear to us that an objective point of view is the best choice.

While these previous two sections have outlined our chosen points of view for the study, there is no denying that earnings management is a controversial topic. We recognize that there are several different ways of undertaking research and of interpreting the world, which makes us pragmatists in the eyes of Saunders et al. (2012, p. 130). They add that pragmatists assert that no single viewpoint can give the entire picture and that there may be multiple realities. This is certainly true for earnings management, where there is an abundance of research investigating the justification, incentives, and reasoning for conducting such practices. However, a pragmatist will still

choose to use a method, or methods, that enable credible, well-founded, reliable and relevant data to be collected in order to further the research (Kelemen & Rumens, 2008, p. 41; Saunders et al., 2012, p. 130).

## 2.4 AXIOLOGY

Axiology is the philosophical branch that studies judgments about value (Saunders et al., 2012, p. 137). We will, as much as possible, leave our own values and inclinations out of the study. This includes, but is not limited to, how much information investors in a firm deserve, and who should be held accountable for eventual misconduct. Some discussion with personal beliefs will be unavoidable for the sake of argumentation, but we intend to keep the examination as objective as possible. We will, however, not neglect the ethical aspects of earnings management, and will dedicate a discussion on this in Chapter 9.

## 2.5 APPROACH

We have chosen to use a deductive approach in this study. According to Bryman and Bell (2011, p. 11; Bryman, 2012, p. 24), a deductive approach can be described in six steps (see Figure 2.1). The first step is theory, second is hypothesis, third is data collection, fourth is findings, fifth is the confirmation or rejection of hypotheses and the sixth is revision of theory. We will begin by examining previous research and establish our own hypotheses thereafter. We will then continue to collect data through Thomson Reuters Datastream and process the data using Microsoft Excel and STATA. In the end, we will be able to confirm or reject the hypotheses and discuss the theory at hand.



**Figure 1: The process of deduction (Bryman, 2012, p. 24)**

## 2.6 RESEARCH DESIGN

A distinction is generally made in methodology between qualitative and quantitative research (Bryman & Bell, 2011, p. 20). Due to the nature of this study we argue that a quantitative method is to be preferred. Data will be gathered in large quantities and analyzed using statistical software. Bryman and Bell (2011, p. 20-21) argues that a quantitative study entails a deductive approach, uses positivism to a large degree and that its ontological viewpoint is objective. We believe that all these three criteria of deductivism, positivism and objectivity are in line with our study and we are able to conclude that a quantitative study will be most suitable.

Earnings management is a relatively sensitive topic that is subject to a lot of debate. It is burdened by controversial approaches and moral dilemmas, which makes it uneasy to examine qualitatively. Professionals are ambiguous toward the practice of earnings

management. For that reason, it is both interesting to study, but tough to design more intimate research. People who are exposed to earnings management in their line of work would likely not want to discuss it openly. Some researchers say earnings management can be rewarded by investors (Bartov et al., 2002), while others are convinced of its negative impact (Dechow et al., 1996). A public position on the practice of earnings management might therefore be deemed unnecessary for a firm to take. The nature of the concept makes it harder to find respondents, disfavoring the qualitative approach. An examination of earnings management using a qualitative approach would have to be adequately persuasive in order to be credible.

Since our study will be based on data collected from a single database, the weight of the study's credibility will be shared with the database. If the database is considered credible, the study can also be considered such, and vice versa.

#### 2.6.1 CROSS-SECTIONAL

A cross-sectional study means that the researcher collects data on more than one case but at a single point in time. Quantitative data is thus collected and examined with several variables in order to find patterns (Bryman & Bell, 2011, p. 53-54). Our study definitely contains more than one case since many different organizations are examined; furthermore, data is gathered at a single point in time i.e. we collect the data simultaneously. Because of this, there is no credible timely relation between the variables, which makes them difficult to manipulate (Bryman, 2008, p. 64). This is in contrast to an experimental design where data is gathered over the course of a longer time period (Bryman & Bell, 2011, p. 54). The data gathered can also be considered quantitative and quantifiable. It is also possible to examine relationships between variables established based on the data. However, since the data is gathered at several points in time over an extended period, we believe a panel data study, explained below, is more appropriate. We have chosen to include cross-sectional in order to better shed light on why a typical cross-sectional study is not in line with the objective of our study and the interest in IFRS implementation, which requires examination during a long time-frame. We also include it because it can be related to a panel data study and thus clarifies how such an examination is performed.

#### 2.6.2 TIME-SERIES

A time-series is a sequence of values of a variable at different times. There are two primary ways in which a time-series can be used. The first one is to obtain an understanding of the forces and structure that produced the data and the second is to fit it into a model and proceed in using different other procedures. It can be used in many different areas but primarily within finance (National Institute of Standards and Technology, 2013). A typical time-series structure of the study has not been chosen since a panel data study, including both elements from a time-series study and a cross-sectional study, could be considered more appropriate for this type of research.

#### 2.6.3 PANEL DATA

A panel study is similar to a trend study. A trend study maps change over a certain period and enables you to find what has happened, what is happening and what is about to happen. A panel study is longitudinal but it is also prospective in nature and the information is collected from the same set of responders. In a panel study, you collect

the data from the same firms over time and then analyze the changes in the pattern that is created (Kumar, 2011). Panel data is a combination of cross-sectional and time-series in that sense.

In this study, the same set of companies will be used throughout the investigation and the data will be collected over an extended period of time consisting of 24 years and 480 different companies. Data is thus collected at the same point in time on a yearly basis, from the same set of companies. These characteristics make it possible for us to argue that the data can be classified as panel data. A panel data study is indeed what is going to be used, because we believe that it best reflects what we would like to do in this study and provides a combination between the cross-sectional and time-series study.

## 2.7 LITERATURE SEARCH

The first step in our literature research was to search through various databases for articles in order to find an interesting topic and additionally attempt to identify an area where further research is needed. Some keywords that have been used for literature research are: earnings management, earnings coefficient, earnings manipulation, income smoothing, income reporting strategy, etcetera. The main tool used for finding literature on the subject of earnings management has been Business Source Premier. Additional database tools have been Google Scholar and DiVA.

During the literature search, we found that most EM related literature seems to be based on samples in the U.S., and on companies using GAAP rather than IFRS. The research based on the EU is considerably smaller and we were not able to find any studies using the Swedish stock exchange as a basis for sample, which also investigates the relationship between earnings management and firm value. Initially, a few relevant articles were found and by examining these we were able to find a larger array of studies through references in articles, which were found earlier. Most research seemed to point towards a few main points. Earnings management does exist and is rather widespread but it is difficult to provide any hard proof. Earnings management will most likely have at least a short-term effect on firm value (Healy & Wahlen, 1999, p. 377).

## 2.8 SOURCE CRITICISM

According to Ejvegård (2003, p. 62-65), there are three criteria that must be met when assessing the literature in a study. These are authentication, independence, and freshness and concurrency. We can directly conclude that the freshness criteria can be met. Earnings management is a subject of hot debate, and the literature is generally very recent, most articles being from the past ten years time. Some are older but those generally work as a basis upon which more recent articles are built.

The majority of the articles used in this study are peer-reviewed and well cited. We have gone as far as possible in order to retrieve the primary source from which any theory or reasoning is based off of. The theoretical frame of reference is specifically designed to include the pioneers of the respective fields, with the addition of some expanding research. The model we have chosen for the practical approach is almost 20 years old, but has been tested and scrutinized to prove its accuracy in modern times by other authors (Michelson et al., 2011).

The database used in this study contains secondary data, which will be discussed in Chapter 5. Some articles are working papers and a few are unpublished. Such sources are treated accordingly, with caution. However, the authentication criteria can be considered met since most of our sources are primary, which means their credibility increases and, in turn, the credibility of our own study.

### 3. PREVIOUS RESEARCH

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*In this chapter we review existing literature on earnings management and its ethical implications, earnings quality, firm value, and IFRS. The theories and empirical evidence are used to create an understanding of the concept that will evolve into our own theoretical frame of reference in the following chapter.*

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#### 3.1 EARNINGS MANAGEMENT

In 1999, Healy and Wahlen summarized and reviewed the earnings management literature thus far. They found several important issues within the literature. For instance, investors view abnormal accruals as a likely indicator to reflect earnings management in contrast to normal accruals. They mention three different incentives for earnings management, with the first one being capital market expectations and valuation. They identify that the focus of the research up to this point has been to detect whether or not earnings management actually occurs (Healy & Wahlen, 1999, p. 367).

Analytical models were developed by Dye (1988) and Trueman and Titman (1988) in order to demonstrate examples of contracting frictions leading to earnings management with the intention of impacting decision making of external investors (Healy & Wahlen, 1999, p. 371). Burgstahler and Eames (1998) found a connection between earnings management and analyst forecasts where earnings management will occur in order to reach the forecasts set by analysts (Healy & Wahlen, 1999, p. 371). Abarbanell and Lehavy (1998) found that firms manage earnings depending on analysts' stock recommendations, and that the unexpected accruals will be either positive or negative depending on the recommendation (Healy & Wahlen, 1999, p. 371).

According to Healy and Wahlen (1999, p. 377), there is relatively little evidence on the magnitude or frequency of earnings management for capital market purposes, which makes a study of the frequency of earnings management on the Swedish market highly relevant. There is an abundance of evidence of earnings numbers' effect on the stock-market, but the research has lacked in assessing the magnitude.

According to Lev (2003, p. 41), accruals are the difference between earnings and cash flows. While there are several different accruals, many of them require estimates, which makes them candidates for manipulation by managers.

Lev (2003) presented a thorough run-down of corporate earnings and the incentives that accompanied them. He concluded that earnings manipulation will not be successfully dealt with through stricter regulation and more detailed rules than before. Lev seemed to favor the principles-based accounting, claiming that earnings manipulation thrived in a thicket of rules. The paper was published in 2003, two years before the EU implemented the IFRS and before the financial world had taken noticeable steps toward more principles-based accounting.

According to Wu (2002), the number of earnings restatements by public companies skyrocketed in the very end of the 20th century and beginning of the 21st. He also showed that the investor-perceived earnings quality decreased following a restatement

announcement, which indicates that firms who restate earnings will lose their investors' trust.

Trueman and Titman (1988) discuss the rationality vs. the irrationality of managers regarding income smoothing. The article provides evidence in line with other similar research, which indicates that managers are susceptible to income smoothing. They do so because they want to lower the different stakeholders perception of firm variance. Interestingly, they also found that income smoothing may actually have positive effects in the long term (Trueman & Titman, 1988).

However, not every investor is able to identify income smoothing. Wang (2013) investigates investors' ability to see through smooth earnings by looking at their reactions to reported earnings. The results suggest that investors actually realize that high persistence of smooth earnings is in fact not real. When they realize this, usually after earnings reports, they discount the persistence of such smooth earnings. The findings also show that institutional investors are better at spotting income smoothing than private investors, particularly due to better tools and access to superior expertise and lower costs in their research (Wang, 2013, p. 705).

A recent theory on real smoothing has been developed in an attempt to explain the underlying accounts that are mainly affected by income smoothing. The theory is called myopic management, and is a practice in which a firm reduces its marketing- and R&D-spending in order to inflate earnings (Mizik, 2010, p. 594). The name comes from the word myopia, which is synonymous with shortsightedness. Marketing spending is the first thing that is cut in bad economic times, when managers might fear not meeting the expectations set upon them (Mizik, 2010, p. 595). Previous research has shown that top-level management will consider using methods to increase earnings in a specific period in order to reach their quarterly goals when they risk failing them, thus harming future cash flows (Mizik, 2010, p. 596). R&D spending also has a tendency to be reduced before a top executive retires (Mizik, 2010, p. 597). A study from 2009 by Bhojraj et al. supports the conclusion that myopic management will help increase stock price short term, but on a longer period of time it will be detrimental. Managers will be willing to ignore positive NPV projects in order to try to beat analyst forecasts in the short term and thus such behavior may end up as value destroying for the firm, eventually resulting in a lower firm value (Bhojraj et al., 2009).

Mizik (2010) also tested the market's perception of potentially myopic firms. She found that myopic management leads to higher current-term earnings and stock price, but hurts the long-term performance of the firm because those initial gains are offset by significantly greater negative abnormal returns. Firms that had been identified as potentially using myopic management had a lower average stock return over the entire year, and continued to perform worse until the end of the investigated four-year period.

Indeed, all research seems to indicate the same thing. During a short-term period, firms using myopic management cannot be correctly priced by the market. This, in turn, gives incentives for managers to commit to strategies that work to enhance current term earnings at the expense of the long-term (Mizik & Jacobson, 2007).

Currim et al. (2012) look in to the relationship between management's compensation on advertising and R&D spending decision and stock market return. They find that

managers have strong short-term incentives to increase current-year profits by cutting the spending on research and development and advertising (Currim et al., 2012, p. 34). They note that there is a strong correlation between advertising and R&D spending as a share of sales (.98), which indicates that as one type of spending increases, so does the other. This leads to the conclusion that it is unlikely that these two types of spending come with a fixed budget (Currim et al., 2012, p. 40).

Dechow et al. (1996) examine the motives and consequences of earnings management, using a sample of firms that have been targeted by the Securities and Exchange Commission (SEC) for reportedly overstating earnings. They find that the main motivations are the desire to raise external financing at low cost, as well as to avoid debt covenant restrictions. Another finding is that they did not find any systematic evidence that the motivations may be based on compensation plans related to earnings, or that managers appear to manage earnings in order to sell their shares at inflated prices (Dechow et al., 1996, p. 31).

It is worth noting that the firms used in Dechow et al.'s (1996) study are of the extraordinary kind, since they examine firms targeted by the SEC. This means that it cannot be generalized to all cases of earnings management, especially not the subtle ones. Motivations in such cases might, or might not, be different.

A year earlier, 1995, Dechow et al. tested five models for income smoothing detection. One of their findings was that none of the models were completely successful in detecting earnings management in firm-years experiencing extreme financial performance. This is interesting considering the recent financial crisis that will be part of this study's observation period. However, the chosen model for this study is from 1996 and therefore not tested by Dechow et al. in their study from 1995. This means that we cannot empirically attest to its accuracy during extreme financial performance. We still recognize that since previous models lacked in this regard, our chosen model may as well. We present it in Chapter 5.

Another practice of earnings management was identified by Athanasakou et al. (2009, p. 29) that utilized classification shifting of small or other non-recurring items in order to reach analysts' earnings forecasts. They found this trend in a small subset of firms with large market capitalizations. The subset being small and the explanatory power of the non-recurring items for excess core earnings being low; the results should be treated carefully. However, it is an interesting finding and points to the ingenuity of those who allegedly manage earnings.

### 3.2 EARNINGS QUALITY

Bao & Bao (2004) argue that firm value does not necessarily come from lower variability in a firm's earnings, i.e. income smoothing. They instead position that the actual quality of the earnings is what is value-relevant when considered in conjunction with the earnings' smoothness. In layman's terms, smoothing income over the years to make them appear stable is not enough to fool investors. One also has to ensure that the earnings are of high quality and not something that has been dishonestly manufactured for the short-term.

The authors use a sample of 12,651 firm-year observations. They classify firms into four categories: quality earnings smoothers, quality earnings non-smoothers, non-quality earnings smoothers, and non-quality earnings non-smoothers. Value relevance between these firms is then examined. They use regressions to compare value relevance of reported earnings between the categories (Bao & Bao, 2004).

Price-earnings multiple and price change-earnings change multiple are not significantly different between smoothers and non-smoothers when the quality of earnings is not considered. The multiples of quality earnings firms are significantly higher than non quality earnings firms when smoothing is not considered. Smoothers with quality earnings have a higher price change-earnings change multiple and a lower price-earnings multiple than quality earnings non-smoothers. Finally, smoothers with non-quality earnings have a higher price-earnings multiple and a higher price change-earnings change multiple compared to non-smoothers with non-quality earnings (Bao & Bao, 2004).

### 3.3 FIRM VALUE

Gavious et al. (2002) examine the principal-agent contract in relation to the growth rate of earnings. They found that firms that are manager-controlled, as opposed to owner-controlled, see increasing growth rates over time. Owner-controlled firms see, and prefer, low growth rates. Therefore, the expected value of an owner-controlled firm is higher than the expected value of a manager-controlled firm.

Gavious et al. (2002, p. 0), using previous research as their basis, concluded that companies manage earnings and that accounting earnings are important for valuation, while maintaining that this is, in fact, an undisputable fact. Degeorge et al. (1999, p. 1) reinforce this claim by stating that:

“Analysts, investors, senior executives, and boards of directors consider the earnings signal the most important item in the financial report issued by publicly held firms”

Degeorge et al.’s (1999) paper looks at how firms deal with earnings threshold, e.g. profit goals, last year’s same-quarter profits, and analyst forecasts. Their data suggests that executives manage earnings in *predictable ways* in order to exceed thresholds. Earnings will be intuitively managed, i.e. upward if they fall short and smoothed if they fall far above or below, making those thresholds more easily attainable the coming years (Degeorge et al., 1999, p. 30). They go as far as to show a hierarchy between the thresholds. Top priority is to show positive profits, second is to report quarterly profits that are at least equal to last year’s same-quarter, and third is to meet the analysts’ forecasts (Degeorge et al., 1999, p. 30). These are all clear incentives for earnings management and a general indication of its prevalence, not only on the investigated markets, but on the Swedish market as well.

Bartov, Givoly and Hayn (2002) focus on the phenomenon referred to as the “expectation game”, in which firms and investors look at the ability to meet or beat analysts’ forecasts. They argue that investors might actually reward some manipulation of earnings because they perceive it as a sign of competent executives. It raises an important question of investor rationality, but their findings do show that investors

appear to apply a discount to firms that manage to meet or beat analysts' expectations, even if it is due to expectations- or earnings management (Bartov et al., 2002, p. 22).

An unpublished paper from Lev and Nissim (2002) argue that sophisticated investors might be aware of earnings manipulations, but are unable to offset the unsophisticated investors reactions to the manipulated numbers, if the sophisticated investors are constrained by short sales or other reasons. This goes straight against the efficient market hypothesis, in that it separates investors into two groups, one more informationally sophisticated than the other. Their argument raises other interesting questions regarding investor rationality. How many investors are aware of earnings management, how many care, and how many use it as a basis for their investing decisions? This area might be tough to investigate empirically, but is nonetheless highly relevant and should be considered in future research.

