Warranty Provisions

…more like Earnings Management Provision?

UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

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University
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University of Gothenburg

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Author
Kalle Wallgren (930124)

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Kalle Wallgren

School of Business, Economics and Law, University of Gothenburg, Sweden

ABSTRACT:

This thesis explores the realm of accounting disclosure concerning warranties provisions and its relation to earnings management. Provisions for warranties require estimates and judgment for future claims, resulting in an accrual that can be used for earnings management, consequently undermining the usage of financial reports. This thesis builds on prior research, asking the question if Swedish firms are using warranty provisions as a tool for earnings management. The findings of this thesis indicate that there are minor implications for earnings management in Swedish firms. This consequently calls for further research on firm specific characteristics that are associated with earnings management through warranty provisions,

Keywords: *warranties, warranty provisions, earnings management, Sweden*

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1. Introduction

One of the cornerstones concerning a purchase may be the seller's provided warranty. A warranty is explicit promise or an insurance to the buyer from the seller, guaranteeing the product in question will hold a certain quality. However, the quality aspect of accounting for warranties (e.g warranty provisions 'relation to earnings management) have barely been explored, except for Cohen, Durrough, Huang and Zach (2011), who found that US companies used warranty provisions as a tool for earnings management. The aim of this study is to replicate Cohens' et al. (2011) study, employing it in a new setting, in order to expand the literatures' knowledge about warranty provisions' relation to earnings management. Hence answering the following research question: Do Swedish firms use warranty provisions as a tool for earnings management?

To answer the research question, this thesis will employ a sample consisting of all listed firms on Nasdaq Stockholm between 2005-2016 that disclose warranty provisions in their balance sheets, proving a sample of 420 observations. The results indicate that one cannot rule out the possibility that earnings management is being used through warranty provisions in Swedish firms.

For a market to be well functioning, information needs to be symmetric among its participants. Symmetric information results in that the market's participants are not reluctant to engage and invest, since they know that they will pay a fair price for their investment. Consequently, a well-functioning market leads to an environment where capital is available, barrier to entry is reduced, information-limited risks are mitigated and competition can thrive. If on the other hand information asymmetry increases in a market, the market's fundamentals are threatened, which may lead to a more inefficient market and a possible collapse, leading to severe economic consequences among society (Akerlof, 1970; Verrecchia, 1983; Flannery, 1986). To be able to mitigate information asymmetry among the market's participants, earnings quality (e.g the usefulness of financial information disclosed in financial reports) needs to be as high as possible (Dechow, Weili & Catherine, 2010). The antagonist that jeopardizes earnings quality is earnings management (e.g when managers practice judgment in financial reports to fit their own narrative) (Hearly & Whalen, 1999). Famous cases where earnings management has consumed earnings quality are the Enron scandal in 2001 (Healy & Krishna, 2003) and the WorldCom scandal in 2002 (Sorensen & Scott, 2017).

Earnings management has been studied in various forms both before and after these major scandals, often related to different accruals in firms' financial reports such as revenue recognitions in income statements, revaluations, impairments, changes in depreciation plans, R&D expenses, administrative expenses and various provisions (Hearly & Whalen, 1999; Dechow et al, 2010; Roychowdhury, 2006; Srivastava 2019).

One provision that has barely been studied is warranty provisions and its possible association with earnings management. One reason is due to the fact that the information needed for this field was not available prior to 2003 in the US, when the Financial Interpretation No. (FIN) 45 forced the guarantor to disclose their obligations made to their guaranties (FASB, 2003).

Previously mentioned act limited the possibility for robust samples. Additionally, research on specific accruals have faced challenges concerning small samples, hence creating appeals for more overhauling research approaches according to McNichols (2000).

Firms distributing products with warranties are required to accrue a warranty expense, but only if there is a probability that the issued warranty will result in a cost and if that cost can be reasonably estimated. If it is not certain that the issued warranty will result in a cost, that cannot be reasonably estimated, firms may utilize a cash basis method, where the costs are accounted for when they occur (FASB, 2003). In most cases, firms accrue warranty expenses when selling a product, which in turn gets entered in the balance sheet as a provision for warranties (e.g a liability). Since warranties are forced on companies through various juridical means, for example Vergeront (1984) described lemon law in the US, the aforementioned provision encompasses considerable amounts in firm's balance sheets.

Since firms themselves can determine the fair value of their warranty provisions, as well as dictate (to some degree) the extent of the warranty, the question of earnings management arises. Being able to allocate provisions from an income statement, firms are able to postpone taxes for that specific year. Additionally, if the obligations for the warranties are not utilized, the provision is relocated in the balance sheet, from a liability to equity, consequently increasing the firm's solidity and affecting the valuation of the firm. Cohen et al. (2011) studied if firms' warranty provisions can be used to determine future performance, hence indicating that managers practice judgment and alter aforementioned accrual for their preferred need, rather than giving a fair representation of the business. Their findings showed that abnormal warranty expenses (e.g fluctual changes in warranty provisions) contains information for future firm performance. The lead them to conclude that US companies utilize warranty provisions as a tool for earnings management. Additionally, Cohen et al. (2011) addresses the question of why firms do not relocate huge amounts of warranty provisions at will, since it results in postponed tax, and other controllable finances. The answer lies in signaling theory. Large warranty provisions (in relation to the firm’s sales) imply that a firm's products have a high failure rate (e.g products of low quality). Low quality products can be detrimental to a firm's performance, resulting in lower sales and reduced trust from their stakeholders and investors (Spencer, 1977; Grossman, 1981; Boulding & Kirmani, 1993). Nevertheless, the option to use warranty provisions as an earnings management tool needs to be weighed against the risk of being perceived as a firm with low quality goods, something that has yet to be studied.

The Swedish context of earnings management has not been studied to a large extent. Sweden is usually incorporated into a larger European sample when it comes to studying IFRS (International Financial Reporting Standards) and its implication on Europe earnings management, as well as comparison studies between European countries' degree of potential earnings management (Leuz et al. 2003; Callao & José, 2020). Since Cohen et al. (2011) only observed US firms and due to the fact that there has not been a study outside of the US, the gap is clear concerning the knowledge on how non-US firms utilize warranty provisions in the context of earnings management. By studying whether or not Swedish firms use warranty provision as a tool for earnings management, this thesis contributes to existing account literature in four ways. First,

prior research on warranty provisions only examines US firms (Cohen et al, 2011). By examining Swedish firms, the overall concept of the earnings management through warranty provisions is broader, hence paving way for continuous research, such as the duality question of using warranty provisions as an earnings management tool, weighed against the risk of being perceived as a firm who is producing goods of low quality. Second, the results of this thesis will contribute to the ongoing debate concerning accounting differences between IFRS and US GAAP (United States Generally Accepted Accounting Principles) (Mary, Landsman, Lang, & Williams, 2012; Soderstrom & Sun, 2007; Bansal, S. 2022). Depending on the results, a debate may arise as to whether one accounting standard leavates the possibility for opportunistic behavior concerning accounting choices, consequently affecting the accounting quality within that certain standard. Third, this thesis answers the call for more specific accrual-based earnings management methods, paving way for evaluation and refinement within a field that is dominated by the more general approaches (McNichol, 2002; Dechow et al. 2010). Fourth, this thesis will take a holistic, cross-industry approach in Sweden, paving the way for more industry specific research that can utilize these results as a sounding board, as well as expanding the scope of earnings management within Sweden.

The findings of this study are relevant for accounting regulators, highlighting potential flaws and potential for opportunistic behavior that may affect the quality procedures following a specific standard. The results may additionally be of interest for legislators formulating frameworks for legal warranty constructs such as express warranty and implied warranties and their respective effect on accounting standard and accounting quality. This in turn may culminate in a more transparent and effective financial, as well as legal sector.

