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# Mark-to-Model

- An Explanation of the Choice and Relative Use

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# Abstract

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- Key Words:** Financial Instruments, Mark-to-model, Fair value accounting, Level 3 and IFRS 7.
- Aim:** The aim with this thesis is to explain the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic.
- Methodology:** This thesis uses a deductive and quantitative approach in analysing 101 annual reports. Logistic regression and linear regression have been used in order to analyse the data.
- Theoretical Approach:** This thesis uses a multi-theoretical approach based on both economic-oriented and system-oriented theories.
- Empirical Foundation:** 101 annual reports from companies within the financial industries listed at Nasdaq OMX Nordic have been analysed.
- Conclusions:** The choice of mark-to-model is influenced by the industry of the company and management bonus schemes connected to profit. The relative use of mark-to-model is influenced by the size and the audit firm of the company.

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Mikael Svensson

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Alexander Wingren

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# List of abbreviations

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CPH	Copenhagen Stock Exchange
EC	European Commission
EU	European Union
FASB	Financial Accounting Standard Board
FI	Finansinspektionen
FVA	Fair Value Accounting
FVO	Fair Value Option
GAAP	General Accepted Accounting Principles
HEL	Helsinki Stock Exchange
IAS	International Accounting Standards
IASB	International Accounting Standard Board
IASC	International Accounting Standards Committee
IFRIC	International Financial Reporting Interpretation Committee
IFRS	International Financial Reporting Standards
IT	Institutional Theory
IMF	International Monetary Fund
PAT	Positive Accounting Theory
ROA	Return on Assets
ROE	Return on Equity
SEC	Securities and Exchange Commission
SIC	Standing Interpretation Committee
SIX	Scandinavian Information Exchange
STO	Stockholm Stock Exchange
US GAAP	United States Generally Accepted Accounting Principles

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# 1 Introduction

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*The first chapter provides a background to the complexity of problems regarding financial instruments and fair value accounting. The aim of the thesis is then developed from the background and problem discussion. Finally the disposition of the thesis is presented in the thesis outline.*

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## 1.1 Background

In 2008 after years of strong economic growth, the global economy entered a downturn that was to be described as the worst situation at the financial markets since the 1930's. Financial institutions experienced that the confidence in their performance and solvency declined leading to the collapse of financial institutions and intervention by western governments to save troubled banks. (IMF, 2008, p. xv, 1) The financial accounting practice also experienced a serious lack of reliability after accounting scandals being revealed in the 21th century among companies such as Enron, WorldCom, Lehman Brothers, Swedish HQ Bank etc. (Unerman and O'Dwyer, 2004; Benston, 2006; Andersen, 2010; Neurath, 2011)

At the time of bankruptcy in 2001, Enron was one of the largest companies in the world and the bankruptcy was the largest ever in US. The Enron scandal raised a lot of issues within financial accounting and auditing, one being fair value accounting for financial assets that was not based on trustworthy numbers (Benston and Hartgraves, 2002). Mark-to-market valuation of financial assets is based on primary and secondary market trades and valuation tools in active markets while mark-to-model valuation is based on calculated expectations and assumptions of future cash flows. Both valuation methods are included in the concept fair value accounting (Negus and Boyles, 2010; Meder et al, 2011). Enron used mark-to-model estimations when they measured various financial instruments and contracts to fair value (Benston, 2006). The complexity of the problems with fair value accounting based at unreliable assumptions has also been highlighted in a Nordic context. In 2010 HQ bank went into liquidation as the Swedish Financial Supervisory Authority (Finansinspektionen) removed the authorization to proceed it's banking activities (Neurath, 2011, pp. 220-227). The Swedish Financial Supervisory Authority biggest concern in HQ bank was



the “edge”, the difference between the internally estimated fair value and the market value of the derivate instruments measured at fair value (Neurath, 2011, p. 206). At the end of the review in 2010, Swedish Financial Supervisory Authority estimated the “edge” to about 800 million SEK, and it had been overvalued during the whole review process (Neurath, 2011, p. 206). The common denominator between the two accounting scandals illustrated above is that both Enron and HQ Bank were using fair value accounting based on mark-to-model to manipulate the valuation of their financial instruments. According to IAS 32 (p. 11) fair value is defined as:

*“The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm’s length transaction”*

The theoretical definition of fair value derives from a hypothetical transaction that could have occurred, but in fact have not. In practice it would be difficult to know what might have happened if the transaction had been performed (Marton et al, 2010, p. 37). Both the Financial Accounting Standard Board (FASB) and International Accounting Standards Board (IASB) have in recent years increasingly put more focus on fair value accounting over historical cost (Guthrie et al, 2011). One reason might be the development of the financial markets and the increased interest in equity investments (Wallison, 2009). Despite the increased interest in fair value accounting the concept has been used for several years. IASC introduced the fair value measure in 1977 but the discussion about valuation methods can be traced back to the aftermath of the 1929 stock market crash (Emerson et al, 2010; Georgiou and Jack, 2011). The advocates of fair value accounting state that fair value estimations and assumptions such as mark-to-market and mark-to-model provide the capital markets with up to date and relevant information. Especially fair value accounting of financial instruments has been argued to provide more appropriate and understandable information than historical costs (Georgiou and Jack, 2011).

Despite that IASB and FASB advocates for the increased use of fair value, there are still those who doubt that fair value is a legitimate conceptual basis (Georgiou and Jack, 2011). Fair value accounting have been accused for being one reason to the emergence of the financial crisis and some financial institutions held fair value accountable for the weak and unstable financial sector during the financial crisis

(Wallison, 2009; Meder et al, 2011). However the Securities and Exchange Commission (SEC) argues fair value accounting such as mark-to-market and mark-to-model accounting did not appear to be the reason for the financial institution failures in 2008 (SEC, 2008, p.4). Despite this Whittington (2008) state that fair value is not necessarily the most appropriate measurement method in every situation. Instead a clear measurement objective should be defined to determine the most appropriate measurement method in different circumstances (Whittington, 2008). Wallison (2009) argues that fair value accounting could create large fluctuations and thereby lead to a decreasing stability in the value of the assets.

## 1.2 Problem Discussion

Different practice exists within IFRS as a result of overt and covert options in the standards, the need for estimations in the measurement methods, imperfect enforcement etc. (Nobes and Parker, 2010, pp. 158-165). Especially financial instruments have often been identified as a problematic and complex area within the financial accounting practice. The implementation of IAS 39 and IFRS 7 has shown to be problematic in practice. (Lopes and Rodrigues, 2008; Marton et al, 2010, pp. 393-394) Sir David Tweedie, former Chairman of the IASB, emphasizes the complexity that exists in standards on financial instruments:

*“Just look at IAS 39, which we inherited from our predecessor organisation. If you think you understand the standard, you have not read it properly”* (IASB Insight, 2007).

According to IFRS 7, a company that are in hold of financial instruments shall classify fair value measurements using a fair value hierarchy divided into three levels that reflects the significance of the market data inputs used in valuation of the financial instrument (IFRS 7, p. 27-27a). The fair value hierarchy according to (IFRS 7, p. 27A) consist of the following levels:

- *“Quoted prices (unadjusted) in active markets for identical assets or liabilities” (Level 1)*
- *“Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices)” (Level 2)*
- *“Inputs for the asset or liability that are not based on observable market data (unobservable inputs)” (Level 3)*

When classifying the different valuation methods of fair value, level 1 is defined as mark-to-market accounting, level 3 as mark-to-model accounting and level 2 as a hybrid between the two (i.e. Ryan, 2008). The fair value methods gives priority to the higher levels of input data when available and must maximize the use of observable market data and minimize the use of unobservable market data (Lewis et al, 2008). In some cases when the market is inactive and the observable input requires substantial adjustments, it is permitted and preferred to use level 3 instead of level 2 (Lewis et al, 2008; Cheng, 2009).


During the financial crisis in 2008 various financial markets became inactive and complex financial accounting areas were highlighted such as management’s estimations and assumptions in the fair value measurement and the use of input data from active and inactive markets in the valuation methods (IASB, 2008, p. 9). The example of Enron and HQ Bank provides good insight into the problems that exists within fair value accounting when fair value measurement of financial instruments is not based on active market prices (Benston, 2006). Mark-to-model has faced a lot of criticism due to the subjectivity and uncertainty involved in the estimations and is even labelled as mark-to-myth by some researchers (Casella and Guyader, 1994; Meder et al, 2011). Investors have shown to perceive mark-to-model accounting as unreliable, not precise and subject for to many assumptions (SEC, 2008, p. 41). The critique of mark-to-model is not only based in the uncertainty involved in the valuation of the asset. The lack of validity of the assumptions estimated internally and the uncertainty in determining if the market is active or not, leading to management being able to determine which level in the fair value hierarchy they want to use has also been criticised (Cheng, 2009). Earlier research has shown that mark-to-model not only is an unreliable valuation method but that it is used to manipulate earnings or

boost future reported income (Huizinga and Laeven, 2009; Fiechter and Meyer, 2010). Studies has shown that there is a correlation between the possessions of assets valued according to mark-to-model and a higher degree of risk (i.e. Tsay, 2010). In the fair value hierarchy, level 1 is seen as the most reliable and level 3 as the least reliable. Compared to fair value based on level 1 and level 2 fair value based on level 3 showed to be less value relevant in a study of banking firms in 2008. The results show that investors put less reliability and weight on level 3 fair value due to the risks involved, possible internal estimation errors and reporting biases from management. (Song et al, 2010). Considering the discussion about the complexity of financial instruments, the unreliable estimations and assumptions on input data used in mark-to-model this thesis aim to explain the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic.

### 1.3 Aim

The aim with this thesis is to explain the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic.

## 1.4 Thesis Outline

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- In chapter 2 the methodology of the thesis will be presented containing research approach and choice of theory.
  - In chapter 3 the legal framework regarding measurement and disclosure of financial instruments will be presented. The current applicable accounting standards and rules will be reviewed.
  - In chapter 4 the theories of the thesis will be presented. System-oriented and economic-oriented theories will then be used to develop the hypotheses.
  - In chapter 5 the empirical method of the thesis containing research methodology, operationalization and sample will be presented.
  - In chapter 6 the analyses of the data and the hypotheses testing will be presented.
  - In chapter 7 the conclusions of the analysis will be discussed. Critique of the thesis and areas for further research will also be discussed.

## 2 Methodology

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*In chapter two the methodology of the thesis is presented. First we will present the research approach of the thesis and then we will look at the choice of theory.*

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### 2.1 Research Approach

The aim with this thesis is to explain the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic. The used research approach depends on to which extent the researcher uses theory before formulating the research strategy (Saunders et al, 2007, p. 117). This thesis takes a deductive approach, which means that it tests different hypotheses derived from accounting theories in an empirical setting (Lundahl and Skäräd, 1999, p. 40; Saunders et al, 2007, p. 117). This thesis test 18 hypotheses derived from economic oriented theories such as positive accounting theory (PAT) and signaling theory and system-oriented theories such as institutional theory, legitimacy theory and stakeholder theory in order to explain the choice and relative use of mark-to-model in the valuation of financial instruments. The deductive approach emphasizes the importance of controls, a highly structured methodology, independence from what is reviewed and a sample that is strong enough to make general assumptions (Saunders et al, 2007, p. 117-120). To conform with these objectives of the deductive method and increase the reliability in our thesis, the thesis is performed on a sample that allows controls such as the reproduction of other researchers. As this thesis use a deductive approach it is important to keep in mind that the approach also has received critique, one being that is too rigid and not allows alternative explanations in the highly structured research design that is used. (Saunders et al, 2007, p. 117-120) Of this reason we found it important to allow a wide rage of explanations for the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic.