Chaney and Lewis (1995) examine previous research and give their take on the area of asymmetric information. According to Trueman and Titman's (1988) model, lower quality firms mimic higher quality firms by smoothing reported earnings, which reduces borrowing costs. Hughes and Schwartz (1989) use informational asymmetry between managers and investors to motivate the choice of inventory accounting methods. For reported earnings to be a credible signal of firm value, there must be a cost associated with over-reported earnings. Otherwise, all firms would report the highest possible earnings level. Chaney and Lewis (1995, p. 6) use the term income reporting strategy to describe the accounting practices in question.

Chaney and Lewis (1993) developed a smoothing proxy computed by dividing the *variance of the firm's operating cash flows* by the *variance of operating income*. A high value indicates income smoothing since the variance of income < variance of cash flows.

Earnings management literature typically assumes that opportunistic reporting through accruals manipulation is easily detectable beforehand from the financial reporting numbers. This assumption is questionable because opportunistic reporting would not really occur if the true earnings number could be easily unraveled. To overcome this logical inconsistency, Hui et al. (2014, p. 630) used an *ex-post* measure of opportunistic financial reporting, i.e. fraud, that is not easily identified by scrutinizing abnormal accruals.

They conclude that managers would lack incentive to report opportunistically if the market could easily see through the earnings manipulation and then undo it. They therefore reason that opportunistic reporting is unlikely to be so easily unraveled by investors. They also argue that managers have an incentive to disguise such reporting from investors, especially if they intend to keep the market's over-valuation of their company (Hui et al., 2014, p. 647).

Hui et al. (2014, p. 647) also found that investors are better informed about the risk of fraud when the companies have a "richer information environment" in that they have a larger group of analysts tailing them, or the level of institutional ownership is higher.

Jensen (2005) argues that letting your stock price go too high, is dangerous. Firms should not manage earnings in a way that they will be unable to deliver the performance

required to support the market's valuation. When the firms subsequently disappoint the capital markets, the stock price will decline and bring pain to stakeholders. This will eventually lead to value destruction, and when boards and managers decide to defend the overvaluation, they destroy part or all of the core value of the firm.

Kothari (2001) argues that prices might take years before they fully reflect available information and that fundamental valuation can yield a rich return in an inefficient market. Specifically, the motivation for earnings management research has expanded from contracting and political process considerations in an efficient market to include earnings management designed to influence prices because investors and the market might be fixated on (or might over- or under-react to) reported financial statement numbers.

Bitner and Dolan (1996) develop a theoretical basis for the relationship between income smoothing and equity market valuation. They develop a model for testing the market's premium for smooth income, as well as for testing if the market's valuation can distinguish between earnings that are natural versus earnings that have been managed.

They argue that, because real smoothing decisions are not subject to disclosure rules, they are more difficult to capture empirically (Bitner & Dolan, 1996, p. 21). It is also implausible that a firm would let income smoothing drive a long-term R&D spending policy, because that would likely influence growth, which is another key variable in determining a firm's market value (Bitner & Dolan, 1996, p. 24). They use Tobin's  $q$ , explained in Chapter 5, as a measure for firm value, and their findings show that smooth income does lead to a higher firm value.

Gaio and Raposo (2011) extend this research by investigating earnings quality's relation to firm value on an international level. They also use Tobin's  $q$  as their proxy for market valuation, and find that a reliable connection between earnings quality and firm value, even after controlling for country heterogeneity and the unobservable industry. The correlation is higher in countries with weak legal environments, which makes Sweden, as a contrastingly strong legal environment for disclosure, an interesting choice of study.

Filip and Raffournier (2014) investigated how income smoothing was affected by macroeconomic conditions. They used the financial crisis and the years before as reference for earnings management behaviour of listed firms in Europe. They found that income smoothing actually decreased in the period, while the quality of accruals improved. The interpretations are many, from less incentive to manipulate due to the market's increased tolerance for poor performance, to litigation risk and an increased demand for more timely income in difficult periods. Their results also show an intensive variation in earnings management between countries, which highlights the importance of studies on individual countries, as is our intention here.

Richardson et al. (2005) examine accrual reliability and their connection to earnings persistence and stock prices. The authors develop a balance sheet categorization of accruals and rate them based on their reliability. The findings show that the less reliable accruals will lead to lower persistence in the earnings and that investors cannot fully anticipate this, which leads to mispricing on the market. The conclusion is that accruals with low reliability bring significant costs when included in the financial statements.

They recommend that all accruals, even the low reliability ones, be incorporated in future research. They exclude all financial companies from their data because the demarcation between operating and financing activities is not clear in such firms (Richardson et al., 2005, p. 451).

### 3.4 ETHICALLY

Johnson et al. (2012) investigated ethical views from managers' perspectives, by illustrating a specific earnings management scenario in which an employee chose whether or not to indulge in earnings management behavior, with consequences that affect the firm favorably or unfavorably. Their findings showed that managers generally try to rationalize unethical behavior; by claiming it is for the "greater good" of the organization. There seems to exist a considerable amount of information on what managers should do in a given ethical situation but the information of what they actually do is considerably lacking (Johnson et al., 2012, p. 911).

Shafer (2015) shows that organizational ethical climate can be directly linked to the ethical perceptions of the manager. Thus, efforts taken to improve the organizational ethical climate can contribute to managers being less willing to resort to earnings manipulation.

They use a conceptualization of ethical climate that views the perceived climate as a reflection of managers' attitudes and behaviour towards ethics, i.e. when employees perceive an unethical climate. Employees will be more susceptible to put little importance on corporate ethics and social responsibility (Shafer, 2015).

A question to consider is whether or not earnings management can be considered ethical. We would like to argue that from the point of view of a manager, conducting earnings management would not be ethical behaviour since it will affect firm value in a negative manner in the long run. Thus, one can conclude that an agency problem is indeed present. The manager has an incentive to utilize earnings management in order to boost their short-term performance and meet the expectations set upon them. However, in the long run this will be harmful to long-term investors in the company since it has a negative impact on firm performance.

### 3.5 IFRS

Ahmed et al. (2013) found that adoption of IFRS significantly increased income smoothing, accrual aggressiveness, and significantly decreased timeliness of loss recognition. They did not find any change in meeting earnings targets for IFRS firms (Ahmed et al., 2013, p. 1369).

They conclude that overall accounting quality decreased after mandatory adoption of IFRS, as opposed to other research that claimed it increased. However, this decrease stems from the presumption that the change in quality is due to managerial discretion or exercise of judgment, not by accounting changes naturally resulting from the new standards. The study has only examined two years post-adoption (Ahmed et al., 2013, p. 1369). They admit that a longer examination period could yield different results, as the familiarization with the new standards will increase over time, along with

improvements in the structure of the financial reporting. Our paper intends to study nine years post-adoption, which will hopefully answer that question.

Atwood et al. (2011) investigate the difference between IFRS, U.S. GAAP, and domestic accounting standards (DAS) in their relation to earnings persistence and the relation between current earnings and future cash flows. Their findings show a positive correlation between current and future earnings and that losses are generally less persistent than profits. They do not find any significant difference in the persistence of positive earnings between IFRS, U.S. GAAP or non-U.S. DAS. They do find that losses are less persistent when reported under IFRS as opposed to U.S. GAAP, but IFRS is not significantly different than non-U.S. DAS. This tells us that the European transition to IFRS might not have changed the reporting of losses, and that they might not have been persistent prior to the implementation.

The findings also show a positive correlation between current earnings and future cash flows in all three sample groups. Accounting earnings under IFRS give less information about future cash flows than do earnings prepared under U.S. GAAP, despite the fact that earnings persistence does not differ between the standards (Atwood, 2011, p. 118). What this boils down to is that U.S. GAAP may be superior in predicting future cash flows. The authors still appear to acknowledge that IFRS adoption will happen in the U.S., but they are unsure which version will be adopted and if that version even exists as of yet.

Capkun et al. (2008) studied the mandatory transition from local GAAPs to IFRS during 2004 and 2005 in 1,722 European firms, looking at the quality of financial statements and earnings management. Apparently, Return on Assets (ROA) showed significant increase under IFRS as opposed to local GAAP, and it was with the same financial statements. They refer to it as transition earnings management, which was predominant in countries with weak legal institutions, which concurs with Gaio and Raposo's (2011) examination on earnings quality that we mentioned in the previous section. In Capkun et al.'s (2008, p. 26) study, Sweden was in the middle of all the countries' magnitude of earnings management post-adoption. They concluded that earnings were indeed managed, using a measure of ROA under local GAAP and under IFRS.

Capkun et al. addressed this topic again in 2011, investigating earnings reconciliations during the transition to IFRS in 2005. Sweden was once again one of the main countries included, with 141 firms examined. The results showed that IFRS 1 allowed managers to set the bar for the earnings either high or low, depending on their objective. This meant that they could set it low if they wanted to beat the earnings easily in the future, or set it high if they wanted to profit from higher earnings. The results indicated that investors could see through the setting of the bar, but also that higher-ups were unwilling or unable to adjust compensation plans for the change in accounting standards (Capkun et al., 2011, p. 37-38).

Capkun et al.'s two most recent studies, from 2012 and 2013, continue their research on the IFRS transition, this time focusing on smoothing, equivalating it to earnings management. They find increases in earnings management for both early- and late adopters, as well as for mandatory ones. The main argument in these studies is that the increased flexibility from the IAS/IFRS standards during the transition period was a

major contributant to the rise of income smoothing (Capkun et al., 2012, p. 35; Capkun et al., 2013, p. 37).

The studies by Capkun et al. are unpublished working papers and should be interpreted with caution. The findings are conclusive with what Ahmed et al. (2013) reported, which points to an increase in earnings management in Europe during the transition to IFRS and shortly thereafter.

Doukakis (2014) expands the research by incorporating real earnings management into the examination, instead of focusing solely on accrual-based earnings management. In this study, the null hypothesis that IFRS adoption had no effect on real- or accrual-based earnings management was not rejected. The conclusion here contradicts that of Capkun et al.'s (2008; 2011; 2012; 2013). However, Doukakis is unusually cautious in his evaluation of the conclusion. While having used a thorough and convincing design, which accounted for contemporaneous changes in the economic environment that might have affected earnings management practices, he was very open to explanations of other earnings management techniques (Doukakis, 2014, p. 32-33). He is very humble in presenting his findings, but the paper is nonetheless peer-reviewed. Below is a table summarizing a few of the articles above for an easy overview.

**Table 3.1 - Summarized select previous research**

<b>Author</b>	<b>Year</b>	<b>Subject</b>	<b>Findings</b>
Trueman & Titman	1988	Income Smoothing	Managers smooth income
Dechow	1996	EM motives	EM to achieve ext. financing at low cost
Bitner & Dolan	1996	Income Smoothing	Smooth income leads to higher firm value
Degeorge et al.	1999	EM	Income is smoothed
Healy & Wahlen	1999	EM Review	EM exists, with many different incentives
Gavious et al.	2002	EM	Firms manage earnings
Bartov et al.	2002	EM	Investors discount for firms beating forecasts
Lev	2003	Accruals & EM	Stricter regulation will not reduce EM
Bao & Bao	2004	Earnings quality	Argue that quality > smoothness in relation to value
Athanasakou et al.	2009	EM	Firms use classification shifting to reach earnings forecasts
Mizik	2010	Myopic management	Smoothing will increase stock price short-term, but is detrimental long-term
Gaio & Raposo	2011	Earnings quality	High quality leads to high firm value
Wang	2013	Income Smoothing	Investors discount for smooth earnings
Ahmed et al.	2013	Income Smoothing	IFRS-adoption increased smoothing
Doukakis	2014	EM	IFRS-adoption had no effect on EM
Hui et al.	2014	EM	Argue that investors cannot easily detect smoothing
Filip & Raffournier	2014	Income Smoothing	Smoothing was reduced during financial crisis

## 4. THEORETICAL FRAME OF REFERENCE

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*With previous research in mind and a decent grasp of the concept of earnings management, we create a theoretical basis for our study. In order to investigate if a relationship exists between EM and firm value, we link the concept to the efficient market hypothesis, information asymmetry, agency theory, and signaling theory. The chapter concludes with the formulation of the thesis' two main hypotheses.*

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### 4.1 EFFICIENT-MARKET HYPOTHESIS

Eugene Fama is by many considered the father of the modern efficient market hypothesis (EMH). He argues that a capital market is efficient based on three criteria. One, there are no transaction costs. Two, all information is costlessly available to market participants. Three, there is a general agreement on the implications said information has on future security prices. When these criteria are met, the price of a security will fully reflect the available information. In the real world, all these three criteria will never be fulfilled. However, all three criteria must not be fulfilled in order for the market to be classified as efficient. They must only be “sufficiently” fulfilled in order for the market to be efficient (Fama, 1970, p. 387-388).

Fama categorizes the efficiency of a market into three categories. Those are strong, semi-strong and weak. In a market where the efficiency is weak, an investor cannot gain any advantage by analyzing historical data since it is available to everyone. In semi-strong market efficiency, the speed at which the stock prices adjust to publicly available information is the main concern. Finally, if market efficiency is strong, the main concern is to test whether or not investors or groups of investors have exclusive access to information that is relevant to changes in stock price (Fama, 1970, p. 388).

What the efficient market hypothesis effectively means is that the competition among actors on the market eliminates all opportunities that might exist where positive NPV transactions are possible (Berk & DeMarzo, 2011, p. 276).

According to Berk and DeMarzo (2011), the accuracy of the efficient market hypothesis will depend on how many investors have access to information that will affect firm value. They make the distinguishment of information into two categories. The first is public information that is easily accessible and the second is private information that might be more difficult to interpret. Naturally, the second category of information creates problems in regards to confirming the efficient market hypothesis in its strong form. However, as investors use this information in order to trade, prices will move and thus start to reflect the private information as well. Furthermore, if the benefit from having private information is large, more individuals will attempt to gain it and thus in the long run the efficient market hypothesis will still stand (Berk & DeMarzo, 2011, p. 276-277).

In regard to the study at hand, if the strong form of the efficient market hypothesis is true, one has to conclude that earnings management will not affect firm value at all because investors will instantly see through it. We do not believe this will be the case and thus our expectation is that one of the weaker forms of the efficient market hypothesis will be true.

## 4.2 INFORMATION ASYMMETRY

Information asymmetry describes scenarios where one party has better or more information in a transaction. This can be harmful because one party can take advantage of the other.

George Akerlof (1970) pioneered the concept, while other researchers have built upon it (Auronen, 2003, p. 6-7). Akerlof used cars in his classic example of displaying information asymmetry and argues that there are both bad and good cars for sale, the price of them are the same since potential buyers do not know which cars are good and which are bad. This means that information asymmetry between the car owner and potential buyers exists (Auronen, 2003, p. 8).

In our study, information asymmetry will exist where certain actors on the market have access to information others do not, which means that this “hidden” information will not be able to be a determinant when assessing the firm value. Insider investors are also very much likely to possess information which outside investors do not, leading to information asymmetry. The actors who possess all information can be considered to have knowledge about the quality of the product according to Akerlof’s model.

A recent Chinese study shows that high value firms are considerably more inclined to provide a higher degree of voluntary disclosures in order to reduce information asymmetry and thus reduce financing costs (Chen et al., 2014, p. 1). This leads us to conclude that firms that believe reporting more will result in positive consequences for themselves will do so and vice versa.

Studies on information asymmetry have shown different results where some researchers argue that if information matters to the market it should also matter for the firm. However, others argue that the theory of information asymmetry can be disregarded when investors hold well-diversified stock portfolios (El Ghouli et al., 2013, p. 170-171). El Ghouli et al. (2013) studied information asymmetry in relation to geographic location and found that firms with a closer proximity to financial centers enjoy a better cost of capital, suggesting that investors do discount for information asymmetry (El Ghouli et al., 2013, p. 170-171).

From the studies mentioned above, we further believe that information asymmetry can be directly linked to the efficient market hypothesis and will have a large impact in whether or not the strong criteria of efficient markets should be accepted or rejected. As mentioned above, if the strong form of the efficient market hypothesis is to be accepted, information asymmetry should not exist. As long as information asymmetry exists, there will be an imbalance in the market where some investors will be able to make use of an information advantage. This is relevant to earnings management since earnings management is something that might affect the value of the firm and whether investors know about the occurrence of it or not can thus be imperative to firm value.

Another thing that can be considered crucial for information asymmetry is how technology and modern advertising affect it. Internet advertising had been increasing at a very rapid pace to the point where revenues from it surpassed printed advertising in 2010 and there seems to be an existence of information asymmetry when firms consider which advertising services to use for their online marketing (Liu & Viswanathan, 2014, p. 1). The key point is that due to the vast information available with new technology,

there is also more information available to analyze, meaning that information asymmetry can occur due to an abundance of information rather than a lack thereof. Startup firms will generally be subject to increased information asymmetry since there is less information available on them (Liu & Viswanathan, 2014, p. 2).

The theory of asymmetric information tells us that it might not be possible to recognize good quality from bad. Such an implication reflects the relevancy of a study of this kind, where the contribution could help investors identify key traits of firms on the Swedish stock market.

#### 4.3 AGENCY THEORY

Agency theory refers to the common agency relationship, in which one party (the principal) delegates work to another (the agent). The theory aims to resolve two problems that can occur in agency relationships. The first is the *agency problem* that arises when (i) the desires or goals of the principal and agent conflict and (ii) the principal is unable, or cannot afford, to verify what the agent is actually doing. The issue at hand is that the principal cannot make sure that the agent is acting according to the principal's plan. The second is the *problem of risk sharing* that arises when the principal and agent have different attitudes toward risk. The issue here is that the principal and the agent may prefer different courses of action because of their differing preferences of risk (Eisenhardt, 1989, p. 58).

The agent, i.e. the manager, may have incentives to commit to decisions or actions that go against the good of the firm (Burton et al., 2011, p. 192-195). A typical case is where the manager might receive increased personal compensation from using earnings manipulation even though it may not be beneficial to the firm itself. Burton et al. (2011, p. 195) identify four incentive systems: profit sharing, bonus based, skill pay and personal pay. They argue that if the incentive system does not fit with the organizational design components, they can lead to undesired results and thus cause agency conflicts (Burton et al., 2011, p. 202-205).

Linking to other mentioned theories, agency theory is relevant when put in connection with signaling theory. For instance, a manager might achieve personal gain from sending a certain signal to investors, even though it might not be for the best of the company. A manager might also have personal gains to make from withholding certain information resulting in harmful effects for the firm. It is further relevant in context with information asymmetry since the managers themselves can contribute to the existence of asymmetric information by withholding said information from other stakeholders.

