A Comparative Study of Models to Reveal Earnings Management


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Sammanfattning


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Titel: En komparativ studie som utvärderar diskretionära modeller.


Förslag till vidare forskning: Ett förslag är att framtida forskning bör bedrivas i syfte för att utveckla redovisningsprinciper som begränsar resultatstyrning. Alternativt förslag är att samla in data som mäter resultatstyrning på en djupare nivå, dock är det problematiskt med dagens regelverk.
Abstract

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**Title:** A comparative study of models to reveal earnings management.

**Background and problem:** This paper illuminates the problem with temptation of earnings management. However, there are particular disadvantages when companies use this technique because it creates an information asymmetry at the stock market. Problem of earnings management is although not a new phenomenon there issue is the quality of financial reporting. The development is concerning, since recently the performance of financial report has a negative trend, a trend that could harm the financial world. If a company does not provide meaningful information the fundamentals of capital market lose confidence.

**Purpose:** This study has two purposes. The first purpose is to evaluate the ability of various discretionary accruals model at Stockholm Exchange Market. The second purpose is concerning a new model in purpose to understand and reveal earnings management.

**Boundaries:** Data contains only business corporations at large cap and operate at the Stockholm Stock Exchange market. Furthermore is this research based on a time series data from year 2000 – 2009 and cross section data from year 2009.

**Method:** The approach of the methodology are inspired of prior earnings management research, as Healy (1985), DeAngelo (1986) and Jones (1991) which have relied on discretionary accruals to detect earnings management.

**Conclusion:** The result indicates that the Jones modified model is the most powerful models to explain earnings management, which also is consistent with prior studies. The result from the extended Jones modified model indicates no improvement, concerning on revealing earnings management. Further, the results confirm that the null hypothesis can be rejected at 1% significant level but the F-value fall drastically compare to Jones modified model.

**Suggestions for further research:** One suggestion is that more research should be conducted in order to develop accounting policies aimed at limiting the application of earnings management. Alternatively, future research should base on data that measures the phenomenon of earnings management at a deeper level. Yet there are some obstacles to gather desire data and therefore it is not easily accessible.
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1. Introduction.

1.1 Background

There are different accountings methods for different companies and these methods vary over time. Earnings management is a method that can be applied in order to equalize for a business, however there are different opinions about earnings management and ways to pursue it. Professionals say that it is a phenomenon that is problematic which permeates in the industry, while theorists argue that it does not exist. Thus there are differences, regarding earnings management (Dechow & Skinner 2000). Prior discussion and study’s have also been focus if earnings management can be good. There proponents argue that benefit can be brought to the professionals as shareholder because it better reflects the economic picture of a company. Hence, it maximizes shareholders wealth since earnings management can contribute to reduce the variability in expected future cash flows (Laux 2003). Levitt (1998) mean some earnings management is necessary for the capital market; however it is not trivial to determine when earnings management is practiced since the accounts have become so complex. Consequently, can backfire be the difficulties to alarm deception before it’s too late. The fall of Enron is one of the most famous cases, there Enron’s business imbued with professional people who created the company’s success. However, Enron went into bankruptcy when investors got the true picture due to Enron had overstated profits and hidden debts. Enron’s case caught the attention of many people there auditors were heavily criticized because they had not discovered that Enron worked with fraud (Healy & Palepu 2003).

Problem of earnings management is although not a new phenomenon there issue is the quality of financial reporting. The development is concerning since recently the performance of financial report have a negative trend, a trend that could harm the financial world. If a company does not provide meaningful information, the fundamentals of capital market lose confidence. Another issue is the concept of auditing standards because auditors encounter challenges due keeping their customers and prepare corporate financial statements accordance with generally accepted auditing standards (Levitt 1998). Therefore it is interesting to develop new perspectives in the accounting because companies operate in a world market which is

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1 Dechow and Skinner (2000) means that that academic research has shown limited evidence of earnings management.
under constant change with consequences that are difficult to predict. Thus, causing the statement to become increasingly important for a company exists.

1.2 Problem discussion
There are particular disadvantages when companies use this technique, earnings management because it creates a major information gap between buyers and sellers at the stock market. Hence, insider and outsider\(^2\). Although the financial report aims to reduce this information asymmetry by providing information through the income statement, balance sheet, notes and management reports, complied under generally accepted auditing standards. Nevertheless do this paper address the problems to the financial statements because lack of fair value, i.e. it does not reflect the company’s actual activities since the complexity of earnings management (Dechow & Skinner 2000). Therefore is the quality of the financial report questionable where earnings management is the contributing factor. Shareholders or new investors do not have the same access to information as members in the board, thus this puts investors in a dilemma because they only have the financial report as the source for decision (Nobes 1998).

1.3 Problem definition
There are prior empirical researches as Healy (1985), DeAngelo (1986) and Jones (1991) which have relied on discretionary accruals to detect earnings manipulation. Although there are several research concerning earnings management DeAngelo (1988) stresses out the demand for a better\(^3\) model which can explain or reveal earnings management. Furthermore there are no prior studies that have implemented these models in object to detect earnings management at Stockholm exchange market. Thus, inspect the quality of the financial report. Therefore it is important to test if these models can be applied regarding Stockholm Exchange Market as well as if Swedish enterprises are engaged in earnings management.

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\(^2\) Nobes (1998) explain that the outsider is a term used to categorize people who do not have a deep relationship and understanding of a company. These people are the majority owners, insurance company, etc. Insiders are those individuals who have deep relationship with the company and access to better information about the company. Insiders are people who sit on the board, government, banks, etc.

\(^3\) In previous studies they searched for a model that has more powerful explanatory variables (DeAngelo 1988).
1.4 Specific issues:
With the above problem discussion the authors concluded that the issues of the research can summarize as;

- Which non discretionary model is most suitable\textsuperscript{4} to reveal discretionary accruals at Stockholm Exchange Market?
- Is it possible to develop a better\textsuperscript{5} model to reveal earnings management, given the information from the annual report?

1.5 Intention
The approach of this study is an empirical research with following purposes;

- Evaluate the competence of various discretionary accruals model.
- Develop a model that widens the perspective and reveal earnings management.

In object to answer these questions the starting point is processing of empiric with aim to find which is/ are variables that could guide the identification of a company engaged in earnings management, given that financial report as the only source.

1.6 Boundaries
The study boundaries are attributable to the data due it contains business corporations at large cap which operate at the Stockholm Stock Exchange market. The sample criterion for business is a market capitalization in excess of one billion euro. Therefore does this sample not include business corporations in mid cap and small cap. This research is based on a time series data from year 2000 – 2009 but using cross section data from year 2009 in order to obtain a better model.

1.7 Key concepts
The manifestation of this paper is to compare models in object to reveal earnings management and therefore this paper illuminates the problem with earnings management.

This study defines earnings management as discretionary accruals and because discretionary accruals are not observable this study estimates discretionary accruals by non discretionary

\textsuperscript{4} Authors mean that “suitable” can be attributable to the model which states the highest R-value as well as R adjusted and finally reject the null hypotheses.

\textsuperscript{5} The authors mean a “better” model can be define as a model with variables that can explain earnings management in a more precise way or different way that widens the perspective of the phenomenon (DeAngelo 1988).
accruals and total accruals (Dechow, Sloan & Sweeney 1995). Thus, there are different traditional nondiscretionary models which this study compares and evaluates regarding Swedish Exchange Market. Furthermore does this paper refer discretionary accrual as DAP or earnings management and it is the difference of non discretionary accruals and total accruals, which conflict with general accepted accounting. The non discretionary models this study uses are DeAngelo, Healy, Jones, Jones modified and Industry models, available in the earnings management. Thus, there are no other models those mentioned in the study and therefore this study evaluates the existence models regarding Stockholm Exchange Market. However, previous authors have chosen to modify the existing models which will be presented later in this study.

In this study these non discretionary models are labeled with NDA and/or with the respective names as mentioned above. The NDA is the expected accrual that shud been implemented for an enterprise and do not conflict with general accepted accounting. At last, total accrual model is define as TA and it is a function of depreciation, amortization expense, the change in current assets, cash equivalent, current liabilities and debts included in current liabilities (Dechow et al 1995). Therefore is total accrual the actual accrual that has been implemented for a company.

In object to develop a new model which will be referred as the extended multiple regression model, the approach of methodology is a multiple regression based as a function of the Jones modified model. There are traditional studies that (Collins & Hribar 1999) argue that a balance sheet approach is more efficient, instead to a cash flows statement approach in object to derive total accruals Therefore are variables investigated and analyzed partly from balanced sheet and partly from operating statement perspective and of a nature that is quantifiable, since there is no prior study in this field. The different feature can be brought to data since it use cross-section data for year 2009 and the variable choices such as stock price, operate income, profit before tax, debt ratio and equity ratio in aim to reveal earnings management.

1.8 Essay outline

The outline of the paper can be brought to chapter two, there the theoretical framework introduces and defines earnings management. Chapter three presents previous studies in this subject. Chapter four explains the study methodology. Hence, data and the model function with its adoption. In chapter five the results will be reviewed and discussed. Finally, in chapter six it summarizes the final results and conclusion.
2. Theory

This chapter presents theories about earnings management in order to increase the understanding of this phenomenal. Hence, these theories will be applied in order to understand earnings management models.

2.1 Basic concepts; positive accounting theory, agency cost and explanatory variables.

Watt’s and Zimmerman (1990) reflect their prior theses, “Toward a positive theory of the determination of accounting standard” and “The demand for and supply of accounting theories: The market for excuses”, in order to broaden the perspective for accounting choice. These papers are considering as benchmark for accounting theory and empirical test. They argue that the basic insights within positive accounting are to predict and explain why certain accounting method is applied in certain situations. Furthermore they mean that prior empirical researches have used a hypotheses about bonus plan, debt equity relation and political cost which has been empirical test due the assumption of agency cost.