## 2.2 Choice of Theory

Gong and Tse (2009) state that each accounting theory has its own primarily explanation of financial accounting practice. This thesis does not limit the explanation of financial accounting practice to only one theory, instead several theories will be used collaterally. Different theories should not be seen as competitive perspectives, rather they should be seen as concurrent perspectives aiming to increase the understanding of financial accounting (Gray et al, 1995b). Gong and Tse (2009) argue that instead of focusing on one perspective, researchers should acknowledge the existence of contradictions in accounting theories and use different accounting theories in order to provide a more complete explanation. Especially complex phenomena can benefit from using an alternative theoretical approach that involves unrelated perspectives instead of one traditional theoretical approach (i.e. Lewis and Grimes, 1999; Collin et al, 2009). Multiple researches within financial accounting uses an eclectic-, or multi-theoretical approach in explaining accounting practice (i.e. Mezias, 1990; Neu and Simmons, 1996; Collin et al, 2009; Broberg et al, 2011). The aim with this thesis is to explain an empirical phenomenon rather than provide a strong explanatory power of one specific accounting theory explaining the empirical results. Therefore this thesis view economic oriented theories and system-oriented theories as complementary instead of competitive (Gray et al, 1995a; Ljungdahl, 1999).

In order to increase the internal validity in our thesis, we have carefully selected applicable accounting theories from different sources. This is of special importance since the tested hypotheses are dependent on the initially chosen theories. In the search for applicable literature and scientific articles we have used the library and search engines available at Lund University. We have especially used Summon and Business Source Complete to find the articles used. Special attention has been given to the work of prominent researchers and respected journals within the theoretical fields that we look at. Landmark articles have also been used to support the more recent research used in the theoretical framework.

## 3 Legal Framework

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*In the third chapter the legal framework regarding classification, measurement and disclosure of financial instruments is presented. The current applicable accounting standards and rules will be presented containing IAS 32, IAS 39 and IFRS 7.*

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### 3.1 Legal Framework

According to the regulation (EC) No. 1606/2002 article 4 by the EU commission the consolidated accounts of publicly traded companies within EU should be prepared in accordance with the international accounting standards adopted by the EU commission. As a regulation, the standards are directly compulsory for the listed companies consolidated accounts in the EU and therefore all companies that we will be looking at in this thesis. In article 2 international accounting standards is defined as; International Accounting Standards (IAS), International Financial Reporting Standards (IFRS) and related interpretations by Standing Interpretation Committee (SIC) and International Financial Reporting Interpretation Committee (IFRIC), that is issued or adopted by the IASB. IAS 39 is the only standard that has not been fully adopted by the EU commission (Marton et al, 2010 pp. 394-395). Of this reason it is important to emphasize that the standards used in this thesis are the once that are adopted by the EU. The three standards that regulate the classification, measurement and disclosure of financial instruments are IAS 32, IAS 39 and IFRS 7. According to IAS 32 (p. 11) financial instruments are defined as:

*“Any contract that give rise to a financial asset of one entity and a financial liability or equity instrument of another entity”*

When initially recognized, financial assets and liabilities should be measured at fair value plus transaction costs that are directly attributable to the acquisition (IAS 39 p. 43). After the initial recognition the financial assets are classified into four categories that determine the subsequent measurement (IAS 39 p. 45). According to IAS 39 (p. 9) the four general categories of financial instruments are:



- financial assets or financial liabilities at fair value through profit or loss
- held-to-maturity investments
- loans and receivables
- available-for-sale financial assets

In the subsequent valuation, the financial assets and liabilities are separated. The complex rules could best be summarized in table 3.1.1 that disclose the valuation methods that should be used for each category of financial instruments.

Table 3.1.1 Classification of Financial Instruments (Marton et al, 2010, p. 405. Authors own translation)

Category	Valuation in Balance Sheet	Profit/ Loss
Financial assets measured at fair value through statement of income	Fair value	In statement of income
Held-to-maturity investments	Amortized cost method	---
Loans and receivables	Amortized cost method	---
Available-for-sale financial assets	Fair value	In other comprehensive income
Financial liabilities measured at fair value through statement of income	Fair value	In statement of income
Other financial liabilities	Amortized cost method	---

Apart from the classification above, the fair value option (FVO) provides an opportunity for companies to measure financial instruments at fair value and recognize changes in the income statement. This should be done at the initial recognition to discourage inconsistencies resulting from reclassification (Marton et al, 2010, p. 403). Certain conditions must be fulfilled in order to use FVO when measuring financial instruments. It is therefore most commonly used on embedded derivatives and in hedge accounting. The EU- commission has not fully adopted the standard and left out macro hedging and fair value options for financial liabilities when the standard was adopted in 2004 (Marton et al, 2010 pp. 393-394). When

estimating the fair value of financial instruments IAS 39 (p. 48A) states that:

*“The best evidence of fair value is quoted prices in an active market. If the market for a financial instrument is not active, an entity establishes fair value by using a valuation technique.”*

Quoted prices of financial instruments in an active market should be regularly available from an exchange or any other market, representing transactions on an arm's length basis (IAS 39, AG71). IASB (2008, p. 10) state that there is not any clear line between active markets and inactive markets. The main difference from an active market is that the trading activities are taking place regularly on an arm's length basis, and therefore lower levels of trading activity and highly volatile prices is characteristics of an inactive market (IASB, 2008, p. 10). The main consequences of inactive markets is that the company must put in more effort into the valuation process of the financial instrument in order to gain assurance of, and make sure that the transaction price represents fair value (IASB, 2008, p. 8). As discussed in chapter 1, financial instruments must be measured using mark-to-model as valuation method if there is no active market available (IAS 39, AG74; IASB, 2008, p. 8). In the valuation of financial instruments to fair value, the entity must maximize observable market data and minimize unobservable market data that is primarily based on managements' internal assumptions and judgment on future cash flow and appropriately risk-adjusted discount rates (IAS 39, AG75; IASB, 2008, p. 8).

The objective with IFRS 7 is to make sure that entities disclose information about their financial statements that enables users to evaluate the extent of the risk and significance involved in the financial statements (IFRS 7 p. 1). When valuating a financial asset to fair value an entity is obligated to disclose the used method, valuation technique and assumptions done (IFRS 7 p. 27). In doing this, the entity should classify and disclose the measurement methods into a fair value hierarchy that consist of the following levels (IFRS 7, pp. 27A – 27B):

- *“Quoted prices (unadjusted) in active markets for identical assets or liabilities” (Level 1) - Defined as mark-to-market (Ryan, 2008)*
- *“Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices)” (Level 2) - Defined as a hybrid between mark-to-market and mark-to-model (Ryan, 2008)*
- *“Inputs for the asset or liability that are not based on observable market data (unobservable inputs)” (Level 3) - Defined as mark-to-model (Ryan, 2008)*

## 4 Theoretical Framework

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*The fourth chapter discuss the accounting theories that are applicable to the aim of the thesis. Hypotheses are then developed from system-oriented and economic-oriented theories using a multi-theoretical approach. The developed hypotheses are then summarized in the end of the chapter.*

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### 4.1 Accounting Theories

The aim with this thesis is to explain the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic. As stated in section 2.2 multiple researches within financial accounting uses an eclectic-, or multi-theoretical approach in explaining financial accounting practice (i.e. Mezas, 1990; Neu and Simmons, 1996; Collin et al, 2009; Broberg et al, 2011). This thesis will consequently apply a multi-theoretical approach with the objective to explain the empirical phenomenon of the choice and the relative use of mark-to-model. System-oriented theories and economic-oriented theories will be used to develop hypotheses aiming to examine the influence on the choice and relative use of mark-to-model by the following eight factors: size, industry, ownership structure, debt ratio, profitability, audit firm, management bonus and country.

The system-oriented view focuses on the relationships between organisations, the state and individual groups in a wider social system (Gray et al, 1996). The organisation is expected to be influenced and have influence on other actors in the social system that it is a part of (Deegan, 2009, pp. 320-321). Deegan (2009, p. 321) state that the system-oriented theories are well suited for predicting management decisions when explaining the choice of particular financial accounting techniques and methods. The system-oriented theories can be divided into institutional theory, legitimacy theory and stakeholder theory (Deegan, 2009, p.320).

Institutional theory might explain the choice and the relative use of mark-to-model by the institutional pressure that pushes the financial companies into a certain structure (DiMaggio and Powell, 1983). DiMaggio and Powell (1983) set out three different

isomorphic processes: coercive, mimetic and normative isomorphism that might influence and affect organizations to become homogeneous in their choice and relative use of mark-to-model.

The pressure to be perceived as legitimate is another factor that influence corporations to take on certain reporting practices, and may influence the choice of valuation method (Deegan, 2009, p. 325). Legitimacy is considered to be a survival factor for a company and is dominated by the public expectations, norms and informal demands of the society (Dowling and Pfeffer, 1975; Deegan, 2009, pp. 323-326). According to Deegan (2009, pp. 323-326) legitimacy theory relies on the notion that there is a “social contract” between the companies and the society, expecting the company to fulfil the expectations.

Stakeholder theory considers the impact different stakeholder groups in the society have on the organisation. Stakeholder theory can be divided in to the ethical and the managerial branch, where the ethical branch considers all stakeholders rights regardless of their power or importance to the organisation (Deegan and Unerman, 2011, pp. 348-349). The managerial branch of stakeholder theory can be used to explain the choice and the relative use of mark-to-model, considering that particular stakeholder groups are more important then others (Gray et al, 1996; Mitchell et al, 1997). According to Gray et al (1996) the more important the stakeholder is to the company, the more energy and effort will be applied to manage the relationship. Owners of external capital control one of the most powerful resources and therefore have a substantial influence on corporate decisions, such as the choice and the relative use of mark-to-model (Freeman, 1984; Ullman, 1995; Wallace, 1995).

Besides system-oriented theories, more economic-oriented theories are used to explain the choice and relative use of mark-to-model. One of these theories is agency theory that handles the relationship between the principal and the agent and is based on self-interest and wealth maximizing (Jensen and Meckling, 1976). According to agency theory different contractual agreements are set up to minimize agency costs in order to rationalize the company (Jensen and Meckling, 1976). The agent’s opportunistic behaviour is assumed to be restricted through monitoring or incentives (Deegan, 2009, p. 265).

Positive accounting theory (PAT) is an economic-oriented theory that is based on rational economic thinking such as self-interest and wealth maximizing (Watts and Zimmerman, 1978). Both perspectives of PAT will be applied in this thesis, the efficiency perspective explain how different contract mechanisms are established in the company in order to reduce agency costs and the opportunistic perspective will be used to predict and explain different opportunistic behaviour by the management (Deegan, 2009, pp. 274-275). Watts and Zimmerman (1990) identifies three key hypotheses within PAT, the management compensation hypothesis, the debt hypothesis and the political cost hypothesis. This thesis will use all three key hypotheses of PAT to develop hypotheses in order to explain the choice and the relative use of mark-to-model.

Signaling theory is another economic-oriented theory that handles the problems that arise when there is an information asymmetry between different parties. The information asymmetry can be reduced when the party in hold of the information sends signals to other parties (Morris, 1987; Connelley et al, 2011). Information asymmetry is a necessity to signaling theory that can be applied in every situation that involves information asymmetry, one being between managers and stakeholders (Morris, 1987; Connelley et al, 2011). Below hypotheses are developed derived from the accounting theories discussed above aiming to predict and explain the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic.

#### **4.1.1 Industry**

According to the system-oriented view companies are exposed for institutional pressure from the society and environment that it operates in (Meyer and Rowan, 1977). According to DiMaggio and Powell (1983) institutional pressure and expectations can be divided into coercive, mimetic and normative isomorphism. According to the system-oriented view and the coercive isomorphism within institutional theory, the pressure arising from governmental regulations and financial markets might cause financial companies to take on similar measurement methods when valuating financial instruments (DiMaggio and Powell, 1983). In situations of

uncertainty, for example in the determination of which valuation method to use, the mimetic isomorphism within institutional theory states that companies tend to look at how reference companies are doing (DiMaggio and Powell, 1983; Carruthers, 1995). In doing this, companies tend to mimic companies within their industry that are perceived as legitimate and successful (DiMaggio and Powell, 1983). Companies within the financial industries have experienced decreased confidence in their performance after the financial crisis in 2008 (IMF, 2008, p. xv). Especially banks have been subject for increased pressure from governments and authorities and have also been subject for stress tests issued by the European Union (IMF, 2008, p. xv, 6; Blundell-Wignall and Slovik, 2010). Companies constantly seek to confirm that they are perceived as legitimate and trustworthy and that they are operating within the bounds and norms of the society (Deegan, 2009, p. 323). Macy (2010) argues that trust and legitimacy are more important in some industries than others. Since the financial industries, and especially banks considers legitimacy and trust essential, they would adopt measurement methods that are perceived as legitimate by the financial markets and the society as a whole (Dowling and Pfeffer, 1975).