#### 4.4 SIGNALING THEORY

Signaling theory is closely related to information asymmetry and it can serve as a mean to reduce the information asymmetry between two different parties (Connelly et al., 2011, p. 40). The concept was first introduced by Spence (1973), where he used the labor market as grounds for research. Since employers lacked information regarding employees, employees would acquire education to signal their own quality (Connelly et al., 2011, p. 42-43). When it comes to firms, research has shown that high quality firms are eager to signal their quality to outsiders while low quality firms will not do so since it will result in a decreased payoff for these firms (Connelly et al., 2011, p. 43). A main

question that arises is what signals firm quality? According to Ross (1973), quality of firms can be measured by their ability to generate positive future cash flows which means that these firms have the ability to make interest and dividend payments over the long term (Connelly et al., 2011, p. 42-43). In their review, Connelly et al. (2011, p. 43) define firm quality a bit more vague as the “underlying, unobservable ability of the signaler to fulfill the needs or demands of an outsider observing the signal”.

Signaling theory has its ground in that all parties do not have equal information, i.e. the information is asymmetric. Managers and other insiders are likely to have superior information compared to outside investors (Berk & DeMarzo, 2011, p. 533). A firm may thus have the need to convey information about itself to outside investors. After all, the firm wants the investors to believe that investing in them will be a profitable venture and therefore needs to provide incentives for doing so. The company may reveal information regarding new contracts or similar affairs that will cause their revenues to increase. Investors will generally consider such statements as credible, due to the legal penalties of attempting to deceive being incredibly high (Berk & DeMarzo, 2011, p. 534).

Signaling theory can be distinguished into four different connecting concepts: signaler, signal, receiver and feedback (Connelly et al., 2011, p. 44).

*Signaler* is the person who sends out the signal. The signaler is always a person who possesses first hand insider knowledge and can thus be concluded to be an insider, i.e. an executive or manager within a firm. The insider obtains information that could be of use to an outsider, i.e. a stakeholder, regardless of whether the information is negative or positive (Connelly et al., 2011, p. 44)

*Signal* is the message sent to the outside by insiders within an organization. It can be both positive and negative messages but signaling theory in large focuses on the positive messages sent out since the negative ones are often unintentional (Connelly et al., 2011, p. 45). There have been two identified criteria for efficient signals: signal observability and signal cost. Observability is related to how well outsiders are able to notice the signal, i.e. if outsiders do not notice the signal, the signal will not communicate the intended message to the outsiders. Signal cost refers to the cost of obtaining a signal, which receivers will respond well to. For instance, receiving an ISO9000 classification has a high signal cost. The signal costs obviously differ between high quality and low quality organizations since the low quality organization would have to commit to considerably more change in order to be eligible for a classification (Connelly et al., 2011, p. 45)

*Receiver* is naturally the one who receives and interprets the signal. These are outsiders lacking information regarding the entity. In order for the concept of signaling to actually occur, the signaler should benefit from actions taken by the receiver as a consequence of receiving the information. The receivers in our study would be shareholders and debtholders. Shareholders for instance, will profit from purchasing shares of companies who send signals of a profitable future (Connelly et al., 2011, p. 45)

*Feedback* is important to the theory of signaling since it has been found that it is of great importance for signalers to receive information on how receivers respond to their signals. The process of receivers sending back information regarding the effectiveness

of signals is called *countersignaling*. A main assumption that is crucial for feedback to occur at all is that the information asymmetry works both ways. In the same way that receivers want information regarding the entity, signalers want information regarding the receivers and their response on the signals that are being sent. This means that it is of further importance for signalers to receive and interpret the countersignaling in order to maximize the efficiency of their signaling (Connelly et al., 2011, p. 45).

Signaling affects our research in the way that it is a sure determinant of firm value. If investors purchase stock in a firm at a premium, naturally the value of that firm will increase, and vice versa. Thus, signaling is an important aspect to consider since it has been shown that it affects outsider decisions by a large margin. The signals being sent or not being sent at all will affect the information available to investors, thus creating or preventing information asymmetry. As has been shown earlier, when information asymmetry exists, investors will make uninformed decisions that would be different if they were given all the available information.

#### 4.5 EARNINGS MANAGEMENT

One aspect of earnings management is the recently developed theory of myopic management. It is the practice of cutting marketing- and R&D-costs in order to inflate earnings. Myopic management is considered a form of income smoothing. Generally, marketing is the first thing that is cut when a firm faces times of worse economic strain (Mizik, 2010, p. 595). Previous research indicated that management would consider using earnings-increasing methods to reach their quarterly goals, harming future cash flows in the process (Mizik, 2010, p. 596). R&D spending is also something that has been found to be cut, especially before a top executive is about to retire (Mizik, 2010, p. 597). Myopic management can help increase stock price in the short term, but eventually it will be detrimental for a firm over a longer period (Bhojraj et al., 2009, p. 2385). Managers have an incentive to ignore positive NPV projects in favor of beating analyst forecasts in the short term, and such behaviour will end up as value destroying for the firm, lowering its value (Bhojraj et al., 2009, p. 2361).

Indeed, all research seems to indicate the same thing. During a short-term period, firms using myopic management cannot be correctly priced by the market. This, in turn, gives incentives for managers to commit to strategies that work to enhance current term earnings at the expense of the long-term (Mizik & Jacobson, 2007).

How do we define conservative vs. aggressive R&D expensing? A study made by Baruch et al. (2004) found that early life cycle companies tend to report R&D more conservatively while mature companies tend to report it aggressively. When a company reports aggressively, they will tend to overstate beneficial numbers such as earnings and understate expenditures. The opposite is thus true for companies with conservative reporting standards where they will understate earnings and overstate expenditures. A key framework in accounting is neutrality. The information presented should basically be free from bias. Conservatism is a fairly common bias leading to understatement of assets and profits as mentioned earlier. Conservatism can lead to a misleading picture in the same way as aggressive accounting will, since investors might not make the decision to invest in the company if figures are understated, making the firm look less profitable (Alexander & Nobes, 2010, p. 42). This obviously leads to a problem when analyzing results as it can be difficult to know whether companies are using aggressive

reporting or conservative. Most companies will most likely mention in their annual reports that they are indeed reporting conservatively, even though that might not be the actual case.

Trueman and Titman (1988) finds evidence in line with similar research showing that managers are susceptible to income smoothing if it will affect their results. Unlike some other studies, they found that income smoothing may actually have long term positive effects for a firm (Trueman & Titman, 1988).

A study by Francis et al. (2013) finds a strong relation between conservative accounting and firm stock performance. The results indicate that this relation is especially strong for firms with low corporate governance and high information asymmetry. They thus conclude that conservative accounting can be a very effective tool for reducing agency problems and information asymmetry, in turn benefiting shareholders. A debate has been ongoing between fair value and conservatism in the accounting research. Standard setters have started to eliminate conservatism in favor for fair value accounting. According to Francis et al. (2013, p. 343), this is something they should be cautious of doing and fully understand the trade off between conservative accounting and fair value accounting before doing so.

In terms of earnings management and the recent financial crisis, some results from studies indicate that there would be a decrease in earnings management in many European firms following the recent financial crisis. Accrual accounting earnings management seemed to decrease more following the burst of the financial crisis in 2008 (Cimini, 2015, p. 312-314). The possible reasons mentioned for this decrease in earnings management was an increase in conservatism as well as more careful monitoring by auditors. Together, these two contributed to an increase in the quality of financial reporting which is something that reduced earnings management (Cimini, 2015, p. 315).

#### 4.6 MAIN HYPOTHESES

With previous research and theory in mind, we are able to formulate hypotheses that will be tested using a model presented below. Due to the fact that earnings management has grown to become such a widespread and hotly debated topic, there is little reason to believe that investors are completely oblivious to it. There is a clear theoretical basis for the relationship between the equity market's valuation and income smoothing, which already in the mid-90's yielded two particular hypotheses developed by Bitner & Dolan (1996). These two will be adopted as the core hypotheses to be tested in this study on the Swedish market.

*Hypothesis 1a: The Swedish market pays a premium for smooth streams of income.*

and,

*Hypothesis 1b: The market can distinguish between income streams that are naturally smooth versus those that are managed.*

## 5. PRACTICAL APPROACH

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*In Chapter 5, we describe the data used in the study, and the process of gathering it. Different research methodologies and collection methods used in earnings management research are evaluated and discussed, in order to reach the most fitting practical approach for our research question. We then describe the chosen model in detail, with every variable and their Datastream equivalence explained. The chapter concludes with a description of multiple regression analysis and the statistical tests that we use to scrutinize the results.*

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### 5.1 DATA AND POPULATION

The population in question is, as mentioned, firms listed on the Swedish stock exchange, namely Nasdaq OMX Stockholm. According to Saunders et al. (2012, p. 282), there is no need to use a sample when data from the entire population can be gathered. Since the objectives of the study are publicly listed firms, they are legally bound to report the financial numbers that we need in this study. Another term for an entire population is census (Bryman, 2012, p. 187), however, the next section explaining the delimitations of the study make the study's objectives unable to be treated as census data. There have been several hundred firms listed on the stock exchange the past couple of decades, ruling out a manual examination of them all due to time restraints. We will therefore resort to a database for data collection. This does, in a way, make the selection a type of convenience sample, because it requires all of the data to be available on the same database. Any listed firm that is missing from the database will be excluded from the study.

The database in question is Thomson Reuters Datastream, hereafter Datastream. The data will be treated as secondary data, because it has already been gathered for other purposes (Saunders et al., 2012, p. 304). We plan on examining data spanning from 1991-2013, to capture the nine reported years Sweden's had so far with the IFRS, as well as ten years prior to the implementation, for comparison. Data is gathered starting from 1991, in order to calculate necessary trends required in the chosen model. The data will be numeric (quantitative) in the form of accruals and financial ratios and measures.

#### 5.1.1 DATASTREAM

Datastream is a rather powerful tool allowing users to gather and analyze complex data (Thomson Reuters, 2015). It will allow us to easily integrate gathered data into Microsoft Excel, making it an optimal tool available at our disposal. Saunders et al. (2012, p. 306) also mention Datastream as a selected online database in their textbook for business research methods, adding to its credibility as a source. The use of secondary data lets a researcher use more of their time analyzing and interpreting. Reanalyzing already existing data can also lead to new discoveries (Saunders et al., 2012, p. 318). Furthermore, using secondary data allows easier replication of a study and makes it more open to public scrutiny (Saunders et al., 2012, p. 318-319).

The choice of Datastream as our source comes with disadvantages as well. As will be discussed in section 5.3, a certain model has been chosen to analyze the data. This model has been used to analyze secondary data before, specifically from Compustat. We

could not find our chosen model applied to data from Datastream. Therefore, since the classification of certain accounts and accruals vary between databases, it may create difficulties in the translation of some measures. Such translation difficulties may result in potential deviations in the adoption of the model. However, the measures used in the model are very general and should not be significantly impacted by such differences.

#### 5.1.2 DELIMITATIONS

The initial selection from Datastream was a list of all the firms that have been listed on the Stockholm stock exchange since its birth, and subsequently available on the database. They were chosen using the following criteria:

*Market:* Sweden

*Primary Quote:* Yes

*Major Security:* Yes

*Status:* Active and Dead

*Instrument Type:* Equity

*Exchange:* Stockholm

The primary quote works to exclude cross-listings by requiring that the stock is listed on its primary market. The major security criteria limits the search to one stock per firm, their most liquid one. This eliminates duplicates in the selection, and eases the filtering process.

The status criteria was chosen to account for both active and dead listings, which means that all firms that have disappeared from the market, for any reason, will still appear in the selection. There are several hundred firms that have been dropped from Nasdaq OMX Stockholm the past couple of decades, but they are still subjects of the study if they were available after 1995. Accounting for survivorship bias might be very important, because firms that are no longer on the market could potentially have disappeared due to investors' perception of earnings manipulation.

The initial selection with the above criteria generated a list of 1241 firms. Aside from firms missing from Datastream; we exclude financial institutions because investors in such firms have access to extensive disclosures that are closely related to key accruals that may help the investors detect earnings management and subsequently affect the stock price. Healy and Wahlen (1999, p. 17) reviewed studies that indicated a pattern of earnings management detection, particularly in the banking and property-casualty industries. They argued that these findings, that conflicted the majority of research that said investors were unable to detect earnings management, were due to the investors' access to extensive disclosures that were available from banks and insurance companies as a result of regulation. For this reason, we deem financial institutions incomparable to the rest of the industries on the stock exchange, and unfit for a credible examination of earnings management practices. Richardson et al. (2005, p. 451) also disregard financial companies because the separation between operating and financing activities is unclear in such firms.

More specifically; the industry groups that were excluded from the selection after the financials sector was removed included asset managers, banks, insurance brokers, investment services, life insurance, private equity, specialty finance, and split capital

investment trusts. Three firms in the financial administrations industry group remained in the final selection because they were classified under the industrial sector. The exclusion of the financial sector lowered the selection to 1067 firms.

Thereafter, the selection was subject to a few more steps of manual filtering. First, firms whose last recorded date was not available had to be removed because necessary data was no longer accessible. Second, firms that left the stock market prior to 1991 were excluded. Third, firms with a market base date later than 2009 were removed because five years of data is needed to calculate the trends mentioned above and discussed below. Following the same reasoning, every firm that had less than five years between its base date and its last recorded date was removed. The final selection comprised of 480 firms listed on Nasdaq OMX Stockholm between 1991 and 2013.

Out of these 480 firms, only the ones with research and development expenditures could be used in the multiple regression analyses, because R&D is an important variable in the model and to the study. The ability to generalize the study will therefore be limited to Swedish listed firms with R&D as part of their corporate strategy.

### 5.1.3 SURVIVORSHIP BIAS

Survivorship bias refers to the bias that may occur when investigating the same set of companies or individuals over a certain period of time. When investigating these, one only accounts for the firms or individuals who have actually existed for the entire period and not those who might have been eliminated from the sample due to bad performance. This means that one has to include both the individuals or firms that currently exists, as well as those that existed in the past, in order to get a bias free sample (Nasdaq, 2015).

We dealt with this bias as explained above. Both firms that are alive and dead, in the sense that they may have existed after 1991, but disappeared from the market before 2013, are included in the observations in order to account for survivorship bias.

## 5.2 RESEARCHING EARNINGS MANAGEMENT

*In the following sections, we evaluate different research methods that are applicable to a study of earnings management. The discussion culminates in the choice of model and a thorough explanation of how it will be used.*

### 5.2.1 EVENT STUDY

An event study is a statistical tool that was developed initially for empirical research in finance and accounting (Corrado, 2011, p. 207). Kothari and Warner (2004, p. 5) describe event studies as the examination of the behaviour of firms' stock prices around corporate events. An event study's basic structure comes from Fama et al. in 1969, where abnormal returns were measured by deviations from market model predictions (Corrado, 2011, p. 225). This study will look at earnings management's effect on firm valuation, i.e., how stock prices move in accordance to manipulation of earnings. In essence, that is one of the main areas the event study method was designed for. The study aims to shed light on if investors in the Swedish stock market are able to detect earnings management and in what capacity, by looking at historical stock prices. Kothari and Warner (2004, p. 5) also mention that event studies are used to examine the

effect of regulation, which is one of the objectives of the study: to assess the impact of the IFRS-implementation.

Additionally, MacKinlay (1997, p. 16) claims that event studies are an ideal tool for investigating the information content of disclosures. He adds that event studies are the most prevalent when doing empirical research in the corporate finance field, e.g. firm valuation (MacKinlay, 1997, p. 36).

However, if we were to use an event study as our research method, a number of difficulties would present themselves. First, we would have to decide specific events to study. One such event could be earnings announcements. Quarterly, yearly, or even unplanned ones. There are many to choose from, and including all of them would not be possible in the time frame for this study.

Identifying the announcements to research would be one task and finding them would be another. We would need two decades worth of earnings announcements for hundreds of firms. Then, an observation window would have to be decided for each earnings announcement. In order to account for pre-announcement anticipation, an adequate window of at least half a month would be necessary. The rest of the observation window would be the announcement day and enough time after that day to include the post-earnings announcement drift. That means each earnings announcement would have to be studied for at least six weeks. The amount of data would be overwhelming for the scope of this study. In conclusion, we have chosen against the event study method, but do recommend it for future research in this area.

#### 5.2.2 LINGUISTICS-BASED MODELS

The ways of detecting earnings management have become increasingly creative over recent years. One such method uses linguistic-based classification models that are designed to detect deceptive discussions in conference calls related to earnings. Findings suggest that such models based on CEO and CFO narratives are even equivalent to models based on accounting variables. Allegedly, the language of the executives can display excessive reference to general knowledge, less non-extreme positive emotions, and fewer references to shareholder value (Larcker & Zakolyukina, 2012, p. 495).

Another study examines if vocal markers of cognitive dissonance can be used to detect financial misreporting. Their method also uses conference calls with CEOs about earnings. They apply automated vocal emotion analysis software to CEOs' speech, and find a positive link between the vocal dissonance markers and the likelihood of irregularity in the financial restatements (Hobson et al., 2012, p. 349).

For fairly obvious reasons, we cannot use the latter method. It requires specific software and is most likely inaccessible to us as students. Both these methods also require access to conference calls, which in fairness is available to some extent. However, the amount of time that would have to be spent finding and analyzing these conference calls would be too overwhelming for a degree project of two students. They are also difficult to use in relation to firm value, since all they do is look for financial misreporting. The methods are without a doubt interesting developments in the field of earnings management, but unfit for our study.

### 5.3 THE MODEL

Michelson et al. (2011) investigated the effectiveness of seven different income smoothing detection methods in order to determine which of them provided the best identification. While their findings were slightly indecisive, their message was more important. Instead of giving us the one true model for income smoothing detection, they highlighted the importance of appropriate methodology in earnings management research. Different methods are not equally suited to determine all forms of smoothing. Instead, one must choose the type of methodology that addresses the specific aspect of the research in question. In this case, that would be Bitner and Dolan's (1996) model for investigating the relationship between income smoothing and firm value, which is one of the seven methods that were tested. The other six methods were not designed to measure earnings management in relation to firm value. We therefore decided against these six methods, in line with Michelson et al.'s conclusion about appropriate methodology.

In order for a smoothing model to be successful, it must distinguish between the deliberate actions of management to manipulate earnings and the actions of management in response to changing economic conditions. Unfortunately, many smoothing models have concentrated on identifying attempts to smooth within a sample of companies and not on identifying individual companies that smooth (Michelson et al., 2011). However, since we are interested in the whole Swedish market, we will attempt to identify smoothing within a sample of companies and not individual firms. Such research will be left for the future.