The basic assumption of agency theory is that individuals act to maximize their own expected utilities. The obvious implication of this assumption is that management lobbies on accounting standards based on its own self-interest (Watts & Zimmerman 1978). This hypothesis is also supported by Gordon (1964). Essentially Gordon (1964) assume that shareholder satisfaction is solely a positive function of accounting income, however cannot shareholders observe the agents actions and decisions which usually refers to moral hazard problem and therefore will the agent act to maximize their own wealth rather than that of the stockholders (Schroeder, Clark & Cathey 2010, pp. 124-126). The fundamental insight in agency theory is the assumptions of a conflict between owners and managers which the theory defines as principle and agent. The conflict occurs when the self-interest manager is not aligned with the interests of shareholders, after the contract is formed due to moral hazard.

Hence, a manager may choose accounting alternatives that increase accounting earnings when a management compensations scheme is tied to those earnings (Schroeder et al. 2010, pp. 125-126).

Watt´s and Zimmerman (1990) also enlighten the lack of consistent between theory and practice their positive accounting suggested that agency and other costs associated with other contracts such as sales contracts could also affect accounting choice. Moreover they defines contracts costs as internal as well as external cost for a company because the concept is central when modeling accounting choice, hence modeling accounting choice must therefore
consider the magnitude at contracting cost. Moreover they explain that developing a positive theory\textsuperscript{6} of accounting choice, requires an understanding of the relative magnitude of various types of contracting costs. There most studies concerning accounting choice assumes that managers choose accounting methods to transfer wealth to themselves at the expense of another part to the firm because they can take the firm’s observed contracts as given and then determine manager’s incentives for accounting choice. DeFond and Jiambalvo (1992) refer to Watts and Zimmerman (1990) statement, when they study abnormal total and working capital accruals with data of firms that reported covenant violations in annual report.

“Positive accounting theory predicts that firms approaching covenant violate will make income-increasing accounting choices to loosen their debt constrains” (Watts and Zimmerman 1990).

Watts and Zimmerman (1990), mean that the most accounting studies use combinations of variables that presenting the manager’s incentive to choose accounting method. Hence, the three sets of variables are bonus plan, debt covenants and political process. Watts and Zimmerman (1990), also referring to Christenson (1983) article, there it criticize positive accounting theory since it has major flaws. They mean that the theory lack of conviction because it is value laded. Nevertheless, Watts and Zimmerman (1990) mean there are several issues regarding the prior research methods due the low explanatory variable there they mean that the genuine difficulty is the lack of substitute model and not the low explanatory power of the extent theory. For that reason accounting research need a model with great explanatory power to predict why circum accounting method is priority.

2.2 What is earnings management?

Healy and Wahlen.

Healy and Wahlen (1999) analysis the cause of earnings management with a perspective from standard setters based on empirical evidence. Despite the theoretical appeal from the academics, they investigate management judgment in financial report. Further they define earning management as;

\textsuperscript{6} Positive theories attempt to explain observed phenomena. They describe what is without indicating how things should be (Watts & Zimmerman 1978).
“Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers” (Healy & Wahlen 1999).

The result shows that it needs more studies about earnings management. Although, Healy and Wahlen conveys different approach to analysis the phenomena the problem is still present.

Dechow and Skinner.

Dechow and Skinner (2000), states that there is no clear definition of earnings management. Nevertheless they make a demarcation between fraud and earnings management which will be enlighten in figure 1. Furthermore the Arthurs mean that companies whose target is either to outperform the stock market or the desire to see an increased share value has a higher possibility to exercise earnings management. They also stresses that a business structure is crucial regarding performance of earnings management.

<table>
<thead>
<tr>
<th>Accounting Choices Within GAAP</th>
<th>&quot;Real&quot; Cash Flow Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overly aggressive recognition of provisions or reserves</td>
<td>Delaying sales</td>
</tr>
<tr>
<td>Overvaluation of acquired in-process R&amp;D in purchase acquisitions</td>
<td>Accelerating R&amp;D or advertising expenditure</td>
</tr>
<tr>
<td>Overstatement of restructuring charges and asset write-offs</td>
<td></td>
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</tbody>
</table>

<table>
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<tr>
<th>&quot;Conservative&quot; Accounting</th>
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<tbody>
<tr>
<td>&quot;Neutral&quot; Earnings</td>
</tr>
<tr>
<td>&quot;Aggressive&quot; Accounting</td>
</tr>
<tr>
<td>&quot;Fraudulent&quot; Accounting</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Violates GAAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recording sales before they are &quot;realizable&quot;</td>
</tr>
<tr>
<td>Recording fictitious sales</td>
</tr>
<tr>
<td>Backdating sales invoices</td>
</tr>
<tr>
<td>Overstating inventory by recording fictitious inventory</td>
</tr>
</tbody>
</table>

The distinction between Fraud and Earnings Management

Figure 1, shows the view of how different types of managerial choices can be characterized. Here it distinguishes between choices that are fraudulent and those that comprise aggressive, but acceptable, ways in which managers can exercise their accounting discretion (Dechow and Skinner 2000).
Levitt.

Arthur Levitt (1998) chairman in SEC\(^7\) argues that the accounting needs to be flexible\(^8\). Nevertheless, Levitt also believe that the flexibility of accounting has a reverse side since it giving rise to difficult regarding the business. Levitt argues that earnings management can be summarized into five different variants, (1)”Big Bath”, (2) ”Creative acquisition accounting”, (3)”Cookie jar reserves”, (4)”Immaterial misapplications of accounting principles” and (5)” Premature recognition of revenue”.

(1)”Big Bath”, means that companies exaggerate their restructuring charges when companies are undergoing a structural change. The reason is that analysts tend to focus their estimates of future cash flows and does not react to firm’s restructuring charges as negative for the stock price since the cost is considered as a disposable item. Companies can subsequently transform the exaggerating costs to revenue.

(2)”Creative acquisition accounting”, arise when a business acquire as well as consolidation by the acquisition method\(^9\). Consequently will the acquire get lower future earnings, which they acquire has difficult to accept. The company can avoid the negative earnings trend by describing an unfair share of the acquisition price as a research and develop, which is in an initial phase, as IAS 38. Since expenditures (cost) for research or a project´s research phase is always an expense (Sundgren, Nilsson & Nilson 2010, p.115) the acquired company can then writes off these expenses as a one-time cost. Levitt also believe that this presentation is equally misleading as the acquired company trying to hide the future costs by reporting it as excessive debt.

(3)”Cookie jar reserves”, arises when companies exceed market expectations which permits scope for the company to make excessive provisions\(^10\). Therefore firms may make unrealistic projections of future liabilities\(^11\) and this create an opportunity for businesses to hide reserves that can be used when earnings are lower than expected.

(4)”Immaterial misapplications of accounting principles”, occurs when companies

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\(^7\) SEC is an abbreviation for Securities and Exchange Commission.

\(^8\) “Flexibility in accounting allows you to keep up with business innovations” (Levitt 1998).

\(^9\) The acquisition method accounts for 100% of assets and liabilities and showing ownership by reducing capital and accounting for a minority interest (Lönnqvist 2006, p.21).

\(^10\) Provisions can be made for product warranties, environmental liabilities, etc (Sundgren et al 2010, p. 268).

\(^11\) The point is that a provision be made for an amount that represents the best estimate of the expenditure required to settle the obligation at the balance sheet date, IAS 37, p36. (Sundgren et al.2010, p. 267).
deliberately make systematic errors in the reporting on items that are considered irrelevant, because firms can always defend themselves by saying that the amount was wrong and has no effect on the financial report in its entirety. However, will this affect investor’s decision in a negative way. Nevertheless the confidence of generally accepted auditing standards can be shaken because of the abuse of the concept of materiality.

(5)” Premature recognition of revenue”, Levitt means that this situation occurs when companies report earnings before the sale actually took place or completed.

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12 Materiality is a term used among auditors in an audit because all records of a company cannot be audited). Materiality means that the audit examine the elements which constitute an important part of a company’s annual report (Moberg 2006, p.111).

13 Good auditing is according 9 ch. 3§ ABL formulated generally accepted auditing standards which the auditor shall audit the company’s most detailed and comprehensive annual report on accounting, the Board and the Executive Director who accepted auditing standards. However, the court will determine the contents of the good audit practice and generally accepted auditing standards (Moberg 2006, p.36).
2.3 Operationalizing from the theory.

The theories that have been presented are aimed to create a theoretical framework that forms basis of data collection. This thesis is therefore based on theoretical assumption that tests an empirical model. Hence, the variables of interest will be highlighted in table 1; there phenomena earnings management is transformed into measureable variables.

<table>
<thead>
<tr>
<th>Event/reason</th>
<th>Statement/Theory</th>
<th>Method</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobbying.</td>
<td>Positiv theory</td>
<td>Political cost.</td>
<td>Firms size.</td>
</tr>
<tr>
<td>Agency cost</td>
<td>Agency theory</td>
<td>Contracts cost.</td>
<td>Overall cost.</td>
</tr>
<tr>
<td>Company whose goal is to outperform the stock analysts.</td>
<td>Positiv theory</td>
<td>Income-increasing. Income-decreasing.</td>
<td>Net income.</td>
</tr>
<tr>
<td>When a business acquire and describe unfair share of the aquisition price to research and development.</td>
<td>Aquation Accounting</td>
<td>Transfer the aquisition price to science.</td>
<td>cost for research and development.</td>
</tr>
<tr>
<td>When a company exceed market expectations.</td>
<td>Cooking jaar reserves</td>
<td>Overstate future cost.</td>
<td>Liabilities.</td>
</tr>
<tr>
<td>When firms deliberatly make systematical error in reporting item that are irrelevant.</td>
<td>Missapplication of accounting priciples.</td>
<td>Violate matching-principl.</td>
<td>Revenues and expenditure.</td>
</tr>
</tbody>
</table>

Table 1 show, different situations that may be associated with earnings management or fraud that is taken from theory or statement which is accepted in the industry.
3. Previous research

There are several studies in object to reveal earnings management. It discusses six studies that like our thesis, which uses a model to estimate non discretionary accrual with aim to broaden the perspectives regarding earnings management.