The structure of the thesis will be as follows: The second section will present prior research on earnings management, as well as describing the legal aspects of warranty provisions, culminating in the thesis hypothesis. The third section will go through the method of the thesis as well as present the data selection, variable definition, regression model, descriptive statistics as well as pairwise correlation. In the fourth section, the results from the regressions will be depicted with its corresponding remarks. Lastly in the fifth section, the conclusions from the results together with their limitations will be presented, with a following discussion where I will describe my thoughts and speculations concerning this thesis and its conclusions.

2. Background

2.1 Earnings Management

Hearly and Whalen (1999) published a well quoted review of earnings management that is being used even 20 years after its initial publishing. Hearly and Whalen (1999, p. 368) define earnings management as the following:

- *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.*

Hearly and Whalen (1999) recognize the relevance of studying earnings management since its occurrence undermines the trust in financial reporting and consequently jeopardizes its use. The incentives for managers practice earnings management are three-fold according to Hearly and Whalen (1999): First, financial market expectations and valuation. Second, contracts are made dependent on accounting numbers. Third, anti-trust and governmental regulations.

The will to meet market expectations and various valuation has been on researchers' agenda for many years. A concerned dimension of earnings management was elevated by Kasznik and McNichol's (2002, p 728) from a CFO article;

- *With Wall Street's earnings targets for 1998 higher than ever and investors skittish about the course of a long-running bull market, companies that miss targets, even by small margins, face unpleasant consequences in the stock market. No wonder strate- gies for nudging targets downward are about as legion as cold remedies, and seldom more reliable... A debate is brewing over how much, or even whether, companies should attempt to manage earnings expectations, and whether the strategy can really affect how the market reacts to earnings news.*

Managers are motivated to beat market expectations for a number of reasons. Kaplan (1989) studied management buyouts (MBO), where managers acquire assets or equity of the firm they already manage. As a result of acquiring stocks in the firm one manages, an incentive to underrate earnings prior to a MBO is attractive because it will likely result in a stock price decrease for the initial purchase of assets and equity, which is directly correlated with the actual valuation of the firm (Kaplan 1989; Hearly & Whalen, 1999). Where underrating earnings becomes attractive is in the case of MBO's, overrating earnings gets attractive in the case of initial public offerings (IPO) and Mergers and Acquisitions (M&A) that is finance with equity and/or equity swaps. In these cases, the price of equity is directly correlated to the amount of liquid assets received in the IPO, or the purchasing power in an M&A (Lambkin & Muzellec, 2010; Hearly & Whalen, 1999; Verbruggen, Christiaens & Milis, 2008).

A broader spectrum of market expectations was studied by Bhojraj, Hribar, Picconi, and Mcinnis (2009). They saw that firms that barely beat expectations with low quality earnings (e.g suspected earnings management through accrual alterations or reducing discretionary expenses like R&D and administration) actually were traded at a premium on the stock market, in relation to comparable firms. An exception from Bhojraj's et al. (2009) findings was a study by Gleason and Mills (2008) where the authors found that firms that beat expectations by mitigating taxes did not trade for a premium in contrast with comparable firms. Hence Gleason and Mills (2008) argues

that investors are more aware of tax implications, compared to alteration on accruals. However, the myopic actions that were shown by Bhojraj et al. (2009) were only profitable for a 3-year period. After the initial years, the premium started to decrease severely. Bartov Givoly and Hayn (2002) found similar results, hence concluding that the market does not view overreacting targets as erosion of firms' actual performance. Consequently, both Bhojraj et al. (2009) and Bartov et al. (2002) state that this myopic behavior destroys value over time, since projects with a positive net present value, that might decrease earnings over a short period of time might be neglected, in order to create short term profits. With that said, in this context a study from Kasznik and McNichols (2002) needs to be mentioned. They observed that firms that regularly beat market expectations had a higher valuation, compared to those that only did it on an ad-hoc basis. To what extent the firm beat the expectations was not mentioned by Kasznik and McNichol's (2002) study, which would have been interesting in the context of Bhojraj et al. (2009), who saw a decrease over a 3-year period. However, this contrast highlights that beating market expectations has a multitude of dimensions to it. For it to be successful, one needs to do it regularly according to Kasznik and McNichol's (2002), and one needs to do it with margin, according to Bhojraj et al. (2009).

The explanation for managers' myopic behavior is usually explained that their compensations are tied to firms' performance and stock valuations. Since these positions are rotated within firms, incentives to maximize profit under one's own terms are elevated. This also leaves future performance issues to future replacements (Ronald, 1988; Guidry, Leone & Rock, 1999; Cornett, Alan, & Hassan, 2008). Another explanation is highlighted by Hearly and Whalen (1999), in that managers try to beat market expectations in order to receive recommendations from investors whether told to hold, sell or buy a stock.

Anti-trust and market regulations have also been shown to create incentives for earnings management, usually in relation to avoiding taxes (even if this were proven to be detrimental according to Gleason and Mills (2008) based on a variety of regulatory aspects imposed by politicians (Lenka, 2021). These regulations are mostly industry specific. Usual examples can be seen from the banking and insurance industry, where firms need to fulfill various capital structure requirements. If there are yields to be made that deviate from these capital structures, motive for earnings management arises (Hearly & Whalen, 1999; Dechow et al. 2010). Additionally, managers that operate in firms vulnerable to anti-trust investigations or other varieties of political/controversial repercussions also have incentives to manage earnings, in order to avoid controversial spotlight (Hearly & Whalen, 1999).

Jiraporn et al. (2008) found that firms engaged in corporate social responsibility (CSR) activities are less prone to practice earnings management. Jiraporn's et al. (2008) findings indicate that firms with higher CSR focus tend to be less prone to maximize profit, and since earnings management, according to Jiraporn et al. (2008), is characterized by firms who profit maximize, the same incentives do not apply to firms more skewed to CSR. Another example of firms that tend to not practice earnings management is depicted by Maglio et al. (2020). Their results show that diversity at firm boards reduces managers' practice of earnings management, though the reason for it is still unexplored.

At this point, it is of interest to highlight the investors relation to earnings management. As mentioned earlier, Gleason and Mills (2008) found that investors tend to notice alteration in firms' reports concerning taxes and hence account for that when deciding on an investment. However, Abarbanell and Reuven (2003), as well as Burgstahler and Eames (2003) show that investors tend to disregard, or rather simply not detect or anticipate the notion of earnings management. One of the explanations for this wide-eyed behavior may be explained by Libby, Hunton, Tan and Seybert (2008). They show that analysts tend to have a bias when it comes to issuing their forecast. In some cases valuing the relation they might have with brokers and investment banks, In pursuit f personal benefits. Hence disregarding potential earnings management in the beginning of their forecasts. However, double down at the end of their forecast when they can not disregard what is actually being disclosed.

2.2 How to Manage Earnings

The question now becomes how managers manage earnings. Researchers usually categorize earnings management in two separate categories, accrual-based earnings management and real earnings management (Cohen & Paul, 2010). Real earnings management is when the actual business is influenced in order to meet or beat short term financial goals. Accrual based earnings management on the other hand does not change the actual business, but rather how it is depicted in the financial statement, such as over or undershooting warranty provisions. (Cohen et al. 2011; Cohen & Paul, 2010). Real earnings management is less researched due to the lack of disclosed information about firms' daily business procedures, while accrual-based earnings management is the backbone of all financial statements produced by the firm. Since this paper will only focus on accrual-based earnings management, a more fundamental understanding for how it is practiced is required. According to Hearly and Whalen (1999), accrual-based earnings management is mostly done through changing depreciation plans, utilization of various provisions and deferred tax valuation allowances. For example, banks have altered and changed provision for bad loan estimates, also known as a "Cookie Jar" (e.g a sources of income from previous quarters that is capitalized in future quarters) to boost earnings, or capitalizing those losses in order to do a "Big Bath" (e.g saving up large amount of losses and capitalized them all at the same time, giving the company a clean slate concerning future losses) (Hearly & Whalen, 1999). Dechow et al. (2010) takes a more "modern" approach labeling similar methods earnings smoothing, earnings timeliness and target beating. Roychowdhury (2006) and Srivastava (2019) adds to Dechow et al. (2010) methods of earnings management by studying abnormal R&D expenses that capitalizes within a varying time period, consequently moving earnings between quarters. Lastly, Roychowdhury (2006) adds that the same practices that were done with R&D expenses can be done by altering administrative expenses.

