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2018 **Jan Habětínek**

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Revenue Management around Seasoned Equity Offerings

Bachelor thesis

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Author: Jan Habětínek

Supervisor: Jiří Novák M.Sc., Ph.D.

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Abstract

This bachelor thesis enhances existing research about unusual operating performance of firms that are subject to Seasoned Equity Offerings. It uses modern tools of estimation of earnings management by discretionary revenues measured as portion of account receivables that cannot be explained by revenues and credit policy. Therefore, it helps to discriminate between two existing explanations of the unusual operating performance, market timing and earnings management, with greater precision. Apart of finding evidence in favour of the earnings management theory, the results additionally, in contrast to previous research, suggest downward-oriented adjustment of revenues in the year before SEO and therefore provide evidence in favour of newly proposed "revenue buffer" hypothesis. Implicitly, combined with the past results, also a shift from dominance of expense management before SEO to dominance of revenue management at the time of SEO is suggested.

Abstrakt

Tato bakalářská práce rozšiřuje stávající výzkum o neobvyklé provozní výkonnosti firem, které emitují druhotný vlastní kapitál. Využívá moderních nástrojů odhadu manipulace s příjmy prostřednictvím diskrečních výnosů měřených jakožto část pohledávek, které nelze vysvětlit přes výnosy a úvěrovou politiku. Tím tato práce pomáhá s větší přesností rozlišovat mezi dvěma existujícími vysvětleními neobvyklé provozní výkonnosti - načasováním trhu a manipulace s příjmy. Kromě důkazů ve prospěch teorie manipulace s příjmy výsledky na rozdíl od předchozích výzkumů naznačují, že v roce před emisí dochází k umělému snižování příjmů, a tedy poskytují důkazy ve prospěch nově navržené „hypotézy výnosové rezervy". Implicitně, v kombinaci s výsledky minulých studií, je také vyvozen posun od dominance manipulace s náklady před emisí k dominanci manipulace s výnosy v době emise.

Keywords

Revenue management, Seasoned Equity Offerings, Earnings management, Discretionary accruals, Discretionary revenues, Quality of corporate governance

Klíčová slova

Manipulace s výnosy, Druhotná emise vlastního kapitálu, Manipulace se zisky, Abnormální akruály, Abnormální výnosy, Kvalita managementu

Range of thesis: 67 026 characters

Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

2. The author hereby declares that all the sources and literature used have been properly cited.

3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague 2. 5. 2018 **Jan Habětínek**

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Institute of Economic Studies

Bachelor thesis proposal

Proposed topic:

Revenue management around seasoned equity offerings

Preliminary scope of work:

Research question and motivation

Publicly listed companies have, excluding operations, two ways of financing its activities: debt and equity financing. If a firm decides to acquire new capital through offering shares to new investors we say that the firm performs seasoned equity offering (SEO). Naturally, the firm will have strong incentive to have as good results before SEO as possible simply because investor's willingness to take part in the SEO depends on it. This incentive may sometimes lead to misreporting the results to the extent that it will no longer be in compliance with the reality. In order to prevent this publicly listed companies must have independent auditor opinion attached to its reports or, for instance, there is a possibility of being punished by regulators in case that the manipulation will be detected. But are those means strong enough to offset such incentive?

In my bachelor thesis I am going to study whether firms use revenue manipulation around SEOs. Based on the previous studies (e.g., Shivakumar, 2000; DuCharme et al., 2004; Cohen and Zarowin, 2010) SEOs are associated with earnings management and subsequent declines in operating performance. My intention is to build on the previous results resulting in my expectation that firms that issue SEOs exhibit evidence of revenue manipulation before SEOs, boosting its profits and return on investment in the short run and, on the other hand, subsequent decline in those variables in the long run. In order to test this statement I formulate following hypotheses:

Primary hypotheses:

H1: Firms that make Seasoned Equity Offering on average exhibit positive discretionary revenues before the issuance.