3.1 McNicholas and Wilson.

McNicholas and Wilson (1988) perform an empirical study in entity to use provision for bad debts to measure earnings management. They define total accrual as:

\[ A = DA + NA \quad [1] \]

\[ A = \text{Total accruals.} \]

\[ DA = \text{Discretionary accruals.} \]

\[ NA = \text{Non discretionary accruals.} \]

**They estimated discretionary accrual as;**

\[ DAP = \text{Estimated discretionary accruals.} \]

There \( DAP \) determinants \( \eta \), hence the estimated variable \( DAP \) is derived by total assets subtracting nondiscretionary accruals. McNicholas and Wilson use an estimation of;

\[ \eta = NA - NAEST \]

\[ DAP = TA + \eta \quad [2] \]

McNicholas and Wilson (1988) hypotheses suggest that earnings management is preformed, alternative by income smoothing or company with explicit bonus system. This hypothesis is also support by Healy (1985). Furthermore, do McNicholas and Wilson use data from compustat\(^{14}\) their approach is to use a dummy variable. Hence, code 1 means that earnings management is specified and code 0 means otherwise. Additionally they conducted a regression analysis there accrual based test of earnings management is;

\[ DA = \alpha + \beta \text{PART} + \varepsilon \quad [3] \]

There, variable PART is the dummy variable; moreover they assume that the expected provision for bad debts has a linear regression function, which considering bad debts and the size of current and next year’s write-offs as exogenous affect. The residuals can be attributed

\[^{14}\text{Compustat is an America database.}\]
to manager accounting discretion (McNicholas & Wilson 1988).

3.2 DeAngelo.
DeAngelo (1988) discusses and reflects the research done by McNicholas and Wilson. She believes that this study has major flaws such as operationalize of the bonus plan hypothesis due omitted firm specific plan parameters. Another feature that causes problems concerning the model can be attributable to write-offs and bad debts, because of the assumption. Final problem concerning the means of classification, there earnings management was and was not expected to come about. DeAngelo means that McNicholas and Wilson model do not reveal earnings management but rather periods of economic procedures. Although there is a difficulty to investigate earnings management due to the moral hazard\(^ {15}\), DeAngelo stresses the demand for research about earnings management. DeAngelo enlightens that every method has its advantage and disadvantage and the choice of research design is a trade off. Hence future research should focus at specific situations there earnings management affect the welfare alter test for new models in object to reveal earnings management.

3.3 DeFond and Jiambalvo.
DeFond and Jiambalvo (1992) study about abnormal accruals\(^ {16}\) of a sample of 94 firms that reported debt covenant violations in annual reports. The study differs to prior since they investigate abnormal accruals of firms having violated the covenants. The author’s hypothesis is that the restriction in debt covenants affects managers accounting choices for former year and year of abuse. Thus they use time series and cross sectional models to derive normal accruals. Watt’s and Zimmerman (1986) mean that the debt and equity relation have a significant effect on the choice of accounting, hence the greater this debt equity relation the more likely is that managers will choose a method that report income from future periods to the current period. Furthermore does DeFond and Jiambalvo mean that there are difficulties of measuring accounting based covenants because this is not output of a compatible with the theory. It rather states that the income shift causes when a firm is close to violating an accounting based covenant. The results indicate that;

\(^{15}\) Managers with an informational advantage over academic researchers have incentives to disguise and adjustment they make to reported income.

\(^{16}\) They refer abnormal accruals as earnings management.
“In the year prior to violation, both models indicate that abnormal total and capital accruals are significant positive and in the year of violation, there is evidence of positive abnormal working capital accruals after controlling for management changes and auditor going concern qualification” (DeFond & Jiambalvo 1992).

The result proving that debt contract affects managers to manipulate income. This conclusion also corresponds with DeAngelo (1988) that the probability for managers to make a big bath is higher with new managers.

3.4 Kaplan.

Kaplan (1985) discusses and analyzes Healy’s paper (1984); there Kaplan praises Healy’s approach to investigate earnings management with respect to the impact of bonus plan on managerial decision. Healy’s research differs in the sense that he uses a new method to measure the impact of a short term bonus plan on managerial decisions. Further does Healy’s results shows that managers with a bonus plan will not always choose income-increasing discretionary accounting policy is not true. Kaplan continuous to reflect about Healy’s result, that manager will tend to use negative discretionary accruals both when net income before accrual is low as high. The traditional opinions regarding income smoothing and bonus plan believes that negative accrual occurs when the year result exceeds the target result.

Healy’s starting point is different in the sense that positive accruals occur when the income is under expectations and bonus maximizing hypothesis predict negative accruals. In Healy’s study there is a significant assumption regarding the formula for accounting earning is that cash flow is given and discretionary accrual affects earnings but not cash flow. Kaplan forwards the importance of further research with Healy’s data alter developing new tests since better models is required in object to measure earnings management. Kaplan stresses out that the revealing is about;

“A high incidence of negative accruals when earnings are above the upper limit of the bonus plan is perhaps the strongest evidence in support of Healy’s theory of bonus-maximizing managerial behavior” (Kaplan 1985).

3.5 Heninger.

Heninger (2001) analyze the association between auditor litigation and abnormal accruals, in purpose to find casual effect between earnings management and auditor litigation. Heninger starting point is to redefine total accruals to abnormal accruals because of earlier studies had showed conflict in their result (Lys & Watts 1994). Heninger also refers to Dechow et al (1995) conclusion, that the modified Jones model is the best approach to identify earnings
management. Although the estimation periods exclude the year of assumed wrongdoing, the result was consistent with earlier studies\textsuperscript{17}. This means that the coefficient for variable cash sales is positive with income increasing. Furthermore do the multiple regressions indicate that the coefficient for variable $PPE^{18}$ has a negative effect on total accruals which implies that income decreasing has a negative effect on total accruals. Heninger extend the Jones model by adding additional variables that measure the relationship between audit, client, company size and’ financial position i.e.

3.6 Dechow, Sloan and Sweeney.

Dechow et al. (1995) studied the phenomena earnings management by evaluating alternative accrual based models. The valuation compares specification and power of commonly used test statistics regarding measures of discretionary accruals in purpose to find significant result which may contribute the importance of controlling for financial performance. They conclude that the modified Jones model is efficient in detecting earnings management. The findings in this study provide major implications for research on earnings management. First, regardless of the model used to detect earnings management, the explanatory power of these tests is relatively low for earnings management. Finally they mean that further research is needed in object to develop better models that deliver better specified and more powerful tests to detect earning management.

\textsuperscript{17} (Lys & Watts 1994) research used filling data because of unreported results, although the lack of data the univariate analysis indicates that manipulation of accounting accruals is not major contributor to lawsuit against auditors.

\textsuperscript{18} The variable $PPE$ is used when estimated the non discretionary accrual there; $PPE=$gross property, plant, and equipment in year t (Dechow et al. 1995).
3.7 Operationalizing from the prior studies.

The literature studies that been presented are objected to supplement the theoretical framework which were presented earlier. Hence, it forms the basis of our data collection.

<table>
<thead>
<tr>
<th>Arthur</th>
<th>Method/ Event.</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>McNicholas and Wilson</td>
<td>Income-smoothing.</td>
<td>Bonus system.</td>
</tr>
<tr>
<td>DeAngelo (1988).</td>
<td>The probability for taking a bath is higher with new managers.</td>
<td>New CEO or not.</td>
</tr>
<tr>
<td>DeFond and Jiambalvo</td>
<td>manipulate income when a company is closed to violated covenant.</td>
<td>Net income.</td>
</tr>
<tr>
<td>Zimmerman (1986).</td>
<td>Indebtedness has a significant affect on the choice of accounting.</td>
<td>Debt/equity ratio.</td>
</tr>
<tr>
<td>Kaplan (1985) and</td>
<td>Income increasing is not always true. Managers use negative discretionary accrued both when net income before accrual is low and when it is high.</td>
<td>Negative accruals.</td>
</tr>
<tr>
<td>Heninger (2001).</td>
<td>Heninger extend the Jones model with additional variables that measure relationship between the audit and the client, company size, and clients financial position.</td>
<td>Audit size. Company size.</td>
</tr>
<tr>
<td>Dechow, Sloan and Sweeny</td>
<td>Research has focused primarily on documenting the properties of existing models.</td>
<td>Revenues. Receivables. Liabilities. Total assets.</td>
</tr>
</tbody>
</table>

*Table 2* shows, different situations that may be associated with earnings management or fraud that is taken from prior research which is accepted in the industry.

All the studies that have been mentioned earlier have both similarities and differences. Yet the common denominator for prior studies is the demand for a better model in object to reveal earnings management. Thus, there are different approaches to derive discretionary accrual and therefore in next section it briefly presents and discussed about pros and cons for the choice of model.
4. Methodology

This study follows a deductive approach where reality will be described in terms of already given theories and therefore this chapter presents an explanation for the choices models, parameter and how the selections affect the study. Furthermore it describes how the study is carried out which enable the reader to create their own opinion about the study’s credibility and quality.

4.1 Data.

The authors of this study made research in prior scientific studies in object to inspect earnings management. Although there is no evidence of prior study regarding Stockholm Exchange market, this paper one the one hand is innovative and on the other side faces challengers such as data sample. This data is created from a sample frame which contains business companies’ at large cap at Stockholm Exchange Market, which is randomly generated\(^{19}\) by thirty selected firms from the population. The data frame consists 78 companies from large cap at Stockholm Exchange Market. The population was first ranked in the firm size (large cap) and then selected by thirty random number generators. Hence an algorithm device was used to generate a sequence of elements between one and seventy-eighth that were used as our random sequence. By persuading a simple random sampling this study ensure that the sequence has no pattern or misleading design.

Since enterprises have possible to choose different accounting principles, there are some challengers due the data collection since it gathered from annual reports. Hence, the annual reports forms the basis of this data sample are partly in functional divided and partly cost category divided. Thus, the presence of bias cannot be ignored because there is a probability of wrong data entry.

Next step is to find the information of interest, regarding this study’s purposes and it’s restriction such as cost, time and available\(^{20}\). Therefore are data collection solely based on printed source in the form of annual reports, books, articles and standards\(^{21}\). Hence, the information doesn’t come directly from the source\(^{22}\). Furthermore does this study observe 300

\(^{19}\) The authors uses excel random generate to generate random sample. The sample is present at appendix 8.4.