2.3 Earnings Quality

Earnings management has been a popular research field due to the fact that it undermines and dilutes earnings quality. In a classic paper from George Akerlof, price taker of "The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2001", Akerlof (1970) explains that incomplete information leads to an inefficient market that harms all its participants in the short term and renders the market almost useless in the long term. Dechow et al. (2010, p 344) defines earnings quality as:

- *Higher quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker.*

Hence, high earnings quality ensures that the information provided in the financial reports is useful for its end-users. Dechow et al. (2010) highlight that the definition of earnings quality only dictates high quality based on the user's perceived utility, which in turn makes earnings quality as a problematic subject to measure. Due to the aforementioned problem, earnings quality relies on a plethora of proxies to be studied (Dechow et al. 2010). One way to quantify the aforementioned elusive definition is to define the variations in firms' earnings as the degree for earnings quality in accordance with Beyer et al. (2019). Isam et al. (2020) builds on Beyer et al. (2019), showing that earnings quality does in fact provide data concerning accounting misstatements. By measuring accounting quality, the usefulness of the provided financial information can be dictated, which has been shown to correlate with higher returns for firms (Pietro & Wagenhofer, 2014). The reason is explained by that higher quality means lower fluctuation in return. Consequently leading to more confidence for investors. Affirmation statement gets elevated by Bhojraj et al. (2009) who showed that fluctuations in earnings did have a negative effect on investors confidence with that specific firm, at least when it comes to barely beating market expectations.

Earnings quality is mostly studied with its antagonist earnings management in order to shed light on the importance of usefulness of accounting information. In cases such as Sweden and the US, most large firms' financial statement are reviewed by a big four accounting firm (EY, KPMG, PWC or Deloitte) which, as concluded by Becker, Defond, Jiambalvo and Subramanyam (1998) is to be associated with a higher degree of account flexibility, since the expertise resulted in a higher degree of utilizing existing frame work, resulting in lower account quality.

2.4 Research methods for earnings management

Earnings management has been moderately problematic to study over the last decades, similar to earnings quality. Dechow et al. (2010) recognize that unexpected accrual changes have acted as proxies for earnings management research for decades, since firms do not disclose their earnings management. According to Srivastava (2019), a problem arising from being dependent on proxies is that the proxies may correlate with pure business practices of the examined firms, consequently

failing to measure earnings management, but rather standard business practices. In a review of earnings management research designed by McNichols (2000), she also finds that the overlapping of these proxies with standard business practices might have been higher than expected in published research between 1993-1999, calling for more robust methods of measuring earnings management. Within the research field of earnings management, there are three recognized models; Aggregate Accruals models, Specific Accruals models and those based on the distribution of earnings following management (McNichols, 2000; Dechow et al. 2010).

The Aggregate Accruals model is the most predominant one. 45,3% of published research in The Accounting Review, Contemporary Accounting Research, Journal of Accounting and Economics, Journal of Accounting, Auditing and Finance, Journal of Accounting and Public Policy, Journal of Accounting Research, Journal of Business Finance and Accounting and Review of Accounting Studies concerning earnings management prior to the period between 1990 and 1999 used the aggregated accruals model. The model was first introduced by Jones (1991) where she wanted to investigate if managers altered their financial reporting in the case of increased tariffs in the US. Jones (1991) based her model on the (for the time) modern DeAngelo (1986), where earnings management was measured based on the number of used accruals, also called unexpected accruals by Hearly and Whalen (1999). Instead of measuring the number of accruals, Jones (1991) proposed a model where discretionary accruals plus an error term (omitted variables and idiosyncratic variation) equals a proxy for discretionary accruals (e.g earnings management). Culminating in a holistic approach to the studied firm's accruals and their fluctuation. Critics of this method, comes from McNichols (2000) where she states that Jones (1991) do not consider how accruals and their fluctuation behave in the absence of earnings management, thus giving further legitimacy to Srivastava (2019) criticism of the research design's validity. McNichols (2000) additionally states that researchers are missing knowledge of what actually makes accruals fluctuate, and further questions the Jones model and the aggregate accruals approach.

Another school of earnings management models is the one developed by Dechow and Dichev (2002). The researchers tried to distinguish unintentional errors from internal errors in order to find earnings management. By calculating abnormal accruals, derived from changes in working capital, divided in in time, the authors could show that longer operating cycles, sales, cash flow and accrual volatility resulted in lower accrual quality, e.g earnings management. Their model deviates from Jones (1991) that it compares the accruals in relation to working capital and its ability to generate cash flow, conceptualize the setting of the accruals. However, one shortcoming of the model that Dechow and Dichev (2002) themselves highlights is that the model is based on assumptions of future cash flow, since it observes the residuals from their regression on change in working capital, related to future cash flow.

Lastly, the specific accruals models focus on a single or few accruals, in order to derive possible earnings management. Contrary to the aggregate accruals model, which is largely based on Jones (1991), there is no consensus regarding a specific accrual model. Nevertheless, Marquardt and Wiedman (2004) studies the use of specific accruals in order to manage earnings based on motives concerning MBO's and IPO's. Petroni (1991) provides a similar study on banks and their

bad-loans provision. Petroni (1991) as well as Marquardt and Wiedman (2004) finding suggests that specific accruals contain information of earnings management and that it needs to be studied further. Which get additional sympathy from Hearly and Whalen (1999) and McNichols (2000).

2.5 Jurisdictional Aspect of Warranties

Law practitioners differentiate types of warranties through express warranty and implied warranty (Gomulkiewicz, 1997; Haskell, 1965; Sidney, 2010). An express warranty is the guaranties your typical retailer provides you with when you buy a charger for your tablet or a pair of headphones. It usually promises the buyer that if their products fail during the first or second year of usage, the buyer will be compensated with a new product. This type of warranty is not enforced by law by default. Instead, it gains legal legitimacy when (and only) if the seller provides a guarantee promise to the buyer, also known as express warranty. Implied warranty on the other hand, is enforced by the law and arises due to the nature of the transaction. Therefore, it is a guarantee that the buyer receives, regardless if the seller has promised a warranty or not. In the US, implied warranty is regulated by the second article of the Uniform Commercial Code. In Sweden, implied warranty is regulated by a dispositive law (e.g Köplagen), while the express warranty is regulated by a non-dispositive law (e.g Avtalslagen).

2.6 Warranty Provisions

Cohen et al. (2011) are the only researchers that have studied the extent of provision for warranty usage in an earnings management context, however their proxies for earnings management have been used in a working paper by Lu and Wang (2009), though in the context of predicted earnings. Prior research on warranty provision has been mainly focused on the signal that high warranty expenses meant for stakeholders. Spencer (1977) and Grossman (1981) stated that lower warranty expenses in a firm's balance sheet would signal that their products were of a high quality. Consequently ensuring customers that the intended use of their purchase would be met. Spencer (1977) and Grossman (1981) additionally stated that disclosure of firms' warranty provisions would mitigate information asymmetry between consumer and producer and reduce adverse selection.

However, Cohen's et al. (2011) study derived from prior studies by placing warranty provisions in a new context. They recognized the size of provision made from sales (1.4% of total sales and 11% of operating income in the sample) and questioned how the stock market values these provisions. Additionally, since warranty provisions had yet not been studied in the context of earnings management, and that authors recognized that these provisions may invite opportunistic behavior, they created a proxy for earnings management, based on warranty provisions.

Their assumption for earnings management was based on the fact that the warranty accruals were estimated based on the firm's own conjectures of future claims. These conjectures were drawn for the fact that warranty expenses should rationally move proportionally to the variation in sales,

e.g if sales increase, so should the warranty expenses and vice versa. To account for changes in product quality that may result in fluctuating warranty expenses that skews the sample, Cohen et al. (2011) observed the aggregated change over time in the relation between sales, warranty provisions and total assets.