In accordance with economic-oriented theories the political cost perspective of PAT assumes that companies tries to avoid political attention and costs (Watts and Zimmerman, 1990). The financial crisis, as stated earlier, raised a lot of attention on banks and especially their fair value accounting of financial instruments (Gebhardt and Novotny-Farkas, 2011). In accordance with the self-interest of managers and companies, it is possible to argue that banks takes on similar methods when valuing financial instruments as this might decrease the attention and the political costs of the company. (Watts and Zimmerman, 1990) According to system-oriented theories companies within the same industry would take on similar valuation methods due to the coercive, mimetic and stakeholder pressure as well as the need to be perceived as legitimate. This argument is also supported by economic-oriented theories and especially the political cost hypothesis of PAT. With support of both system-oriented and economic-oriented theories we argue for the following hypothesis.

*H1 A: Industry will have influence on the choice of mark-to-model*

*H1 B: Industry will have influence on the relative use of mark-to-model*

#### 4.1.2 Size

The size of an organisation is often expected to have influence on the accounting practice in an organisation (i.e. Noronha et al, 2008; Berkman et al, 2009; Broberg et al, 2011). System-oriented theories and legitimacy theory focus on the role of the organisation in relation to the social contract while stakeholder theory focus on the role in relation to specific stakeholder groups (Deegan, 2009, p. 346). With an increased size of the company the amount of stakeholders also increases (Hackston and Milne 1996; Knox et al. 2006). With growth of corporations in size, market power, and impact on society it is naturally that it bring a commensurate growth in responsibility as well (Deegan and Unerman, 2011, pp. 351-352) It has been shown that investors view mark-to-model as the least decision useful valuation method and also in the valuation of financial instruments mark-to-market is preferred instead of mark-to-model (Gassen and Schwedler, 2008). As the organisation is dependent on external capital as a resource, shareholders and potential investors can be argued to be a powerful stakeholder for organisations in general (Deegan and Unerman, 2011, p. 353). As large organisations are subject to higher levels of pressure from society and stakeholders that do not view mark-to-model as decision useful and legitimate we argue for the following hypothesis with support from system-oriented theories:

*H2 A1: Size of the company is negatively correlated with the choice of mark-to-model*

*H2 A2: Size of the company is negatively correlated with the relative use of mark-to-model*

Considering economic-oriented theories Watts and Zimmerman (1978) argued that the factor that had most effect on managerial behaviour was company size. This is explained by that large firms are subject to political costs and pressure to larger extent than smaller companies. Of this reason large firms have incentives to reduce reported earnings to avoid governmental intervention (Watts and Zimmerman, 1978). Agency theory emphasizes the information asymmetry that exists between agents and principals and that the agents will act in self-interest, which causes agency costs. These agency costs increases with the share of external capital (Jensen and Meckling 1976). The degree of external capital increases with size and therefore agency costs are generally seen as higher in in large companies (i.e. Prencipe, 2004; Broberg et al., 2010). In line with economic-oriented theories, the political cost hypothesis and the



assumption that agents act in self-interest we argue that the use of mark-to-model should appeal to managers in large corporations as this leaves room for more judgment and assumptions.

*H2 B1: Size of the company is positively correlated with the choice of mark-to-model*

*H2 B2: Size of the company is positively correlated with the relative use of mark-to-model*

#### **4.1.3 Ownership Structure**

Economic-oriented theories and especially agency theory can be used to explain how ownership structure could influence the choice of valuation method. Several researchers have defined ownership structure as ownership concentration (Adrem, 1999; Prencipe, 2004; Broberg et al, 2010). According to Prencipe (2004) companies that have many shareholders have a larger separation between owners and the management of the firm. In companies within the financial industries where a separation between ownership and management exists, agency costs increases due to the information asymmetry and different interest of firm objectives (Prencipe, 2004). In companies with many owners, the management will be assumed to use the information asymmetry in order to maximize their own wealth (Adrem, 1999). Leuz et al (2003) state that the management of the company attempt to protect their private control benefits and therefore particular accounting choices are used to keep the outsiders and owners satisfied. The choice and the relative use of mark-to-model will according to the basic assumptions of agency theory be used in a wider extension in companies with a high spread of ownership due to the larger room for operating freedom and assumptions by the management (Jensen and Meckling, 1976). With the support of economic-oriented theory we argue for the following hypothesis:

*H3 A: Low ownership concentration is positively correlated with the choice of mark-to-model*

*H3 B: Low ownership concentration is positively correlated with the relative use of mark-to-model*

#### 4.1.4 Debt Ratio

System-oriented theories state that powerful stakeholders such as banks, investors and other owners of capital that control essential resources for the company have a high influence on managements decisions (Ullman, 1985). Powerful stakeholders are according to the managerial branch of stakeholder theory able to put high pressure and demands on the companies. One demand and pressure from stakeholders might be to keep key performance indicators such as the debt ratio at an acceptable level, otherwise threatening with higher costs of capital (Deegan and Unerman, 2011, pp. 352-354). Therefore a high debt ratio might appeal managers to use mark-to-model as a tool to stay under these thresholds.

Economic-oriented theories assume a conflict of interest between the principal and the agent (Watts and Zimmerman, 1978). One result of this conflict is that principles and agents have different perceptions to risk. (Deegan, 2009, pp. 288-292). The capital structure and the level of external capital from investors is an essential feature for how the managers are governing the company (Broberg et al, 2011). Watts and Zimmerman (1978) discuss different contract mechanisms in connection to the debt ratio hypothesis in PAT that are put in place in order to reduce agency costs and maintain confidence and trust between the managers and the owners. Companies in the financial industries that have high debt ratios also have higher agency costs and therefore higher costs of capital (Jensen and Meckling, 1976; Watts and Zimmerman, 1979; Deegan, 2009, p. 289). Broberg et al (2011) argue that even though there is a conflict of interest between the principal and the agent there are situations where there is an alignment of interest between the two. Sustaining lower cost of capital is one situation where both managers and owners have equal incentives. According to both system-oriented theories and economic-oriented theories, companies with a high debt ratio have incentives to chose mark-to-model when determining fair value of financial instruments as this can be used to decrease the debt ratio and increase the key performance indicators of the entity.

*H4 A: A high debt ratio is positively correlated with the choice of mark-to-model*

*H4 B: A high debt ratio is positively correlated with the relative use of mark-to-model*

#### **4.1.5 Profitability**

Economic-oriented theories such as signaling theory and PAT could be applied to explain the choice and relative use of mark-to-model by profitable companies. Signaling theory handles the problems that arise when there is an information asymmetry between parties. The theory states that information asymmetry can be reduced when the party in hold of the information send signals to other parties. Information asymmetry is a necessity to signaling theory and can be applied in every market situation that involves information asymmetry, such as between managers and stakeholders (Morris, 1987; Connelley et al, 2011). One basic hypothesis within signaling theory is that “good” firms with positive inside information about the future, uses income- increasing accounting methods to signal the condition of the company. However the empirical evidence supporting this hypothesis has been very weak (Gaeremynck, 1997). This is also discussed by Frantz (1997) who explain the use of income increasing discretionary accounting choices when the manager possess positive inside information or expectations about future performance and wants to raise more equity. In line with the basic hypothesis of signaling theory “good” firms who are profitable have incentives to use income-increasing methods such as mark-to-model when determining fair value of financial instruments to signal the condition of the company as this allows estimates and assumptions that can increase income.

PAT is another economic-oriented perspective that also could be used to explain the choice and relative use mark-to-model by profitable companies, but with the objective to reduce instead of increase the reported income and profitability. High profits generate attention to a company as the public associates high profits with monopoly power and rents. Other costs that are associated with a high profitability include the costs that arise as labour unions and organisations increase the pressure at companies when high profits are reported (Watts and Zimmerman, 1978). To avoid the costs that are associated with the political attention according to the political cost hypothesis in PAT, companies could use accounting choices to reduce profits (Watts and Zimmerman, 1978; Watts and Zimmerman, 1990). Therefore, we argue that the choice of mark-to-model would appeal to managers in companies that show high profits, as this valuation method leaves room for more assumptions and estimations to be done. The objective with the use of mark-to-model differs between the two theories within the economic-oriented perspective, but both signaling theory and PAT

support the hypothesis that managers in profitable companies would have incentives to choose mark-to-model which leads to the following hypotheses.

*H5 A: Profitability is positively correlated with the choice of mark-to-model*

*H5 B: Profitability is positively correlated with the relative use of mark-to-model*

#### **4.1.6 Audit Firm**

According to the system-oriented perspective, one of the three isomorphism that DiMaggio and Powell (1983) identified as the reason for the similarities between organisations was the normative influence. The prime source of normative influence derives from the pressure executed by the profession. There are two main sources of normative influence, one that derives from the education and legitimization from professionals and the second from professional networks that influence changes and adoptions in organisation (DiMaggio and Powell, 1983). Audit firms contribute to the normative isomorphism in an organisation as the firms' techniques, structures and methods influence the organisational practice and competence, independent of the qualifications of the auditor in charge of the audit (Pentland 1993; Fischer, 1996). The choice of audit firm also has substantial influence on the amount and quality of the information provided by a company (Inchausti, 1997). Previous research has shown that there is a connection between size of the audit firm and the quality of the audit and this is partially connected to that big audit firms have more to lose in terms of legitimacy (DeAngelo, 1981). The choice of mark-to-model when determining fair value of financial instruments has been argued to be very uncertain, involving a lot of doubtful estimations and assumptions (Meder et al, 2011).

Economic-oriented theories assume that accounting is used to reduce agency costs and auditing is one way to monitor and reduce costs associated with the contracts (Watts and Zimmerman, 1986, pp. 312-313). Therefore contracting theory could be able to explain the audit as well as the accounting practice. The political process can also be argued to influence the auditing (Watts and Zimmerman, 1986, p. 336). Among others, audit firm reputation, organisational form as well as the size of the audit firm is expected to influence the independence of the auditor and the quality of the audit and therefore we expect it to influence different audit firms perception of the choice and relative use of mark-to-model in the audited companies (Watts and

Zimmerman, 1986, pp. 315-318). With support from the system-oriented perspective and the normative isomorphism within institutional theory as well as economic-oriented theories such as contracting theory, we argue that audit firms will influence the choice and the relative use of mark-to-model. Partially because of the existence of techniques and methods for valuation within the audit firm, the competence of the auditors in charge but also as the quality of the audit vary with the audit firm's characteristics. The above discussion leads to the following hypothesis.

*H6 A: The audit firm of the company will have influence on the choice of mark-to-model*

*H6 B: The audit firm of the company will have influence on the relative use of mark-to-model*

#### **4.1.7 Management Bonus**

Economic-oriented theories such as agency theory and PAT could be used to explain the choice and the relative use of mark-to-model influenced by management bonus schemes. The separation between owners and the management control have been argued to be greater in large listed companies (Baixauli-Soler et al, 2010). Consequently large listed companies within the financial industries are considered to possess high agency costs. According to Smith and Watts, (1992) higher information asymmetry between the agent and the principal leads to greater agency conflicts. In order to reduce the agency costs that are associated with information asymmetry, different contractual mechanisms are set up to align the interest of the agent and the principal (Alchian and Demsetz, 1972; Jensen and Meckling, 1976). The rational economic behaviour through acting in self-interest by the management is managed through the contracts, for example by monitoring or incentives (Collin et al, 2012).