\(^{20}\) The authors mean that it is costly to gather data due observations are required for companies for at least six month to ensure the data’s credibility.

\(^{21}\) When using secondary data, it is important to have a critical attitude to the source because the authors may have a certain view.

\(^{22}\) Primary data is instructions and information taken directly from the primary information source for example
entitles since this sample include 30 business companies for ten years period.

4.1.1 Disappearance.

In this study there was a falling off about 30 annual reports of 330\(^{23}\), which is approximately 9 percent. The reason that these financial statements are not included is that these companies did not exist and therefore are the financial statements not available. This disappearance indicates that the results should be interpreted with some caution. However, this should not have a significant impact on the study because the research is not aimed at investigating a specific company but rather evaluate which alternative non discretionary model is most appropriate in order to know whether companies in large cap applies the earnings management, at the Stockholm Exchange Market.

4.2 Total accruals, non accruals model, and discretionary accruals.

4.2.1 Model for total accruals.

In this paper discretionary accruals are defines as reflecting managers practicing earnings management. Hence, to know the estimated discretionary accruals it requires suitable total accrual and non discretionary models. This paper follows similarly approach as prior earnings management research as Healy (1985), DeAngelo (1986) and Jones (1991), which has relied on discretionary accruals to detect earnings manipulation. Yet these models also are the most widely recognized and available on this subject (Dechow et al.1995). This subsection explains the alternative models in object to reveal management.

The equation to obtain total accruals is derived by using;

\[
TA_{it} = \Delta CA_{it} - \Delta CASH_{it} - \Delta CL_{it} + DCL_{it} - DEP_{it} \tag{4}
\]

\(\Delta CA_{it} = \) Is the change in current assets in year \(t\)

\(\Delta CASH_{it} = \) Is the change in cash and cash equivalents in year \(t\)

\(\Delta CL_{it} = \) Is the change in current liabilities in year \(t\)

\(\Delta DCL_{it} = \) Is the change in debt included in current liabilities in year \(t\)

\(\Delta DEP_{it} = \) Is depreciation and amortization expense in year \(t\)

through interviews and observations. At this time of year are especially Swedish accounting firms and the companies’ lack of time for students.

\(^{23}\) Look at appendix 8.4, a company list that also shows these excluded years in this sample.
The equation [4] aims to derive total accrual which is recognized in prior studies, there total accrual is a function of the change in a firm’s assets, cash and cash equivalents, current liabilities and expenses. The reason that this study uses this equation to estimate total accrual can be taken to prior research as Healy (1985) and Jones (1991) were they used a balance sheet approach to obtain total accruals. This approach is also consistent with Collins et al. (1999) since they also argue that using balance sheet approach is more efficient instead to a cash flows statement to derive total accruals. Hence, this equation is accepted in the existence researchers about variables that constitute the total accruals and therefore this equation is applied in order to compare the differences non discretionary accrual (Dechow et al.1995).

4.2.2 Alternative models for non discretionary accruals.

This study defines earnings management as discretionary accruals and because discretionary accruals are not observable this study estimates discretionary accruals by non discretionary accruals and total accruals. There is alternative non discretionary model in object to estimated discretionary accruals and therefore this subsection briefly explains the selected non discretionary models.

**The DeAngelo model (1986), for estimate non-discretionary accruals is:**

\[
NDA_t = \frac{TA_{t-1}}{A_{t-2}}
\]  

[5]

DeAngelo model implies that non discretionary accrual is derived by total accrual in prior year, \((TA_{t-1})\) and lagged total assets, \((A_{t-2})\). Moreover the index t-1 implies prior year value, hence lagged is a term for a time lag (Dechow et al.1995).

**The Healy model (1985) for estimate non-discretionary accruals is:**

\[
NDA_t = \frac{1}{n} \times \Sigma^n_i \left( \frac{TA_t}{A_{t-1}} \right)
\]  

[6]

Healy model assume that average non discretionary accrual is a function of a relationship of total accrual in this year, \((TA_t)\) and lagged total assets, \((A_{t-1})\). Where the index \(t\) implies this year value, hence lagged is a term for a time lag\(^{24}\) (Dechow et al.1995).

---

\(^{24}\) A lag is used to calculate a time delay and it is common in time series.
The Jones model (1991), for estimate non-discretionary accruals is:

\[ NDA_{it} = \alpha_1 \left( \frac{1}{A_{t-1}} \right) + \alpha_2 \left( \frac{\Delta \text{REV}_{it}}{A_{t-1}} \right) + \alpha_3 \left( \frac{\text{PPE}_{it}}{A_{t-1}} \right) \]  \[7\]

\( NDA_{it} \) = Nondiscretionary accruals in year t scaled by lagged total assets.
\( A_{t-1} \) = Total assets in the end of year t-1.
\( \alpha_1, \alpha_2 \) and \( \alpha_3 \) = The parameters for firms.
\( \Delta \text{REV}_{it} \) = revenues in year t less revenues in year t-1.
\( \Delta \text{PPE}_{it} \) = gross property, plant, and equipment in year t.

\( i \) = firm index; and \( t = 1, \ldots, \) there;
\( t_i \) = year index for the number of years included in the estimation period for firm \( i \).

Jones model assume that non discretionary accrual is a function of a relationship of total assets, \((A_{t-1})\), the change in revenues \((\Delta \text{REV}_{it})\) and the expenses, \((\Delta \text{PPE}_{it})\). Where index \( t \), represent this year value (Dechow et al.1995).

The modified Jones model (1991), for estimate non-discretionary accruals is:

\[ NDA_{it} = \alpha_1 \left( \frac{1}{A_{t-1}} \right) + \alpha_2 \left( \frac{\Delta \text{REV}_{it} - \Delta \text{REC}_{it}}{A_{t-1}} \right) + \alpha_3 \left( \frac{\text{PPE}_{it}}{A_{t-1}} \right) \]  \[8\]

\( \Delta \text{REC}_{it} \) = Is net receivable in year t minus net receivable in year t-1.
The difference is the new added variable; \( \Delta \text{REC} \) which represent the adjusted change in revenues for the change in receivable in the year earnings management is implicit to occur (Dechow et al.1995).

The Industry model (1995), for estimate non-discretionary accruals is:

\[ NDA_{i} = \beta_1 + \beta_2 \text{median} \left( \frac{TA}{A_{t-1}} \right) \]  \[9\]

This model assumes that non-discretionary is derived of total accrual \((TA_i)\) in this year and total assets, \((A_{t-1})\) previous year. It is notable that this equation uses a median value of this relation to derive non-discretionary accruals (Dechow et al.1995).
4.2.3 Discretionary models.

The empirical question of those models as mentioned earlier is firstly; evaluate the ability of various non discretionary accruals model and total accruals, in object to know discretionary accrual. Thus, this subsection describes how discretionary accruals can be derived.

\[ \text{DAP}_{it} = T\text{A}_{it} - \text{NDA}_{it} \] \hspace{1cm} [10]

Equation [10] shows the estimated value for \( \text{DAP}_{it} \) which reflect earnings management. Hence, the calculation to derive total accruals is independent whatever the choice of non accruals models as shown in equations [5 - 9]. The difference is the output regarding the choice of DeAngelo, Healy Jones, Jones modified or Industry model.

These models to those discussed can summarize that having different specific assumption, which means that each model has its advantage and disadvantage. The difference between DeAngelo and Healy model is that DeAngelo assuming a random process while Healy model assumes that non-discretionary accruals revert to a previous state. The difference between The Jones model [6] and modified Jones model [7] is that modified Jones model eliminates the exogenous affects such as different economic conjunction, while the original Jones model is affected by. Another factor that is important when deciding non accruals model is the choice of data. At last the underlying assumption regarding Industry model is that nondiscretionary accrual is same over the time and the deviations of nondiscretionary are same for all firms (Dechow et al.1995).

4.3 The extended multiple regression model.

The second object is to develop a new model in purpose to understand and reveal earnings management. In order to answer this question it uses a cross section data from year 2009 and the Jones modified model. The motivation is supported by Dechow et al (1995) and Jones (1991) since they proved that the Jones modified model is the most powerful in detecting earnings management.

Since there is no prior study regarding Stockholm Exchange Market this study choice variable partly from cash flows statement and partly from a balance sheet, since investors only has the financial report as source for investment decisions.

\[ \text{NDA}_t = a_1 \left( \frac{1}{A_{t-1}} \right) + a_2 \left( \frac{\Delta \text{REV}_t - \Delta \text{REC}_t}{A_{t-1}} \right) + a_3 \left( \frac{\text{PPE}_t}{A_{t-1}} \right) + a_4 \text{X}_4 + \ldots + \beta_k \text{X}_{ki}. \] \hspace{1cm} [11]
Equation [11] shows the estimated value for NDA_{it}, which reflects earnings management as a function of Jones modified model with additional variables. The choice of the variables can be brought to the $\beta_k X_{ki}$, which represent these new variables which will be run in SPSS\textsuperscript{25}. The variables choices are highlighted in table 3 here below;

<table>
<thead>
<tr>
<th>Variables out of Annual Report.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta$ Operate income.</td>
</tr>
<tr>
<td>$\Delta$ Profit before tax.</td>
</tr>
<tr>
<td>$\Delta$ Net profit.</td>
</tr>
<tr>
<td>$\Delta$ Depreciation from income statement.</td>
</tr>
<tr>
<td>$\Delta$ Stockprice.</td>
</tr>
<tr>
<td>$\Delta$ Debt/Assets ratio.</td>
</tr>
<tr>
<td>$\Delta$ Debt/ Equity ratio.</td>
</tr>
</tbody>
</table>

Table 3 shows the variables that will be tested in the new model in purpose to develop a better model which can explain earnings management. The icon delta, $(\Delta)$ shows the change in the variable from year 2008 and 2009.

Another feature which is important when applying multiple regressions is one must take into account omitted variable\textsuperscript{26} because it causes the OLS\textsuperscript{27} be bias. There are two principles for omitted variable bias to arise;

- One regressor is correlated with the omitted variable.
- The omitted variable is determinant of the dependent variable (Stock & Watson, 2007, p.204).