Cohen's et al. (2011) results indicated that US firms use warranty provisions for earnings management, bringing up to date the question of how earnings management is being used when there are incentives and a framework allowing for it to occur. Additionally, the authors acknowledge their limited setting in which their study is taking place (e.g solely US firms), hence raising the question of how their method would work in another setting, when it comes to probing for earnings management through warranty provisions.

2.7 Hypothesis Development

Research concerning Sweden and potential earnings management is scarce. One of the only studies available is provided by Callao and José (2020) who found that European firms (Sweden was included in their sample) who adopted IFRS saw an increase in earnings management. Concerning warranties and their relation to earnings management the knowledge is non-existing. Since the majority of research focuses on US-GAAP regulated firms, as can be seen by Petroni (1991); Marquardt and Wiedman (2004); Cohen et al. (2011); Lu and Wang (2009); Roychowdhury (2006); Srivastava (2019), a Swedish, IFRS setting will allow for a larger research gap to be explored.

Prior research has given a multitude of reasons for firms to practice earnings management. Beating analysts' forecasts and beating market expectations, being able to raise additional capital, being in a position for purchasing equity with a discount and have individual managers compensation based upon firms' performance makes for a strong foundation when it comes to motives (Hearly and Whalen, 1999; Kasznik & McNichol's, 2002; Roychowdhury, 2006; Srivastave, 2019; Verbruggen, Christiaens & Miles, 2008; Lambkin & Muzellec, 2010). Furthermore, since investor tend to not care about potential earnings management, except in cases of tax avoidance and marginally beating the market (Gleason & Miles, 2008; Abararell & Reuven, 2003, Burgstahler & Eames, 2003), repercussions in a Swedish setting should not deviate from what prior research has shown.

Additionally, the leeway given by express warranty in structuring warranty plans, in conjunction with firm's option to estimate the fair value of their warranty provision, do consequently not pose additional restriction when it comes to practice earnings management in a Swedish setting through warranty provisions.

Finally, building on the finding from Cohen et al. (2011) that showed warranty provision containing information of future firm performance culminating in that warranty expenses should be associated with firms' performance in a Swedish setting.

Hence the following hypothesis:

H0: Swedish firms do not use warranty provision for earnings management.

3. Methodology

3.1 Data Description

Since this thesis aims to investigate whether Swedish firms use warranty provisions as a tool for earnings management, the sample will consist of all listed firms on Nasdaq Stockholm during the years 2005-2016. The year 2005 is set as the starting year since that was when IFRS was introduced in Sweden, going prior to that year would cause endogeneity within the sample. Due to the fact that more data has been generated since Cohen's et al. (2011) study, this thesis will span a broader time period, hence adding a longer time period aspect to the method. Additionally, the end year will be 2016 in order to have consistent data concerning revenue recognition, based on the shift to IFRS 15 for Swedish firms in the years to come (IASB, 2014). The initial search yielded 379 unique firms with 2,903 observations. After excluding firms within the financial sector, in accordance with Cohen et al. (2011) (e.g banks, investment firms, insurance companies) 344 firms remained with 2,645 observations. The remaining firms were then matched against financial data from DataStream. 13 of the 344 firms had no financial data, resulting in them being excluded from the sample, with 331 firms and 2,514 observations, spanning over 12-year period. Of the 2,514 remaining observations, 549 were incomplete concerning information of provisions. Lastly, this resulted in a manual collection through Retriever Business for the remaining data. After the manual collection of data, firms without warranty provision and non-applicable data were excluded from the sample, leaving 420 observations for 41 firms

Table 1: *Sample composition*

	Number of firms	**Firms' observations**
Original file	379	2903
Remaining firms after excluding all firms within the financial sector.	344 (35)	2645 (258)
Remaining firms with missing financial data in Data steam.	331 (13)	2514 (131)
Remaining firms after excluding firms without provisions for warranties (e.g Warranty provisions and Claims),	41 (289)	420 (2094)
Total number of observations:	41	420

Table 1 provides a detailed breakdown of the sample's exclusions and its numeric impact on the samples as a whole. It also details during which stage exclusions were introduced. The exceptions are depicted as numbers in the parentheses, while remaining firms/observations are resided in the number above the parentheses.

3.2 Variable Definitions

The central independent variable, acting as a proxy for earnings management in this study is abnormal warranty expenses (ABWEXP), which is directly drawn from Cohen et al. (2011). The fundamental assumptions for ABWEXP are that warranty provision should move proportionate to the sales of a firm. If sales increase, then the amount of provisions related to warry should increase, because the firms should have an increase in future warranty related issues. Additionally, if the firm's decrease their sales, a decrease in warranty provisions should be accounted for, since the amount of future warranty related issues should decrease. In order to account for interferences that may arise for changes in the firm's capital structure, the quote derived from warranty expenses and sales will be divided with the total assets for the prior year, in accordance with Cohen's et al.

(2011). Noteworthy is that this thesis will make a minor deviation from Cohen's et al. (2011) definition of ABWEXP and utilize yearly data, instead of quarterly, due to data availability. Additionally, since this thesis, 11 years later, has access to a longer array of data, it will draw upon this opportunity and cover a longer time period. This resulted in the following definition of ABWEXP;

$$ABWEXP_{i,t} = \frac{(WEXP_{i,i} - WEXP_{i,t-1}) * \frac{Sales_{i,t}}{Sales_{i,t}}}{\mathrm{TA}_{i,t-1}}$$

As mentioned before, ABWEXP is the proxy for earnings management. WEXP stands for warranty expenses. Sales equals the yearly revenue. TA stands for total assets in the firms' balance sheet. *i* represent firm and *t* represents the year.

In addition to AWEXP, Cohen et al. (2011) further adds two additional "abnormal" variables to their research model AMCLAIM and AMGM. These variables are calculated in the same manner as ABWEXP, implying that claims fall under the same assumption as the warranty reserve, in that it should move proportionately with the sales of the firm, in regard to the total assets. The same goes for the gross margin. After the variables are calculated, winzoriade is done with a 1% and 99% interval in order to clear up any extreme values.

ABCLAIM is predicted to have a negative coefficient, since it is meant to control for product quality. Higher claims on warranty should imply reduced quality and therefore reduced profitability. ABGM should also control for product quality since higher quality products tend to have higher margins in relation to lower quality products. SALES_GR is expected to have a positive coefficient due to its natural strong relation to profitability (Cohen et al, 2011).

$$ABCLAIMS_{i,t} = \frac{(Claims_{i,i} - Claims_{i,t-1}) * \frac{Sales_{i,t}}{Sales_{i,t}}}{\mathrm{TA}_{i,t-1}}$$

$$ABGM_{i,t} = \frac{(GM_{i,t} - GM_{i,t-1}) * \frac{Sales_{i,t}}{Sales_{i,t}}}{\mathrm{TA}_{i,t-1}}$$

$$SALES\_GR_{i,t} = \frac{SALES_{i,t}}{SALES_{i,t-1}}$$

In addition to aforementioned variables, Cohen et al. (2011) include 3 more independent variables into their research model. The first one is Sales_GR, which should be positively related to the dependent variable (e.g ΔROA), since these two measurements have been shown to persist in the long run (Cohen et al, 2011). The second is BM, which should have a negative relation to ΔROA because the larger a firm is, the harder it should be for them to become more profitable in the long run (Cohen et al, 2011). Size is the last variable, Cohen et al (2011) do not make any predictions whether this variable will have a positive or a negative relation to ΔROA. I will speculate that it will have a negative relation with ΔROA because the stock market may tend to

favor firms with future ahead growth opportunities and high dividend, which is not reflected in the measurement of ΔROA.