H2: There is negative association between discretionary revenues before Seasoned Equity Offering and after Seasoned Equity Offering

H1: According to statistics more than 70% actions taken by SEC in order to prevent accounting manipulation was against manipulation with revenues. This gives us strong evidence that revenue manipulation is the most common type of manipulation with accounting. Confirmation of this hypothesis is crucial for my research question. H2: Firms will need to reverse the manipulation in the years following SEO; those who used manipulation more than usual is expected to face more severe consequences of their actions. Confirmation of this hypothesis is crucial for the second part of my research question.

My motivation to work on this topic is that it has multiple applications in several sectors of finance. For instance, as said before, it has impact on investment decisions because rational investors will include the expected earnings management in pre-investment analysis. Another example can be that the regulators (SEC, Komise pro cenné papíry…) should be more likely to examine the accounting of firms around SEOs if the answer on my research question will be positive. Thus, the results of this study can be applied in real life.

Contribution

This topic has been already studied multiple times but no one has examined it from the discretionary revenue point of view so far. Stubben showed that his discretionary revenue model (Stubben, 2010) outperforms accrual models both in detecting and failing to detect earnings management, as appropriate. Discretionary revenue model, by nature, fails to detect earnings management when only expense manipulation is used but Stubben also showed that the other models have troubles with detecting expense management as well. Furthermore, revenues are the most common type of financial restatement (Turner, 2001). Thus, revisiting research settings with the revenue model could shed light on whether significant results were driven by misspecification of accrual models. If I get to similar results using Stubben's model we can claim that the bias of accruals models did not have crucial impact on the past results. From what was said above is clear that my contribution to the existing literature is not only adding new perspective but getting the assurance over the reliability of past results as well. Moreover, as far as I know, I am the first one to tell that revenue, one particular area of

accounting, is manipulated somehow. Previous studies were unable to distinguish between what exactly is being manipulated.

Methodology

In my bachelor thesis I will investigate revenue management in one year preceding SEO, in the year of SEO and one year after SEO. In order to get estimate of the discretionary revenue I am going to apply the conditional revenue model (Stubben, 2010) which models premature revenue recognition and its effect on the relation between revenues and accounts receivable. With respect to previous research premature recognition is expected to be the most commonly used form of revenue management (Feroz, 1991) resulting in believe that we can get quite a good proxy of revenue management by modeling only its premature recognition. The expectation is that the estimate will be positive in the year before SEO with the peak in the year in which SEO takes place and negative in the following years.

Using Stubben's conditional revenue model the estimate of a firm's discretionary revenue is the residual (ε) from the following equation :

$$\Delta AR = \alpha + \beta_1 * \Delta R + \beta_2 * \Delta R * SIZE + \beta_3 * \Delta R * AGE + \beta_4 * \Delta R * AGE_{SQ} + \beta_5 * \Delta R * GRR_P + \beta_6 * \Delta R * GRR_N + \beta_7 * \Delta R * GRM + \beta_8 * \Delta R * GRM_{SQ} + \varepsilon$$

Where AR are accounts receivable, R is revenue, SIZE is the natural log of total assets, AGE is the natural log of the firm's age in years, AGE_{SQ} is its square, $GRR_{P\ (N)}$ is the positive (negative) industry-median-adjusted growth rate in revenues, GRM is the industry-median-adjusted gross margin and GRM_{SQ} its square.

After solving this equation using multiple linear regression analysis on my data sample I should have an estimate of discretionary revenue which will be used as evidence to either prove or disprove my hypotheses.

Outline

• *Abstract*- In this section of my thesis I will briefly introduce what my research was about and show what I have found out.

• *Introduction*- In this section I will explain what SEO is, why do we believe that there will be some manipulation or, for instance, what is done to prevent it. After this introduction to the topic I specify my research question and what hypotheses will be tested.

• *Literature review*- I will introduce some of the previous papers on this topic, explain how previous research helped me to formulate my research question and hypotheses and what is my contribution to the existing literature.

• *Methodology*- In this part I will introduce my sample and how it was selected. I will also explain my approach to testing and why do I believe that this is the right way of doing it.

• *Results and discussion*- Here will be introduced the results of my testing and discussed some implications of this outcome.

• *Conclusion* – In this section I will discuss whether my results prove or disprove my hypotheses and conclude whether and how my research question was answered.

• *List of references*- In the last section I will provide detailed listing of literature used when working on my research.