The choice of these explanatory variables can be brought to prior studies\textsuperscript{28} and empirical restrictions. In prior study’s as mentioned authors argues that it is not relevant to include a dummy variable for bonus system (McNicholas & Wilson 1998) since it lack of trust, hence it needs a deeper understanding and complex data to make a significant conclusion, thus therefore will this variable be substitute with variables such as; $\Delta$ debt assets ratio and $\Delta$ debt equity ratio in object to take into account the bonus system (Healy 1984).

\textsuperscript{25} SPSS is a statistic program.

\textsuperscript{26} Omitted variable bias means that the OLS is bias in the OLS estimator (Stock & Watson, 2007, p. 316).

\textsuperscript{27} OLS is an abbreviation of ordinary least square.

\textsuperscript{28} Look at operationalising from theory as well from prior study.
Total accrual includes all immaterial assets, financially assets and material assets which are represented by variable CA, (Dechow et al.1995). The aquation accounting predicts that, when a business is in process with acquired they describe an unfair share of the aquation price to research and development. Hence, in this study this phenomenal is measure by variables such as immaterially assets, (Levitt 1998).

Debt contracts are a restriction that a company has when they borrow money. Debt covenants can be represented by current liabilities and liabilities. Example if liabilities increase then equity will fall which a lead to those solidities shrinks. Since, agency cost means that overall cost has an effect on earnings management this multiple regression model represented it with variable DEP. Furthermore, does agency theory also predict that managers exercise income smoothing by income increase or decrease, which is represented by the variable CA (Watts & Zimmerman 1990). The additional variables which will be tested such as; Δ profit before tax, Δ net profit and Δ depreciation is an effort to develop the understanding of income smoothing.

4.4 Parameters.
Parameters firms $\alpha_1, \alpha_2$ and $\alpha_3$, denotes the OLS estimation $\alpha_1, \alpha_2$ and $\alpha_3$, which are derived by using:

$$\frac{T\text{A}_t}{A_{t-1}} = \alpha_1 \left( \frac{1}{A_{t-1}} \right) + \alpha_2 \left( \frac{\Delta \text{REV}}{A_{t-1}} \right) + \alpha_3 \left( \frac{\text{PPE}}{A_{t-1}} \right) + \varepsilon_t \tag{12}$$

There the residuals represent each firm’s specific parameters

$$\varepsilon_{it} = T\text{A}_{it} - \bar{T\text{A}}_{it} \tag{13}$$

The coefficients for the variables that have been chosen are estimated by OLS. Since this sample is randomly chosen by a random generator, the estimators for the variable have a probability distribution. This indicates that the OLS estimator is not bias. Moreover do this the principle clarifies that a large sample makes the distribution of the estimated coefficients consistent with the least square assumptions. This indicates that in large sample the OLS estimators $\hat{\beta}_0, \hat{\beta}_1 \ldots \hat{\beta}_k$ are jointly normally distributed and each $\hat{\beta}_j$ is distributed

$$N \left( \beta_j, \sigma^2_{\hat{\beta}_j} \right), j=0\ldots k.$$ Thus, this data contains 300 entities in order to ensure that the condition to hold (Stock & Watson 2007, p.198).
4.5 Hypotheses test

Type I Error; In a hypothesis test for a single coefficient, a type I error occurs when the null hypothesis is rejected when it is in fact true, that is when $H_0$ is wrongly rejected. In our case the null hypothesis is that the coefficient $b_1$ has no effect on earnings management, on average. The following table 4 gives a summary of possible results of any hypothesis test:

<table>
<thead>
<tr>
<th>Decision</th>
<th>Reject $H_0$</th>
<th>Don't reject $H_0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$H_0$</td>
<td>Type I Error</td>
<td>Right decision</td>
</tr>
<tr>
<td>$H_1$</td>
<td>Right decision</td>
<td>Type II Error</td>
</tr>
</tbody>
</table>

*Table 4, shows the possible outcome of the hypothesis test*

A type I error is often considered to be serious, and therefore vital to avoid, than a type II error. The hypothesis test procedure is therefore adjusted so that there is a guaranteed 'low' probability of rejecting the null hypothesis wrongly. The probability of a type I error can be precisely computed as; $P$ (type I error) = significance level = $\alpha$. If it not reject the null hypothesis, it may still be false (a type II error) as the sample may not be big enough to identify the falseness of the null hypothesis (especially if the truth is very close to hypothesis). In this paper the empirical works proves that we can eliminate these risks for type 1 and type 2 errors.

Type II Error; Suppose that you would want to verify for a type II error with a hypothesis test. Then a type II error occurs when the null hypothesis $H_0$, is not rejected when it is in fact false. For example, the null hypothesis might be that the coefficient has no effect on earnings management, on average.

$H_0$: There is no effect on earnings management on average.

A type II error would occur if it was concluded that the parameters has no effect on earnings management, on average, when in fact that the coefficient has an effect on earnings management. The probability of a type II error is generally unknown, but is symbolized by $\beta$ and written; $P$ (type II error) = $\beta$. 
The coefficient on De Angelo, Healy and the Industry model, $\hat{b}_1$, provides a point estimates of the magnitude of the earnings management attribute to the stimulus represented by the tree different models. The null hypothesis of no earnings management in response to this factor is tested by applying a t-test to the null hypothesis that $b_1 = 0$.

**F- Test**

The F-Test is useful when testing the joint hypothesis about multiple regression coefficients. The hypothesis that both the coefficients on the revenue ratio ($b_1$) and the coefficient on the property, plants and equipment ($b_2$) are zero is an example of joint hypothesis. In this case, the null hypothesis restricts the value of two of the coefficients, the null hypothesis in the Jones model and the Modified Jones model imposes two restrictions on the multiple regression models: $b_1 = 0$ and $b_2 = 0$. The F-statistic combines the two t-statistics $t_1$ and $t_2$ using the formula

$$F = \frac{1}{2} \left( \frac{\frac{t_1^2}{1-\hat{\rho}_{t_1,t_2}^2} + \frac{t_2^2}{2}}{\frac{1}{\hat{\rho}_{t_1,t_2}^2}} \right), \tag{14}$$

Where $\hat{\rho}_{t_1,t_2}$ is an estimator of the correlation between the two t-statistics. If the value of the F-statistics computed from our dataset exceeds the critical value of the $F_{2,\infty}$ distribution, so the null hypothesis is rejected at the 1% significance level. Thus we can reject the earnings management hypothesis that neither the revenue ratio nor property, plants and equipment have an effect on earnings management.
5. Result

5.1 Results from the alternative non-discretionary models.
This study focused on analyzing and evaluating alternative non-discretionary accruals models in order to reveal discretionary accruals, which this study defines as earnings management. The results obtained are illustrated in tables, were Table 5 shows the output of the sum of all the firm’s non discretionary accruals and total accruals in percentage during a ten years period. Hence, theses non-discretionary models are De Angelo (1986) model, Healy model (1985), Jones model (1991), Jones modified model (1991) and at last Industry model (1995). The variables NDA representing the estimated average non-discretionary accrual by all firms during year 2000-2009 and TA indicates the estimated average total accruals done by all firms in same period. The discretionary accrual is the difference between total accrual and non-discretionary accrual which this study defines as earning management. The results from empirical data representing here below;

![Estimated discretionary accrual.](image)

Table 5 Shows the sum of the estimated total accrual and non discretionary accruals for each model, given thirty company’s during a ten years period, (1999-2009). Due to increase understanding of this study intended theses authors choose to label only variable NDA in percentage.
The results shows that the estimated average total accruals (TA) is 0, 22 percentage for all firms in this sample during year 2000-2009. The results with DeAngelo model indicates that the estimated average non-discretionary accruals (NDA) for all firms in this sample during ten years period shud be 0,04 percentage, while Healy model indicate that the average non discretionary accruals for all firms in this sample during ten years period are zero. Finally, results from the Industry model indicate that the estimated average non-discretionary accruals for all firms in this sample during ten years period is 0,04 percentage, given this study. The results indicate that business do income smoothing which is supported by Healy (1984) and Kaplan (1985). They mean that managers use a negative discretionary accrual both when net income before accrual is low and when it is high. This is also consistent with positive theory as well as agency theory, which states that business do applied method in object to income increase as income decrease, (Watt’s & Zimmerman 1990). The results from De Angelo can interpreted as the business do positive discretionary accrual, in that sense that firms decrease the net result, (+0,18% = 0,22% - 0,04%). Levitt (1988) calls this phenomenon as cooking jaar reserves. The Industry model shows similarly path. The results from Jones model can interpreted as the business do positive discretionary accrual, in that sense that firms increase the net result by not offset enough to future obligations, (-2,43% = 0,22% – 2,65%). Although this result do not confirms Levitt (1988) statement as premature recognition of revenues, it gets some guidance on corporate behavior. The Jones modified model also support this but the difference is, (-2, 33% = 0, 22% – 2, 55%). The results from Healy model differ in that sense that the results indicates that firms do not applies earnings management. Although the result showed this behavior from business the authors were skeptical and therefore it preformed an additional research. The results from above and new summarized here below.
Table 6 shows the average total accrual as well as non-discretionary accruals in percentage for all firms for each year using Healy model, given this study. Hence, the survey covers ten year period were starting point is year 2000 and ends year 2009. Due to increase understanding of this study the authors choose to label only variable NDA in percentage.

The results for the estimated average total accruals is minus 0,07 percentage for all firms in the sample during year 2000-2009. Thus, the estimated average non-discretionary accruals for all firms in this sample are positive 0,32 percentages in year 2000. The results from 2001 indicates that the estimated average non-discretionary accruals for all firms in this sample in year 2002 are minus 0,45 percentage. The result from 2003 indicates that the estimated average non-discretionary accrual for all firms in this sample in year 2003 is negative -0,28 percentage and so forth.

It is noteworthy that the results from the Healy model in Table 5, using time series data indicates that the average discretionary model for all business over ten years period is zero. While using cross sectional data the Healy model indicates that the average discretionary accruals is not zero (table 6). As previously mentioned, these average discretionary accruals are either positive or negative depending on the year as estimated.
5.2 Output with the non-discretionary model.