According to the bonus plan hypotheses based on the opportunistic perspective of PAT, management bonus schemes connected to the performance of the firm are one common example of a contractual incentive that is aiming to reduce the agency costs and to align the interest of the owners and managers (Watts and Zimmerman, 1990; Deegan, 2009, pp. 278-279; Chen et al, 2011). Management bonuses based on accounting figures have also shown to be influencing management decisions and motivating managers to make optimal decisions (Bodolica and Spraggon, 2009; Chen

et al, 2011). Using financial accounting figures as a base for management bonus schemes have been argued to create incentives for management to choose accounting methods that improve the reported financial accounting figures and the management's related bonuses (Healy, 1985; Watts and Zimmerman, 1990). According to the agency theory and the opportunistic perspective of PAT, management that receive bonus schemes would have incentives to choose mark-to-model to a greater extent in order to influence the performance of the company and thereby their related bonuses, leading to the following hypotheses:

*H7 A: Management bonus schemes will have influence on the choice of mark-to-model*

*H7 B: Management bonus schemes will have influence on the relative use of mark-to-model*

#### **4.1.8 Country**

System-oriented theories focus on the impact that society has on the organisation and could therefore be used to explain the choice and the relative use of mark-to-model when determining fair value of financial instruments dependent on in which country the company is based in (Deegan and Unerman, 2011, p. 321). The environment and the culture in a country have shown to have an impact on the financial accounting practice in companies (Nobes and Parker, 2010, p. 29). Ball et al. (2003) states that incentives often dominate accounting standards, and therefore it is misleading to classify countries after standards ignoring incentives and institutional contexts. According to Hofstede (1984) (as referred in Nobes and Parker, 2010) the culture in different countries are categorized after four different cultural dimensions. These are:

- Individualism vs. collectivism
- Large vs. small power distance
- Strong vs. weak uncertainty avoidance
- Masculinity vs. Femininity

According to Gray (1988) these cultural values can be used to explain differences in financial accounting and can be converted into the accounting values:

- Professionalism vs. statutory control
- Uniformity vs. flexibility
- Conservatism vs. optimism
- Secrecy vs. transparency

Based on the cultural values by Hofstede (1984), the converted accounting values by Gray (1988) conservatism versus optimism it is of special interest to explain the choice and relative use of mark-to-model, as mark-to-model was argued to be of high risk (i.e. Tsay, 2010). Gray (1988) defines conservatism versus optimism as:

*“A preference for a cautious approach to measurement so as to cope with the uncertainty of future events as opposed to a more optimistic, laissez-faire, risk-taking approach.”*

According to Gray (1988) a country with a high degree of conservatism in accounting values is connected to a high level of uncertainty avoidance but is also likely to rank low in individualism and masculinity. The motivations for different accounting choice are also influenced by the connection to the finance system, the tax system and the legal system (Nobes and Parker, 2010, pp. 158-165). This has also been confirmed in a study of European companies (Coppens and Peek, 2005). According to the system-oriented view and the legitimacy theory companies constantly seek to confirm that they are perceived as legitimate and that they are operating within the bounds and norms of the society (Dowling and Pfeffer, 1975; Deegan, 2009, p. 323). Legitimacy is dependent on the social system at the place the entity operates, and therefore this might differ between countries. (Deegan, 2009, p. 324) Also institutional theory emphasizes the pressure executed on companies by stakeholders that the entity is dependent on as well as cultural pressure in the society. One example of this could be changes that are a response to governmental regulations (DiMaggio and Powell, 1983). Even though the countries involved in this thesis often are seen as similar in many aspects (i.e. Gray, 1988) there are still differences between the countries. For example, Denmark has a substantially higher gearing ratio than Sweden (Nobes and Parker, 2010, p. 34). According to the system-oriented view and the expected

differences in culture, financing structure, tax system and legal system we argue for the following hypothesis:

*H8 A: The country will have influence on the choice of mark-to-model*

*H8 B: The country will have influence on the relative use of mark-to-model*

## 4.2 Summary of Hypotheses and Theoretical Model

In table 4.2.1 we summaries the 18 hypotheses developed from system-oriented and economic-oriented theories. The A hypotheses aims to analyse the choice of mark-to-model and the B hypotheses the relative use of mark-to-model.

Table 4.2.1 Summary of hypotheses

<i>Hypothesis</i>	
<i>H1 A</i>	<i>Industry will have influence on the choice of mark-to-model</i>
<i>H1 B</i>	<i>Industry will have influence on the relative use of mark-to-model</i>
<i>H2 A1</i>	<i>Size of the company is negatively correlated with the choice of mark-to-model</i>
<i>H2 A2</i>	<i>Size of the company is negatively correlated with the relative use of mark-to-model</i>
<i>H2 B1</i>	<i>Size of the company is positively correlated with the choice of mark-to-model</i>
<i>H2 B2</i>	<i>Size of the company is positively correlated with the relative use of mark-to-model</i>
<i>H3 A</i>	<i>Low ownership concentration is positively correlated with the choice of mark-to-model</i>
<i>H3 B</i>	<i>Low ownership concentration is positively correlated with the relative use of mark-to-model</i>
<i>H4 A</i>	<i>A high debt ratio is positively correlated with the choice of mark-to-model</i>
<i>H4 B</i>	<i>A high debt ratio is positively correlated with the relative use of mark-to-model</i>
<i>H5 A</i>	<i>Profitability is positively correlated with the choice of mark-to-model</i>
<i>H5 B</i>	<i>Profitability is positively correlated with the relative use of mark-to-model</i>
<i>H6 A</i>	<i>The audit firm of the company will have influence on the choice of mark-to-model</i>
<i>H6 B</i>	<i>The audit firm of the company will have influence on the relative use of mark-to-model</i>
<i>H7 A</i>	<i>Management bonus schemes will have influence on the choice of mark-to-model</i>
<i>H7 B</i>	<i>Management bonus schemes will have influence on the relative use of mark-to-model</i>
<i>H8 A</i>	<i>The country will have influence on the choice of mark-to-model</i>
<i>H8 B</i>	<i>The country will have influence on the relative use of mark-to-model</i>



In figure 4.2.2 we present an overview of the theoretical model that have been applied in this thesis. We have identified eight different factors developed from both economic-oriented and system-oriented theories that might influence and affect the choice and relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic.

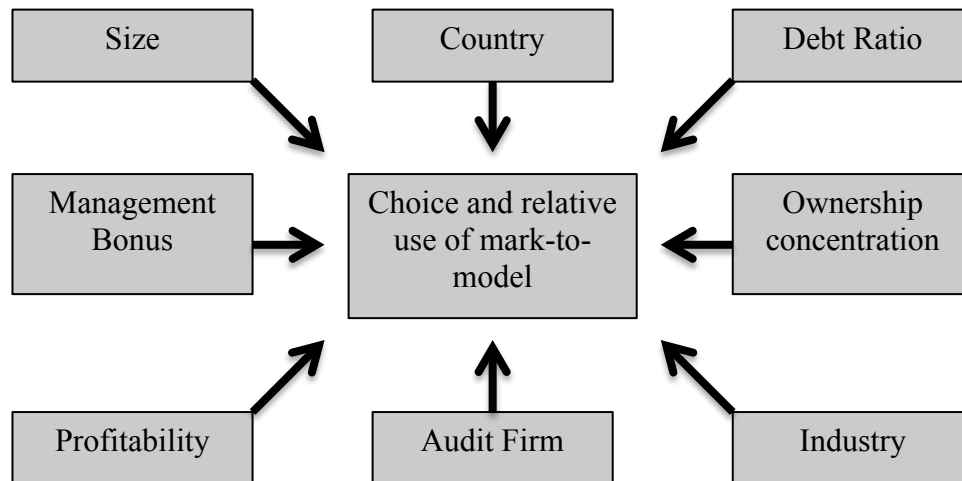


Figure 4.2.2 Theoretical Model

## 5 Empirical Method

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*In the fifth chapter the empirical method of the thesis is presented containing the research methodology, operationalization of dependent and independent variables, sample, statistical methods and finally a summary of the thesis overview.*

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### 5.1 Research Methodology

This thesis applies a quantitative method, analysing data collected by observing 101 audited consolidated annual reports from year 2010 of companies within the financial industries listed on Nasdaq OMX Nordic. Quantitative methods are based on observable data that can be generalizable and the objective is to find cause and effect correlation (Lundahl and Skärvad, 1999, p.39-45; Saunders et al, 2007, p. 103). The quantitative method has been argued to be the most applicable and structured method when analysing and comparing relationships in large samples of data (Lundahl and Skärvad, 1999, p. 124; Hartman, 2008). The use of a quantitative method makes it possible to examine causal relationships between variables in order to explain the choice and the relative use of mark-to-model among listed companies within the financial industries. Therefore we have put a lot of focus on ensuring that the sample is large enough by studying all financial companies listed at Nasdaq OMX Nordic to be able to make general assumptions and to ensure the external validity. The use of a quantitative method is applied in this thesis to keep the data as value-free and objective as possible (Saunders et al, 2007, p. 103). However, critics claim that all research to some extent is subject to value judgment, i.e. when selecting what to research (Saunders et al, 2007, p. 103; Deegan and Unerman, 2011, p. 303). This thesis uses a variety of statistical methods, such as logistic regression and linear regression in order to test and analyse the different hypotheses. It is important to keep in mind that the analysis of the annual reports is only as good as the documents that it is based on (Bryman and Bell, 2007, pp. 227-228). The consolidated annual reports used in this thesis have all been audited and this provides an external confirmation of the quality of the documents, which increases the reliability and validity of the thesis.

## 5.2 Operationalization

This thesis aims to analyze 18 hypotheses using one dependent variable and one independent variable by logistic regression or linear regression, depending on the dependent variable. The hypotheses seek to explain the correlation and relationships between the two variables. The aim with this thesis is to explain the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic. Below we will go through and explain the hypotheses derived from accounting theories and how they are operationalized.

### 5.2.1 Dependent Variables

The two dependent variables that will be tested in the analyses are the choice of mark-to-model and the relative use of mark-to-model. Mark-to-model is defined as financial instruments classified as level 3 according to IFRS 7 p. 27A in the consolidated accounts of the companies (i.e. Ryan, 2008).

- *The choice of mark-to-model* is measured as a dummy variable that is determined by the existence of level 3 as a measurement method in the valuation of financial instruments. The existence of level 3 is marked as “1” while the absence of level 3 fair value measurement is marked as “0”.
- *The relative use of mark-to-model* is a measure of level 3 in relation to all financial instruments measured at fair value. Financial instruments measured at fair value are the sum of level 1, level 2 and level 3. The relative use of mark-to-model is defined as:  $\text{Level 3} / \text{Total Financial Instruments at Fair Value}$ .

### 5.2.2 Independent Variables

The independent variables seek to analyze the correlation and relationship with the choice and the relative use of mark-to-model. The hypotheses are developed from system-oriented and economic-oriented theories. The independent variables are industry, size, ownership structure, debt ratio, profitability, audit firm, management bonus and country.

- Industry:** The first two hypotheses seek to analyze if there is any correlation between the industry of the company and the choice and the relative use of mark-to-model. The objective with the hypotheses is to find similarities among the companies within the same industry. We have mainly used information disclosed in the annual reports, the companies' websites and related sources such as the Scandinavian Information Exchange (SIX) to identify the industry in which a company operates. Based on the information the companies within the financial industries is then divided into following sub-industries; banks, investment companies, insurance companies and real estate companies. In the case when a company operates within multiple industries, i.e. a bank that also provides insurance, the core business of the entity has been regarded. The different industries are then labeled as dummy variables in the empirical analysis.(i.e. Broberg et al, 2011).
- Size:** The objective with these hypotheses is to analyze if there is any correlation between the size of the company and the choice and the relative use of mark-to-model. However, there is not one uniform way to measure size, instead the measures used varies among researchers. Size could be measured by turnover, the number of employees, the balance sheet total or by a combination of measures (i.e. Watts & Zimmerman, 1978; Francis & Wilson, 1988; Johnson & Lys, 1990; Scott, 1994; Gray et al., 1995b; Zarzeski, 1996; Adams et al., 1998; Watson et al., 2002; Prencipe, 2004; Cormier et al., 2005; Collin et al., 2009; Tagesson et al. 2009; Broberg et al., 2010; Broberg et al., 2011). This thesis will be using all three measures presented above to explain the choice and the relative use of mark-to-model. As our companies apply different currencies in their consolidated accounts, the companies using Swedish SEK and Danish DKK will be converted to EURO using the exchange rate on the 30 of December 2010 (Affärsvärlden, 2010).
- Ownership structure:** These hypotheses aims to analyze if there is a correlation between the choice and the relative use of mark-to-model and the ownership structure of the company. This thesis defines ownership structure as ownership concentration (i.e. Adrem, 1999; Prencipe, 2004; Broberg et al,

2010). Clarkson (1995) state that the shareholders are a company's most important stakeholder, often with high demand on profit maximizing. Thus the objective is to find a relationship between a high ownership concentration and the choice and the relative use of mark-to-model. Ownership concentration will be measured by share of equity and classify the three major shareholders as "large" and the rest as "small" (Maury and Pajuste, 2004). In Danish annual reports only shareholders with an ownership of over 5 % needs to be disclosed. Of this reason the three largest shareholders are not always possible to identify. In the situation when one of the three biggest shareholders is not disclosed, this shareholder will consequently own between 0 – 5 % of the shares and to solve this problem in our analysis we have assumed an average ownership of 2,5 % by undisclosed owners.