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Content

1. Introduction

Seasoned Equity Offerings (SEOs) are considered to be one of the most important events that publicly listed companies' experience. Most of the times SEOs are conducted by growing firms in order to finance new investment projects that are rather uncertain and therefore debt issue would be too costly. That is the reason why this action is associated with great information asymmetry that gives an advantage to the management. They can opportunistically benefit from such advantage by presenting the company in a more favourable light to the market, thus increasing the value of new equity and obtaining maximised benefits from the SEOs.

Some papers were able to find evidence in favour of this hypothesis as it seems that on average the value of shares of a company that announces SEO issue declines (Masulis et al., 1986) and the main contributor of drop of prices seems to be the information asymmetry between the issuer and the investor (Kalay et.al., 1987) which is exactly what rational market reaction should be. The investors have only limited access to information of what is happening behind the scenes and therefore may be worried about the motivation of management to artificially increase the market value of the company above its natural level. Also, it was observed that firms are not able to fulfil expectations about future operating performance that investors have at the time of SEOs (Spiess et al., 1995) which indicates that the rational response of market is not sufficient to completely offset the effect of SEOs on the operating performance of issuing companies.

Given the information asymmetry between the issuing firm and potential investors managers might be tempted to opportunistically manipulate earnings upwards. This action requires either artificially increased revenues, reduced expenses or some combination of both. Intuitively, these artificial adjustments should be measurable by comparing earnings or its particular components to other figures reported in the financial statements. This intuitive idea comes from the fact that there is a connection of nearly all accounting figures with each other and therefore movements of one of them should be explained by the movements of others. However, these associations need not to be the same during unusual periods and SEOs are believed to be in general conducted

during periods of unusual growth resulting in the possibility of positive bias present in such estimation. In such a case it is important to distinguish between simple market timing and opportunistic earnings management effect. This thesis has the ambition to provide evidence that opportunistic earnings management actually occurs.

Proponents of opportunistic earnings management theory often argue that the significant difference between the operational results before and after SEOs can be explained by earnings management and its subsequent negative effect on the future operating performance – so called "borrowing from the future effect" (e.g. Rangan, 1998; DuCharme et al., 2004 or Cohen and Zarowin, 2010). They also argue that independently on how good their actual results are managers will still have the incentive to boost them around important events such as SEOs, simply because it is a profit maximizing behaviour (Shivakumar, 2000).

The main problem is that nearly all literature on firms and their behaviour around seasoned equity issues is based on various modifications of models (e.g. Jones, 1991) whose baseline idea is basically the same and dates back to the early 1990s. Since the unusual development of operating performance of firms conducting SEOs started to be more in detail discussed around the same time, it has never, as far as I am aware, actually used methodology based on other ideas. That is the reason why, following the suggestions on problems of using the traditional methodology to measure earnings management (e.g. Bernard et al., 1996; Healy et al., 1999 or Stubben, 2010), majority of previous studies might suffer from omitted variable bias. That can be one of the explanations why the statistical significance of results of these studies is, in general, not very high. By modelling earnings management using a modern analytical tool which should be more precise, this thesis can provide assurance over the reliability of the past results as well as discriminate between market-timing and opportunistic earnings management hypotheses with a greater precision.

One of the modern approaches which have not been applied on the problematic of SEOs yet and which will be followed in this thesis is to estimate the extent of earnings management by the extent of manipulation with revenues (more discussed in following sections). This thesis aims to contribute to the existing pool of research papers by applying modern methodology used to estimate earnings management that was never

used to measure earnings management specifically around SEOs and that was shown to be more efficient than the traditional ones under different settings. The research question therefore is: *Do firms manage revenues upward before Seasoned Equity Offerings?*

This thesis finds evidence in favour of the opportunistic earnings management hypothesis by identifying upward-oriented artificial adjustments at the time of the secondary equity issue. The artificiality is supported by the negative effect of corporate governance quality on the extent of the upward-oriented adjustment which is strictly against market timing hypothesis and perfectly in line with earnings management hypothesis. Furthermore, based on the pattern and associations observed in this thesis, completely new source of the upward-oriented adjustment is proposed. It seems that at least some firms use revenue buffer from preceding period rather than borrowing from the future periods. Overall, my results are in line with past papers and therefore this thesis argues that past results were not driven only by possible bias of the traditional method of measurements. Combined with their results also a structure of earnings management in terms of accounting components is suggested.