Table 2: *Variable definitions*

Variable	***Variable Label***	***Definition [source: code]***
ABWEXP	*Abnormal Warranty Expenses*	*The difference of warranty expenses in firm i of the year t and warranty expenses of the same firms in year t-1. Multiplied with the quotient sales in firm i, in year t and year t-1. Divided with total assets of firm i in year t-1.*
ABCLAIMS	*Abnormal Claims*	*The difference of claims in firm i of the year t and claims of the same firms in year t-1. Multiplied with the quotient sales in firm i, in year t and year t-1. Divided with total assets of firm i in year t-1.*
ABGM	*Abnormal Gross Margin*	*The difference of gross margin in firm i of the year t and gross margin of the same firms in year t-1. Multiplied with the quotient sales in firm i, in year t and year t-1. Divided with total assets of firm i in year t-1.*
SALES_GR	*Sales Growth*	*Rev of firms i in year t, divided with sales of firms i in year t-1 [DS: WC01001]*
WEXP	*Warranty Expenses*	*Total Expenses for provisions for warranties. [Annual reports]*
Claims	*Claims*	*Total Claims. [Annual reports]*
GM	*Gross Margin*	*Net profit Margin. [DS: WC08366]*
Sales	*Revenue*	*Revenue. [DS: WC01001]*
TA	*Total Assets*	*Total Assets. [DS: WC07230]*
ROA	*Return on assets*	*Revenue divided by total assets. [DS: WC08326]*
BM	*Book-to-market*	*Firms' assets – liabilities, divided by the firms' market capitalization. [DS:* WC08326)
Size	*Size*	*Balance sheet total. [DS: WC07230]*
i	*Firm*	*Chosen firm.*
t	*Year*	*Intended year.*

Table 2 provides an orderly presentation of this thesis variables. Additionally, the table provides the data sources for each variable drawn from data steam (Universität of Bern, 2017). Additionally, TA (total assets) will be logarithmized. Additional descriptive statistics for the variables used in the regression analysis will be provided in Table 3: Descriptive Statistics, while their crosswise correlation will be described Table 4: Correlation Matrix

3.3 Regression Model

In order to answer if warranty provisions are being used for earnings management, Cohen et al. (2011) suggests testing if warranty provisions serve as an indicator for future performance. The method is executed through employing a measurement for change in profitability, ΔROA (e.g change in return on assets) as a dependent variable in a panel data regression. Aforementioned proxies are then regressed on ΔROA, which will be the case in this thesis as well.

Cohen et al. (2011) dependent variables are the change in ROA for current quarter (e.g ΔROA_t) and the change in ROA for the next quarter (e.g ΔROA_{t+2}). Since this thesis will test yearly data and not quarterly data, a slightly different dependent variable will be used to regress on. The first regression is preformed on the change in ROA for year t in firm i (called ΔROA_t). Secondly, second regression regresses on the change for the coming year (called ΔROA_{t+1}). Lastly, the final regression will regress on the change in ROA the following 2 years (called ΔROA_{t+2}). By employing this longitudinal approach this thesis is able to analyze a longer time period that Coen et al. (2011) were able to. Additionally, regressing on multiplied changes on ROA may captivate lagging effects from warranty provision on a firm's profitability. Additionally, fixed effects will be added in order to get a more robust result. Fixed effects for year and for the individual firm will be added. Finally, prior reasoning yields the following research model:

$$\Delta \mathrm{ROA}_{i,t} = \Delta\beta_0 + \beta_1 \mathrm{ABWEXP}_{i,t} + \beta_2 \mathrm{ABCLAIMS}_{i,t} + \beta_3 \mathrm{ABGM}_{i,t} + \beta_4 \mathrm{SALES\_GR}_{i,t} + \beta_5 \mathrm{Size}_{i,t} + \beta_6 \mathrm{BM}_{i,t} + \varepsilon_{i,t}$$

ΔROA stands for the change in return on asset for firm *i* in year *t*. ABWEXP stands for the abnormal warranty expenses for firm *i* in year. ABCLAIM stands for the abnormal claim for firm *i* in year. ABGM stands for the abnormal gross margins for firm *i* in year. SALES_GR stands for the sales growth for firm *i* in year. Size stands for total assets for firm *i* in year. Lastly, BM represent the market-to-book ratio for firm *i* in year.

3.4 Descriptive Statistics

Table 3 depicts the descriptive statistics for the whole sample. The mean value for ABWEXP is positive, with a value of 0.01778, with a corresponding median of 0.0036. The standard deviation for ABWEXP is 0.0821 and ABWEXP's minimum value is -0.1372, with a respective maximum value of 0.2607. ABCLAIM have a lower mean compared to ABWEXP, residing on 0.0002 and a median of 0.00007. ABCLAIM's standard deviation is 0.0013. Lastly, ABCLAIM's minimum value is -0.0014 and its maximum value resides on 0.0070. ABGM has an even lower mean of 0,0001 and a similar median as ABCLAIM of 0.0000. The standard deviation resides on 0,0009, consequently resulting in a similar spread between the minimum value and maximum value as ABCLAIM of -0.0058 and 0.0065. Sales_GR has a significantly higher value. Its mean resides on 1,0816, with a median of 1.0613. This results in a positively skewed sample. Standard deviation is higher compared to previous "abnormal measurements", residing on 0.2223 with a minimum

value of -0.0058 and a maximum value of 2.1395. Size's mean is 14.6642 with a median of 14.2870, once again resulting in a positively skewed sample. Standard deviation is 2,1172 and the min value resides on 0.2238 and the max value is 19.3328. BM has a mean of 2.9832 and median of 3.0165, resulting in a negatively skewed sample. The standard deviation resides on 3.4539, with a minimum value of 0.2500 and a max value of 34.860.

Table 3: *Descriptive Statistics*

	Obs.	Mean.	Median.	Std. Dev.	Min	Max
ΔROA	412	-0.0041	-0.0016	0.1297	-0.4764	0.5152
ABWEXP	420	0.0178	0,0036	0.0821	-0.1372	0.2607
ABCLAIM	420	0.0002	0.0000	0.0013	-0.0014	0.0070
ABGM	419	0.0001	0.0000	0.0009	-0.0058	0.0065
Sales_GR	420	1.0816	1.0613	0.2223	-0.0058	2.1395
Size	420	14.6642	14.2870	2.1772	0.2238	19.3328
BM	405	2.9832	3.0165	3.4539	0.2501	34.8602

Table 3 provides an overview of the descriptive statistic of the dependent variables, as well as the independent variables. "Obs." stands for number of observations. "Std.Dev" stands for standard deviation. Min. and Max. stands for the variables minimum value and its maximum value. All variables are winzoriade with 1%, in order to mitigate the impact of potential extreme values. Additionally, all variables have been rounded up to 4 decimals.

3.5 Correlation Table

Table 4 presents the correlation table of the variables used in the regression model ABWEXP as positive correlation with ΔROA, though not significant. ABCLAIM has a negative correlation with ΔROA and a negative correlation with ABWEXP. Both correlations are not significant. ABGM has a positive correlation with ΔROA, and negative correlations with ABWEXP and ABCLAIM. As in the last case, these correlations are not significant. Sales_GR has a significant positive correlation with ΔROA of 0.1978, which was to be expected due to Cohen's et al (2011) prediction that these two measurements have shown to persist in the long run. Additionally, Sales_GR has a positive, non-significant correlation with ABWEXP and ABBGM, and a negative non-significant correlation with ABCLAIM. BM has a negative non-significant correlation with ΔROA and ABCLAIM, and a positive, non-significant correlation with ABWEXP. However, BM have a

significant negative correlation with ABGM of -0.1357, indicating that firms in this sample with a high market-to-book ratio have lower margins. Additionally, BM also has a positive correlation of 0.2440 with Sales_GR. Indicating that firms within the sample have with high market-to-book ratio have been able to increase their sales numbers. Lastly, Size has positive, non-significant correlations with ΔROA and ABWEXP. While negative non-significant correlation with ABGM. However, Size has a significant positive correlation with ABCLAIMS of 0.1366. Indicating that firms within the sample's size do experiment higher abnormal claims. Size also has negative, significant correlations with Sales_GR (e.g -0.1112) and BM (-0.1625).