In order to know how well these models can explain the phenomenon of earnings management this study performs different regression analyzes. The results from these alternative models appear in the outputs which this study represents here below;

**Regression with De_Angelo.**

The regression use the dependent variable De_Angelo_DAP as dependent variable and TA_minus1 as explanatory variable. Were;

- **De_Angelo_ DAP** = is the sum of all business discretionary accruals during the estimated year.
- **TA_ minus1** = is the sum of all business previous total accruals in this sample.

**Output 1.2**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>3,303</td>
<td>1</td>
<td>3,303</td>
<td>8,112</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>121,356</td>
<td>298</td>
<td>407</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>124,660</td>
<td>299</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table (output 1.2) shows the regression with the De Angelo model where the \( t^2 = F = 8,112 \), thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 5 % level significance. The Anova table (output 1.2) shows the regression with the De Angelo model where the \( t^2 = F = 8,112 \), thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 5 % level significance. The results (output 1.1 in appendix) shows that the R square is 0,026 while the adjusted R square is 0,023 which explains that the regressor is not good at predicting, or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression is 0,638 which is an estimator of the standard deviation of the regression error \( u_t \). The coefficients table (output 1.3 in appendix) shows the value for the coefficient (0,163) and the single t-statistic (2,848) for the regression model. The slope of 0,163 mean that an increase in the non-discretionary accrual ratio (TA_minus1) by one percentage, on average, is associated with an increase in the dependent variable by 0,163 percentages.
Regression with the Healy model.

The regression uses the dependent variable Healy_DAP as dependent variable and Healy_TA as explanatory variable. Were;

- Healy A_minus 1 = is the sum of all business previous total assets in this sample.
- Healy_ DAP = is the average of total accruals during ten years time divided with Healy A_minus 1. This divides with the estimated time period, hence ten year.
- The average total accrual = the average discretionary accrual = Total accruals for all business divides with ten year.
- Healy_TA = TA =is calculated as in equation [4], original equation to derive total accruals\(^{29}\).

**Output 2.2**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>719240,499</td>
<td>1</td>
<td>719240,499</td>
<td>12143,912</td>
<td>.000a</td>
</tr>
<tr>
<td>Residual</td>
<td>17649,475</td>
<td>298</td>
<td>59,226</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>736889,974</td>
<td>299</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table, (output 2.2) shows the regression with the Healy model where the \( t^2 = F = 12143,9 \), thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 1 % level significance. The results (output 2.1 in appendix) shows that the R square is 0,976 while the adjusted R square is 0,976 which explains that the regressor is excellent at predicting or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression is 7, 69 which is an estimator of the standard deviation of the regression error \( u_i \). The coefficients table, (output 2.3 in appendix) shows the value for the coefficient (0,988) and the single t-statistic (110, 19) for the regression model. The slope of 0,988 means that an increase in the non-discretionary accrual ratio (Healy_TA) by one percentage, on average, is associated with an increase in the dependent variable (Healy_DAP) earnings management by 0,988 percentages.

---

\(^{29}\) Look at section 4.2.1
Multiples regression with Jones model.

The multiple regressions use the variable Jones_DAP as dependent variable and the variables Jones_1_delat_A_minus1 and Jones_REV, Jones_PPE as explanatory variables. Were:

- Jones_DAP = is the sum of all business, previous total assets, change in revenues and gross property plants and equipment.
- Jones_1_delat_A_minus1 = is the sum of all business previous total assets during ten year.
- Jones_REV = is the sum of change in revenues for all business during ten years period.
- Jones_PPE = is the sum of all gross property plants and equipment during ten years period.

Output 3.2

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>83,220</td>
<td>3</td>
<td>27,740</td>
<td>3719,872</td>
<td>.000a</td>
</tr>
<tr>
<td>Residual</td>
<td>2,207</td>
<td>296</td>
<td>.007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>85,427</td>
<td>299</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table (output 3.2) shows the regression with the Jones model where the $t^2 = F = 3719.8$ thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 1 % level significance.

The results (output 3.1 in appendix) shows R Square is 0.974 and adjusted R Square is 0.974 which explains that the regressors are excellent at predicting, or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression is 0.086 which is an estimator of the standard deviation of the regression error $u_i$. The coefficients table (output 3.3 in appendix) shows the value for the coefficients Jones_1_delat_A_minus1 (-0.018), Jones_REV (0.404) and the Jones_PPE (0.891). The slope of 0.891 means that an increase in the property, plants and equipment (Jones_PPE) by one percentage, on average is associated with an increase in the dependent variable (Jones_DAP) earnings management by 0.891 percentages holding all order variables constant.
**Multiples regression with Jones modified model.**

The multiple regressions use the variable Jones_DAP as dependent variable and the variables Jones_1 deltas A_minus1, M_Jones_REV_minus_REC and Jones_PPE as explanatory variables.

The only different regarding to Jones model is the Jones modified model includes another new variable. Were:

- M_Jones_REV_minus_REC = is the sum of the change in revenues minus the sum of all change in receivables for all business during ten years period.

- Another change is that the dependent variable in Jones model renames to M_Jones_DAP due to separate these two models, (Jones model respective Jones modified model).

**Output 4.2**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>7,890E7</td>
<td>3</td>
<td>2,630E7</td>
<td>5299,219</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>1469039,995</td>
<td>296</td>
<td>4962,973</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8,037E7</td>
<td>299</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table (output 4.2) shows the regression with the Jones modified model where the \( t^2 = F = 5299,21 \) thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 1% level significance. The results (output 4.1 in appendix) shows R Square is 0.982 and adjusted R square is 0.982 which explains that the regressors is excellent at predicting or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression is 70.44 is an estimator of the standard deviation of the regression error \( u_i \). The coefficients table (output 4.3 in appendix) shows the value for the coefficients Jones_1 deltas A_minus1 (0.000), M_Jones_REV_minus_REC (0.990) and the Jones_PPE (-0.008). The slope of 0.99 means that an increase in the revenue minus net receivable ratio (M_Jones_REV_minus_REC) by one percentage, on average, is associated with an increase in the dependent variable (M_Jones_DAP) earnings management by 0.99 percentages holding all order variables constant.
Regression with the Industry model.

The regression use the dependent variable Industry DAP as dependent variable and TA*median as explanatory variable. Were:

- Industry DAP = is the sum of all business non-discretionary accruals for all company.
- That is TA*median for a specific company.
- TA*median = A specific company’s total accruals during ten years period multiplied with the obtained median for the specific time period.
- TA= Total accruals from equation [4].

Output 5.2

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>361640,035</td>
<td>1</td>
<td>361640,035</td>
<td>289,854</td>
<td>.000a</td>
</tr>
<tr>
<td>Residual</td>
<td>371802,953</td>
<td>298</td>
<td>1247,661</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>733442,987</td>
<td>299</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table (output 5.2) shows the regression with the Industry model where the $t^2 = F = 289.85$, thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 1 % level significance. The results (output 5.1 in appendix) shows that R square is 0.493 and adjusted R square is 0.491 which explains that the regressor is around 50 % good at predicting or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression is 35.3) is an estimator of the standard deviation of the regression error $u_i$. The coefficients table (output 5.3 in appendix) shows the value for the coefficient (0.702) and the single t-statistic (17.025) for the regression model. The slope of 0.702 means that an increase in the non-discretionary accrual ratio (Median_TA_Ind) by one percentage, on average is associated with an increase in the dependent variable (Industry DAP) earnings management by 0.702 percentages.

30 Look at section 4.2.1
5.3 Result from the extended multiple regression model.

The second purpose in this study is an attempt to develop a new regression model in purpose to understand and reveal earnings management since there is a demand for a better model that can explain earnings management.

The new model is based on the previous Jones modified model since the results showed it is best\textsuperscript{31} to use in object to reveal earnings management. The different feature in this analysis can be brought to data since it’s using cross-section data for year 2009 and quantifiable variable such as stock price, opera Income, and profit before tax, debt ratio and equity ratio. However, did the effort not contributed to a better model in purpose to detect earnings management. Therefore, does this paper only present the model which rejects the null hypothesis obtained by many experiments\textsuperscript{32}.

The extended Jones modified model.

The multiple regressions use the same variables as Jones modified model there the dependent variable is Jones_DAP with explanatory variables Jones_1_delat_A_minus1, M_Jones_REV_minus_REC and Jones_PPE.

The contribution is that this model includes new variables. Were;

- STOCK\_PRICE = Change in stock price at end of 2009 for each firm\textsuperscript{33}.
- D\_E\_RATIO\_09 = Change in debt ratio at end of 2009 for each firm.
- Debt ratio = is derived by total debts divided with equity.

\textsuperscript{31} The authors define “best models” as a model that reject the null hypothesis and generated highest R-adjusted value. Another advantage is that the model takes into account the exogenous effects, while the others models do not.

\textsuperscript{32} Look at the table 3, there it shows the variables that this study have choose to test. Hence these variables above are explained because they perform the best results of many tests and therefore it present in subsection 5, (results). In this case the “best result” is the model that rejects the null hypothesis.
The Anova table (output 6.1) shows the regression with the extended Jones modified model where the $t^2 = F = 24,638$ thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 1% level significance.

The coefficients table (output 6.3 in appendix) shows the value for the coefficients Jones_1_delat_A_minus1 (0.012), the Jones_PPE (0.801), M_Jones_REV_minus_REC (0.422), D_E_RATIO_09 (0.091) and finally STOCK_PRICE_09 (-0.097).

The slope of (0.091) means that an increase in the debt ratio (D_E_RATIO_09) by one percentage, on average, is associated with an increase in the dependent variable (M_Jones_DAP) positive earnings management by 0.091 percentages holding all order variables constant. The slope of (-0.097) means that an increase in the stock price (STOCK_PRICE) by one percentage, on average is associated with a decrease in the dependent variable (M_Jones_DAP) earnings management by -0.097 percentages holding all order variables constant.
6. Final result and conclusion.