The remainder of the paper is organized as follows. Section 2 reviews prior literature regarding earnings management around SEO, traditional methods of the measurement of the earnings management as well as existing research about revenue management and specifies primary and secondary hypotheses together with the motivation for formulating them and the logic behind. In section 3 the methodology of the research is discussed and models which will be applied in the thesis are specified. There is also description of the selection of data sample and discussion regarding initial analysis of the data (descriptive statics, definition and computation of variables, subsets of the data used for detailed analysis with reasoning of making such subsets, winsorization…). Section 4 presents the empirical results of the thesis and Section 5 concludes and presents ideas on possibilities of future research based on the empirical results.

2. Literature Review

The topic of earnings management has been subject of a very broad and extensive discussion in the past years. In this part research that was conducted to answer why the operating performance of firms that are subject to SEO is so unusual, is going to be reviewed. One of the most commonly used method of estimating earnings management in previous research will be introduced and explained. It will be also examined what management can do in order to manipulate the earnings and some indicators that can predict whether firm's financial statements might be manipulated will be introduced. It is also important to see what the consequences of any such action taken are and what might prevent these actions from happening. After that some of the previous papers from the particular subset of research on earnings management that is the most relevant one for this thesis will be introduced. That means manipulation with certain components of accounting such as revenues.

2.1. Operating performance around SEOs

The operating performance of companies that issue SEOs has in general rather strange development in time. Many papers discovered short-term overperformance of market expectations before SEOs (e.g. Rangan, 1998 or DeAngelo et al., 2010) followed by long-term underperformance of market expectations (e.g. Spiess et al., 1995; Loughran et al, 1997 or Cohen and Zarowin, 2010) after the SEOs. Intuitively, this can be explained either by timing of the SEOs chosen by managers or by the extent of how much the overly optimistic expectations of investors were purposely mislead by the managers (Shu et al., 2014).

Under the hypothesis that equity capital will be issued mainly by growing firms in need of capital for further expansion the market timing is present by definition. However, managers are motivated to boost the expectation even further. In example, for the value of the growing firm, it is essential to show sustainability of their growth and so they would like to ensure even better results than during previous periods. Or, under the rationality of the financial market hypothesis, investors expect that around the time

when the equity issue is made, managers want to have as good results as possible, therefore earnings management (one of the way how managers can boost the firm's statements) might be conducted in order to reflect rational expectation of investors about the firm's behaviour before the offering (Shivakumar, 2000) not to mislead them. In other words it was found that there is a game between investors and issuers around events such as SEOs. From this game both sides can gain additional benefit depending on whether the true value of the company is overestimated or underestimated at the time of new equity issuance. Since this is a game without repetition, the best response of the issuer always is to mislead investors.

The best response, however, does not necessarily equal the highest payoff. There is a very strong correlation between number of civil lawsuits and the extent of earnings management measured as abnormal accruals, the traditional method of estimation discussed in more details in the following sub-section, prior the SEOs (DuCharme et al., 2004) which mean that at least some investors fail to recognize the size of manipulation and therefore lose the game. This finding is very important for the discussion about validity of pure market-timing theory. One of the most powerful arguments of the proponents of pure market timing is that events such as SEOs attract attention of regulators and auditors. Hence, the managers are encouraged to have the accounting as precise as possible in order to mitigate the possible litigation risk arising from higher probability that any manipulation will be detected. But, if the estimated level of earnings management around SEOs was driven only by exceptionally good operating performance rather than true manipulations, why should investors exhibit greater probability of suing the issuing company? This can be explained only by increasing probability that firms mislead investors with increasing level of abnormal accruals. In other words the level of abnormal accruals should be driven by level of earnings management. But crucial discussion, which makes these conclusions controversial at least, is about the validity of the estimation methods – discretionary (or abnormal) accruals.