Table 4: *Correlation Matrix*

	ΔROA	***ABWEXP***	***ABCLAIM***	***ABGM***	***Sales_GR***	***BM***	***Size***
ΔROA	**1,000**						
ABWEXP	**0.0246**	**1.0000**					
	0.6189						
ABCLAIM	**-0.0088**	**0.0226**	**1.0000**				
	0.8585	0.6448					
ABGM	**0.0583**	**-0.0090**	**-0.0053**	**1.0000**			
	0.2385	0.8547	0.9133				
Sales_GR	**0.1978**	**0.0136**	**-0.0462**	**0.0091**	**1.0000**		
	*****	0.7807	0.3449	0.8527			
	0.0001						
BM	**-0.0009**	**0.0657**	**-0.0354**	**-**	**0.2440***	**1.0000**	
	0.9862	0.1871	0.4777	**0.1357***	0.0000		
				0.0063			
Size	**0.0138**	**0.0614**	**0.1366***	**-0.0862**	**-0.1112***	**-0.1625***	1.000
	0.7804	0.2092	0.0050	0.0780	0.0227	0.0010	

*Table 4 shows all variables crosswise correlation that have been used in the regression analysis. The correlation coefficient is written with bold numbers, while the underlying numbers represent the t-test. For detailed definitions for respective variable, refer to Table 2: Variable definitions. For descriptive statistics for each variable, refer to Table 3: Descriptive Statistics. Lastly, *, **, *** represents statistical significant at the 10%, 5% and 1% level.*

4. Results

4.1 Regression Analysis on ΔROA_t

Table 5 presents the results from the first set of regressions, comparing the change in ΔROA_t in year t and in firm i. Column (1) shows the results when ABWEXP solely regress on $\Delta ROA_{t.}$ Column (2) shows the results including year fixed effects when ABWEXP on ΔROA_t. Column (3) shows the same regression as the other two but includes fixed effects for both year and firm. Colum (4) includes all other variables that were excluded from column (1), column (2) and column (3) (e.g ABWEXP, ABCLAIMS, ABGM, SALES_GR, BM and SIZE), excluding fixed effects for both year and firm. Column (5) shows the same regression as in column (4) but included fixed effects for year. Lastly, column (6) includes year and firm fixed effects.

Drawing from table 5, Sales_GR (e.g sales growth) is the only independent variable that has a significant coefficient of 0.1253, with a p test 2.48. When controlling for year fixed effects, Sales_GR still has a positive coefficient of 0.1226 that is significant with a p test of 2.42. Adding the fixed effects for firms lowers the p test for Sales_GR, bringing down the score to 1.68, rendering it insignificant. ABWEXP (e.g abnormal warranty expenses) in ΔROA_t have a positive coefficient of 0.0416 and a t-test of 0.54. Which makes it non-significant. Including fixed effects for year do increase the coefficient of ABWEXP to 0.0471 as well as increasing its p value to 0.66. Finally, when adding fixed effects for year and firm, ABWEXP's coefficient changes trajectory to -0.0032 with a p value of -0.03. These findings deviate from Cohen's et al. (2011) findings in that they found a significant positive coefficient of ABWEXP to $\Delta ROA_{t.}$

ABCLAIM (e.g abnormal claims) in column (4) have a negative coefficient of -0.4399 with a p value of -0.65. ABCLAIM's trajectory changes when adding fixed effect for year, landing on 0.7030 with a p value of -0.43. The trajectory stays the same in column (6) but decreases to 0,0858 with a p value of 0.03. Even in this case, my findings deviate from Cohen's et al. (2011) in that they find a significant negative relation between ABCLAIM and $\Delta ROA_{t.}$

ABGM (e.g abnormal gross margins) have positive non-significant coefficient on ΔROA_t with a coefficient of 7.4246 and a p value in column (4). When including fixed effect for year, ABGM coefficient increases to 8.8077 with an increases p value of -1,05. However ABGM is still non-significant when considering fixed effects for year. In column (6), ABGM's coefficient increases to 10.2234 while its p value decreases to 0,95, rendering it non-significant for all regression on ΔROA_t. As the results for ABWEXP and ABCLAIM, ABGM results do also deviate from Cohen's et al. (2011) results in that they found a significant negative relation between ABGM and $\Delta ROA_{t.}$

BM (e.g market-to-book) follows a reversed patch as to ABGM. Its coefficient increases decreases from column (4) to column (5) where fixed effects for year is added, consequently going from a coefficient of -0.0015 and a p value of -0.84 to a coefficient of -0.0020 and a p value of -1.20. When controlling for year and firm fixed effects in column (6), the coefficient increases to -0.0002 with a t-test of -0.04. The results are somewhat in line with Cohen's et al. (2011) in that

the trajectory of BM's coefficient are negative, however this thesis cannot say that the trajectory is significant, as was the case with Cohen et al. (2011).

Size (e.g total assets) had a positive coefficient of 0.0018 and a p value of 1.17 when not controlling for year nor firm. When controlling for year fixed effects, the coefficient decreases slightly to 0.0015 with a lower p value of 0,94. When including fixed effects for both year and firm, the trajectory for the coefficient changes to negative, resulting in a coefficient of -0.0294 with a p value of -0.99. Cohen et al. (2011) did not find a significant coefficient when not controlling for fixed effects, as was the case in this thesis. However, when Cohen et al. (2011) controlled for year (in their case quarter instead) they found a negative coefficient of on ΔROA_t, as once again, was not the case in this thesis.

Table 5: *Regression Analysis on ΔROA_t.*

Variables	**ΔROA_t** (1)	**ΔROA_t** (2)	**ΔROA_t** (3)	**ΔROA_t** (4)	**ΔROA_t** (5)	**ΔROA_t** (6)
$ABWEXP_{i,t}$	0.0385	0.0476	0.0229	0.0416	0.0471	-0.0032
	(0.50)	(0.68)	(0.25)	(0.54)	(0.66)	(-0.03)
$ABCLAIM_{i,t}$	-	-	-	-0.4396	0.7030	0.0858
				(-0.65)	(-0.43)	(0.03)
$ABGM_{i,t}$	-	-	-	7.4246	8.8077	10.2234
				(0.92)	(1.05)	(0.95)
$Sales\_GR_{i,t}$	-	-	-	0.1253**	0.1226**	0.1344
				(2.48)	(2.42)	(1.68)
$BM_{i,t}$	-	-	-	-0.0015	-0.0020	-0.0002
				(-0.84)	(-1.20)	(-0.04)
$Size_{i,t}$	-	-	-	0.0018	0.0015	-0.0296
				(1.17)	(0.94)	(-0.99)
$Constant_{i,t}$	-0.0047	-0.2388	-0.3012	-0.1629**	-0.1909**	-0.1933**
	(-1.44)	(-1.02)	(-1.14)	(-2.54)	(-2.54)	(-2.53)
Year FE	No	Yes	Yes	No	Yes	Yes
Firm FE	No	No	Yes	No	No	Yes
R^2	0.0006	0.0396	0.0916	0.0468	0.0814	0.0284
N	412	412	412	396	396	396

*Table 5 provides the regression results that tests the thesis hypothesis. Column (1) depicts the model when ABWEXP solely regress on ΔROA_t without any fixed effects. Column (2) and (3) includes year, as well as year and firms fixed effects. Column (4) include all variables without any fixed effects. Column (5) and (6) includes year, as well as year and firms fixed effects. A comprehensive description on all variables used in table 5 can be obtained from table 2. Year FE represents the year fixed effects, while firm FE represent each firms's ISBN number. The independent variables are winsorized at the 1% and the 99% distribution interval. Lastly, *, **, *** represents statistical significant at the 10%, 5% and 1% level.*

4.2 Regression Analysis on ΔROA_{t+1}

Table 6 presents the results from the first set of regressions, compares the change in ΔROA_{t+1} to the coming year for firms i, with the same independent variables drawn from the change in year t to t+1. The extensive gap-increase between the measurement of ΔROA results in a reducing number of observations compared to those depicted in table 5 (e.g 412 to 351 for solely $ABWEXP_{i,t}$ on ΔROA_{t+1} and 396 to 336 for all independent variables on ΔROA_{t+1}). As in table 5, Column (1) shows the results when ABWEXP solely regress on $\Delta ROA_{t+1.}$ Column (2) shows the results including year fixed effects when ABWEXP on ΔROA_{t+1}. Column (3) shows the same regression as the other two but includes fixed effects for both year and firm. Colum (4) includes all other variables that were excluded from column (1), column (2) and column (3) (e.g ABWEXP, ABCLAIMS, ABGM, SALES_GR, BM and SIZE), excluding fixed effects for both year and firm. Column (5) shows the same regression as in column (4) but included fixed effects for year. Lastly, column (6) includes year and firm fixed effects.