The manifestation of this paper is to evaluate the competence of various discretionary accruals model due to answer; which is most suitable non discretionary model to reveal discretionary accruals at Stockholm Exchange Market. Furthermore does this research develop a new model in aim to answer, if it is possible to develop a better model that reveals earnings management. Hence, a model with more powerful explanatory variables given information from the annual report. For that reason this paper develops a new multiple regression model.

In object to answer these questions this study defines earnings management as discretionary accruals. Since discretionary accruals are not observable this study estimates discretionary accruals by non-discretionary accruals and total accruals. Hence, the non-discretionary models applied are DeAngelo, Healy, Jones, Jones modified and Industry model. Furthermore does this study use a time series data between years 2000 – 2009, with thirty randomly selected business at large cap at Stockholm Exchange Market.

In this sample there was a disappearance of 30 annual reports of 330\textsuperscript{34}, which is about 9 percent. This indicates that the results should be interpreted with some caution. However, this should not have a significant impact on the study because the research is not aimed at investigating a specific company but rather evaluate which alternative non discretionary model is most appropriate in order to know whether companies in large cap applies the earnings management, at the Stockholm Exchange Market

Finally, the results are presented in table 5 with the output of the sum of all the firm’s non discretionary accruals and total accruals during a ten years period. The discretionary accrual is the differences between total accrual and non discretionary accrual.

The results in table 5, shows that the estimated average total accruals is 0, 22 percentage of the sales in each year for all enterprises during year 2000-2009. While the results obtained with these non discretionary accrual models showed that the average estimated non discretionary accruals is 2, 65 percentage with Jones and 2, 55 percentage with Jones modified model, compare to DeAngelo (0, 04%), Healy (0%) and Industry model (0, 04%). These results reflect well with the other results obtained for all firms in the same period.

Nevertheless, should these results be interpreted with some caution because of threat of internal validity is presence\textsuperscript{35}.

\textsuperscript{34} Look at appendix 8.4, a company list that also shows these excluded years in this sample.

\textsuperscript{35} The annual reports forms the basis of this data sample are partly in functional divided and partly cost category divided. Thus, the presence of bias cannot be ignored because there is a probability of wrong data entry.
Hence there is some probability for wrong data entry as well as disappearance at 9 percentages in the sample.

Although the results from the Healy model in Table 6, using time series data indicates that the estimated average discretionary model for all business over ten years is zero. While using cross sectional data the Healy model indicates that the estimated average discretionary is not zero, given this study. This conclusion is also consistent with DeAngelo (1988) statement, every method has its advantage and disadvantage and the choice of research design is a trade off. Thus, differences model as Healy, Jones or Jones modified can be applied in difference conditions. In this case the argument can be brought to data. Furthermore do this conclusion also supported with Dechow et al. (1995), there they point out that it is important when deciding non accruals model is the choice of data. There assumption with time series data is that the lengths of firm’s operating cycle do not change over the estimated period and the event year, while cross-sectional data assumes that all firms in the same industry have a similar operating cycle Dechow et al. (1995).

In order to get a broader perspective and how well these models actual explain the phenomenon of earnings management, this study manifest different regression analyzes as well as hypothesis test. A pointers is that the result should be interpreted with some caution because of threat of internal validity is questionable. The result from the Anova as well as coefficient tables indicate that the Healy and Jones modified model is the most powerful models to explain earnings management. These results are however consistent with previous studies as Heninger (2001) as well as Dechow et al.1995; their conclusion is that the modified Jones model is the most appropriate in detecting earnings management. This means that the coefficient for cash sales is positive with income increasing. Furthermore do the multiple regressions indicate that the coefficient PPE has a negative effect on total accruals which implies that income decreasing has a negative effect on total accruals. Although the output 4.2 is support by Heninger (2001) the coefficient PPE is not significant at 1%. It might be explained partly by the fact that data is not large enough and the fact that there is an error in data entry.

In prior study Watt´s and Zimmerman (1990) enlighten the lack of consistent between theory and practice. Despite the theoretical appeal from the academics, Healy and Wahlen (1999) investigate management judgment in financial report, while Jones modified model eliminates the exogenous affects such as different economic conjunction. Therefore it indicates that the Jones modified model is the most appropriate model when analyzing earnings management, given time series data.
The second purpose is an attempt to develop a model that widens the perspective and reveal earnings management since there is a demand for a better model. Where the empirical question concerning if it possible to develop a better\textsuperscript{36} model to reveal earnings management, given the information from the annual report\textsuperscript{37}.

To answer this question the authors first extended Jones modified model with additional variables. Moreover the authors gathered variables that are supported by theory and previous studies, given that variables are quantifiable. The different feature in this analysis can be brought to data since it using cross-section data for year 2009 and quantifiable variable such as stock price, opera income, and profit before tax, debt ratio equity ratio and depreciation. Watt´s and Zimmerman (1986) states that the greater this debt equity relation the more likely is that managers will choose a method that report income from future periods to the current period. Although the results from output 6.1 with variables $\Delta$ stock price support this conclusion it is not significant at 1 % nor is the variables $\Delta$ debt equity ratio. Further, the results confirms that the null hypothesis can be rejected at 1% significant level but the F-value (24,638) fall drastically compare to Jones modified model (F-value=5299, 219). Another change is that the variable $PPE$ is positive 0,801 and significant at 1%. The coefficient for $(\Delta REV - \Delta REC)$ has dropped to 0,422 compare to Jones modified model 0, 99 and still significant at 1%. The results from the extended Jones modified model indicate no improvement in full, concerning reveal earnings management. Threats to internal validity are questionable since it is difficult to investigate earnings management due the moral hazard. Arguments can also concern omitted variables.

The starting point for finding additional variables is to use prior thesis or test unsure variables that may differed from zero. Thus, the discussion may be why this study do not chose better variables to measure bonus system since most accounting studies use combinations of variables. One reason is that prior authors, (McNicholas & Wilson 1998) argue that it is not relevant to include a dummy variable for bonus system, since it lack of trust. Hence, it needs a deeper understanding and complex data to make a significant conclusion due to moral hazard (DeAngelo 1988).

\textsuperscript{36} The authors mean a "better" model can be define as a model with variables that can explain earnings management in a more precise way or different way that widens the perspective of the phenomenon (DeAngelo 1988).

\textsuperscript{37} The assumption for the question is that is takes a perspective from investors with no insider information or close relation with the board or authorities.
Statistic inferences:

- The first inference is that there are evidences that businesses in large cap at Stockholm Exchange Market are engaged in earnings management, which is contrary to generally accepted accounting principles.
- The second inference is that Jones model and Jones modified model reveal that business in this sample makes higher average discretionary accrual compare to DeAngelo, Healy and Industry model.
- The third inference is that differences model as Healy, Jones or Jones modified can be applied in difference conditions.
- Fourth conclusion is that the Jones modified model is the most suitable\textsuperscript{38} non discretionary model when analyzing earnings management, given time series data.
- The fifth inference is that the result from the extended Jones modified model indicates no improvement as full, concerning reveal earnings management.
- The sixth inference can be brought to that there is difficult to investigate earnings management, their arguments can concern omitted variables. Adding variables such as debt ratio and stock price cannot explain earnings management, since it lack of trust.

Finally, the results showed that the businesses are engaged in earnings management, which is contrary to generally accepted accounting principles. Therefore do the financial statements not provide the information as an investor or external stakeholders can be expected, nor eliminate information asymmetry at stock market.

One suggestion is that more research should be conducted in order to develop accounting policies aimed at limiting the application of earnings management. Alternatively, future research should base on data that measures the phenomenon of earnings management at a deeper level but the obstacle is that the desire data is not easily accessible. The arguments can be brought to the remarks, comment or objection by the auditor. Nevertheless, is today’s regulatory framework designed so that it is the business that decides who will have access to them.

\textsuperscript{38} Authors mean that “suitable” can be attributable to the model which states the highest R-value as well as R adjusted and finally reject the null hypotheses.
7. References

7.1 Reference from books.


7.2 Reference from Internet.

Financial statement from Avanza bank.  
https://www.avanza.se/aza/aktieroptioner/bolagsguiden/resbalans.jsp?companyid=103 [2011-


Annual Reports from website.


http://www.industrivarden.se/Finansiellt/Arsredovisningar/ [2011-04-05].


8. Appendix

8.1 Appendix from the alternative non discretionary models.

The results from empirical data representing here below, were the primary purpose is to evaluate alternative models to explore the phenomenon of earnings management, regarding OMX. The second objective is to create a new model that can explain earnings management in a way that can bring new perspectives and opportunities relating to earnings management. The results obtained are illustrated by figures, were figure 1 shows the output of the sum of all the firm’s non discretionary accruals and total accruals in percentage during a ten years period. Hence, the alternative models are De Angelo model, Healy model, Jones model, Jones modified model and at last Industry model, were the variables NDA representing non discretionary accrual, TA indicates the actually accruals done by the firm. The estimated discretionary accruals are the difference between total accruals and non-discretionary accruals.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>De Angelo</th>
<th>Healy</th>
<th>Jones</th>
<th>Modified Jones</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00%</td>
<td>0.04%</td>
<td>0.22%</td>
<td>2.65%</td>
<td>2.55%</td>
<td>0.04%</td>
</tr>
</tbody>
</table>

The non discretionary models.

Table 5 Shows the sum of the estimated total accrual and non discretionary accruals for each model, given thirty company’s during a ten years period, (1999-2009). Due to increase understanding of this study intended theses authors choose to label only variable NDA in percentage.
8.2 Appendix with the output from alternative non discretionary models.

Table 6 shows the average total accrual as well as non discretionary accruals in percentage for all firms for each year using Healy model, given this study. Hence, the survey covers ten year period were starting point is year 2000 and ends year 2009. Due to increase understanding of this study intended theses authors choose to label only variable NDA in percentage.
Output 1.1

Regression with the DeAngelo model.

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.163^a</td>
<td>.026</td>
<td>.023</td>
<td>.63815</td>
</tr>
</tbody>
</table>

This model summary contains the R Square (0.026) and the Adjusted R Square (0.023) which explains that the regressors is very bad at predicting, or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression (0.638) is an estimator of the standard deviation of the regression error $u_i$.