Bitner and Dolan (1996) investigated the relationship between income smoothing and firm value. They used Tobin's q-ratio, i.e. a firm's market value divided by the replacement cost of its physical assets, to measure stock valuation. The q-ratio tells us whether a firm generates economic rents or if it is cheaper to replace the firm's assets from the financial markets. They then compare that q-value, using regression, to a firm's smoothness of reported income, growth, profitability, eventual accounting changes, discretionary timing of expenses i.e. R&D, leverage, asset size, and industry (Bitner & Dolan, 1996, p. 21-25). This is the one method we have found that measures precisely what we intend to measure on the Swedish market and is therefore our chosen model. In the following paragraphs, we will present and describe each variable used in the model. We include the Datastream information necessary to calculate the variables in Appendix A.

#### **Tobin's Q**

Q is the dependent variable in the model, and it is a measure of a firm's stock valuation that puts its market value in relation to the book value of its assets. A q-ratio below 1 indicates that the stock is undervalued, because its stock is worth less than the assets of the firm. A q-ratio above 1 indicates that the stock is overvalued, or that it generates economic rents (Lindenberg & Ross, 1981, p. 2-3). Economic rents can be considered as excess returns (Tollison, 1982, p. 575).

In this paper, the calculation for Tobin's q is dependent on the availability and reliability of the datatypes in Datastream. The q-ratio is not available by itself, it has to be manually expressed. Therefore, we use highly ranked datatypes in a recommended Tobin's q-formula in the construction of our dependent variable (Vermunt, 2013). The following is the chosen expression in Datastream:

$DPL\#((X(WC08001) + X(WC03351)) / (X(WC03501) + X(WC03351)),6)$

where,  
DPL indicates that it is a user-defined expression,  
WC08001 is Market Capitalization,  
WC03351 is Total Liabilities,  
WC03501 is Common Equity (Book Value) and,  
6 is the number of decimal points requested.

A more perspicuous description of the formula shows that,

Tobin's q = (Market Capitalization + Total Liabilities) / (Common Equity + Total Liabilities)

The individual datatypes were also gathered and used to calculate random q-ratios in order to double-check that the expression worked.

### **SMOOTH**

The measure of income smoothing uses the reciprocal of the sum of the squared residuals (SSQR) from a standardized five-year income trend. The income trend is estimated using annual net income values. The smallest values of SSQR, and consequentially the largest reciprocals, represent the firms that are exhibiting higher levels of income smoothing.

Net income is readily available from Datastream. The values are then standardized to a mean of 0 and a standard deviation of 1. In order to adopt the five-year income trend that Bitner and Dolan used in the birth of the model, we have decided to use the same five-year trend, overlapping every year from 1995 to 2013. This is why data from 1991 was used, because of the first five-year trend ending in 1995. Ultimately, our model differs from Bitner and Dolan's not only in the choice of database and variable calculation, but in that we use 19 five-year trends and averages, instead of their single five-year period.

To find the reciprocal of the SSQR, we use Excel's functions for INDEX and LINDEX. The LINDEX function is a statistical one that calculates a straight line using the least squares method. The function returns an array of values, which is why the addition of the INDEX function is a necessity. For the smooth variable, we are only interested in one of the values from the array. INDEX lets the user choose a specific value, in this case from the array. Among the values from the LINDEX function, we find the sum of the squared residuals. To calculate the reciprocal of the sum of the squared residuals, we simply take the inverse of the value. In Excel, the complete formula is:

$=1/INDEX(LINDEX(X1:X5;Y1:Y5;1;1);5;2)$

where,  
1 is used to find the reciprocal,  
X1:X5 are standardized annual net income values,  
Y1:Y5 are standardized years,  
1 & 1 are logical values and,

5 & 2 are row- and column numbers in the array, respectively.

As the theoretical frame of reference has established, the expectation is that the market will favor smoothness in the income streams, which brings us to the next hypothesis:

*Hypothesis 2a:  $\Delta Q / \Delta \text{SMOOTH} > 0$*

The sign delta ( $\Delta$ ) indicates that we are investigating changes in the variables over time. Hypothesis 2a treats the change in the variable Q from year to year in relation to the change in the variable SMOOTH. If the relation is positive ( $> 0$ ) and statistically significant, then we accept the hypothesis.

## **GROWTH**

The variable for growth is defined as a firm's annual income trend. It is the ordinary least squares (OLS) coefficient of standardized income regressed against time. The growth variable can be derived from the same standardized income trend that was calculated for the smooth variable; it is found in the same array of returns from the LINEST function. As we mentioned above, the Y-range in the LINEST function is a range of five years that are standardized. This is important in order to acquire the correct coefficient from the calculation. The complete formula is:

=INDEX(LINEST(X1:X5,\$Y1:\$Y5;1;1);1;1)

This is essentially the same as the function above, with different row- and column numbers and without the inverse at the beginning.

A firm with high growth will have high expected cash flows and, in turn, a higher Q. Therefore, the growth variable is a positive coefficient and the next hypothesis posits:

*Hypothesis 2b:  $\Delta Q / \Delta \text{GROWTH} > 0$*

## **MARGIN**

This variable measures a firm's profitability. It is included to control for differences in the value of Q that come from market power and economic efficiency. Since Q measures economic rents; the ability to raise prices above marginal costs must be accounted for in the model. The variable's definition in the original model was:

Gross Profit Margin = (Total Revenue - Cost of Goods Sold) / Total Revenue

Our immediate response was to search Datastream for a gross income datatype. However, that datatype included depreciation and amortization, which was unwanted in the variable. Instead, we used datatypes for Net Sales or Revenues and Cost of Goods Sold (excluding depreciation). With this, an expression was used to download the values. The individual datatypes were also gathered to double-check these values.

DPL#(((X(WC01001) - X(WC01051)) / X(WC01001)),5)

Since the margin variable is included to account for market power and economic efficiency, the following hypothesis is formed:

*Hypothesis 2c:  $\Delta Q / \Delta \text{MARGIN} > 0$*

### **ACCOUNTING CHANGE**

If two firms have similar smoothness in their incomes, but a difference in their q values, this variable measures the degree to which an income stream would be less smooth due to the influence of accounting changes. To capture the effect, after-tax income is reconstructed using information from the footnotes of financial statements that are flagged by qualified audit opinions. The reconstructed figures are then used to calculate a second set of sum of the squared residuals. It is then compared to the original one, measuring the difference between the two.

If the effect is to smooth income relative to trend by accounting changes, then the residuals will be greater on the reconstructed income trend line. The variable will be positive where the effect of accounting changes works to smooth reported income, and equal to 0 for firms that have not adjusted their income over the period. The accounting change variable could be considered a variable measuring artificial income smoothing.

In this study, we are not afforded sufficient time to thoroughly examine footnotes in financial statements for all listed Swedish firms during 19 years. For this reason, we will have to disregard this variable in the regression analyses and in the study as a whole.

### **Research & Development (R&D)**

Similar to the variable above, accounting for the discretionary timing of expenses allows the model to distinct between a market's valuation of income that is smooth for natural reasons, and income that is smoothed intentionally by managers. It is therefore a variable for real income smoothing.

Timing outlays for big R&D projects can shift expenses over periods, thus smoothing income. This would result in greater volatility around the long-term R&D trend. It is measured by the sum of the squared residuals from the R&D spending trend. High volatility means the capital market could potentially identify a firm as real smoothers (Bitner & Dolan, 1996, p. 25).

R&D is its own datatype available in Datastream, which we used to calculate the spending trend in the same way as we did for the smooth variable. First, the values and the years are standardized, then the INDEX and LINEST functions are used to find the sum of the squared residuals, from which we then calculate the reciprocal.

The reasoning follows that managed smoothness will be discounted by the market, which is why the R&D coefficient is negative. In order to make the coefficient negative, the observations are multiplied by -1 (Bitner & Dolan, 1996, p. 23). Therefore, the prediction for this variable creates our next hypothesis.

*Hypothesis 2d:  $\Delta Q / \Delta \text{R\&D} < 0$*

### **LEVERAGE**

The last three variables are not measures of income smoothing, but function as control variables in the model. The first one is a measurement of a firm's leverage, which is defined by Bitner & Dolan (1996, p. 23) as its long-term debt-to-assets ratio.

Leverage=Long-Term Debt/Total Assets

In Datastream: DPL#((X(WC03251) / X(WC02999)),4)

A high degree of leverage implies a greater risk, lower free cash flows and a lower Q. The coefficient therefore has a negative sign, and forms the next hypothesis.

*Hypothesis 2e:  $\Delta Q / \Delta \text{LEVERAGE} < 0$*

### **ASSET SIZE**

This variable is included in order to control for possible influences on Q by firm size. It is important because the other variables assume standardized values in the regression analysis, which means the asset size variable is the only control for absolute firm size's influence on Q. It is, however, undefined if the variable is a positive or negative coefficient, as it could be both.

The measurement uses two binary variables, either LARGE ASSETS or SMALL ASSETS. This places a firm in either the top or bottom quintile, ranked by asset size. Every firm listed on Nasdaq OMX Stockholm is categorized into small-, mid-, or large cap. These segments are based on total amount of share value. Large is > €1 billion, Mid is between €1 billion and €150 million, and Small is < €150 million (Nasdaq OMX, 2015). Datastream values are in local currency, which means that Swedish firms are in SEK. We simply multiplied the caps by the current currency, which was approximately 10:1. Now, these variables are not a measurement of market capitalization, but of asset size. However, the cap segments are used as guidance in categorizing the firms. The original model had a large assets cap of \$2.2 billion and a small assets cap of \$150 million. We use the following caps with the appropriate currency below.

For LARGE ASSETS, each firm is given a binary number. Firms with a total asset value of more than 10 billion SEK receive the number 1. Every other firm receives a 0.

For SMALL ASSETS, firms with a total asset value of less than 1.5 billion SEK receive the number 1. Every other firm receives a 0.

### **INDUSTRY**

The last variable uses industry-specific numbers to test if Q varies systematically between industries, all else equal. This coefficient is also neutral. In our sample of 480 firms we find 9 different industries, each given a number between 1-9. INDUSTRY will work as a control variable in the model, and will be incorporated into the regression as a factor (or categorical) variable. This means that the regression results will show the difference between the 9 different industries by categorizing the variable from 1 to 9.

An important note to all explanatory variables is that Bitner & Dolan generally standardize them to a mean of zero and a standard deviation of one, due to the significant differences in the size of the firms used in their sample. Because we, in this study, are examining as many available firms as possible from the Swedish stock exchange, the data will be comprised of firms from small cap-, mid cap-, as well as large-cap listings. They will vary considerably in size, which leads us to adopt this general standardization of the explanatory variables, and will be done through an option in the regression command in the statistical software described below, called beta. The

beta option gives, as an addition to the usual regression results, the standardized coefficients as well.

These variables then together form a function that is used in multiple regression analyses to test the independent variables' explanatory power in relation to the dependent variable, Q. These analyses, and other statistical tests mentioned below, will be done in STATA. The regression model is expressed as equation 1 below:

$$(1) \quad Q_i = f(\text{SMOOTH, GROWTH, MARGIN, R\&D, LEVERAGE, ASSET SIZE, INDUSTRY})_i$$

where,

$Q_i$  = the q-value for an individual firm

The independent variables all have, as explained in the above sections, predicted coefficient signs, which make them eligible for testing with both one- and two-tailed tests.

This regression model will be used in seven instances, with different year-intervals, with the intention of identifying trends and testing the explanatory power of the model through time. For a total examination of 19 years, these are the chosen intervals:

1995 - 2013  
1995 - 2004  
2005 - 2013  
1995 - 1999  
2000 - 2004  
2005 - 2009  
2009 - 2013

The last two intervals overlap in 2009, but do so for comparison reasons by making the last four intervals all five-year periods.

## 5.4 STATA

STATA is statistical software that provides tools for data analysis, data management and graphics. STATA supports a wide array of statistical features and tests that are essential in the analysis of large samples of data (StataCorp, 2015). A study that treats a large amount of data is required to account for statistical implications and tests of significance in order to achieve a high and desired credibility. STATA will allow this by offering an abundance of post-regression analyses and postestimation tools to complement the underlying regression results, and in turn, add to both the reliability and validity of our study. In the next section, we will describe the additions that have been chosen to elaborate on the results.

## 5.5 STATISTICAL TESTS

The first thing we did in STATA after the appropriate data had been imported was to filter away outliers. After the data had been processed in Excel and subsequently transferred to STATA for analysis, it still contained a few unrealistically extreme

values. In order to modify said outliers, we used a command called winsorize. It is a popular user-defined command for STATA. Winsorizing means that the outliers are fitted into a predefined percentile (Cox, n.d.). We use a percentile of 99% in this study, which means that the outliers are replaced by the chosen percentile. Every observation below the 1st percentile and above the 99th percentile was modified. This procedure was done on all the continuous independent variables, i.e. SMOOTH, GROWTH, MARGIN, R&D, and LEVERAGE.

#### 5.5.1 MULTIPLE REGRESSION ANALYSIS

A multiple, also known as a multivariate, regression analysis, uses more than one independent variable. The aim is to isolate the impact on the dependent variable of a change in one variable from the impact on the dependent variable of changes in the other independent variables. This is done by accounting for the movements in all the independent variables while estimating the coefficient of just one. It is a very advantageous way of analysis because regressions allow the measurement of the impact of one variable on the dependent variable, while holding the other variables' influence in the equation constant (Studenmund, 2013, p. 13).

By utilizing regression analysis with multiple independent variables, we can look at how different ratios and practices ultimately affect the market's valuation of firms. The model can easily be expanded to incorporate additional variables if one were inclined to replicate the examination with different goals in mind. We use an equation similar to the original one, because it was developed to examine what we are interested in learning. We apply it to the Swedish market, because it is an unexplored market in the area of earnings manipulation in relation to market valuation.

After the multiple regression analyses that are performed for the different periods, a number of post-regression tests are done on the results.

#### 5.5.2 HETEROSKEDASTICITY

We begin by testing for the variance of the error term, which is synonymous with testing for heteroskedasticity. The term heteroskedasticity refers to the increase in the variance of the error term as the variable itself increases. The observations of the variable are then, on average, farther away from the regression line for large values of the variable than they are from small values. It is claimed to be likely violated in data sets that are cross-sectional, which our panel data partly is (Studenmund, 2013, p. 103). We therefore test for heteroskedasticity using the Breusch-Pagan / Cook-Weisberg test, with the null hypothesis that the variance is constant.

The Breusch-Pagan test has been criticized for being sensitive to the assumption of normality (Greene, 2011, p. 316). Since our data has been winsorized, it can be argued that it is closer to a normal distribution, which makes it more prone to heteroskedasticity using this test. If this happens to be the case, we will use a robust estimator as suggested in Greene (2011, p. 316) to compute the test.

#### 5.5.3 ADJUSTED $R^2$

Adjusted  $R^2$  is not a separate test itself, but a measurement we would like to address. It is an extension of the original  $R^2$ , in that it accounts for the amount of independent

variables that are included in the regression, something the original measurement does not. Adjusted  $R^2$  can be described as the explanatory power of the model. It measures the percentage of the variation of the dependent variable, in this case  $Q$ , around its mean that can be explained by the regression equation, and adjusted for degrees of freedom (Studenmund, 2013, p. 55-56). The Adjusted  $R^2$  measurement is given in the regression results, which is why we do not refer to it as a separate test. We will use Adjusted  $R^2$  to describe how well the model works in explaining changes in  $Q$  and how it has potentially changed through time.

#### 5.5.4 MULTICOLLINEARITY

Collinearity refers to a linear correlation between the independent variables in a model, where multi is added to the term if there are more than two variables involved. Since regression analysis aims to isolate the independent variables from one another, the absence of correlation between these variables is vital. If some independent variables suffer from multicollinearity, the movements of one variable will be difficult to distinguish from the others (Studenmund, 2013, p. 261-262). Therefore, we perform post-regression tests that control for multicollinearity within the model. There are no true statistical tests for multicollinearity that are generally accepted (Studenmund, 2013, p. 272). We have chosen the following tests for our study.

Pearson's correlation is the first test, which is one of the most widely used tests for correlation that describes how well the chosen variables are related to each other. We will test to see how the movements of the variables in the income smoothing model tend to affect the other variables. A correlation can be a negative, neutral, or positive relationship, ranging from -1 to 1. The discussion on what level of correlation that should raise red flags has reached no conclusion, but many researchers pick an arbitrary number around -0.8 or 0.8. Correlations close or beyond those numbers are causes for concern regarding the relationship between the variables (Studenmund, 2013, p. 272). The use of correlation tests is, however, limited when more than two independent variables are treated. Groups of independent variables may together cause multicollinearity without there being any single correlation between coefficients that is high enough to cause concern (Studenmund, 2013, p. 272). We have for that reason chosen to expand the multicollinearity testing to include tests for variance inflation factors (VIF).

VIF-tests are methods of detecting multicollinearity by examining to what extent one independent variable can be explained by all the other independent variables in the model. Every independent variable has a variance inflation factor, which is an index that measures the increase in the variance of an estimated coefficient by multicollinearity. A high VIF-value indicates that multicollinearity has increased the variance a lot, which is unwanted. A general rule of thumb for a critical VIF-value is above 5 for an independent variable, and should slightly increase as the number of variables increases (Studenmund, 2013, p. 273; STATA, 2013, p. 23). We will measure the VIF using a mean for all the independent variables' individual values in all the examined periods. As well as a standard centered VIF-test for the collinearity of the independent variables in the model, we will apply an uncentered VIF-test that plots the variables against the constant term created in the regressions.

## 5.6 FULL LIST OF HYPOTHESES

*Hypothesis 1a:*                    *The Swedish market pays a premium for smooth streams of income.*

*Hypothesis 1b:*                    *The market can distinguish between income streams that are naturally smooth versus those that are managed.*

*Hypothesis 2a:*                     $\Delta Q / \Delta \text{SMOOTH} > 0$

*Hypothesis 2b:*                     $\Delta Q / \Delta \text{GROWTH} > 0$

*Hypothesis 2c:*                     $\Delta Q / \Delta \text{MARGIN} > 0$

*Hypothesis 2d:*                     $\Delta Q / \Delta \text{R\&D} < 0$

*Hypothesis 2e:*                     $\Delta Q / \Delta \text{LEVERAGE} < 0$

## 6. EMPIRICAL RESULTS

*The results chapter includes the most relevant results and statistics deemed necessary in order to analyze the regressions performed for the chosen periods. Every continuous variable's results for every examined period is presented along with readable tables that show if a variable affects firm value and by how much, using a comparable standard deviation-measure. The differences between industries and between years are also presented, followed by summary statistics and post-regression tests.*

**Table 6.1 - Descriptive statistics for the period 1995-2013**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>Q</b>	4621	2.521	22.279	-12.286	1500.25
<b>SMOOTH</b>	3566	1.225	2.562	.250	18.732
<b>GROWTH</b>	3566	.147	.642	-.967	.992
<b>MARGIN</b>	5134	-1.218	8.538	-71.899	.933
<b>R&amp;D</b>	883	-2.254	4.459	-28.887	-.250
<b>LEVERAGE</b>	5711	.124	.133	0	.539

Table 6.1 shows descriptive statistics for every variable calculated from the available data, except asset size, industry and year, and after having been winsorized. The number of observations available for the variables varies significantly, but the most noteworthy one is Research & Development (R&D). With only 883 firm-year observations, compared to the second lowest number of observations, SMOOTH and GROWTH at 3,566, the regressions using the complete model had to be reduced. The total number of observations that could be used with the complete model, i.e. the firm-years that had data available for every single variable, ended up at 876. That is slightly below 10% of all the firm-years that have taken place for the 480 firms on the Nasdaq OMX Stockholm exchange during the period 1995-2013 that were chosen for our study. This fact unfortunately reduces the ability to generalize the study on to the whole market during the examined period.