Drawing from table 6, ABGM when controlling for year and firms fixed effects have a positive coefficient of 18.5805 and a p value of 2.72 rendering in significant within the 10% level. BM's coefficient when controlling for year and firm fixed effects are also significant with a trajectory of -0.0091 with a p value of -3.30 rendering it significant at the 5% confidential level. The results deviated from Cohen et al. (2011) in that they could find a significant coefficient on ABGM when regressing on $\Delta ROA_{t+1.}$ However, this thesis can say that abnormal gross margin does have a positive effect on ΔROA_{t+1} within a 10% confident interval when controlling for year and firm fixed effects. When not controlling for any fixed effects or solely year fixed effects, no significant coefficient could be observed. The results on BM when controlling for year and firm fixed effects are in line with what Cohen et al. (2011) found in their study, e.g a high book-to-market ratio has a negative effect on ΔROA_{t+1}.

ABWEXP coefficient when excluding fixed effects for year and firm is 0.0165 with a p value of 0.26, rendering it non-significant as in the case when regressed on ΔROA_t. When including fixed effects for year. ABWEXP's coefficient changed trajectory to a negative -0.0014 with a p value of -0.02. When controlling for year and firm fixed effects the coefficient's trajectory stays negative with -0.0035 with a p value of -0,04. These results are not in line with what Cohen et al. (2011) found. Instead Cohen et al. (2011) could show that ABWEXP had a significant positive coefficient when regressing on ΔROA_{t+1}.

ABCLAIM's coefficient stay negative and non-significant through all columns with coefficients of -0.2794 (column (4), p value-0.42), -1.3209 (column (5), p value -0.90) and -1.6879 (column (6), p value -0,82). Cohen et al. (2011) found that ABCLAIM had a significant negative coefficient on ΔROA_{t+1}, which this thesis also found.

Sales_GR coefficient when not accounting for fixed effects for year and firm resides on 0.0035 with a p value of 0.01. When adding fixed effects for year, the coefficient decreases slightly to 0.0028 with an increased p value of 1,38, however, not enough to show any significance. When controlling for fixed effects for both year and firm, the coefficient increases to 0.1213, although the p value decrease to 0.17. Size coefficient stay positive in both columns (4) and (5), residing on

0.0025 (p value of 1.29) and 0.0029 (p value of 1.38) when adding fixed effects for year. With fixed effects for both year and firm, the coefficient changed trajectory to -0,0626 with a p value of 1.61, almost with a 10% confidence interval. The results are similar to those of Cohen et al. (2011) in that they could initially find significant coefficient on ΔROA_{t+1} with BM. However, when they added fixed effects for quarters, they could see a significant, positive minor coefficient on ΔROA_{t+1}.

Table 6: *Regression Analysis on ΔROA_{t+1}*

Variables	**ΔROA_{t+1}** (1)	**ΔROA_{t+1}** (2)	**ΔROA_{t+1}** (3)	**ΔROA_{t+1}** (4)	**ΔROA_{t+1}** (5)	**ΔROA_{t+1}** (6)
$ABWEXP_{i,t}$	0.0142	-0.0076	-0.0181	0.0165	-0.0014	-0.0035
	(0.23)	(-0.13)	(-0.25)	(0.26)	(-0.02)	(-0.04)
$ABCLAIM_{i,t}$	-	-	-	-0.2794	-1.3209	-1.6879
				(-0.42)	(-0.90)	(-0.82)
$ABGM_{i,t}$	-	-	-	3.3257	4.7287	18.5805**
				(0.47)	(0.62)	(2.72)
$Sales\_GR_{i,t}$	-	-	-	0.0035	0,0028	0,1213
				(0.01)	(1.38)	(0.17)
$BM_{i,t}$	-	-	-	-0.046	-0.0039	-0.0091***
				(-0.45)	(-1.25)	(-3.30)
$Size_{i,t}$	-	-	-	0.0025	0.0029	-0.0626
				(1.29)	(1.38)	(1.61)
$Constant_{i,t}$	-0.0019	-0.4449*	-0.0456	-0.0275	-0.0726	-1.1591
	(-0.44)	(-1.94)	(-1.68)	(-0.45)	(-0.88)	(-1.66)
Year FE	No	Yes	Yes	No	Yes	Yes
Firms FE	No	No	Yes	No	No	Yes
R^2	0.0001	0.0400	0.1089	0.0161	0.0516	0.1485
N	351	351	351	336	336	336

*Table 6 provides the regression results that tests the thesis hypothesis. Column (1) depicts the model when ABWEXP solely regress on ΔROA_{t+1} without any fixed effects. Column (2) and (3) includes year, as well as year and firms fixed effects. Column (4) include all variables without any fixed effects. Column (5) and (6) includes year, as well as year and firms fixed effects. A comprehensive description on all variables used in table 5 can be obtained from table 2. Year FE represents the year fixed effects, while firm FE represent each firms's ISBN number. The independent variables are winsorized at the 1% and the 99% distribution interval. Lastly, *, **, *** represents statistical significant at the 10%, 5% and 1% level.*

4.3 Regression Analysis on ΔROA_{t+2}

Table 7 presents the results from the first set of regressions, compares the change in ΔROA_{t+1} to ΔROA_{t+2} with the same independent variables for firm i in year t. The extensive gap-increase between the measurement of ΔROA results as in a reducing number of observations compared to those depicted in table 6, as had happened in the reduction from table 5 to table 6 (e.g 351 to 302 for solely $ABWEXP_{i,t}$ on ΔROA_{t+2} and 336 to 388 for all independent variables on ΔROA_{t+2}. Since Cohen et al. (2011) did not observe the independent variables effect on ΔROA_{t+2}, a comparison to Cohen et al. (2011) will not be presented in this section.

Table 7 contains more significant variables compared to the table 5 and 6. ABWEXP have significant negative coefficient against ΔROA_{t+2} residing at -0.9863 with a p value of -1.79. When adding fixed effect for year and for year plus firm, the coefficient is not significant anymore, however the trajectory does not change. Observing ABWEXP in column (4) the trajectory of the coefficient is still negative with a value of -0.1068 and a p test of -2.06, rendering in significant level within a confident level of 5%. When adding fixed effect in column (5) and (6) the trajectory stays the same, but the p value drops, resulting in a non-significant coefficient.

ABCLAIM's coefficient starts by being positive and non-significant in the first columns with coefficients of 0.1809 (column (4), p value -0.42). When considering fixed effect for year and for year plus firm, ABCLAIMS trajectory changes to negative, resulting in a coefficient of -0,2185 (column (5), p value-0,12) and -1,9830 (column (6), p value0,38).

ABGM's coefficients are all positive and non-significant. With no fixed effects, the coefficient is 4,3869 with a p value of 0,40. With fixed effect for year, the coefficient is 2,0232 with a p value of 0,19. With fixed effects for more year and firm, the coefficient bumps back up to 4.2826 with a p value of 0.38.