- **Debt ratio:** The objective with the debt ratio hypotheses is to analyze if there is a correlation between a company's debt ratio and the choice and the relative use of mark-to-model. We define debt ratio as debt in relation to equity excluding minority interest (i.e. Adrem, 1999; Broberg et al, 2010). The reason for why we have chosen to exclude minority interest is because minority interest often is capitalized in the profit and loss accounts in the observed annual reports.
- **Profitability:** The objective with the profitability hypotheses is to analyze if there is a correlation between the company's profitability and the choice and the relative use of mark-to-model. Profitability is a variable that can be measured in different ways. One method that has been used to measure profitability is return on assets (ROA) and return on equity (ROE) (Belkaoui and Karpik, 1989; Ljungdahl, 1999; Tagesson et al. 2009). This thesis will apply both ROA and ROE to measure profitability in order to explain the choice and the relative use of mark-to-model. When measuring ROE we have consistently looked at equity excluding minority interest.

- ***Audit firm:*** These hypotheses aims to analyze if there is a correlation between the choice and the relative use of mark-to-model and the audit firm of the company. The objective with the hypothesis is to find similarities among the companies that have the same audit firm. The audit firm of the company is determined by looking at the signing auditor of the audit report. We will use dummy variables to analyze the relationship between the audit firm and the choice and the relative use of mark-to-model. The “big 4” audit firms are analyzed individually and other audit firms are grouped into one category (Broberg et al. 2011). The audit firms will be measured in the following categories; Deloitte, Ernst & Young, KPMG, PWC and other firms as a fifth residual category.
- ***Management bonus:*** The aim of these hypotheses is to determine if there is any correlation between management bonus schemes and the choice and the relative use of mark-to-model. Management bonus is defined as a dummy variable (i.e. Broberg et al, 2011). Since it is assumed that managers will use mark-to-model in order to increase the profit, management bonus has only been recognized and analyzed if it is related to the profit of the company. Any other bonus scheme related objectives are not recognized as influencing the choice and the relative use of mark-to-model (Healy, 1985).
- ***Country:*** The objective with these hypotheses is to determine if there is any correlation between the country and the choice and the relative use of mark-to-model. The objective with the hypothesis is to find similarities among the companies that based in the same country. We have chosen to look at which stock exchange within Nasdaq OMX Nordic the company is listed at. To use the home stock exchange to group companies into country variables has been used by i.e. Astami and Tower (2006). We have identified companies from Sweden, Denmark and Finland and these countries have been represented by dummy variables. If one company is listed at several Stock Exchanges, the home Stock Exchange according to Nasdaq OMX Nordic will be applied.

### 5.3 Sample

The use of annual reports from 2010 is motivated by the fact that the annual reports from 2011 were not available from all companies when we started the work with this thesis. Therefore we used 2010 annual reports to achieve a higher comparability among the companies. This research comprises companies within the financial industries listed on Nasdaq OMX Nordic. On the 28<sup>th</sup> of March the number of listed financial companies was 142. The total sample consists of 101 financial companies within the industries; banking (44), investment companies (27), real estate companies (29) and insurance companies (8). The 101 financial companies are listed in Copenhagen (53), Helsinki (10) or Stockholm (38). Of the total sample of 101 observations used in the choice analysis, 68 provided enough information to allow an analysis of the relative use. Of the 41 missing observations 21 were multiple listings of a company's share and 20 missing observations the result of unavailable annual reports or a lack of information in them. For further information, see table 5.3.1 and figure 5.3.2. To provide an example of how it may look like when an annual report disclose to little information to be included in the sample we can look at the following quotation from the annual report of The Bank of Greenland (2010, p.59):

*“...the fair value is calculated on the basis of observing the market price at the balance sheet date. For financial instruments which are not priced on active markets, the fair value is calculated on the basis of commonly recognised pricing methods.”*

In this case we do not have enough information about the valuation methods to know if they are to be classified as level 2 valuation or level 3 valuation, and therefore it is impossible to use the observation in the analysis of choice and as we can see the information is not nearly enough to allow an analysis of the relative usage of level 3. When we have missing observations, there is always a risk of twisted results (Bryman and Bell, 2007). In our sample of 101 observations, only 68 provide enough disclosure to be included in the analysis of the relative use of mark-to-model. If the remaining 33 companies possess financial instruments valued at level 3 to a substantial different degree compared to the 68 examined, this could have lead to different results in the linear regression. The total sample of 101 observations consists

of 83,5 % of all unique companies within at the financial industries listed at Nasdaq OMX Nordic and 71,1 % including multiple listings.

Table 5.3.1 Total Sample

Total Sample		N
Financial companies		101
Industries	Bank	44
	Investment	27
	Real Estate	29
	Insurance	8
Stock Exchange	CPH	53
	HEL	10
	STO	38
Total sample of unique companies		83,5 %

A total of 41 observations were missing in the empirical analysis of different reasons. In figure 5.3.2 Sample Overview we will present an overview of the total original sample, the missing observations and the sample with full and limited information on disclosures of financial instrument measured in the fair value hierarchy.

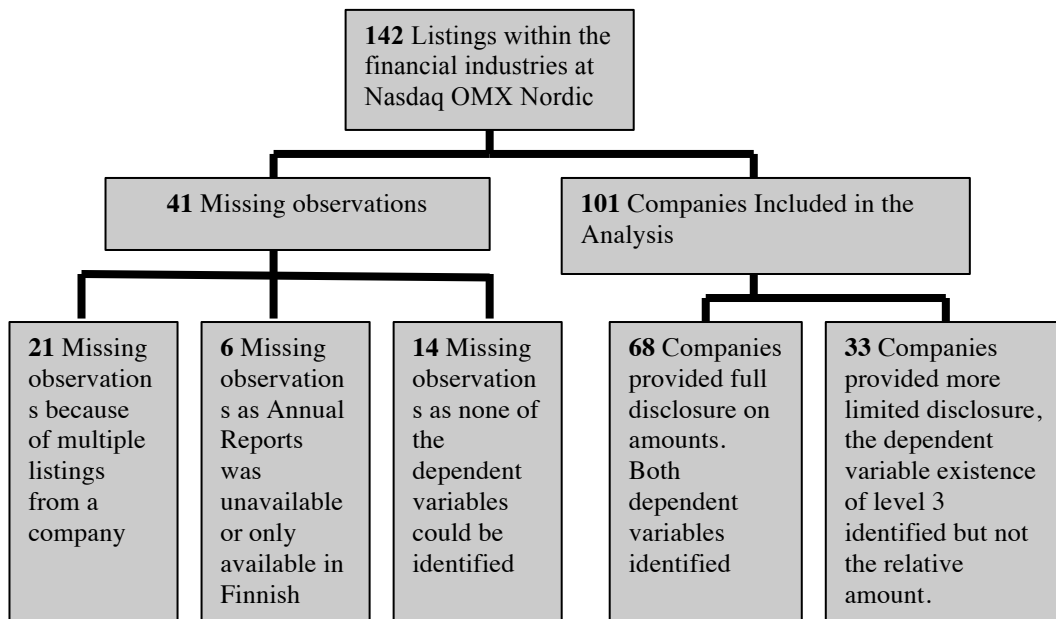


Figure 5.3.2 Sample Overview



## 5.4 Statistical Methods

In the initial process of collecting the data Excel has been used. After this the data have been transformed into the statistic program SPSS 20.0. Both Spearman and Pearson correlation have been performed in order to analyse if there is any multi-correlation between the variables that might distort the hypotheses testing. Logistic and linear regression is then used to test the 18 hypotheses in the analysis. In chapter six empirical analysis, descriptive statistics, analysis and result of the hypotheses testing is presented.

## 5.5 Thesis Overview

In figure 5.5.1 Thesis Overview the procedure of the thesis is summarized into the model below. The thesis is based on the aim and then analysed through 18 hypotheses aiming to test the choice and relative use of mark-to-model. The results of the analyses are then discussed in the conclusion section.

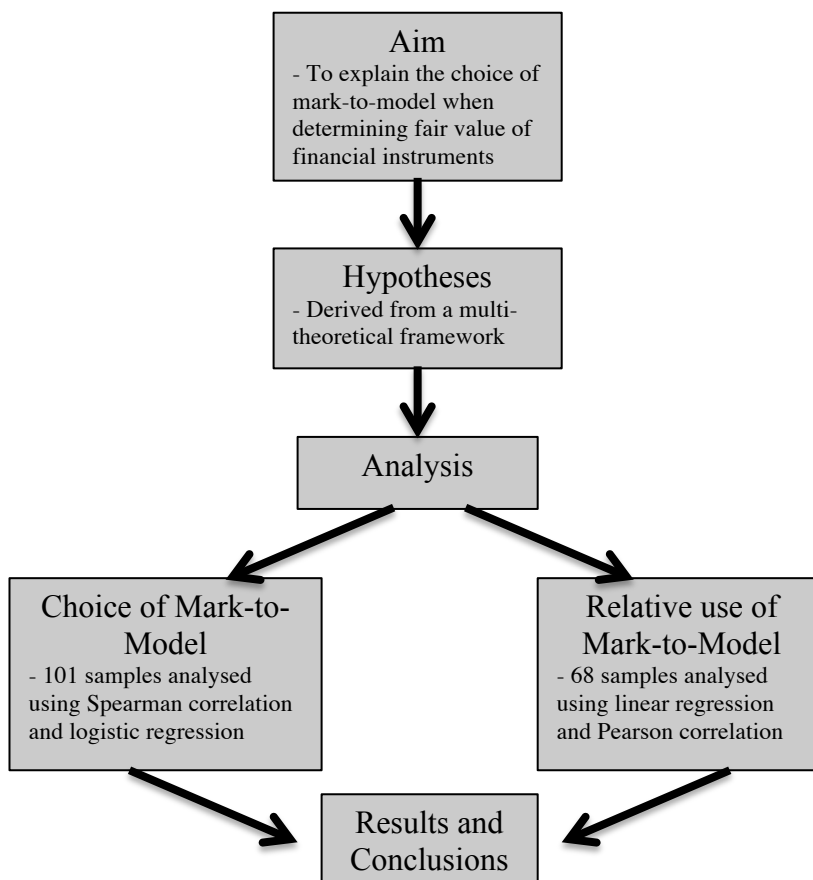


Figure 5.5.1 Thesis Overview

## 6 Analyses

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*Chapter six present the analyses of the thesis. Initially descriptive statistics of the dependent and independent variables are presented in tables. Thereafter the results of the analyses are discussed and presented in the two sections choice of mark-to-model and relative use of mark-to-model.*

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### 6.1 Descriptive Statistics

The analysis of the empirical data start with descriptive statistics presented in tables in order to gain an overview of the analysed data. The first step of a statistical analysis is to present descriptive statistics of the dependent and independent variables (Djurfeldt et al, 2010). The dependent and independent variables are presented in tables containing values such as, minimum, maximum, mean and standard deviation. The use of tables and the values presented gives an important overview of the studied variables and the variation of them. The figures in the tables are presented both in absolute and relative numbers to increase the understanding of the data (Djurfeldt et al, 2010). The first table (table 6.1.1) present the two dependent variables the choice of mark-to-model and the relative use of mark-to-model. The second table (table 6.1.2) present the independent variables turnover, balance sheet total, employees, capital, ROA and ROE followed by audit firm, country, industry and finally management bonus.