2.2. Earnings management estimation methods

In order to properly understand the controversy in the discussion regarding the validity of past research it is important to introduce baseline concept on which past papers were built. In the past, researchers relied on discretionary (or abnormal) earnings accruals as a measure of earnings management. But how is this measure defined? One of the most commonly used methods of estimation are various modifications of so called Jones model (Jones, 1991)

$$\left(\frac{acc_{it}}{a_{it-1}}\right) = \beta_1 \left(\frac{1}{a_{it-1}}\right) + \beta_2 \left(\frac{\Delta rev_{it}}{a_{it-1}}\right) + \beta_3 \left(\frac{gppe_{it}}{a_{it-1}}\right) + \mu_{it},$$

where acc_{it} are the actual earnings accruals of firm i in time t, Δrev_{it} is the change in revenues in period t from period t-1, $gppe_{it}$ is the gross property, plant and equipment at the end of period t and a_{it-1} is the book value of total assets at the end of period t-1. The discretionary accrual in time t for firm i is the residual from this regression - μ_{it}.

The baseline idea of this and also other models commonly used in the past papers examining behaviour of firms conducting SEOs is that during each period firms record earnings accruals from operations. If the researcher models earnings management, he or she splits it into two categories: nondiscretionary (prediction of the model) and discretionary or abnormal (residual). In case that we observe positive discretionary accruals during periods in which there exists incentive to cheat, the higher level of discretionary accruals was believed to be positively correlated with the level of earnings management. That is the reason why it was selected as a proxy of the extent of earnings management, which hardly ever can be empirically measured on its own.

However, critiques pointed out that too many variables have significant effect on earnings accruals resulting in omitted variable bias nearly for sure present in the past research (e.g. Bernard et al., 1996). If there is such bias than the residuals from the regression (discretionary accruals) cannot be used as a measure of earnings management because it is modelled incorrectly. This critique was accepted by past researchers resulting in already mentioned modifications of Jones and other models by adding additional control variables. But, taking into account how many variables have

significant effect on earnings, it is unlikely that the omitted variable bias was not an issue after these adjustments as well.

Also, in case that the discretionary accruals are at least problematic if not even biased measure, as suggested by several researchers (e.g. Bernard et al., 1996; Healy et al., 1999 or Stubben, 2010), then its limitations should show primarily at the time of SEO when the performance is by definition positively biased by exceptionally good market conditions even under strict market timing hypothesis – there is no earnings management present in the firm's accounting but the variables used in the model are higher than it should be according to predictions due to the unusual market conditions. That is the reason why it makes sense to revisit the results of past studies using more reliable measures, such as discretionary revenues (Stubben, 2010) – since revenues are only one component of earnings the number of variables significantly affecting revenues must be, by definition, much lower and one can further reduce the noise by focusing on particular parts of revenues only, such as those recorded against accounts receivables. Conditional revenue model (Stubben, 2010) will be in detail described in the methodology section.

Even though there is a controversy about the validity of past studies findings, it is still beneficial to review the most important ones as it might help to see the flows of ideas of other researchers and therefore it will help with the formulation of hypothesis and the setting of this research. Next sub-section is intended to do so.

2.3. Earnings management around SEOs

The question whether firms that are about to issue SEOs exhibit evidence of earnings management is the most important one studied in the past. Firms in general exhibit disproportionately low stock returns at least five years after conducting SEO than one would expect based on their operating performance beforehand (Loughran et al, 1997). That is an interesting finding on which subsequent research was based. It seems as significant portion of the relatively poor performance can be explained by reversals of earnings management conducted before SEO in order to temporarily overvalue the company (Rangan, 1998). This statement is absolutely crucial for subsequent research. It provides evidence that some earnings management should be present around SEOs, assuming that the bias of discretionary accruals as a measure of earnings management did not lead to false results. Therefore this thesis can further elaborate on this finding by estimating the extent of earnings management via discretionary revenues, which is suggested to be a more reliable measure (i.e. Bernard et al., 1996; Healy et al., 1999 or Stubben, 2010).