Sales_GR however have significant coefficient through table 7. Without any fixed effects, the coefficient is 0.0884 with a p value of 2.85. When adding fixed effects for year. The coefficient decreases slightly to 0,0864, with a p value of 2.32. Lastly, when accounting for fixed effects for both year and firm, the coefficient increases to 0.0910, however the p value decreases to 1,83. Consequently resulting in a drop from a 5% coefficient interval to a 10% coefficient interval.

BM coefficient when not accounting for any fixed effects resides on -0.0032 with a p value of -1,06. With fixed effects for year, the coefficient decreases to -0.0045 with a p value of -1,46. Lastly, when including fixed effects for both year and firm the coefficient change trajectory to 0.0085 with a p test of 1.38.

Size's coefficient when not accounting for fixed effects is significant within a confidence interval of 10%, residing on 0.0039 with a p test of 1.90. When adding fixed effects for firm the coefficient experience a minor increase, residing on 0.0035, with an increase p value of 1.97. Lastly, when including fixed effects for both year and firm, the coefficient loses its significance, residing on 0.0489 with a p test of 1.48 As stated before, tables 7 provided more significant variables compared to table 5 and 6. With significant coefficients for ABWEXP, as well for Sales_GR and BM.

Table 7: *Regression Analysis on ΔROA_{t+2}*

Variables	**ΔROA_{t+2}** (1)	**ΔROA_{t+2}** (2)	**ΔROA_{t+2}** (3)	**ΔROA_{t+2}** (4)	**ΔROA_{t+2}** (5)	**ΔROA_{t+2}** (6)
$ABWEXP_{i,t}$	-0.9863*	-0.0698	-0.0766	-0.1068**	-0.0834	-0.0768
	(-1.79)	(-1.34)	(-1.07)	(-2.06)	(-1.57)	(-0.95)
$ABCLAIM_{i,t}$	-	-	-	0.1809	-0.2185	-1.9830
				(0.13)	(-0.12)	(0.38)
$ABGM_{i,t}$	-	-	-	4.3869	2.0232	4.2826
				(0.40)	(0.19)	(0.38)
$Sales\_GR_{i,t}$	-	-	-	0.0884***	0.0864**	0.0910*
				(2.85)	(2.32)	(1.83)
$BM_{i,t}$	-	-	-	-0.0032	-0.0045	0.0085
				(-1.06)	(-1.46)	(1.38)
$Size_{i,t}$	-	-	-	0.0039*	0.0035*	0.0489
				(1.90)	(1.97)	(1.48)
$Constant_{i,t}$	0.0012	0.3181	0.3309	-0.1461***	-0.0726	-0.9689*
	(0.36)	(1.62)	(1.38)	(-3.06)	(-0.88)	(-1.70)
Year FE	No	Yes	Yes	No	Yes	Yes
Firms FE	No	No	Yes	No	No	Yes
R^2	0.0038	0.0392	0.0861	0.0161	0.0584	0.0584
N	302	302	302	288	288	288

*Table 7 provides the regression results that tests the thesis hypothesis. Column (1) depicts the model when ABWEXP solely regress on ΔROA_{t+2} without any fixed effects. Column (2) and (3) includes year, as well as year and firms fixed effects. Column (4) include all variables without any fixed effects. Column (5) and (6) includes year, as well as year and firms fixed effects. A comprehensive description on all variables used in table 5 can be obtained from table 2. Year FE represents the year fixed effects, while firm FE represent each firms's ISBN number. The independent variables are winsorized at the 1% and the 99% distribution interval. Lastly, *, **, *** represents statistical significant at the 10%, 5% and 1% level.*

4.4 Remarks from the regression analysis

Observing the association between abnormal warranty expenses and future firms' performance in table 5 and 6 gives no evidence that abnormal warranty expenses contain information of future firm performance. However, the results from table 7 indicate that abnormal warranty expenses do

have a negative relation with future firm performance, when not considering fixed effects for year and firm. These results are in line with Cohen's et al. (2011) findings in that they could observe a negative relation between future firm performance and abnormal warranty expenses with firms in the same industry, however in a shorted future time period compared to the results in this thesis. However, when considering fixed effects for year and firm, the coefficient in table 7 losses significance. Culminating in that the null hypothesis can be rejected, when not including the fixed effects.

A further relevant observation is sales growths' positive relation with future firm performance, which is shown in both table 5 and 6 when excluding, as well as including fixed effects for both year and year + firm. Book-to-market had a negative relation with future firm performance in table 6 when including fixed effects for both year and firm. Both findings for sales growth and book-to-market's association with future firm performance are in line with Cohen's et al. (2011) findings.

5. Conclusion

In order to provide insight into the utilization of warranty provision and its relation to earnings management in Sweden, this thesis includes data from every listed firm at the NASDAQ Stockholm that disclosed warranty provisions in their balance sheet between 2005-2016.

The null hypothesis was that Swedish listed firms do not warranty provisions as a tool for earnings management, based on the various motives behind earning management, as well as the regulatory and juridical leeway given warranties' design and disclosure. To be able to answer the research question, the same method practiced by Cohen et al. (2011) was applied in this thesis.

The findings indicate that there is evidence of earnings management in Swedish firms. However, since the proxy for earnings management lose significance when including fixed effects for firm, more research needs to be conducted in order to disclose which specific firm characteristics are contributing to earnings management through warranty provision.

The same can be said for the other control variables in the models, except increase in net revenue that had a significant positive relation with return on assets in all three models, with an increasing degree of significance, as well as the negative relation between future performance and BM in table 6, when controlling for fixed effects. Consequently, the findings of this thesis deviate from Cohen's et al. (2011) in that they found clear evidence of for earnings management in the US. Finally, this thesis indicates a need for more research concerning the discrepancy between the US and Sweden in earnings management through warranty provisions. As well as specific firm research concerning what firm characteristic are contributing to warranty provision relation to earnings management in Sweden.

5.1 Limitations

There has been limitation to this study. First, categorizing the sample firms might have proven more useful for drawing conclusions. Based on the fact that ABWEXP had a negative relation to future firm performance, as was found by Cohen et al. (2011) when they categorized their sample intro different industries. One speculation might be that this thesis sample is somewhat homogeneous when it comes to industries or type of companies. Another approach might have been to explore the weight of the different companies within regression since Volvo AB, Ericsson, Alfa Laval and Skanska might have considerable higher warranty expenses compared to smaller firm on OMX Stockholm.

Another limitation is that of Cohen et al. (2011) method, e.g the proxy for earnings management ABWEXP. Since firms need to accrue a warranty expense when a warranty case might occur (if it can be reasonably estimated), changes in product markets might affect the sample. If a firm is selling a product on the Swedish market, Köplagen procure a two-year warranty, which needs to be accounted for. This creates a two-year period in which a warranty case might occur. Considering whether a firm would start to operate on a new market, where there is a longer warranty period forced by law, like the lemon law in US. That would severely increase the warranty expense since there is a longer time period for a warranty case to occur. Consequently, the quote between warranty expense and sales would indicate in Cohen's et al. (2011) model that ABWEXP contains increased information of future performance, while in reality, a company just established a new market with new sets for justice means.

Another limitation in Cohen's et al. (2011) is that it does not consider whether a firm changes their method for calculation warranty expenses. Changes in methods could affect the value of ABWEXP, since a method could result in lower or higher percentages of expected warranty cases, as well as potential cost.

Lastly, since the methods of calculating warranty expenses usually is based on historical data, new projects or new products expected warranty expense needs to be extrapolated from similar project or product data. Since this extrapolation might not result in the most accurate of predictions, fluctuations in warranty expenses might occur for a company, which in turn would affect the value of ABWEXP and provide false indications on future performance. Why there is a difference in the use of earnings management between Sweden and the US might have to do with the differences in IFRS and US GAAP. If one standard allows for more flexibility, then there would be more earnings managed occurring according to Becker et al. (1998).

Another aspect might be corporate culture as Isam et al. (2020) states might affect earnings management. If the climate encourages opportunistic behavior, in conjunction with a more flexible accounting framework, earnings management might occur to a wider extent. However, the lack of organizational culture on earnings management are scarces, but might be a worthy subject for future research.

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