Table 6.1.1 show that almost 60 % of the observed companies choose mark-to-model to some extent in their valuation of financial instruments. Table 6.1.1 also present the relative use of level 3 in relation to total financial instruments measured at fair value. The use of level 3 as measurement method varies between 0 and 100 % with a mean of 14,5 %.

Table 6.1.1 Dependent Variables. (in 1000 EUR)

	N	Percent	Min	Max	Mean	Std. Deviation
Choice of mark-to-model (level 3)	101					
Choose of mark-to-model	60	59,4%				
Did not choose mark-to-model	41	40,6%				
The relative use of mark-to-model	68					
The relative use of mark-to-model (level 3)	68		0%	100%	14,5%	26,735%

Table 6.1.2 contains turnover, balance sheet total, employees, capital, ROA, ROE, audit firm and country of listing. The table show that there is a high variation in turnover, balance sheet total and number of employees. Return on assets have a mean of 3,9 % and return on equity a mean of 9,2 % Table 6.1.2 also show the number of companies that the audit firms have signed the audit report on. As expected, the “Big 4” audit firms were auditing the major part of the companies. The residual category other firms can also be seen as substantial but includes several audit firms such as Beierholm, BDO, Grant Thornton, Nielsen & Christensen and SET. As can be seen in the table Denmark is the home exchange to most of the companies in this thesis. Finally table 6.1.2 show the number of companies that uses bonus schemes connected to the profit of the entity. As seen in the table, it is more common not to have bonus connected to profit then the opposite among the companies.

Table 6.1.2 Independent Variables

	N	Percent	Min	Max	Mean	Std. Deviation
Numerical variables						
Turnover	100		69164	9334000000	622821221	1499437239
Balance Sheet Total	101		188193	217982000000	74425818889	350871475363
Employees	101		0	350000	5113	35032
Capital	99		0,75%	94,4%	35,2%	23,7%
ROA	101		-15,5%	29,1%	3,9%	6,7%
ROE	101		-317,8%	59,6%	9,2%	36,2%
Audit firm						
Deloitte	23	22,8%				
KPMG	20	19,8%				
PwC	24	23,8%				
Ernst & Young	16	15,8%				
Other firms	18	17,8%				

Companies listed in		
Sweden	38	37,6%
Denmark	53	52,5%
Finland	9	8,9%
Industry		
Bank	44	43,6%
Real Estate	29	28,7%
Insurance	8	7,9%
Investment	27	26,7%
Management bonus		
Bonus related to profit	43	42,6%
No bonus related to profit	58	57,4%

## 6.2 Introduction to Analyses

Further in this chapter we will present the results of the analyses performed by using a Spearman correlation (table 6.3.1), Logistic regression (table 6.3.2), Pearson correlation (table 6.4.1) and Linear regression (6.4.2). In the logistic and the linear regressions presented below some variables has been excluded of multi-collinearity reasons. As seen in both the Pearson correlation (table 6.4.1) and the Spearman correlation (table 6.3.1) the variables representing size (balance sheet total, turnover and number of employees) and profitability (ROA and ROE) are highly correlated with the other variables with the same measure. Of this reason we have chosen to only use balance sheet total and ROA to increase the reliability of the models and decrease the problems with multi-collinearity. The reason that we choose to use ROA and balance sheet total was that they showed to be the most stabile variables in the analysis that we performed. During the gathering of the data we also experienced that the turnover and the number of employees was very volatile and varied substantially between companies. In the analyses we have transformed all numerical values into logarithms to avoid misleading results because of extreme cases. The transformation was not done at dummy variables or ROA, as ROA involves negative results and the transformation would be misleading (Djurfeldt and Barmark, 2009, p. 105). The three dummy variables that have been left out to in the logistic regression and linear regression as they are used as reference variables are: KPMG for audit firm, Sweden for country and banks for industry (Djurfeldt and Barmark, 2009, pp. 110-111).

## 6.3 Choice of Mark-to-Model

In the following two sections the choice of mark-to-model will be analysed. One Spearman correlation (table 6.3.1) and one logistic regression (6.3.2) are used in the analyses in order to test the A hypotheses.

### 6.3.1 Spearman Correlation

A Spearman correlation is presented in table 6.3.1 where the independent variables multi-correlation is analyzed. Multi-correlation exists if the independent variables are correlated with each other (Djurfeldt et al, 2010, p. 364). The Spearman correlation is used as a first step of the empirical analysis of the dependent variable choice of mark-to-model, though a high multi-correlation might distort the results of the analysis and effect the logistic regressions explanatory power measured as R<sup>2</sup>. Correlation between variables that is over 0,7 - 0,8 should not be used in the same model for further analysis (Djurfeldt et al, 2010, p. 366). In the Spearman correlation matrix the independent variables representing size are significant with each other at the 0,01 level. The variables ROA and ROE are significant at the 0,01 level indicating that they are similar measurements. Debt ratio is correlated with both capital and ROA, which might create multi-collinearity in the logistic regression analysis. Dummy variables consisting of audit firm, country and industry are included in the model but not presented in the table.

Table 6.3.1 Spearman correlation matrix. (n=101)

Variables	Choice of mark-to-model	Balance Sheet Total	Turnover	Employees	Capital	Debt Ratio	ROA	ROE
Choice of mark-to-model	1							
Balance Sheet Total	0,299**	1						
Turnover	0,300**	0,857**	1					
Employees	0,348**	0,706**	0,704**	1				
Capital	0,077	0,069	0,058	-0,118	1			
Debt Ratio	0,14	0,109	0,049	0,204	-0,203*	1		
ROA	0,021	0,139	0,333**	-0,051	0,076	0,430**	1	
ROE	0,123	0,329**	0,447**	0,149	-0,07	-0,122	0,774**	1

\*\*\*Correlation is significant at the 0,001 level

\*\*Correlation is significant at the 0,01 level

\*Correlation is significant at the 0,05 level

† Correlation is significant at the 0,10 level

### 6.3.2 Logistic Regression

The hypotheses including the dependent variable choice of mark-to-model have been tested using logistic regression (table 6.3.2). In the logistic regression, the full model is significant at the 0,001 level. The explanatory power is 0,624 and it correctly classify 84,7 % of the cases, which is an increase of 25,5 % from the naïve probability of 59,2 %. The Spearman correlation matrix (table 6.3.1) shows that the variable debt ratio is significant correlated with capital and ROA and might distort the results of the logistic regression. Of this reason we present a model without debt ratio to avoid problems with multi-collinearity. As can be seen in table 6.3.2 the second model without debt ratio provides support for the full model, as the same variables are significant correlated. The model without debt ratio is also significant at the 0,001 level, has an explanatory power of 0,624 and correctly classifies 83,8 % of the cases, which is an improvement of 24,2 % from the initial naïve 59,6 % probability. In both models capital structure is moderately significant at the 0,1 level, indicating that a company with low ownership concentration tend to choose mark-to-model in a higher degree then a company with high ownership concentration. Management bonus is positively correlated with the choice of mark-to-model at the 0,05 level. The logistic regression also indicate that industry of the firm might influence the choice of mark-to-model and show that investment companies are significant at the 0,5 level and real estate companies at the 0,001 level compared to the reference case banks. This negative correlation is especially strong between banks and real estate companies.

Table 6.3.2 Logistic Regression. (n=101)

Variables	Full model		Model with debt-ratio excluded	
	B	S.E.	B	S.E.
Balance Sheet Total	0,208	0,213	0,256	0,198
Capital Structure	0,827†	0,488	0,837†	0,481
Debt Ratio	0,139	0,203		
ROA	0,067	0,049	0,058	0,048
Management Bonus	1,677*	0,814	1,577*	0,788
Deloitte	0,973	1,255	1,918	1,266
E&Y	1,239	1,195	1,276	1,210
PwC	-0,627	1,065	-0,615	1,062
Other Firms	-1,920	1,312	-2,101	1,294
Denmark	-0,230	1,155	0,010	1,091
Finland	1,722	1,229	1,846	1,210
Real Estate	-6,235***	1,643	-6,199***	1,633
Invest	-2,839*	1,368	-3,123*	1,295
Insurance	20,979	17428,717	20,600	17690,810
Constant	-5,055	5,310	-5,985	5,024

Model chi-square	60,901***	61,450***
Percent correct predicted	84,7	83,8
Negelkerke R2	0,624	0,624

\*\*\*Correlation is significant at the 0,001 level

\*\*Correlation is significant at the 0,01 level

\*Correlation is significant at the 0,05 level

† Correlation is significant at the 0,10 level

## 6.4 Relative use of Mark-to-Model

In the following two sections the relative use of mark-to-model will be analysed. One Pearson correlation (table 6.4.1) and one linear regression (table 6.4.2) are used in the analyses in order to test the B hypotheses.

### 6.4.1 Pearson Correlation

Table 6.4.1 present a Pearson correlation matrix where the dependent variable relative use of mark-to-model is constant. The Pearson correlation matrix also indicates that there might be multi-collinarity problems, which may distort the results of the linear regression if the correlated variables are used in the same model. In table 6.4.1 the independent variables measuring size are correlated with each other, indicating that we can only use one measure of size in the linear regression. Further ROA are positively correlated with turnover, debt ratio and ROE at the level of 0,01. Dummy variables consisting of audit firm, country and industry are included in the model but not presented in the table.

Table 6.4.1 Pearson Correlation matrix. (n=48)

Variables	Relative use of mark-to-model	Balance Sheet Total	Turnover	Employees	Capital	Debt Ratio	ROA	ROE
Relative use of mark-to-model	1							
Balance Sheet Total	-0,490**	1						
Turnover	-0,422**	0,810**	1					
Employees	-0,450**	0,683**	0,769**	1				
Capital	-0,046	0,117	0,091	-0,091	1			
Debt Ratio	-0,308*	0,119	0,152	0,239*	-0,039	1		
ROA	0,28	0,045	0,266**	-0,057	0,109	0,386**	1	
ROE	-0,258	0,097	0,177	0,105	-0,083	-0,1	0,486**	1

\*\*\*Correlation is significant at the 0,001 level

\*\*Correlation is significant at the 0,01 level

\*Correlation is significant at the 0,05 level

† Correlation is significant at the 0,10 level

### 6.4.2 Linear Regression

In table 6.4.2 we present three different multiple regressions with the independent variables balance sheet total, debt ratio, capital structure, ROA, management bonus, audit firm, country and industry and their correlation with the relative use of mark-to-model. Ideally, VIF should not exceed 2,5 to be able to establish the statistical significance and to conclude that there is no multi-collinearity between the variables. (Djurfeldt and Barmark, 2009, pp. 111-115) Our first model shows that the variable investment companies that have a VIF- value of 4,136, which was the lowest possible with all variables included. This is high but somewhat justified by the fact that the values of the other variables did not change when the variable was removed, and this indicates that the other values are stable. To achieve a result with higher statistical significance and to avoid multi-collinearity, we had to perform two models with excluded variables. The model with the variables industry and country excluded, as well as the “core” model showing only the relation between balance sheet total, debt ratio and audit firm on the dependent variable have a much higher statistical significance and does not have any problem with multi-collinearity.

We can see that the models in the linear regression have an adjusted R<sup>2</sup> and thereby an explanatory power of 26,2 %, 30,2 % and 32,9 % respectively. This means that between 73,8 % and 67,1 % of the variations in the dependent variables can be explained by other factors than the once examined in the independent variables. We can also conclude that all models are significant at different levels. The full model is significant at the 0,05 level the one without industry and country at the 0,01 level and finally the last model show the highest significance of 0,001 level. (Djurfeldt et al, 2010, pp. 316-318) All models in table 6.4.2 have been tested using a one-sample Kolmogorov-Smirnov test to make sure that the sample is normally distributed. In the table we can see that balance sheet total is negatively correlated with the relative use of mark-to-model at the 0,001 level, or 0,05 in the full model. It is also indicated in the table that there is a negative correlation between the debt ratio and the relative use of mark-to-model at the 0,1 and the 0,05 level. Finally the audit firms Ernst & Young and Deloitte seem to be negatively correlated with the relative use of mark-to-model at the 0,05 level, compared to the reference case KPMG.