Nevertheless, R&D is an important variable in the model. It is the one variable that accounts for real smoothing, as opposed to the other continuous variables that account for artificial smoothing. Regressions were also run with the R&D variable dropped, which made the model, as a whole, statistically insignificant and its explanatory power was all lost. The value of Q could not be predicted without the inclusion of R&D, and that is why the total number of observations used had to be reduced to the amount of available R&D data from Datastream. All 876 firm-years used in the analyses have values for every single variable and for every single year. Below is a table of descriptive statistics for the values used in the regression analyses and statistical testing.

**Table 6.2 - Descriptive statistics for variables used in the regressions**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>Q</b>	876	2.170	2.088	.257	27.954
<b>SMOOTH</b>	876	1.273	2.610	.250	18.732
<b>GROWTH</b>	876	.225	.625	-.967	.992
<b>MARGIN</b>	876	.107	3.817	-71.899	.933
<b>R&amp;D</b>	876	-2.442	5.950	-68.766	-.25
<b>LEVERAGE</b>	876	.140	.123	0	.539

Table 6.2 shows descriptive statistics for every variable used in the regressions except asset size, industry and year, and after having been winsorized. The dependent variable in the model had values that were fairly expected. Remember from Chapter 5 that Tobin's q is centered on the number 1. A value below one indicates that a firm is valued less than its assets, while a value above one indicates that a firm generates economic rents, and thus, is worth more than its assets (Lindenberg & Ross, 1981, p. 2-3). The mean value of Q is slightly above 2, which means that investors active on Nasdaq OMX Stockholm value the average firm on that market twice as high as its assets, i.e. that it generates significant economic rents. The lowest valued firm is valued at about a quarter of its assets, while the highest is valued at more than twenty times its own assets. The q-ratio itself is dependent on the type of firm and industry. Technology companies for example, do usually not have a lot of physical assets, but have been valued incredibly high, especially since the technology boom at the end of the 20th century. The variation in the values of Q is therefore not surprising when accounting for the market's historical behaviour.

The SMOOTH variable is the reciprocal of the sum of the squared residuals (SSQR) for a standardized net income trend. Every year's value is the reciprocal of the SSQR for a standardized net income trend for the past five years. This means that the value for 1995 is based on the trend between 1991-1995, and 1996 is based on the trend between 1992-1996 etc. This created 19 different five-year trends for every firm and was done to replicate Bitner & Dolan's original model as closely as possible. The reciprocals that represent the SMOOTH variable are all positive with fairly large differences in the values. It is hardly surprising that some firms smooth more than others. Income for some firms fluctuates vigorously, while it is naturally smooth over long periods for others.

GROWTH is the ordinary least squares coefficient derived from the same income trend as the SMOOTH variable. It can also be described as the slope of the standardized income regressed against time. As one can see from the minimum and maximum values, the slope for the examined firms can be anywhere from -1 to 1. Incidentally, the values for SMOOTH are fairly high for firms with a slope close to the top or bottom percentiles. The mean slope is .22 while the standard deviation is as high as .62.

The MARGIN variable measures firm profitability. It is equivalent to a firm's average annual gross profit margin over a five-year period. In this study we used raw data of the firms' revenue and cost of goods sold that specifically excluded depreciation. The most extreme negative gross profit margin values were identified as originating in 2008, the first full year of the recent financial crisis. They are therefore not inconceivable under

the circumstances. The mean was around 11% and the highest measured value was 93%.

Despite the extraordinary values of the MARGIN variable, it was still not the most varying one. With a standard deviation of 4.46, Research & Development (R&D) fluctuated immensely. The variable was defined as the reciprocal of the SSQR for the R&D spending trend over five-year periods. Remember that the coefficient was multiplied by -1 to make it negative, because the assumption is that the market discounts for managed smoothness. The minimum and maximum values are not too far from the SMOOTH-reciprocals, but R&D varies significantly more. This could be due to a number of reasons, some being separate from smoothing, which will be discussed later.

LEVERAGE measures the average annual long-term debt-to-assets ratio for a five-year period. The values are relatively standard and unsurprising with five-year averages between no leverage and 54% leverage. The mean is 14%, meaning that Swedish listed firms are not keen on assuming a lot of long-term debt risk. This is in line with the hypothesized direction of the LEVERAGE variable, which assumes that Q will vary negatively with leverage, because of the added risk that investors experience from high debt levels.

## 6.1 SMOOTHING MODEL

In the following sections, we will present select results for the regressions performed for each period. They are quite different in many ways, which will be further highlighted in the analysis. The periods are separated into categories that fit the purpose of the study. The four tables that are presented first are five-year periods that pay homage to Bitner & Dolan's original examination of a five-year period, as well as divide the key periods into two, making it possible to further analyze the 1995-2004 and the 2005-2013 periods more in depth. The following two tables are of the key periods: ten years before IFRS adoption and the nine reported years post-adoption that were available. Part of the objective of the study is to distinguish these periods from each other in an earnings management setting. The seventh table is of the entire examined 19-year period. We then continue by presenting results for the categorical variables for years and industries. The chapter ends with a summary of the regression results and a presentation of the post-regression statistical tests that add scrutiny to the model and examination as a whole.

### 6.1.1 VARIABLE RESULTS 1995-1999

**Table 6.3 - Independent variable results for 1995-1999**

	SMOOTH	GROWTH	MARGIN	R&D	LEVERAGE
<b>Number of obs</b>	78	78	78	78	78
<b>Standardized coefficient</b>	.112	.145	.543	-.067	-.240
<b>Significance level</b>		*	***		**
<b>Hypothesized sign</b>	+	+	+	-	-
<b>Affects value</b>	NO	YES	YES	NO	YES

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Standardized coefficient gives the standard deviation change in the dependent variable, Q, per one standard deviation

*increase in the independent variable. Hypothesized sign gives the predicted direction of the variable in relation to Q. Affects value answers whether or not a variable significantly affects Q.*

As can be seen from table 6.3, neither the SMOOTH nor R&D variables seem to affect value in this early time frame indicating that any earnings management on the market is most likely insignificant, if it occurs at all. It is still reasonable to assume that some variations of income smoothing may occur, but are not significant enough to affect firm value, suggesting that investors can see through such smoothing. The period in table 6.3 contains the earliest measured years in our total time frame when the IFRS had not yet been adopted. The period also suffers from the lowest amount of observations. Data is not as easily accessible the farther back in time one goes.

The standardized coefficient is given by the beta option within the regression command in STATA. We mentioned that the standardization originated from the difference in size among firms and that the variables are measured differently. We want to compare the impact on Q between the variables, which requires a measure such as the one beta provides. We do, however, also include the unstandardized variable results a few sections below for additional clarification and transparency.

The variables all have different strength in predicting Q for the period 1995-1999, but the smoothing variables both stand out. Neither of them can predict Q with a significant certainty in this five-year period, despite at least SMOOTH having a noticeable coefficient. The MARGIN variable is by far the most dominant in this period, predicting more than half a standard deviation increase in Q per change in the variable. It is also highly significant at a 1% level on a two-tailed test. LEVERAGE is the second most powerful and predicts about a quarter decrease in Q per change in the variable, and significant on a 5% level, two-tailed test. GROWTH is the third and last statistically significant variable in the model for the period 1995-1999, with a predicted change of 15%.

#### 6.1.2 VARIABLE RESULTS 2000-2004

**Table 6.4 - Independent variable results for 2000-2004**

	SMOOTH	GROWTH	MARGIN	R&D	LEVERAGE
<b>Number of obs</b>	148	148	148	148	148
<b>Standardized coefficient</b>	.083	.140	.347	-.024	-.178
<b>Significance level</b>		*	***		**
<b>Hypothesized sign</b>	+	+	+	-	-
<b>Affects value</b>	NO	YES	YES	NO	YES

*\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Standardized coefficient gives the standard deviation change in the dependent variable, Q, per one standard deviation increase in the independent variable. Hypothesized sign gives the predicted direction of the variable in relation to Q. Affects value answers whether or not a variable significantly affects Q.*

Table 6.4 shows similar results to table 6.3. The variables' level of significance remains unchanged at the chosen alpha levels. The same variables are significant to value as in the earlier period examined in table 6.3, which means that income smoothing or myopic management does not affect firm value in this period either. The independent variables' predicted changes are all in the same direction, but has started decreasing. MARGIN has dropped from 54% to 34%, LEVERAGE from 24% decrease to 18% decrease, and

GROWTH a marginal drop from 15% to 14%. The smoothing variables are still statistically insignificant, but have nonetheless followed in the decrease in prediction. This is in conjunction with an increase in the number of observations to almost double that of the previous period. The increase in observations is a pattern that will continue the closer we get to present day, which will factor in to the analysis later on.

#### 6.1.3 VARIABLE RESULTS 2005-2009

**Table 6.5 - Independent variable results for 2005-2009**

	SMOOTH	GROWTH	MARGIN	R&D	LEVERAGE
<b>Number of obs</b>	320	320	320	320	320
<b>Standardized coefficient</b>	.101	.090	-.169	-.002	-.065
<b>Significance level</b>	*		***		
<b>Hypothesized sign</b>	+	+	+	-	-
<b>Affects value</b>	YES	NO	YES	NO	NO

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Standardized coefficient gives the standard deviation change in the dependent variable,  $Q$ , per one standard deviation increase in the independent variable. Hypothesized sign gives the predicted direction of the variable in relation to  $Q$ . Affects value answers whether or not a variable significantly affects  $Q$ .

The variables take a different turn in the period 2005-2009. The GROWTH and LEVERAGE variables lose their statistical significance, while SMOOTH does the opposite. We are now in the post-adoption period of the IFRS, and the main variable for income smoothing significantly affects the market's valuation in a five-year period. It is not at the most convincing level, but it has moved from completely insignificant, to significant at a 5% level in a one-tailed test, with a predictive strength of 10%. The GROWTH variable has shifted in the opposite direction in the prediction of  $Q$ . Note that the variable now has a negative standardized coefficient. The direction of GROWTH in 2005-2009 is not in line with the hypothesized sign, but the variable is still the strongest in predicting  $Q$  at 17%. The five-year period between 2005-2009 is dominated by the recent financial crisis that began in 2007, and will be subject to analysis in the next chapter. The number of observations has once again doubled, with 320 firm-years included in this period.

#### 6.1.4 VARIABLE RESULTS 2009-2013

**Table 6.6 - Independent variable results for 2009-2013**

	SMOOTH	GROWTH	MARGIN	R&D	LEVERAGE
<b>Number of obs</b>	360	360	360	360	360
<b>Standardized coefficient</b>	.039	.095	.068	-.108	.107
<b>Significance level</b>		*		**	*
<b>Hypothesized sign</b>	+	+	+	-	-
<b>Affects value</b>	NO	YES	NO	YES	YES

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Standardized coefficient gives the standard deviation change in the dependent variable,  $Q$ , per one standard deviation increase in the independent variable. Hypothesized sign gives the predicted direction of the variable in relation to  $Q$ . Affects value answers whether or not a variable significantly affects  $Q$ .

The last five-year period includes one year from the previous period since the whole observation period is 19 years. There were only 9 reported full years post-IFRS. The last two five-year periods both include 2009. The number of observations is highest at 360, a slight increase from the previous period. SMOOTH is once again insignificant in a five-year period, as is MARGIN. The variables are not relatively strong in predicting Q in this period, but R&D and LEVERAGE have noticeable changes. From being insignificant in all three previous five-year periods, the R&D variable has become significant. Its predicted change has gone from 0.5% in 2005-2009 to a staggering 10% in this period. LEVERAGE has gone from insignificant at a change of 7% decrease in Q to a significant change of 10% increase in Q.

The five-year periods make for interesting comparisons and open up doors to time-sensitive analyses. They are long enough to spot trends and short enough to relate to specific events in the world of business. We will now continue by presenting results for regressions performed on the whole examined pre-adoption IFRS period, post-adoption period, and finally on the whole examination period.

#### 6.1.5 VARIABLE RESULTS 1995-2004

**Table 6.7 - Independent variable results for 1995-2004**

	SMOOTH	GROWTH	MARGIN	R&D	LEVERAGE
<b>Number of obs</b>	203	203	203	203	203
<b>Standardized coefficient</b>	.158	.125	.352	-.026	-.230
<b>Significance level</b>	**	*	***		***
<b>Hypothesized sign</b>	+	+	+	-	-
<b>Affects value</b>	YES	YES	YES	NO	YES

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Standardized coefficient gives the standard deviation change in the dependent variable, Q, per one standard deviation increase in the independent variable. Hypothesized sign gives the predicted direction of the variable in relation to Q. Affects value answers whether or not a variable significantly affects Q.

The results from the first period longer than five years are quite interesting. They have combined the observations from the two first five-year periods, bringing the number of observations to 203. The increase in time interval makes it easier to detect trends, which is evident from the results here. From being insignificant in each of the five-year periods that are pre-IFRS adoption, the SMOOTH variable is now significant in a two-tailed test and with a predicted change of 16%. MARGIN is strongest with a 35% predicted increase in Q with every standard deviation increase, LEVERAGE second with a 23% predicted decrease, and GROWTH slightly after SMOOTH with a 12.5% predicted increase. The increase in the examination window has thus altered the significance of the variables as well as their predictive strengths. Four out of five continuous variables significantly affect Q in the 10-year pre-IFRS period. R&D is quite conclusively insignificant in the model for this period, with neither a statistical significance nor strong predicted changes.

## 6.1.6 VARIABLE RESULTS 2005-2013

**Table 6.8 - Independent variable results for 2005-2013**

	SMOOTH	GROWTH	MARGIN	R&D	LEVERAGE
<b>Number of obs</b>	633	633	633	633	633
<b>Standardized coefficient</b>	.115	.122	.044	-.099	-.003
<b>Significance level</b>	***	***		***	
<b>Hypothesized sign</b>	+	+	+	-	-
<b>Affects value</b>	YES	YES	NO	YES	NO

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Standardized coefficient gives the standard deviation change in the dependent variable, *Q*, per one standard deviation increase in the independent variable. Hypothesized sign gives the predicted direction of the variable in relation to *Q*. Affects value answers whether or not a variable significantly affects *Q*.

The results continue to differ from the five-year periods after the IFRS adoption. The regression includes 633 observations. The MARGIN and LEVERAGE variables are both insignificant and are very weak in predicting the dependent variable. Instead, the smoothing variables and the GROWTH variable are stronger than in any other period. All three are significant at the highest alpha level in a two-tailed test. They have predicted changes between 10% and 12%, indicating that a smooth income stream and timely spending on research and development may improve the market's valuation of firms.

R&D has changed from insignificant at every level before the IFRS were adopted, to significant at the 1% level with four times the predictive strength post-IFRS adoption. The profitability measure that is the MARGIN variable has done the opposite, and is now irrelevant in the post-adoption period. SMOOTH and GROWTH are prevalent in both periods, but with more statistical certainty in the later period. Both periods see the coefficients follow the hypothesized signs from the model, affecting *Q* like we anticipated.

## 6.1.7 VARIABLE RESULTS 1995-2013

**Table 6.9 - Independent variable results for 1995-2013**

	SMOOTH	GROWTH	MARGIN	R&D	LEVERAGE
<b>Number of obs</b>	876	876	876	876	876
<b>Standardized coefficient</b>	.100	.129	.018	-.097	-.022
<b>Significance level</b>	***	***		***	
<b>Hypothesized sign</b>	+	+	+	-	-
<b>Affects value</b>	YES	YES	NO	YES	NO

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Standardized coefficient gives the standard deviation change in the dependent variable, *Q*, per one standard deviation increase in the independent variable. Hypothesized sign gives the predicted direction of the variable in relation to *Q*. Affects value answers whether or not a variable significantly affects *Q*.

Table 6.9 describes the entire time period investigated in this study. The number of observations amounted to a total of 876 different firm-years. The results look similar to the ones in the period 2005-2013, because the majority of the observations are from that period. However, even when including all the observations before 2005-2013, the SMOOTH, GROWTH, and R&D variables are all dominant in predicting the market's

valuation. They are still significant at the highest level, with predictive strengths of 10%, 13%, and 10%, respectively.

The results suggest a trend where the market pays a premium for income that is smooth over the years and growing, as well as a negative relationship between Q and volatility in the spending of R&D projects. The variables all move in the same direction as hypothesized. The one thing that could potentially improve the model is the inclusion of the ACCOUNT variable that measures changes in accounting practices. As mentioned, it had to be excluded due to restraints in time and manpower. However, we tried to remedy the situation by separating the examination period into pre- and post-IFRS, effectively working the paper around a known change in accounting, as opposed to incorporating accounting change into the model. The results are quite different in the two periods separated by the IFRS, which means our choice was successful.

The variables generally predict Q differently in all the periods presented above, which will be grounds for analysis. We build upon the variable results by presenting unstandardized variable results, as well as summary statistics and post-tests for all the regressions performed, below.

## 6.2 UNSTANDARDIZED VARIABLE RESULTS

**Table 6.10 - Unstandardized coefficients and t-values for long periods**

	1995-2013	1995-2004	2005-2013
<b>SMOOTH</b>	.0801*** (2.93)	.0521** (2.48)	.1035*** (2.84)
<b>GROWTH</b>	.4324*** (3.65)	.1673* (1.88)	.4652*** (2.93)
<b>MARGIN</b>	.0099 (0.55)	1.7893*** (5.48)	.0144 (1.10)
<b>R&amp;D</b>	-.0454*** (-3.02)	-.0048 (-0.45)	-.0529*** (-2.60)
<b>LEVERAGE</b>	-.3703 (-0.60)	-1.8452*** (-3.84)	-.0495 (-0.06)

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Top values are unstandardized coefficient results from the regression analyses. Bottom values in parentheses are t-values.