Output 1.2

ANOVA^b

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>3,303</td>
<td>1</td>
<td>3,303</td>
<td>8.112</td>
<td>.005^a</td>
</tr>
<tr>
<td>Residual</td>
<td>121,356</td>
<td>298</td>
<td>.407</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>124,660</td>
<td>299</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table shows the regression with the De Angelo model where the $t^2 = F = 8.112$, thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 5 % level significance.

Output 1.3

Coefficients^a

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>.000</td>
<td>.037</td>
<td></td>
<td>.013</td>
</tr>
<tr>
<td>TA_minus1</td>
<td>4.517E-7</td>
<td>.000</td>
<td>.163</td>
<td>2.848</td>
</tr>
</tbody>
</table>

a. Dependent Variable: De_Angelo_DAP

The coefficients table shows the value for the coefficient (0.163) and the single t-statistic (2.848) for the regression model. The slope of 0.163 means that an increase in the non-discretionary accrual ratio (TA_minus1) by one percentage, on average, is associated with an increase in the dependent variable (Industry_DAP) earnings management by 0.163 percentages.
Output 2.1

Regression with the Healy model.

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.988a</td>
<td>.976</td>
<td>.976</td>
<td>7.69587</td>
</tr>
</tbody>
</table>

This model summary contains the R Square (0.976) and the Adjusted R Square (0.976) which explains that the regressors is excellent at predicting, or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression (7.69) is an estimator of the standard deviation of the regression error $u_i$.

Output 2.2

ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>719240,499</td>
<td>1</td>
<td>719240,499</td>
<td>12143,912</td>
<td>.000a</td>
</tr>
<tr>
<td>Residual</td>
<td>17649,475</td>
<td>298</td>
<td>59,226</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>736889,974</td>
<td>299</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table shows the regression with the Healy model where the $t^2 = F = 12143,9$, thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 1 % level significance.

Output 2.3

Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>.505</td>
<td>.445</td>
<td>1,135</td>
<td>.257</td>
</tr>
<tr>
<td>Healy_TA</td>
<td>9.756</td>
<td>.089</td>
<td>.988</td>
<td>110,199</td>
</tr>
</tbody>
</table>

The coefficients table shows the value for the coefficient (0.988) and the single t-statistic (110, 19) for the regression model. The slope of 0.988 means that an increase in the non-discretionary accrual ratio (Healy_TA) by one percentage, on average, is associated with an increase in the dependent variable (Healy_DAP) earnings management by 0.988 percentages.
Output 3.1

Regression with the Jones model.

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.974</td>
<td>.974</td>
<td>.974</td>
<td>.08636</td>
</tr>
</tbody>
</table>

This model summary contains the R Square (0.974) and the Adjusted R Square (0.974) which explains that the regressors is excellent at predicting, or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression (0.086) is an estimator of the standard deviation of the regression error $u_i$.

Output 3.2

ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>3</td>
<td>27,740</td>
<td>3719.872</td>
<td>.000a</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>296</td>
<td>.007</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>299</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table shows the regression with the Jones model where the $t^2 = F = 3719.8$ thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 1 % level significance.

Output 3.3

Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.003</td>
<td>.008</td>
<td>.455</td>
</tr>
<tr>
<td>Jones_1_delat_A_minus1</td>
<td>-142,498</td>
<td>76,860</td>
<td>-.018</td>
<td>-1.854</td>
</tr>
<tr>
<td>Jones_REV</td>
<td>.933</td>
<td>.022</td>
<td>.404</td>
<td>43.078</td>
</tr>
<tr>
<td>Jones_PPE</td>
<td>1.013</td>
<td>.011</td>
<td>.891</td>
<td>93.657</td>
</tr>
</tbody>
</table>

The coefficients table shows the value for the coefficients Jones_1_delat_A_minus1 (-0.018), Jones_REV (0.404) and the Jones_PPE (0.891). The slope of 0.891 means that an increase in the property, plants and equipment (Jones_PPE) by one percentage, on average, is associated with an increase in the dependent variable (Jones_DAP) earnings management by 0.891 percentages holding all order variables constant.
Output 4.1

Regression with the Jones modified model.

### Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.991&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.982</td>
<td>.982</td>
<td>70.44837</td>
</tr>
</tbody>
</table>

This model summary contains the R Square (0.982) and the Adjusted R Square (0.982) which explains that the regressors is excellent at predicting, or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression (70.44837) is an estimator of the standard deviation of the regression error $u_i$.

Output 4.2

### ANOVA<sup>b</sup>

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>7.890E7</td>
<td>3</td>
<td>2.630E7</td>
<td>5299.219</td>
<td>.000&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Residual</td>
<td>1469039,995</td>
<td>296</td>
<td>4962,973</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8,037E7</td>
<td>299</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table shows the regression with the Jones model where the $t^2 = F = 5299.21$ thus we can eject the null hypothesis that the coefficient has no effect on earnings management at 1% level significance.

Output 4.3

### Coefficients<sup>a</sup>

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>4.690</td>
<td>6.176</td>
<td>.759</td>
<td>.448</td>
</tr>
<tr>
<td>Jones_1_delat_A_minus1</td>
<td>1510.727</td>
<td>62539,268</td>
<td>.000</td>
<td>.024</td>
</tr>
<tr>
<td>Jones_PPE</td>
<td>-8.947</td>
<td>8.827</td>
<td>-.008</td>
<td>.312</td>
</tr>
<tr>
<td>M_Jones_REV_minus_REC</td>
<td>.981</td>
<td>.008</td>
<td>.990</td>
<td>125.817</td>
</tr>
</tbody>
</table>

The coefficients table shows the value for the coefficients Jones_1_delat_A_minus1 (0.000), M_Jones_REV_minus_REC (0.990) and the Jones_PPE (-0.008). The slope of 0.99 means that an increase in the revenue minus net receivable ratio (M_Jones_REV_minus_REC) by one percentage, on average, is associated with an increase in the dependent variable (M_Jones_DAP) earnings management by 0.99 percentages holding all order variables constant.
Output 5.1

Regression with the Industry model.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.702</td>
<td>.493</td>
<td>.491</td>
<td>35,32224</td>
</tr>
</tbody>
</table>

This model summary contains the R Square (0,493) and the Adjusted R Square (0,491) which explains that the regressor is around 50% good at predicting, or explaining the values of the dependent variable in the sample of data on hand. The standard error of the regression (35, 32) is an estimator of the standard deviation of the regression error ůᵢ.

Output 5.2

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td></td>
<td>361640,035</td>
<td>289,85</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>298</td>
<td>1247,661</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>299</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table shows the regression with the Industry model where the $t^2 = F = 289,85$, thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 1% level significance.

Output 5.3

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>1,678</td>
<td>2,040</td>
<td>.822</td>
<td>.412</td>
</tr>
<tr>
<td>Median_TA_Ind</td>
<td>7,897E-7</td>
<td>.000</td>
<td>.702</td>
<td>17,025</td>
</tr>
</tbody>
</table>

The coefficients table shows the value for the coefficient (0,702) and the single t-statistic (17,025) for the regression model. The slope of 0,702 means that an increase in the non-discretionary accrual ratio (Median_TA_Ind) by one percentage, on average, is associated with an increase in the dependent variable (Industry_DAP) earnings management by 0,702 percentages.
8.3 Appendix with the extended multiple regression model.

**Output 6.1**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>5,606</td>
<td>5</td>
<td>1,121</td>
<td>24,638</td>
<td>.000²</td>
</tr>
<tr>
<td>Residual</td>
<td>1,092</td>
<td>24</td>
<td>.046</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6,698</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Anova table (output 6.1) shows the regression with the extended Jones modified model where the \( t^2 = F = 24,638 \) thus we can reject the null hypothesis that the coefficient has no effect on earnings management at 1% level significance.

**Output 6.2**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>-.036</td>
<td>.098</td>
<td>-.367</td>
<td>.716</td>
</tr>
<tr>
<td>Jones_1_delat_A_minus1</td>
<td>60,295</td>
<td>410,442</td>
<td>.012</td>
<td>.147</td>
</tr>
<tr>
<td>Jones_PPE</td>
<td>1,035</td>
<td>.109</td>
<td>.801</td>
<td>9,508</td>
</tr>
<tr>
<td>M_Jones_REV_minus_REC</td>
<td>1,392</td>
<td>.276</td>
<td>.422</td>
<td>5,041</td>
</tr>
<tr>
<td>D_E_RATIO_09</td>
<td>.043</td>
<td>.040</td>
<td>.091</td>
<td>1,084</td>
</tr>
<tr>
<td>STOCK_PRICE_09</td>
<td>.000</td>
<td>.000</td>
<td>-.097</td>
<td>1,157</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Jones_DAP

The coefficients table (output 6.3) shows the value for the coefficients Jones_1_delat_A_minus1 (0,012), the Jones_PPE (0,801), M_Jones_REV_minus_REC (0,422), D_E_RATIO_09 (0,091) and finally STOCK_PRICE_09 (-0,097). The slope of (0,091) means that an increase in the debt ratio (D_E_RATIO_09) by one percentage, on average, is associated with an increase in the dependent variable (M_Jones_DAP) positive earnings management by 0,091 percentages holding all order variables constant. The slope of (-0,097) means that an increase in the stock price (STOCK_PRICE) by one percentage, on average, is associated with a decrease in the dependent variable (M_Jones_DAP) earnings management by -0,097 percentages holding all order variables constant.
### Appendix with the company list.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ABB Ltd</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AstraZeneca</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Autoliv Inc.</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Boliden</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Electrolux A</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Elekta B</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Ericsson B</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Hennes &amp; Mauritz</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Holmen B</td>
<td>Income Statement, by Nature</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Industriv. A</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Lundbergs</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>NCC A</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>SAAB</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Sandvik</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Scania A</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>SKF B</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>SSAB A</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Stora Enso R</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Swedish Match</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Volvo B</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Skanska B</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Trelleborg B</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Tele2 B</td>
<td>Income Statement, by Function</td>
<td></td>
</tr>
</tbody>
</table>

*Table 7, shows companies included in the sample. This table also describes the method for operating statement for each business and also year of loss in this sample.*