Table 6.4.2 Linear Regression (n=68)

Variables	Full Model			Model with the variables industry and country excluded			Model with the variables industry, country, ownership, profit and management bonus excluded		
	B	SE(b)	VIF	B	SE(b)	VIF	B	SE(b)	VIF
(Constant)	14,347	4,663		13,251	3,228		11,547	2,452	
Balance sheet total	-0,411 *	0,154	2,382	-0,404 ***	0,108	1,235	-0,408 ***	0,102	1,174
Debt Ratio	-0,163	0,159	2,312	-0,245 †	0,128	1,582	-0,228 *	0,101	1,067
Ownership structure	-0,707	0,524	1,331	-0,437	0,466	1,113			
ROA	-0,039	0,062	2,050	0,003	0,052	1,547			
Management Bonus	-0,505	0,610	1,172	-0,405	0,579	1,115			
Deloitte	-1,653	1,017	2,413	-1,787 *	0,811	1,62	-1,628 *	0,766	1,542
E&Y	-2,072 *	0,916	1,830	-1,908 *	0,813	1,523	-1,895 *	0,786	1,517
PwC	-0,172	0,863	1,737	-0,351	0,81	1,615	-0,441	0,761	1,615
Other Firms	-0,580	2,081	1,181	-1,055	1,983	1,132	-0,76	1,891	1,09
Denmark	-0,720	0,931	2,758						
Finland	-0,484	1,197	1,779						
Insurance	0,663	1,566	2,496						
Real Estate	1,083	1,399	2,428						
Investment	0,964	1,154	4,136						
R <sup>2</sup> /Adj. R <sup>2</sup> /F value/Sig.	0,492/ 0,262/ 2,141/ 0,038			0,441/ 0,302/ 3,160/ 0,0065			0,416/ 0,329/ 4,752/ 0,001		

\*\*\*Correlation is significant at the 0,001 level

\*\*Correlation is significant at the 0,01 level

\*Correlation is significant at the 0,05 level

† Correlation is significant at the 0,10 level

## 6.5 Hypotheses Testing

The aim with this thesis is to explain the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic. In order to analyse the empirical data two dependent variables are applied and tested through two different hypotheses. The A hypotheses aim to test the choice of mark-to-model while the B hypotheses aim to test the relative use of mark-to-model. The hypotheses analysing the choice of mark-to-model are tested through a logistic regression (Table 6.3.2) and the hypotheses analysing the relative use of mark-to-model are tested through a linear regression (Table 6.4.2). The objective with the hypotheses testing is to conclude whether the hypotheses should be rejected or not rejected.

### **6.5.1 Industry**

According to system-oriented theories companies tend to mimic well performed and legitimate companies within their industry in order to be perceived as legitimate and trustworthy (DiMaggio and Powell, 1983). Specific industries and especially banks are subject to increased attention and this can be connected to economic-oriented theories and especially the political cost hypothesis within PAT (Gebhardt and Novotny-Farkas, 2011). The hypotheses H1 A and H1 B assume that industry of the company will have influence on the choice and the relative use of mark-to-model. Compared to the reference case banks, investment companies has a significant negative correlation with the choice of mark-to-model at the 0,5 level while real estate has a significant negative correlation with the choice of mark-to-model at the level of 0,001. This is supported in both models and therefore hypothesis H1 A is not rejected. In the linear regression (table 6.4.2) industry do not show any significant correlation in the full model and in the following two models the variable industry is excluded of multi-collinarity reasons. Hypothesis H1 B is rejected though there is no significant correlation between the industry and the relative use of mark-to-model.

*H1 A: Industry will have influence on the choice of mark-to-model – Not rejected*

*H1 B: Industry will have influence on the relative use of mark-to-model - Rejected*

### **6.5.2 Size**

System-oriented theories state that companies constantly seek to ensure that they are perceived as legitimate and trustworthy (Deegan and Underman, 2011, pp. 323-324). When valuing financial instruments, mark-to-model has been perceived as the least reliable and most risky valuation method by investors (Song et al, 2010). Hypotheses H2 A1 and H2 A2 predict a negatively correlation between the size of the company and the choice and relative use of mark-to-model. The logistic regression (table 6.3.2) shows that the variable size using balance sheet total is insignificant in the model. There is no significant negatively correlation between the size of the company and the choice of mark-to-model and hypothesis H2 A1 is therefore rejected. In the linear regression (table 6.4.2) balance sheet total show a significant negative correlation at the 0,5 level in the full model and at the 0,001 level in the following two models with excluded variables and hypothesis H2 A2 is therefore not rejected.

*H2 A1: Size of the company is negatively correlated with the choice of mark-to-model  
- Rejected*

*H2 A2: Size of the company is negatively correlated with the relative use of mark-to-model – Not rejected*

According to economic-oriented theories larger companies are subject for political attention and stakeholder pressure to a greater extent than small companies (Watts and Zimmerman, 1978). Hypotheses H2 B1 and H2 B2 assume a positive correlation between the size of the company and the choice and relative use of mark-to-model in order to reduce the political attention and stakeholder pressure. In the logistic regression (table 6.3.2) balance sheet total is insignificant and hypothesis H2 B1 is therefore rejected. In the linear regression (table 6.4.2) balance sheet total show a strong negative correlation with the relative use of mark-to-model. Balance sheet total have a significant negative correlation in the full model at the 0,5 level and at the 0,001 level in the models with excluded variables, but as the correlation is counter current H2 B2 is rejected.

*H2 B1: Size of the company is positively correlated with the choice of mark-to-model  
- Rejected*

*H2 B2: Size of the company is positively correlated with the relative use of mark-to-model - Rejected*

### **6.5.3 Ownership Structure**

Economic-oriented theories and especially agency theory state that managers will use the information asymmetry in order to maximize their own wealth (Jensen and Meckling, 1976). Hypotheses H3 A and H3 B assume that mark-to-model will be used in a wider extension in companies with a high spread of ownership due to the larger room for operating freedom by the management. In the logistic regression (table 6.3.2) ownership structure has a weak positive correlation with the choice of mark-to-model, which is moderately significant at the 0,10 level. However, the correlation is concurrent to the one predicted and therefore hypothesis H3 A is rejected. In the linear regression (table 6.4.2) the ownership structure do not show any significant correlation in any of the models that it is tested in and consequently H3 B is rejected.

*H3 A: Low ownership concentration is positively correlated with the choice of mark-to-model - Rejected*

*H3 B: Low ownership concentration is positively correlated with the relative use of mark-to-model - Rejected*

#### **6.5.4 Debt Ratio**

Both economic-oriented theories and system-oriented theories assume a positively correlation between debt ratio and the choice and relative use of mark-to-model. The system-oriented theories support the view that powerful stakeholders put pressure on the companies to keep the debt ratio at a low level (Deegan and Unerman, 2011, pp. 352-354). Economic-oriented theories state that companies have incentives to keep the debt ratio at a low level in order to lower the cost external of capital (Deegan, 2009, p. 289; Broberg et al, 2011). Hypotheses H4 A and H4 B predict a positively correlation between a high debt ratio and the choice and relative use of mark-to-model. According to the logistic regression (table 6.3.2) debt ratio do not show any significant positive correlation with the choice of mark-to-model, and therefore hypothesis H4 A is rejected. In the linear regression (table 6.4.2) debt ratio is insignificant in the full model but show a weak negative correlation in the two following models with excluded variables. The second model shows a significant negative correlation at the 0,10 level and in the third model a significant negative correlation at the 0,5 level indicates that there is a weak negative correlation. However due to the counter current correlation hypothesis H4 B is rejected.

*H4 A: A high debt ratio is positively correlated with the choice of mark-to-model - Rejected*

*H4 B: A high debt ratio is positively correlated with the relative use of mark-to-model - Rejected*

#### **6.5.5 Profitability**

The economic-oriented theories signalling theory and PAT was used in developing hypotheses H5 A and H5 B, which assumes a positive correlation between profitability and the choice and the relative use of mark-to-model. With support of signalling theory it was assumed that “good” firms wanted to signal their future success by increasing the earnings further with the use of mark-to-model

(Gaeremynck, 1997). According to PAT profitable firms would use mark-to-model to reduce earnings and thereby their political costs (Watts and Zimmerman, 1978). In the analysis of the choice of mark-to-model the logistic regression (table 6.3.2) did not show any significant correlation between profitability (ROA) and the choice of mark-to-model and therefore hypothesis H5 A is rejected. In the linear regression (table 6.4.2) the relative use of mark-to-model was analysed in relation to profitability (ROA). The result of the linear regression did not show any significant correlation between the variables and therefore H5 B is rejected.

*H5 A: Profitability is positively correlated with the choice of mark-to-model - Rejected*

*H5 B: Profitability is positively correlated with the relative use of mark-to-model - Rejected*

#### **6.5.6 Audit Firm**

In section 4.1.6 it was argued that the audit firm of a company contributes to the organisational techniques, practices and methods used in a company and influence the information that is provided externally by the company. (Pentland 1993; Fischer, 1996; Inchausti, 1997) Both system-oriented and economic-oriented theories was used to develop the hypotheses. The logistic regression (table 6.3.2) did not show that there were any differences between the companies with different audit firms and the choice of mark-to-model, and due to this hypothesis H6 A is rejected. The relative use of mark-to-model analysed using linear regression in (table 6.4.2) did however show to be significant. In the full model Ernst & Young showed significance at the 0,05 level compared to the reference case KPMG, while the other two models showed that both Ernst and Young and Deloitte are significant at the 0,05 level compared to the reference case KPMG and because of this hypothesis H6 B is not rejected. All tests performed indicates that audit firm is significant on the relative use of mark-to-model.

*H6 A: The audit firm of the company will have influence on the choice of mark-to-model – Rejected*

*H6 B: The audit firm of the company will have influence on the relative use of mark-to-model – Not rejected*

### **6.5.7 Management Bonus**

Economic-oriented theories state that financial accounting numbers such as profits often is used to determine the management bonus schemes (Watts and Zimmerman, 1990). Management bonus has been argued to be a way to reduce agency costs related to the opportunistic behaviour and the different interest between owners and management (Chen et al, 2011). Hypotheses H7 A and H7 B assume that management bonus schemes connected to profit will have influence on the choice and relative use of mark-to-model. In the logistic regression (table 6.3.2) management bonus has a significant correlation with the choice of mark-to-model at the 0,5 level and therefore hypothesis H7 A is not rejected. In the linear regression (table 6.4.2) management bonus did not show any significant correlation with the relative use of mark-to-model in the first two models and is excluded in the third, and therefore hypothesis H7 B is rejected.

*H7 A: Management bonus schemes will have influence on the choice of mark-to-model – Not rejected*

*H7 B: Management bonus schemes will have influence on the relative use of mark-to-model - Rejected*

### **6.5.8 Country**

According to system-oriented theories, societies have impact on organisational practice and the environment and the culture in a country may influence accounting choices (Nobes and Parker, 2010, p. 29). Additionally we argued that the finance system, the tax system and the legal system could lead to different accounting choices and thereby differences in the choice and relative use of mark-to-model (Nobes and Parker, 2010, pp. 158-165; Coppens and Peek, 2005). In (table 6.3.2) the logistic regression of the choice of mark-to-model show that country is insignificant in explaining the choice of mark-to-model and consequently hypothesis H8 A is rejected. The linear regression of the relative use of mark-to-model (table 6.4.2) also shows that country is insignificantly correlated and therefore hypothesis H8 B is rejected.

*H8 A: The country will have influence on the choice of mark-to-model - Rejected*

*H8 B: The country will have influence on the relative use of mark-to-model – Rejected*

## 6.6 Summary of Hypotheses Testing

In table 6.6.1 a summary of the hypotheses testing is presented and an overview of the 18 hypotheses tested in the analysis is provided. Four hypotheses were not rejected and fourteen were rejected. There were not any factor that showed similar result in both the logistic and the linear regression.