Table 6.10 and 6.11 present the unstandardized coefficients and their respective t-values for all the periods examined. These are mostly included for transparency, but also add clarity to the individual variable results. The variables in table 6.10 and 6.11 are not standardized to a mean of 0 and a standard deviation of 1. Difference in firm size is therefore not accounted for, which means some results are extraordinary. However, the variables are still winsorized, meaning the extreme outliers have been reduced.

A firm's Q is affected positively by income that is smooth and growing before IFRS and after IFRS. The profitability of a firm, the MARGIN variable, was significant in predicting Q before IFRS, but not after. The results for MARGIN are massively different between the periods, which indicate an investor preference in the earlier period

for a firm that is convincingly profitable. R&D affected Q significantly in the period post-IFRS, but not before. LEVERAGE is similar to the MARGIN variable. It is significant and the coefficient is high in the pre-IFRS period, but not after or in the whole examination period.

**Table 6.11 - Unstandardized coefficients and t-values for 5-year periods**

	1995-1999	2000-2004	2005-2009	2009-2013
<b>SMOOTH</b>	.0347 (1.44)	.0292 (1.03)	.0809* (1.87)	.0449 (0.72)
<b>GROWTH</b>	.1837* (1.75)	.1975* (1.77)	.3706 (1.53)	.3197* (1.77)
<b>MARGIN</b>	2.4947*** (5.43)	1.882*** (4.02)	-.2293*** (-3.20)	.0129 (1.23)
<b>R&amp;D</b>	-.0068 (-0.87)	-.0063 (-0.33)	.0010 0.03	-.0443** (-2.08)
<b>LEVERAGE</b>	-1.7652** (-2.17)	-1.5280** (-2.16)	-1.3580 (-1.11)	1.605* (1.71)

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Top values are unstandardized coefficient results from the regression analyses. Bottom values in parentheses are t-values.

### 6.3 ASSET SIZE

**Table 6.12 - Systematic differences between asset size**

	1995-2013	1995-2004	2005-2013	1995-1999	2000-2004	2005-2009	2009-2013
<b>LARGE</b>	-.240	-.237*	-.270	-.672***	-.326**	-.104	-.246
<b>SMALL</b>	.959***	.304*	1.089***	.415	.152	1.195***	1.067***

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test.

Table 6.12 shows the coefficients for the variables for large- and small assets. LARGE was defined as > €10 billion in total assets, and SMALL was defined as < €1.5 billion in total assets. The variables had undefined coefficient signs in our predictions, but the results show a clear trend. A large amount of assets varies negatively with Q in every period, while a small amount of assets varies positively with Q in every period.

The variables take turns being statistically significant in the periods, with only one period showing significance for both: 1995-2004. The variables for asset size are the only independent continuous variables that are not standardized to a mean of 0 and a standard deviation of 1, meaning they are the only control for possible influence of absolute firm size on the dependent variable, Q.

## 6.4 INDUSTRIES

**Table 6.13 - Systematic differences in Q between industries**

Industry	Coef.	Std. Err.	t	P>t	Beta
<b>Basic Materials</b>	1.017	.733	1.39	0.166	.130
<b>Consumer Goods</b>	.627	.718	0.87	0.382	.091
<b>Consumer Services</b>	1.882	.742	2.54	0.011	.193
<b>Health Care</b>	1.648	.707	2.33	0.020	.282
<b>Industrials</b>	1.109	.695	1.59	0.111	.262
<b>Oil &amp; Gas</b>	1.763	.822	2.14	0.032	.126
<b>Technology</b>	1.200	.702	1.71	0.088	.207
<b>Telecommunications</b>	.946	.882	1.07	0.284	.055
<b>Utilities</b>	1.226	1.080	1.14	0.257	.048

The INDUSTRY variable is treated as a categorical, or factor, variable in the regression. The results above show coefficients for the variable in the regression for the whole period, 1995-2013. The baseline industry, the omitted variable in the regression, to which the nine industries above are compared to, is “unspecified”, i.e. firms that were not listed under any specific industry or sector.

Four of the industries above are statistically significant in the way they are different from a firm with an unspecified industry. These four industries are all more likely to have a higher market valuation than firms in the unspecified industry category. The result of the INDUSTRY variable is an interesting addition to the field and could be a subject of research in future papers.

## 6.5 YEARS

The year variable was treated as a categorical, or factor, variable in the final regression, in order to see how different every year was from the first year, i.e. 1995.

**Table 6.14 - Differences in Q between years**

Year	Coef.	Std. Err.	t	P>t	Beta
<b>1996</b>	.033	.680	0.05	0.961	.002
<b>1997</b>	.485	.671	0.72	0.470	.032
<b>1998</b>	.380	.657	0.58	0.564	.026
<b>1999</b>	.619	.675	0.92	0.360	.041
<b>2000</b>	.473	.649	0.73	0.467	.034
<b>2001</b>	.223	.603	0.37	0.712	.020
<b>2002</b>	.006	.610	0.01	0.993	.000
<b>2003</b>	.423	.598	0.71	0.479	.039
<b>2004</b>	.342	.570	0.60	0.549	.036
<b>2005</b>	.595	.560	1.06	0.289	.066
<b>2006</b>	<b>1.108</b>	.545	2.03	<b>0.042</b>	.142
<b>2007</b>	.853	.542	1.57	0.117	.111
<b>2008</b>	-.303	.544	-0.56	0.578	-.040

<b>2009</b>	.662	.545	1.22	0.225	.089
<b>2010</b>	.776	.542	1.43	0.153	.106
<b>2011</b>	.161	.543	0.30	0.766	.022
<b>2012</b>	.248	.543	0.46	0.649	.033
<b>2013</b>	<b>.947</b>	.545	1.74	<b>0.083</b>	.125

The value of the coefficient tells us how different each year is from the base year, 1995. The further away from 0, the more different the year can be considered to be in regards to market value measured by the entirety of the model. As can be seen in the figure above, the coefficient does not take linear increases over the years; however, something of note is that the coefficients are more extreme after the year of 2005. Many of the values of the coefficient after 2005 take a number closer to 1 than previously and there is also a negative value in 2008. Only two of the years are statistically significant, which leaves little room for conclusions. The table and results are included to inspire future research.

## 6.6 SUMMARY STATISTICS AND POST-REGRESSION TESTS

**Table 6.15 - Regression- and post-regression test results**

	1995-2013	1995-2004	2005-2013	1995-1999	2000-2004	2005-2009	2009-2013
<b>Number of obs</b>	876	203	633	78	148	320	360
<b>Prob &gt; F</b>	p = 0.00***	p = 0.00***	p = 0.00***	p = 0.00***	p = 0.00***	p = 0.00***	p = 0.00***
<b>R-squared</b>	0.19	0.52	0.16	0.80	0.41	0.25	0.14
<b>Adj R-squared</b>	0.15	0.45	0.13	0.74	0.33	0.20	0.09
<b>Heteroskedasticity</b>	p = 0.00***	p = 0.00***	p = 0.00***	p = 0.304	p = 0.00***	p = 0.00***	p = 0.00***
<b>Multicollinearity</b>							
- VIF-centered	1.34	1.29	1.36	1.41	1.34	1.34	1.36
- VIF-uncentered	2.75	4.16	2.79	4.42	4.64	2.75	2.70
<b>Ramsey RESET</b>	p = 0.00***	p = 0.0035***	p = 0.00***	p = 0.00***	p = 0.00***	p = 0.00***	p = 0.0056***

\*\*\*Significant at 1% level, two-tailed test, \*\*Significant at 5% level, two-tailed test, \*Significant at 5% level, one-tailed test. Prob > F shows the statistical significance of the model. R<sup>2</sup> and Adj R<sup>2</sup> show the explanatory power of the model. Heteroskedasticity shows results for the constant variance test. VIF-centered and VIF-uncentered are mean variance inflation factors for all the independent variables without and with the constant term, respectively.

The model was statistically significant in every period examined on a 1% level with a two tailed test. Further, the number of observations increased over the years amounting to a total number of 876 observations, which is a number we are quite satisfied with since we believe it is enough to draw relevant conclusions from.

The explanatory power of the model (Adj R<sup>2</sup>) is very high in the earlier period but decreases rapidly as time passes. A significant decrease in explanatory power can be noticed after the IFRS adoption in 2005 where the previous period had an Adj R<sup>2</sup> of .45 while the Adj R<sup>2</sup> after IFRS adoption is only .13. Looking at a smaller scope, the explanatory power decreases even further in the last period between 2009-2013 taking a value of .09. When compared to the first five-year period examined between 1995-1999, it becomes evident that the explanatory power has significantly decreased since in that period the value of Adj R<sup>2</sup> is .74. In regards to the IFRS adoption, the five-year period before the adoption of the IFRS had an Adj R<sup>2</sup> value of .33, while the five-year period

right after IFRS adoption had a value of .20. Interestingly, the decrease in explanatory power is higher after the millennium shift, suggesting that something even more drastic than the IFRS adoption may have happened then. Before the millennium shift, the explanatory power is high at an Adj R<sup>2</sup> of .74 whereas afterwards it has a much lower value of .33. In summary, the explanatory power decreases over the entire study, while the model remains statistically significant.

After the regressions were complete, post-regression statistical tests were performed in order to validate the results. The first of these was a Breusch-Pagan / Cook-Weisberg test of heteroskedasticity, which showed signs of increased variance in every examined period except 1995-1999. Since heteroskedasticity seemed to appear in almost every regression, we requested White-corrected robust standard errors by adding an option to the regression command in STATA (STATA, 2013a, p. 10-15). This is also a recommended adjustment by Greene (2011, p. 316). It slightly altered the variables' standard errors, confidence intervals, and p-values. The same variables are still statistically significant, but on a weaker level. The process of adding robust standard errors relaxes the assumption of independence in the panel data.

Before running the variance inflation factor (VIF) tests for multicollinearity, we examined the independent variables' simple correlations between each other. It is an easy way to detect severe multicollinearity, according to Studenmund (2013, p. 272). However, none of the variables suffered from high correlation, which is why we chose to expand the scrutiny with the VIF-tests. The results of the correlations for the whole examination period can be found in Appendix B.

A rule of thumb says that multicollinearity is present if a variable has a VIF over 10 (STATA, 2013b, p. 23). In our regressions, none of the variables had VIFs close to 10, and the mean value was close to 1. This means that multicollinearity is not present in the model. The uncentered VIF adds the constant term to the calculation, which calls for an increase in the rule of thumb-value. However, the values are still not close to being multicollinear, despite adding the constant term. We therefore conclude that the model does not suffer from multicollinearity.

## 7. ANALYSIS

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*Having the results readily presented above, this chapter is dedicated to analysis of our findings. We first analyze the model as a whole, followed by acceptance or rejection of the hypotheses. The results are then analyzed from a theoretical point of view, using the frame of reference outlined in Chapter 4. Note that when analyzing, we are using results from the seven regressions and periods. One for the whole examination period, two periods separated by IFRS-implementation, and four five-year periods.*

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### 7.1 MODEL

The results of the regressions tell us several things that are important for analysis. Firstly, the power of the model diminishes over time linearly until reaching present date. We believe that this could be explained primarily by the technology boom that happened after the millennium shift where the model also started to become significantly weaker in its power. In the early stages of the data, the independent variables accounted for almost three fourths of the change in the dependent variable. Between 2000 and 2004, the power dropped by half, which means it accounted only for a third of the change in Q. The power continued to decrease, along with the European Union's adoption of the IFRS. This adoption meant that financial reporting standards were standardized over the entire region besides perhaps being stricter than previous standards, giving fewer options for subjective reporting.

The explanatory power of the model from 2005 to 2009 was a mere 20%, with the period also including the majority of the recent financial crisis. As seen in the previous chapter, it can be difficult to say whether or not the financial crisis or the IFRS, or a combination of both, is the explanatory factor for the drastic decrease in the power of the model. The fact that the model still has statistical significance leads us to conclude that the results are nonetheless relevant. The model has however lost some of its power and there might exist a need to update or completely replace it.

A possible relation with said model that we noted in the results is that the explanatory power decreased the more observations were included. The number of observations is also correlated with the examination periods, which means they are all in different years. The trend shows that the further back in time we go, the more explanatory power we achieve. The trend also shows that the further back in time we go, the fewer amount of observations are available. A low amount of observations is therefore consistent with high explanatory power and an old period in time. A high amount of observations is consistent with low explanatory power and a recent period in time. This reflects either a weakness in the model as time progresses or as the number of observations increase, or a combination of both. We tend to believe that the model has lost its strength over the years due to the changes made in technology, access to information for the average investor, and perhaps the adoption of the IFRS.

The model had decent explanatory power prior to the IFRS implementation, but started lacking thereafter. This could be due to the model only working well on GAAP- and local GAAP-reporting firms. Bitner & Dolan (1996, p. 28) were happy with their explanatory power of slightly below 0.5, which is the same as we achieved for the pre-IFRS period of 1995-2004.

There are two main events identified which could be the cause of the drop in explanatory power of the model. They are the millennial shift with the following technology boom in 2000 and the IFRS adoption in 2005. Since the explanatory power decreases in an almost linear manner over the entire period we have examined, it is reasonable to assume that technology accounts for part of the loss in explanatory power. If it was entirely dependent on the IFRS adoption, we would see very high values of Adj R<sup>2</sup> before 2005 followed by very low values. This is not the case but we rather have a scenario where the explanatory power of the model decreases over the entire course of the period examined. The general results of the SMOOTH and R&D variables remain where they are related to firm value over the entire period, but when looking at individual fragmented periods, they are mainly related to firm value after IFRS adoption. This does not necessarily suggest that income smoothing is more widespread after IFRS adoption but rather that it affects firm value compared to not affecting firm value before. Such an explanation could also be attributed to the rise in technology and easier access to information.

Tobin's q may also have lost a significant amount of statistical relevance following the technology boom. With everything becoming digitalized in this day and age, including a significant amount of firms' assets, some measurements need to be updated. In the past couple of decades, market valuations and the ways of investing have become more available through the Internet, with investors possibly becoming more optimistic and confident in their decisions due to the increased access to relevant information. Behavioral finance is an interesting field of research that could help answer how a firm is valued, in relation to modern investment behaviour.

The bottom line is that we are critical towards both the model and its application in modern times, as well as the choice of dependent variable i.e. Tobin's q. Our study can still be replicated following the steps outlined in Chapter 5, but further research should adapt the measurements to an ever-evolving world of finance.

Four out of the nine industries had significantly higher market values than firms in an unspecified industry: Consumer Services, Health Care, Oil & Gas, and Technology. The variable is not directly relevant to the purpose of this study. It is an addition that controls for differences in industries that systematically affect the value of Q. The fact that some of these systematic differences are significant in our regression may be of interest to researchers intending to pursue continuing studies on the Swedish market.

The factor variable for looking at yearly differences compared to the base year 1995 showed results that were fairly consistent up until 2005. The coefficients then began fluctuating more, indicating that something happened in the year of 2005 causing this change. One reasonable explanation would be the IFRS introduction, which transformed the way of accounting in Sweden, and the European Union, indefinitely. We cannot pinpoint the specifics that altered the results after 2004, but the coefficients are noticeably different. However, only two of the years are statistically significant, specifically 2006 and 2013, which means we are unable to draw conclusions with real certainty. The results will therefore simply add fuel to the possibility of further research on the Swedish market as well, that is focused enough to achieve significance between each year.

The regressions also used control variables for looking at systematic differences in Q based on asset size. The results were conclusive in that a Swedish firm with a large amount of assets systematically had a lower Q, while a firm with a small amount of assets systematically had a higher Q. This result is rather unsurprising, given the way we chose to calculate Tobin's q in this study. Remember that the equation used the market's valuation of a firm in relation to its total assets. It is therefore obvious that firms with a large amount of assets will be valued closer to their reported assets using Tobin's q. Firms with a small amount of assets may be valued for a number of different reasons, e.g. growth potential, patents, market power, and will usually not be as close to their reported assets in their valuation on the market.

## 7.2 HYPOTHESES

Seven different hypotheses were developed in order to examine the problem presented in the introduction. Two of these hypotheses are broad and contingent on the five other hypotheses, which will be analyzed first. These five hypotheses treat individual variables in the model, all of who together create a picture that can answer the two most important hypotheses in this paper, 1a and 1b.

*Hypothesis 2a:*  $\Delta Q / \Delta \text{SMOOTH} > 0$

Hypothesis 2a asks whether or not the market values smoothness. If the market does value smoothness, then Q will vary positively with SMOOTH. The results showed that the coefficient for SMOOTH was larger than 0 in every period, leading us to accept the hypothesis, which suggests that the market does value smooth income.

Our results also indicated that income smoothing could potentially have long term overall beneficial effects for a firm. This is in line with work done by Trueman and Titman (1988). Another important aspect to consider regarding income smoothing is conservatism. Conservatism by a firm is generally seen as a good sign by investors since it means the firm is careful about overstating performance and would rather understate it. Francis et al. (2013) finds a strong relation between firm performance and conservative accounting. Our results indicate that income smoothing is value enhancing for a firm, but a relevant question remains to ask, which is if the type of income smoothing associated with the value-enhancement is of a conservative or aggressive nature. Given results from previous research, one could argue that the income smoothing procedures associated with an increase in firm value is most likely of a conservative nature.

*Hypothesis 2b:*  $\Delta Q / \Delta \text{GROWTH} > 0$

Hypothesis 2b is an extending hypothesis regarding smoothness that asks whether or not firm value is affected positively by income streams that are growing. Not only did we find evidence that the income streams were smooth over the years, but also that they were growing. The OLS coefficient was significantly above 0 in mainly the post-IFRS period, but also significant, if yet at a weaker level, in the period before. GROWTH was even the strongest predictive variable in the regressions for the whole period and post-IFRS. The results are hardly surprising, considering the appreciation investors generally have for firms' growth. It is a fundamental aspect of a firm listed on a stock exchange, with a few exceptions of firms that are not growth firms. This hypothesis was obviously accepted, suggesting that firm value does increase due to growing income streams.

*Hypothesis 2c:*  $\Delta Q / \Delta \text{MARGIN} > 0$

Hypothesis 2c asks whether or not gross profit margin is correlated positively with the value of the firm. The results showed a massive difference in the strength of the variable, specifically between the periods separated by the IFRS-adoption. In the period 1995-2004, and in the same interval separated by two five-year periods, the MARGIN variable was by far the strongest in prediction. It was more than twice as powerful as the second most powerful independent variable in each of these periods, with an impressive standardized coefficient of .54 in the 1995-1999 period. In the next five-year period it was still high at .34, but dropped all the way to becoming significantly negative in the 2005-2009 period. It slowly regained its positive coefficient in the last period, but was not statistically significant at that time. The hypothesis was accepted despite being negative in 2005-2009, which we believe is a cause of the financial crisis.