Table 6.6.1 Summary of Hypotheses Testing

<b>Hypothesis</b>	<b>Results</b>
H1 A: <i>Industry will have influence on the choice of mark-to-model</i>	Not rejected
H1 B: <i>Industry will have influence on the relative use of mark-to-model</i>	Rejected
H2 A1: <i>Size of the company is negatively correlated with the choice of mark-to-model</i>	Rejected
H2 A2: <i>Size of the company is negatively correlated with the relative use of mark-to-model</i>	Not rejected
H2 B1: <i>Size of the company is positively correlated with the choice of mark-to-model</i>	Rejected
H2 B2: <i>Size of the company is positively correlated with the relative use of mark-to-model</i>	Rejected
H3 A: <i>Low ownership concentration is positively correlated with the choice of mark-to-model</i>	Rejected
H3 B: <i>Low ownership concentration is positively correlated with the relative use of mark-to-model</i>	Rejected
H4 A: <i>A high debt ratio is positively correlated with the choice of mark-to-model</i>	Rejected
H4 B: <i>A high debt ratio is positively correlated with the relative use of mark-to-model</i>	Rejected
H5 A: <i>Profitability is positively correlated with the choice of mark-to-model</i>	Rejected
H5 B: <i>Profitability is positively correlated with the relative use of mark-to-model</i>	Rejected
H6 A: <i>The audit firm of the company will have influence on the choice of mark-to-model</i>	Rejected
H6 B: <i>The audit firm of the company will have influence on the relative use of mark-to-model</i>	Not rejected
H7 A: <i>Management bonus schemes will have influence on the choice of mark-to-model</i>	Not rejected
H7 B: <i>Management bonus schemes will have influence on the relative use of mark-to-model</i>	Rejected
H8 A: <i>The country will have influence on the choice of mark-to-model</i>	Rejected
H8 B: <i>The country will have influence on the relative use of mark-to-model</i>	Rejected

## 7 Conclusions

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*In the last chapter of the thesis, conclusions will be discussed related to the aim and problem discussion of the thesis. The conclusions are based on the results from the analyses and the hypotheses developed from accounting theories. Finally criticism and ideas for further research will be discussed.*

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### 7.1 Discussion and Conclusions

The aim with this thesis was to explain the choice and the relative use of mark-to-model when determining fair value of financial instruments in companies within the financial industries listed at Nasdaq OMX Nordic. The complex of problem with mark-to-model and level 3 fair value arise when companies in absent of an active market choose to value their financial instruments using unreliable assumptions and estimations (Casella and Guyader, 1994; Meder et al, 2011). According to Cheng (2009) it is up to the companies to determine when the market is active or not, and the complexity of financial instrument often makes it hard to determine if the trading activities is large enough to classify the market as active (IASB, 2008, pp. 8-10). Therefore the choice of mark-to-model often lies in the hands of the management. With the help of a multi theoretical approach we identified eight different factors and developed a total of 18 hypotheses that were tested in the analysis to explain the choice and relative use of mark-to-model.

The main contribution of this thesis is that our research show that the choice and relative use of mark-to-model cannot be seen as an rigid accounting rule but rather a valuation method that is influenced by both internal and external factors. The identified results suggest that the choice and relative use of mark-to-model is associated with audit firm, size, industry and management bonus and therefore we can conclude that both system-oriented theories such as IT and legitimacy theory but also the economic oriented theory PAT had an explanatory power in explaining the choice and relative use of mark-to-model. None of the factors that showed to be significantly correlated with the choice or relative use of mark-to-model was correlated in both the logistic regression and the linear regression. This result was unexpected and is of high relevance as it shows that factors such as audit firm and size influence the relative use



of mark-to-model, while industry and management bonus influence the initial choice of mark-to-model.

Industry of the company did show to influence the choice of mark-to-model. In the logistic regression companies within the real estate industry as well as investment companies choose mark-to-model to a lower extent than the reference case banks. The negative correlation was especially strong between banks and real estate companies. This supports the hypotheses developed out of system-oriented theory that coercive and mimetic isomorphism pressures companies to take on a similar form (DiMaggio and Powell, 1983). However it could also be the result of differences in the companies core business. Therefore the results was not unexpected as it is probable that banks possess financial instrument to a much higher degree and of more complex nature than real estate companies, and therefore it is natural that real estate companies choose mark-to-model to a lower extent. The choice of mark-to-model by banks might also be a result of the financial crisis when a lot of markets for complex financial instruments became illiquid forcing the banks to value their financial instruments using mark-to-model (IASB, 2008, p. 9). However the prediction that banks, as subject to high pressure would avoid mark-to-model of legitimacy reasons showed to be false (Dowling and Pfeffer, 1975; Blundell-Wignall and Slovik, 2010). Investment companies were shown to choose mark-to-model to a significantly lower degree then banks, and this is an interesting finding of our research.

As expected management bonus connected to the companies profit was shown to influence the choice of mark-to-model. The hypotheses were supported by the economic-oriented theory PAT and the management bonus hypothesis (Watts and Zimmerman, 1990). The results indicate that managers of the companies might choose mark-to-model in order to increase the reported profit of the period and thereby increase their related bonus schemes.

Audit firm of the company significantly influence the relative use of mark-to-model in determining fair value of financial instruments, which suggests that the audit firm have influence on the valuation methods. Among those companies who choose mark-to-model, the relative use is significantly lower by companies that are audited by Ernst & Young and Deloitte compared to the reference case KPMG. One reason of

why companies with a certain audit firm tend to have a lower relative use of mark-to-model could be that system-oriented theories argue that audit firms often implement their techniques and methods at their clients (i.e. DiMaggio and Powel, 1983; Pentland, 1993; Fischer, 1996), and different audit firms might have different procedures, methods and techniques when it comes to an area as complex as the valuation of financial instruments. The influence of audit firms on the relative use of mark-to-model is not a surprising result and is in line with the hypothesis that are supported by both system-oriented (i.e. DiMaggio and Powel, 1983; Pentland 1993; Fischer, 1996) and economic-oriented theories (Watts and Zimmerman, 1986, pp. 315-318). As discussed in the introduction the accounting profession experienced a great downturn in trust and reliability after corporate scandals such as Enron, WorldCom, Lehman Brothers and HQ Bank was revealed (Unerman and O'Dwyer, 2004; Benston, 2006; Andersen, 2010; Neurath, 2011). The results of our research provide evidence that audit firms influence the relative use of mark-to-model. Mark-to-model has been blamed to be an unsecure and unreliable valuation method (Meder et al, 2011). Since trust and reliability is an essential factor for an audit firms its not surprising that the signing audit firm will have influence on such an important matter (DeAngelo, 1981). This implies a higher accountability and responsibility for the use of different valuation methods by auditors. This also comply with the accounting scandals at Enron and HQ Bank, where the auditors misjudged the abuse of mark-to-model, and received a lot of criticism for their actions (Benston, 2006; Neurath, 2011).

Size of the company was shown to have influence on the relative use of mark-to-model though it had a strong negative correlation in the linear regression. The result suggests that system-oriented theories (i.e. Knox et al. 2006; Gassen and Schwedler, 2008; Deegan and Unerman, 2011, pp. 351-352) have a stronger explanatory power then economic-oriented theories (Watts and Zimmerman, 1978) in this case. A speculation of why Watts and Zimmerman's (1978) political cost hypothesis from PAT was rejected is that the political costs associated with the attention of using mark-to-model (that has received criticism in the latest accounting scandals) might be higher then the classical political costs associated with high profits by large entities. As discussed in the theoretical framework larger companies are subject for a higher pressure from the society (Watts and Zimmerman, 1978) and the use of mark-to-

model might jeopardize the legitimacy that large companies are dependent on in order to survive.

Surprisingly we ended up with two contradictory significant correlations from what we predicted in the hypotheses developed from the theoretical framework. This led to the rejection of both the debt ratio hypotheses and the ownership structure hypotheses. In the operationalization of ownership structure we stated that the disclosure of ownership in Danish annual reports was limited and introduced a measure to avoid problems with this limitation. The unexpected results could be seen as criticism against the operationalization of the measure and the reliability of the results. It can also be explained by that companies with a low ownership concentration is more dependent on external capital and therefore avoid mark-to-model as it is perceived as risky and unreliable by investors (Song et al, 2010; Meder et al, 2011). The other hypotheses that showed to be reversed were debt ratio, and we can only speculate on the results. Mark-to-model may already have been used in order to lower the debt ratio to a low level, which creates difficulties in analysing the relationship between debt ratio and the choice and relative use of mark-to-model. One other explanation might be that a company with a high debt-equity ratio are subject to more pressure and scrutiny from creditors, which may prohibit or prefer other valuation methods than mark-to-model that could be seen as unreliable (Song et al, 2010; Meder et al, 2011).

Finally the identified results suggest that the choice and relative use of mark-to-model is not associated with profitability or country. The profitability hypotheses were developed with the help of the economic-oriented theories signalling theory (Morris, 1987; Connelley et al, 2011) and PAT (Watts and Zimmerman, 1978; Watts and Zimmerman, 1990). As stated in the theoretical framework the empirical evidence for the profitability hypothesis developed from signalling theory has been very weak (Gaeremynck, 1997) and this is further supported by the results from our analysis. In the theoretical framework, system-oriented theories were used to argue for the fact that cultural differences (Gray, 1988) and differences in tax, finance and legal system (Nobes and Parker, 2010, pp. 158-165) would lead to differences in the choice and relative use of mark-to-model between countries. The result could possibly be explained by the simple fact that the differences between Denmark, Finland and

Sweden in cultural dimensions as well as the tax, finance and legal system are insignificant compared at an international level and especially in the area highlighted in this thesis. Throughout this thesis we have worked by the conception that the choice and relative use of mark-to-model is influenced by internal and external factors which can be connected to economic-oriented theories as well as system-oriented theories. The results of this thesis however, with the exception of management bonus, point towards a choice and relative use of mark-to-model mainly explained by factors supported by system-oriented theories. These factors are the audit firm of the company, the industry in which it operates and the legitimacy in the eyes of stakeholders which is increasingly important with the size of the entity. The financial crisis and accounting scandals highlighting the problems with mark-to-model might serve as an explanation to why companies in general are reluctant to use mark-to-model to control their profit, which is the main component in economic-oriented theories. Regardless of this the findings indicate that managers perceive mark-to-model as a way to control their profits, and the correlation to audit firm, industry and size makes an important contribution to the knowledge of highlighting that the choice and relative use of mark-to-model is not an objective rigid measurement method but needs to be scrutinized as it varies with the objectives and the characteristics of the entity.

## 7.2 Critique and Further Studies

This thesis is based on a quantitative and deductive approach. This approach has many advantages but also some disadvantages, one being that it does not allow alternative explanations in the highly structured research design that is used (Saunders et al, 2007, p. 117-120). Even though we used a multi-theoretical framework to minimize these problems, it is important to keep in mind that the explanatory power of our thesis only covers the eight factors and 18 hypotheses that is analysed. We also stated that the operationalization of ownership structure related to the problem with Danish firms lack of disclosure could be criticised, and this critique could be supported by the contradictory correlation that we presented in the analysis and conclusions. One other possible critique is the classification of audit firms into the “big 4” individually and “others” as one category. Even though we argue for the fact

that other firms are too small to be analysed on their own, it would be interesting to see differences within these firms as well.

In the process of writing this thesis the authors ran into many areas where further studies would be of interest and benefit the research. One of the areas where further studies would be of interest is the problem connected with active and inactive markets and the reclassification of financial instruments between level 1, 2 and 3. It would also be interesting to look closer into the classification of financial instruments and perform a qualitative study aiming to explain the internal practices in the valuation of financial instruments within companies, and thereby allowing a broader explanatory base. One other field of interest would be to investigate why some companies deviate from the rules in IFRS 7 p. 27A and to look at the characteristics of these companies to find possible explanations. Finally it would be interesting, as a response to the critique that the deductive approach is too rigid in its explanatory power, to analyse the choice and relative use of mark-to-model including other explanatory factors reaching without the traditional accounting theories, one example being the correlation between the beta value, external ratings of the company risk and the choice and relative use of mark-to-model.

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