MARGIN is an interesting variable, because it can be related to a number of things. It can explain a firm's market power on an industrial level, as well as be related to economic efficiency as a whole. Neither of these are necessarily relevant to the objective of this study, since the aim is to assess the impact on firm value from income smoothing. MARGIN is only really a controlling variable in the model that accounts for marginal impacts on Q by both market power and economic efficiency, while smoothing is the main focus.

*Hypothesis 2d:*  $\Delta Q / \Delta \text{R\&D} < 0$

Hypothesis 2d is related to R&D projects and the practice of real smoothing. It asks whether or not the market can identify and discount the value of firms for managing income streams through the timing of real transactions. This hypothesis is crucial to whether or not investors are able to distinguish between firms that have naturally smooth income streams and those that manage their income to become smooth.

R&D was significantly affecting Q after IFRS implementation, meaning short-term volatility in R&D spending affected firm value. It was also significant in the whole examination period and 2005-2009, but none of the other five-year periods. This leads us to believe that the prevalence of timely R&D spending after 2004 stem from either the IFRS or the financial crisis. It is possible that firms had to resort to creative measures in order to cope with the crisis. Firms generally saw highly volatile income streams and other accounts during that period, which they could potentially remedy by adjusting e.g. their spending on R&D.

However, such practices may not have been as common during that time as one might think, as evidenced by Filip & Raffournier (2014). They found that European firms instead showed significant decreases in income smoothing and an improved quality of accruals. This could be attributed to the way a firm wants to be perceived in a time of crisis by its investors. When everyone is on the edge due to macroeconomic events, their perceptive behaviour might be altered. After the news of the nature of the crisis came to light, we as researchers were not alone in raising suspicion about the practices of not only banks, but firms as well. The adaptability of listed firms is therefore of great importance in a recession, because the investors are more invested in their investments.

In terms of R&D expenditures and myopic management, previous research indicated that firms using myopic management are hard to, or cannot be correctly priced by the market (Mizik & Jacobson, 2007). This explains why our R&D variable appears the

way it has in certain periods and in the overall research time frame where it has a connection with firm value. This means that cutting or increasing R&D expenditures, at least in the short term, may have a value-increasing effect on the firm.

Alas, one should be cautious in the interpretation of the R&D variable. One cannot necessarily always find a link between the volatility in R&D and real smoothing. Volatility could exist due to a lack of strategic planning or commitment to R&D policies. This could mean that the Q is driven down rather than resulting in an impact on income. We do accept the hypothesis that firm value varies negatively with the R&D variable. Remember that every observation of the R&D variable was multiplied by -1 to achieve its negative sign in the model. Despite this fact, the standardized coefficient and the significance were convincing in three periods, indicating that the variable is capable of predicting Q. To some extent, the market does seem able to distinguish between naturally and artificially smooth streams of income.

*Hypothesis 2e:*  $\Delta Q / \Delta \text{LEVERAGE} < 0$

Hypothesis 2e handles the control variable that is unrelated to income smoothing. High leverage means greater risk and, subsequently, a lower Q. Therefore, leverage is predicted to reduce firm value. On the Swedish market, the LEVERAGE variable was insignificant in the regression for the whole period and the post-IFRS period, but strong and significant in the 1995-2004 period and the five-year period between 2009-2013.

It was the second most powerful predictor after gross profit margin in 1995-2004, predicting a 23% standard deviation decrease in Q per standard deviation increase in LEVERAGE. Leverage did not seem to be preferable according to investors in the pre-IFRS period. If anything, this could perhaps be a signal of caution from investors who had recently experienced a crisis in Sweden in the early 1990s. Similar to that suggested above, the lack of preference for leverage could be explained by how on edge investors are following a crisis.

The fact that the variable was significant in 2009-2013 comes with a caveat. LEVERAGE actually positively affected Q in that period, indicating an investor preference for leverage. This goes against the argument made above, but is still a statistic we cannot ignore. The reasoning here could be that the firms were required to, and encouraged, to assume additional debt. After having potentially lost large sums in the financial crisis, firms may have had to borrow to stay alive. It is not unreasonable to assume that investors understood this and reflected it in their valuation. We accept hypothesis 2e since the coefficient was consistently negative in the regressions, with the exception of one five-year period that we attribute to extraordinary circumstances.

In the beginning of this section, we mentioned that there are two hypotheses in particular that are essential in answering the problem and reaching the objective of this study. The first one is hypothesis 1a:

*The Swedish market pays a premium for smooth streams of income.*

Our results seem to support the fact that the market will indeed pay a premium for smooth streams of income in one way or another. There thus seems to be a direct connection between income smoothing and the value of a firm. This leads us to accept hypothesis 1a.

The second hypothesis is 1b:

*The market can distinguish between income streams that are naturally smooth versus those that are managed.*

This hypothesis is not as straightforward as 1a. Other research concludes that the market does care about how the smooth income is attained (Bitner & Dolan, 1996, p. 29-31). Due to the similarity of our results, we agree and are thus willing to accept the hypothesis. We can accept it because hypotheses 2a-2e were all accepted and have a strong relationship with both hypothesis 1a and 1b.

For instance, hypothesis 2a is related to whether the market values smoothness, which we found it to do. This is one reason, along with being in line with the results of previous studies, to why hypothesis 1a was accepted. The main reason for hypothesis 1b to be accepted however, is the result of hypothesis 2d, which handles whether or not the market can distinguish between different types of smoothing. Both our results and previous research indicate that the market does distinguish between managed and unmanaged smooth income.

### 7.3 THEORETICAL ANALYSIS

We will continue the analysis by relating the results to the theoretical frame of reference and putting them in a more general perspective.

#### 7.3.1 IFRS

Studies on the IFRS adoption have found somewhat differing results. In 2013, Ahmed et al. (p. 1369) found that IFRS adoption increased income smoothing as well as accrual aggressiveness and timeliness of loss recognition. The main reason for these results according to the authors was managerial discretion or exercise of judgment. Another study tells us that there will be no difference in income smoothing regardless of what reporting standard is used (Atwood et al., 2011).

Capkun et al. have addressed the issue of earnings management and IFRS adoption several times. The first study was done in 2008 where it was concluded that earnings management increased under the IFRS compared to local GAAP. Sweden was in the middle of countries as far as the magnitude of earnings management under the IFRS goes (Capkun et al., 2008, p. 26). Later results indicated that investors could see through most of the earnings management increases that came with IFRS adoption (Capkun et al., 2011, p. 37-38). Most research seems to indicate that there is either no difference or an increase in earnings management with IFRS adoption. This could lead us to conclude that the reason why the model drops in power is in fact the inclusion of the IFRS that in different ways will make the model less powerful.

The most likely reason for this might be that the IFRS is heavily based on principles-based accounting rather than rules-based. It contains considerably less pages than the U.S. GAAP for instance, and has less fixed rules than most other accounting standards (Mirza & Holt, 2011, p. 2). When the accounting standard consists of less volume it is reasonable to assume that there is some degree of increased flexibility regarding reporting requirement. However, this is not necessarily a bad thing since the main point

of shifting to a more principles-based standard is to eliminate straight up fraud and make accounting reporting more ethically based (Mirza & Holt, 2011, p. 2). This could perhaps be a reason why the model decreases in power as there are less rules-based regulations present in the accounting standard as a natural effect of the shift to principles-based accounting.

While the IFRS might allow for more income smoothing procedures, we believe those procedures are only likely to have a smaller impact on actual results. “Loop holes” in rules-based standards are likely to have a larger impact on actual results compared to interpretational issues in principles-based standards. A great example of this is the Enron scandal in 2001 where the company had been using SMEs in order to inflate their earnings using loans directed towards these SMEs that would not affect the results of the company as a whole. This was a loophole in the U.S. GAAP, which was aggressively abused. After the Enron scandal, GAAP standard setters made many changes in order to reduce the chance of something similar happening in the future (The Economist, 2002).

### 7.3.2 EMH

In order for the efficient market hypothesis to be fulfilled, certain conditions have to be “sufficiently” met. It can either be fulfilled in its strong, semi-strong or weak form (Fama, 1970, p. 387-388). The first criteria of no transaction costs can basically be considered fulfilled in a modern market where stockbrokers are all but eliminated in favor for automated systems for the knowledgeable investor. The second criterion is a lot harder to consider since we as authors cannot know whether all information is actually available. It is however reasonable to assume that a lot of information is available due to quite strict reporting frameworks while at the same time there is some information that may not be available.

The third criterion of the EMH is perhaps even harder to consider whether or not it is fulfilled. The whole idea of being able to capitalize on a free stock market is based on the fact that investors are not always in agreement what is about to happen to a certain stock or market. This leads to the ability to capitalize on said stock or market. Furthermore, that is a reason why the EMH can be questioned in its strongest form, since if the EMH in its strongest form would be true there would be no possibility to ever make profits on an open stock market such as the Nasdaq OMX Stockholm investigated in this paper. The strong form of the EMH would mean that all information is publically available and if that is the case, all investors can make rational decisions. Assuming everyone is a rational decision maker and all information is available, one cannot theoretically make abnormal profit on the market.

Having established the fulfillment of the efficient market hypothesis’ criteria, the theory will be incorporated into the analyses below in more depth and relation to the other theories and the results at hand.

### 7.3.3 INFORMATION ASYMMETRY

EMH can be linked to information asymmetry. It is reasonable to make the assumption that asymmetric information will exist on the market, and it is further reasonable to assume that information asymmetry will affect the value of the firm (El Ghoul et al., 2013, p. 170-171). What we need to consider is thus not the existence of information

asymmetry but rather how it might affect the results of this study. Firstly, we surely do not have access to all information ourselves. The information we have access to reflects the information that the market also has access to and thus we are subject to information asymmetry since there undoubtedly exists additional information that is unavailable. Since we do not know what kind of information is “hidden” it is of course impossible to say exactly what impact the information might have had. One conclusion is that high value firms that are doing well will be more reliable in their reporting as they have no unfavourable results to hide as it is positive for themselves to report more (Chen et al., 2014, p. 1).

We conclude that since information asymmetry exists, there is further no possible way that the EMH in its strongest form could be accepted since information asymmetry contributes to an inefficient market. The firms themselves decide to a large degree how complete they want their information to be, i.e. the signals they send out. Research found that high quality firms are more eager to signal their quality to outsiders in comparison to low quality firms (Connelly et al., 2011, p. 43). The financial reporting standards set up a framework to try and eliminate managerial reporting discretion as much as possible but there still exists a large amount of managerial discretion when it comes to how much information the firm wants to share with the outside world considering that they also share this information with competitors. Thus, it becomes a balance of sharing enough information for investors to view the company in a positive light while at the same time not sharing any information that could be of vital use to competitors.

#### 7.3.4 AGENCY THEORY

Since how much information can be up to managers themselves, agency theory is relevant in this context. When a manager (agent) has a different benefit than a principal from a certain action, in this case how much information to report, an agency problem occurs (Eisenhardt, 1989, p. 58). This is something to consider due to the reason that managers will tend to favor themselves over the principals if there is a perceived benefit from doing so. Agency problems themselves can contribute to information asymmetry since managers may withhold vital information and thus will possess more information than outsiders. Asymmetric information will always exist as long as one party has superior information compared to another.

#### 7.3.5 EARNINGS MANAGEMENT AND SIGNALING

A question that is highly relevant to ask ourselves considering our test results where it became clear that income smoothing and R&D expenditures do affect firm value is if investors are also aware of this fact and thus discount for it. Since the information we have gathered in this study is publicly available it may be reasonable to assume that investors are also aware of this and discount for this factor. Any professional investor should reasonably be aware of these facts that means that it in turn should also be reflected in the market value. If such measures do result in higher dividends in a certain year, it will be a quite natural change where the firm value increases, however, as mentioned in the theory chapter, upcoming years should still see negative results as a direct consequence of this for the individual company (Bhojraj et al., 2009, p. 2385).

The matter of individual companies might be the reason why we are not able to identify this in the actual study. When viewing the entire market, it may thus be possible to say

that income smoothing and myopic management actually will have a value-added effect for the market as a whole. That being said, since the market is built up by companies, it also has to be the same for individual companies in general. There will certainly always be exceptions to the rule however, where some companies might see large detrimental effects from income manipulation, especially if it becomes public knowledge and their reputation is damaged as a result.

Many of these results are, as we have covered, already established by authors of earlier studies. A main difference we highlighted in our study is that we exclusively investigate the Swedish market. Indeed, our results seem to indicate that the Swedish market is not that different from the international one. Companies will still commit to procedures that tend to increase the value of the firm and they will make use of the tools at their disposal to do so. This leads us to another explanation of why our results appear as they do. As mentioned earlier, income smoothing and R&D seems to increase the closer we get to current day. We have several explanations of why this might be the case. Since the increase in technology, the Swedish market as a whole is less differentiated from the international market after the adoption of the IFRS. Why this might be the case is self-explanatory. With the same regulatory accounting standards in a world where information travels quickly, there should be a decreasing diversity between nations. This decreasing diversity is one among many possible explanations for our results.

Assuming that conservative accounting is one of the main reasons for the value increase related to income smoothing, one has to ask why this might be the case. Francis et al. (2013) found that conservative accounting can be a very effective tool for reducing both information asymmetry and agency problems. As mentioned earlier, both of these can be highly problematic for a firm since they will most likely cause problems for investors.

However, when investors know that a firm practices conservative accounting, they may also have knowledge of the effects conservative accounting can have on agency problems and information asymmetry, resulting in them putting more trust in the firm. As a result, the value of the firm should increase, suggesting that conservative accounting can possibly be a factor contributing to value increases.

When adopting conservative accounting, it is of course important for the firm to send out proper signals to investors that this is the case. Given that conservative accounting is a reason why income smoothing increases firm value, it is further reasonable to assume that the signals that are sent out by companies properly reaches investors and are thus strong. The observability of these signals seems to be rather high, otherwise the results would not appear as they do. If the observability would be low it would mean that investors would not react to the signal. If that would have been the case, a relation between firm value and income smoothing could not have been found since the knowledge of investors dictate the price of the firm, and if they do not possess certain knowledge, it does not attribute to the firm value. Anything unknown to investors cannot contribute to the market's valuation of the firm.

When a signal is sent from a firm, it will generally always be positive if the signal was intentionally sent (Connelly et al., 2011, p. 45). Connelly et al. (2011, p. 43) found that firms will be eager to signal their position when it is strong, and vice versa. A possible yet unlikely explanation for the results is that Swedish firms are generally of high

quality and thus are eager to signal their strength to investors. This means that information regarding their practices would have a higher availability and since many of them may use conservative accounting, the results appear as they do. This explanation is rather unlikely however and it is far more likely that other explanations given to our results are true. A combination of given explanations will most likely be the actual case.

Earnings management in general has quite a negative sound to it, however, our results and some previous research suggest that this might not always be the case. As mentioned, conservative accounting is a form of earnings management, but both we and other scholars have found evidence suggesting that conservative accounting may be value-adding for a firm, and that investors actually are inclined to value firms using conservative measures higher.

Smooth income may be more important for firms with a lot of pressure and a tight following. Popular listed firms with the most thorough investors may have more incentives to smooth, but they may also be detected for such practices much quicker. Popular companies usually have more analysts looking into them, while private investors might also be slightly more sophisticated. These factors could make firms more prone to having a smooth stream of income, but worried about the risk of someone finding out how the smoothness is achieved. They have to weigh the potential benefit of having a smooth income stream against the potential loss of having a majority of investors learning of the manipulation and subsequently disliking it. According to our results, income smoothing seems to be a viable corporate strategy that is value increasing. Results suggest that income smoothing has a positive effect on firm value and thus investors are likely to value smooth streams of income.

When analyzing our results, we need to acknowledge that a large financial crisis happened during our examined period. A previous study investigating earnings management and the recent financial crisis together suggested that earnings management decreases during a financial crisis, mainly due to an increase in conservative accounting as well as the auditors of the firms being more careful thus increasing the quality of financial reporting (Cimini, 2014, p. 315).

Admittedly, that study addressed a larger EU-based market while our study only addresses the Swedish market of the Nasdaq OMX. However, we still believe the results should be applicable. Our results on the other hand, indicate an increase in income smoothing during the entire period after 2005. Myopic management also seems to increase which could be a result of the financial crisis. As known, firms tend to cut their marketing and R&D expenditures when faced by harder financial times (Mizik, 2010, p. 595). This was thus an effect that could be expected, but the smoothing variable however, was not. Earnings management should have decreased following the financial crisis. The fact that it did not do so in our study could possibly mean that the effect the IFRS had on income smoothing and an increase in this aspect, outweighs the possibly negative income smoothing related results that should have shown up following the financial crisis.

The market seems to reward a smooth income stream, but it also seems to care how such an income stream is attained, i.e. by what methods the firms smooth their income. Relevant to consider, is also the difference between investors themselves. For example, certain investors such as institutional investors will be more informed than others and

will have an easier time detecting earnings manipulation while others will be fooled by it (Wang, 2013, p. 705). This suggests that earnings management will fool parts of the market while others will not be fooled, further supporting a semi strong version of the efficient market hypothesis.

If some investors in fact are able to detect earnings manipulation, while acknowledging that many other investors are not, how would they react? Perhaps they would take advantage of their knowledge and utilize the fact that other investors are unable to identify smoothing. This means that the unsophisticated investors, the ones that are unable, will pay a premium for smooth income and drive up the stock price. The sophisticated investors, the ones who have identified the smoothing, can then enjoy the increase in the stock price and their wealth. All they have to do is lean back and let the market do the rest for them. If part, or all of the market, can be fooled by income smoothing and subsequently reward such practices through increased stock prices, then actively smoothing is a sound corporate strategy to increase firm value. The key for firms interested in such strategies would then be to identify to what extent the market can be deceived.

## 8. CONCLUSION

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*Our quantitative panel data study of 19 years on the Swedish stock market has shown evidence of earnings management in the form of income smoothing. The results also show that income smoothing positively affects firm value. This chapter also discusses the study's contribution and implications, as well as recommendations for future research.*

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The aim of this study was to answer the initial research question presented in the introduction:

*Is earnings management prevalent on the Swedish stock market, and if so, how does it affect firm valuation?*

We already know from several previous studies that earnings management does take place, but none of them specifically target Sweden (Burgstahler & Dichev, 1997; Healy & Wahlen, 1999; Michelson et al., 2011). Our results not only prove the prevalence of earnings management, they also indicate that income smoothing has a relationship that leads to an increase in the value of a firm. We thus conclude that income smoothing can possibly be a viable corporate strategy that is value enhancing.

The results further indicate that income smoothing is more beneficial for a firm after the adoption of the IFRS in 2005. We believe this could possibly be a cause of switching to more principles-based accounting. We do not believe this is negative since research indicates that principles-based accounting leaves more room for mild income smoothing while leaving less room for direct fraud when it comes to earnings manipulation (Mirza & Holt, 2011, p. 2). Our results are consistent with previous research on other markets using similar methods, such as Bitner & Dolan (1996).

In terms of myopic management, there is also a positive relationship between adjusting R&D expenditures and increases in firm value. We do not believe that this is a viable corporate strategy in the same way as income smoothing, since a vast majority of previous research has found that the value increases from adjusting R&D and marketing is generally only applicable short-term (Bhojraj et al., 2009; Mizik, 2010; Mizik & Jacobson, 2007). This is logical since reduction of such expenditures will often result in increased earnings, which in turn tend to affect dividends, which investors take into account in their trading activities. In the long-term, cutting these kind of expenditures is quite obviously detrimental to the value of a firm since their development of new, innovative products will be harmed from such practices. We believe that the results on R&D expenditures thus are in line with previous research on the subject since we have not investigated the effect on individual companies in a longer term and these results can be considered short term for this variable.

We believe that in regards to accounting standard settings, the IFRS did still provide positive changes. While income smoothing seems to be a viable corporate strategy under the IFRS, it is important to note that stricter standards can encourage types of earnings management that are harmful to firms. We then refer to the type of earnings management that impacts the actual operations of the firm and not just artificial manipulation of accounting numbers, which cannot have a real negative impact since

they do not affect the operations in the first place, but the numbers reported in financial statements. We believe that standard setters should take measures to reduce earnings management that affect operations, while there is less of a need to regulate artificial manipulation of accounting numbers.

As we approached present time in the study, we also found that the explanatory power of our model started to drastically decrease. We have speculated for why this might be the case and believe the most likely explanation would be the technology boom after the millennial shift. This is when the explanatory power starts to take drastic decreases and continues to do so as time goes on. We conclude that the model has lost its power over the past couple of decades and thus needs to be updated or possibly replaced.

We believe that the study did address its main purpose of investigating earnings management and its impact on firm value on the Swedish stock exchange. Results were interesting in the way that they suggest income smoothing to indeed be a viable corporate strategy, explaining why so many firms would commit to this type of practice. If one pays attention, you can often hear about firms having considerably more to do during the periods of the year when financial reporting is due. For instance, many companies tend to want to pay for goods that are due to be delivered in the next reporting period, which is a typical indication of income smoothing.

## 8.1 THEORETICAL AND PRACTICAL IMPLICATIONS

Results show that earnings management, typically income smoothing, is a practice that can potentially have beneficial effects for a firm. These results have several implications to both firms themselves and investors. For firms, the results indicate that income smoothing is something that they might benefit from and thus something that they should consider doing, given adequate risk-assessment. For investors, this shows that the market might not always discount properly for income smoothing and earnings management in general, which means there could be potential profits to be reaped. If income smoothing is a viable corporate strategy that is value-enhancing, investors would be able to identify such firms.

This study also contributes evidence in line with previous research. It fills a gap where the Swedish stock exchange is uninvestigated in its own context, but rather investigated in conjunction with the entire European market. We found that the strong form of the efficient market hypothesis cannot be accepted on the market, due to the reason that not all investors seem to see through earnings management.

## 8.2 FUTURE RESEARCH

The broad spectrum of the concept of earnings management invites several interesting topics to research. We discussed the use of potentially outdated measurements in our analysis, where Tobin's  $q$  came to mind. Research in the future could either focus on developing new measurements for firm value, or use existing measurements that are more applicable in modern times.

The continuation of investigation of the Swedish market is highly recommended. Both of our categorical variables indicate differences between industries and between years. Our method did not include examination that yielded sufficient results to interpret these

categories properly. Part of our focus was to spot a difference in the periods separated by the IFRS. While having done so, we are still interested in identifying what specifically caused these changes, which further research could aim to do.

The chapter treating practical method included a method called event study. We believe that could be incorporated into a study of earnings management on the Swedish market or practically any market. Instead of looking at changes through years, such research could focus on specific dates and events that trigger investor responses. Firm value could thus be investigated following e.g. an earnings announcement. The examination could further be specified to treat announcements within certain industries or after a larger event of macroeconomic proportion.

Another area of interest is how many investors are actually aware of earnings management. Quantitative research could be applied to investigate if earnings management is common knowledge and to what extent investors detect it. In addition to their knowledge of it, one can inquire about how investors perceive earnings management and how it affects their investment decisions.

Finally, research could expand on the relationship between incentives and earnings management. On a managerial level, previous research has found that certain compensation policies can affect the choices managers make regarding income smoothing. Future research could attempt to tailor such incentives like compensation to become more long-term in nature and effectively reduce the inclination to manage earnings in the first place.

## 9. CRITERIA OF TRUTH

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*The final chapter discusses the reliability, replication, validity, issues, and societal and ethical aspects of the study. The practical approach is designed with thorough steps to allow easy replication, using a chosen model that is acknowledged and tested (Michelson et al., 2011). The problems faced in the course of the study are transparently discussed in order to reach a high level of credibility.*

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According to Bryman & Bell (2012, p. 45), reliability, replication and validity are vital criteria for assessing the quality of social research. These criteria ensure that the results are correct and meaningful. In our research, we have chosen already established theoretical frameworks and models using a wide variety of sources. This is something that has contributed to addressing these criteria and in this section we will delve deeper into each criteria and why we believe it has been fulfilled in this thesis. We will also present some problems we have faced in the thesis work and how we have worked to solve these.

### 9.1 RELIABILITY

In order for a study to be reliable, the results of the study have to be repeatable. Furthermore, there should not exist any measures causing inconsistency (Bryman & Bell, 2012, p. 46). In this study, the data has been exclusively gathered through Thomson Reuters Datastream. We consider this to be a reliable source of information meaning that the process of gathering data is indeed repeatable. This is one of the main perks with doing a quantitative study. Compared to a qualitative study, there is no need for interpretation, which means that the data is objective compared to the subjective data of a qualitative study.

The model we have used can be considered a proven model. It was used by Bitner and Dolan in 1996 and has since then been tested by other authors (Michelson et al., 2011). Thus, the model and design were already tested, which leads to a high reliability. One thing that would contribute to a lower reliability is the elimination of the ACCOUNT variable from the model. This will obviously cause our model to look slightly different compared to Bitner and Dolan's in 1996, even though it is based on said model. The model is also from 1996 which could cause a decrease in reliability since there might exist a need for updating the model in order to reflect for certain important events that has contributed to major changes in the market. The testing of the model was however done in 2011, which means its accuracy in detecting income smoothing is not outdated. In general, we would argue that the reliability of our study is high even though some clear problems exist.

### 9.2 REPLICATION

Replication is a further criterion rather similar to reliability. Replication refers to the ability of other researchers to replicate the study yielding similar results. An important note on replication is that the researchers must spell out their procedures in great detail, allowing for others to replicate the study (Bryman & Bell, 2012, p. 47). We believe that this criterion is fulfilled in this study since every step and use of methods has been sufficiently described in order for someone else to replicate our study.

Neither the original paper by Bitner & Dolan (1996) nor the paper testing their model by Michelson et al. (2011) went into greater detail of how the practical method worked. They did not spoon feed the reader how to go about measuring, which means we had to work hard to replicate their initial method. We have therefore tried to outline every necessary step thoroughly in our process, in order to make it easier for anyone choosing to replicate us.

### 9.3 VALIDITY

Validity is a criterion concerned with whether or not the research is sufficiently related to the actual conclusions drawn. There are three types of validity measures that will be handled separately (Bryman & Bell, 2012, p. 47).

Measurement validity is concerned with whether or not the methods are actually measuring what they are intended to measure and is related to reliability (Bryman & Bell, 2012, p. 47). Measurement validity should be high considering the model is specifically constructed to test firm value in relation to earnings management. It has been tested and scrutinized by others, confirming that the model actually measures what we intended to measure in this study (Michelson et al., 2011).

Internal validity is related to causality and asks the question if there is a causal relationship between two variables. It is related to an integral question in all correlation studies asking how one can be sure that a change in x is also responsible for a change in y and that the said change in y is not actually related to something entirely different (Bryman & Bell, 2012, p. 47). Since the models were specifically constructed to test firm value in relation to earnings management, we believe that the internal validity is acceptable, given the amount of general knowledge of what investors inspect in a firm's statements and use in their investment decisions.

External validity is related to the concept of generalizability, i.e. whether or not the results of a study can be generalized (Bryman & Bell, 2012, p. 47-48). We believe our study has a sufficiently high external validity due to our data sample being representative since it incorporated all firms that existed during the chosen time frame investigated. We have not chosen to limit our sample size but have used all firms that were ever active on the Nasdaq OMX Stockholm during the time period while of course eliminating certain firms due to reasons such as lack of data and incomparable sectors. An issue that causes the study to be less generalizable for the entire market is the exclusion of firms without R&D. R&D was one of our main concerns, and a vital variable in the model. This makes the study generalizable to Swedish firms that have research and development in their monetary spending, but not generalizable to those without.

### 9.4 ISSUES

Survivorship bias is one issue we came across. In order to reduce the risk of survivorship bias having an impact on results we have chosen to include both dead and alive firms. This means that all firm observations are included in the data regardless of whether they exist during the entire period. This led to an increasing amount of observations the closer we got to present time, suggesting a healthy growth on the Nasdaq OMX stock exchange, or in the Datastream database availability.

Due to time constraints and limit in manpower, we had to eliminate one variable from the original model. This is the ACCOUNT variable that reflects changes in accounting practices. In order to retrieve the ACCOUNT variable, one has to examine footnotes in financial statements. Investigating footnotes from thousands of annual reports would have been a rather time consuming venture. We attempted to circumvent this issue by separating the examination into periods around a collective accounting change, the IFRS-implementation.

Furthermore, certain firms had been eliminated from the sample, the main part being financial institutions. However, this is something we believe would contribute to an increase in the credibility of this paper. According to several authors, it is easier to detect the existence of earnings management in financial institutions due to the increased disclosure requirements these firms are subject to (Healy & Wahlen, 1999, p. 17; Richardson et al., 2005, p. 451). This means that investors have an easier time identifying when said firms use earnings management and thus we believe it was a wise choice excluding them from the study.

Another issue we met is that a large number of the companies in the sample did not have an R&D variable. These firms were automatically eliminated in the regressions, which caused a drastic reduction in sample size. As we covered earlier, this affected the generalizability of the study on the entire market.

A final important consideration is that by using refined data handling and statistical software we have attempted to reduce any human error that might have otherwise occurred in these procedures. This leads us to be confident in our results and we feel that we have been able to give a fair and truthful view of the problem investigated in the study yielding results that, to the best of our knowledge, should be correct.

## 9.5 ETHICAL AND SOCIETAL ASPECTS

Finally, earnings management is, as we have mentioned in section 2.5 and 3.4, subject to frequent ethical debate where some consensus has been reached that earnings management resulting in personal gains for a manager should be considered unethical (Johnson et al., 2012, p. 910-911). As we have already concluded, income smoothing can indeed be a viable corporate strategy and the question then surfaces whether or not earnings management in relation to business related goals should be considered ethical or not. Of course, this is an issue that is very hard to give an ultimate answer to since there exists so many different types of earnings management and a rather large grey zone seems to exist within the practice. Obviously, earnings management that can be defined as outright fraud is not considered ethical in any aspect, which is confirmed through the example of Enron (The Economist, 2002).

The ethical aspect of earnings management is interesting but incredibly difficult to investigate mainly due to several reasons. A qualitative study would be suitable for this kind of investigation. This creates an immediate problem where managers who might be exposed to such practices in their professional life would likely not be very interested to partake in a study and discuss it openly. The societal stigma would thus make it very hard to find any respondents for such a study, which results in disfavoring the qualitative approach. However, when using a quantitative approach, it is hard to highlight any ethical aspects of the practice as they usually occur on an individual level.

Our results found that earnings management exists on the market and, more importantly, income smoothing practices can be a viable corporate strategy in order to increase firm value. As previous researchers, we also feel rather ambiguous towards the practice of earnings management where we feel that to a certain extent it can be considered ethical. Firms using income smoothing in order to achieve smooth earnings, without it having an effect on their overall reported results during a longer time frame is something we would consider to be within the line of what is ethical. Cutting R&D expenditures in order to inflate their earnings in the short term cannot be considered ethical either, since it is a practice that has been proven to result in unfavourable performance in the longer term. Thus, we can reach a conclusion in regards to the ethical matter of earnings management, where our personal opinion is that earnings management that does not have the main objective of falsifying economic performance, can be considered ethical.

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**APPENDIX 1 – DATATYPES IN DATASTREAM**

<b>Variable</b>	<b>Worldscope Code</b>
Market Capitalization	WC08001
Total Liabilities	WC03351
Common Equity (Book Value)	WC03501
Net Income Before Extra/Preferred Dividends	WC01551
Operating Income	WC01250
Net Sales or Revenues	WC01001
Cost of Goods Sold (excl depreciation)	WC01051
Research & Development	WC01201
Long-Term Debt	WC03251
Total Assets	WC02999

**APPENDIX 2 - CORRELATIONS**

	<b>Q</b>	<b>SMOOTH</b>	<b>GROWTH</b>	<b>GM</b>	<b>R&amp;D</b>	<b>LEVERAGE</b>
<b>Q</b>	1.0000					
<b>SMOOTH</b>	0.1173	1.0000				
<b>GROWTH</b>	0.1365	0.2990	1.0000			
<b>GM</b>	-0.0216	-0.1829	0.1103	1.0000		
<b>R&amp;D</b>	-0.0715	-0.0820	-0.0704	0.0849	1.0000	
<b>LEVERAGE</b>	-0.1492	0.0365	0.0650	-0.0193	0.0127	1.0000

**APPENDIX 3 - EQUATION 1**

$$Q_i = f(\text{SMOOTH}, \text{GROWTH}, \text{MARGIN}, \text{R\&D}, \text{LEVERAGE}, \text{ASSET SIZE}, \text{INDUSTRY})_i$$

where,

$Q_i$  = the firm value for an individual firm

**APPENDIX 4 - REGRESSION OUTPUT FOR 1995-2013**

q	Coef.	Std. Err.	t	P>t	Beta
smooth2	.0801333	.0273169	2.93	0.003	.1001524
growth2	.4323681	.1183556	3.65	0.000	.1293601
gm2	.0099156	.018052	0.55	0.583	.0181243
rd2	-.0453877	.0150248	-3.02	0.003	-.0968491
lev2	-.3702982	.6199167	-0.60	0.550	-.0217537
large	-.2397017	.1893919	-1.27	0.206	-.0554826

small	.958887	.1969412	4.87	0.000	.2268575
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**APPENDIX 5 - REGRESSION OUTPUT FOR 1995-2004**

q19952004	Coef.	Std. Err.	t	P>t	Beta
smooth2	.052061	.0210082	2.48	0.014	.1581905
growth2	.1673327	.0889594	1.88	0.062	.1250555
gm2	1.789257	.3263906	5.48	0.000	.3518392
rd2	-.0048212	.0107816	-0.45	0.655	-.0255492
lev2	-1.84524	.4806195	-3.84	0.000	-.229577
large	-.2374298	.121371	-1.96	0.052	-.1403286
small	.3038334	.1785269	1.70	0.091	.1333729

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**APPENDIX 6 - REGRESSION OUTPUT FOR 2005-2013**

q20052013	Coef.	Std. Err.	t	P>t	Beta
smooth2	.103491	.0364923	2.84	0.005	.1149133
growth2	.4651603	.1587328	2.93	0.004	.122204
gm2	.0144254	.013111	1.10	0.272	.0438636
rd2	-.0529446	.0203621	-2.60	0.010	-.0990101
lev2	-.0495125	.8193181	-0.06	0.952	-.0026892
large	-.2700908	.2702038	-1.00	0.318	-.0518665
small	1.089374	.2578203	4.23	0.000	.2302894

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**APPENDIX 7 - REGRESSION OUTPUT FOR 1995-1999**

q19951999	Coef.	Std. Err.	t	P>t	Beta
smooth2	.0347379	.0241117	1.44	0.155	.1116778
growth2	.1836851	.1048741	1.75	0.085	.145269
gm2	2.494683	.4595864	5.43	0.000	.5432085
rd	-.0067668	.007756	-0.87	0.386	-.0668793
lev2	-1.765238	.8147256	-2.17	0.034	-.2400271
large	-.6718966	.1270402	-5.29	0.000	-.3805598
small	.4154844	.2920851	1.42	0.160	.1054298

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**APPENDIX 8 - REGRESSION OUTPUT FOR 2000-2004**

q20002004	Coef.	Std. Err.	t	P>t	Beta
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smooth2	.0292196	.0284378	1.03	0.306	.0827392
growth2	.197544	.1115708	1.77	0.079	.1400513
gm2	1.882388	.4677467	4.02	0.000	.3466809
rd2	-.0062776	.0188525	-0.33	0.740	-.0242749
lev2	-1.527913	.7081061	-2.16	0.033	-.1779127
large	-.3325423	.1629773	-2.04	0.043	-.193673
small	.1494913	.188003	0.80	0.428	.0740182

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**APPENDIX 9 - REGRESSION OUTPUT FOR 2005-2009**

q20052009	Coef.	Std. Err.	t	P>t	Beta
smooth2	.0809341	.0431841	1.87	0.062	.100795
growth2	.3706173	.242914	1.53	0.128	.0895576
gm2	-.2293479	.0717807	-3.20	0.002	-.1694863
rd2	.0010211	.035344	0.03	0.977	.0015079
lev2	-1.358038	1.221301	-1.11	0.267	-.0654996
large	-.0995263	.3962725	-0.25	0.802	-.017982
small	1.194697	.3734778	3.20	0.002	.2308465

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**APPENDIX 10 - REGRESSION OUTPUT FOR 2009-2013**

q20092013	Coef.	Std. Err.	t	P>t	Beta
smooth2	.0448682	.0624376	0.72	0.473	.0393594
growth2	.3196733	.1807237	1.77	0.078	.0948401
gm2	.0129419	.0105369	1.23	0.220	.0684126
rd2	-.0443316	.0212771	-2.08	0.038	-.1084354
lev2	1.605408	.9378248	1.71	0.088	.1065357
large	-.2427499	.3094434	-0.78	0.433	-.0540306
small	1.075235	.2956853	3.64	0.000	.2663295

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