Other authors, mainly during last few years, try to find some characteristics that could be used to predict the extent of earnings management conducted by specific company without the need of using discretionary accruals, which is not only possibly imprecise measure but also is relatively difficult to obtain. For instance, it seems that information uncertainty (Chen et al., 2013) is positively correlated with the total amount of abnormal accruals. It is quite logical finding as the management can use the uncertainty in favour of concealing their action and so minimize the possibility of being detected. Also firm's size (Shu et al., 2014) seems to have positive effect on the extent of abnormal accruals of a firm prior SEO. Small firms seem to time the issue whereas large firms seem to be relying on manipulation with their earnings (Shu et al., 2014). Moreover, the effect of both of these actions indeed exhibits the same path - positive effect on market value in the short-run and negative effect on operating performance in the long-run (Shu et al., 2014).

Other indicator can be the firm's ownership structure (Nam et al., 2014) as it seems to be correlated with the total amount of abnormal accruals as well. The effect of

ownership structure is very difficult to examine but this study discovered that firms backed by venture capitalists are more likely to manipulate with earnings. Furthermore, there is a negative correlation between the venture capitalist's reputation and the size of the manipulation. Venture capitalists generally invest in companies with intention to hold its shares only for short amount of time and then resale these shares with profit. As rational economic agents they try to maximize their profits and one of the possibility how they can relatively quickly increase the value of their shares is earnings management. However, if they use such practices regularly and to too high extent it lowers their reputation. Ownership structure might be seen as one variable that was, as far as I am aware, never used as control variable when explaining accruals. But since it seem to have an effect on discretionary accruals it seems that it should have been and therefore this finding might be also interpreted as in favour of omitted variable bias of discretionary accruals hypothesis.

Another category of research papers tries to explain how firms manipulate the earnings and what the consequences of using such practices are. The focus of majority of them was on accrual-based versus real activities management after it was found that firms exhibit signs of real activities management as well as accrual-based one (Roychowdhury, 2006). The main difference between accrual-based and real activities manipulation is that the real activities-based affects statement of cash flow whereas accrual-based does not. An example of real activities manipulation with revenues could be opportunistic sales discounts meaning that they are not intended to maximize long-run profits but to only boost it in the short-run with possibility of negative effect of this action in the long-run. It would be logical, from the firm's point of view, to use both of them in order to hedge discrepancies among its statements. However, some papers suggest that the management threat those possibilities as substitutes rather than complements (e.g. Zang et al., 2007). Also, one of the previous studies found evidence that firms use real activities manipulation specifically prior SEO and, most importantly, that the usage of real activities manipulation leads to more severe decline (when compared to accrual-based one) in operating performance afterwards (Cohen and Zarowin, 2010).

There are two questions arising from the previous paragraph. Why would firms threat those two different kinds of manipulation as substitutes and why would they even

use the real one if it is worse for them in terms of post-SEO operating performance? Prior research proposes the same answer on both: regulation.

For instance independent auditors are one of the main means intended to prevent manipulation with financial statements. However, there is evidence that the effect of audit work depends on the auditors characteristics (Becker et al., 1998; Kim et al., 2003). Both of these studies present results showing that bigger audit firms are more effective in preventing upward oriented discretionary accruals. This means that size of the auditors should be negatively correlated with the extent of revenue management around SEO as we would expect revenue to be manipulated upwards around that time. It also seems that bigger auditors are, surprisingly, less effective in preventing downward oriented discretionary accruals (Kim et al., 2003) meaning that we would expect greater share of manipulation with expenses on earnings management around SEO for firms with the big-4 audit firms as their independent auditors.

Moreover, presence of auditors of higher expertise, bigger size, and of higher tenure induces substitution of accrual-based earnings management by real activates management (Chi et al., 2011). The authors also found evidence that the total amount of firm's earnings management is constant nevertheless, therefore quality of auditors can only shift the structure in favour of real activities management and as a result induce even worse operating performance afterwards. The reason of the shift is that auditors will be able to detect accrual-based management only. The reason is that real activities manipulation can be done via completely legal actions and therefore auditors will have no incentive or right to question such actions taken by a management. Auditors can also induce usage of less aggressive accrual-based management as e.g. premature revenue recognition can be masked as mistake when detected which is hardly possible with entirely fictitious revenues.

Similar effect as auditor quality has, not surprisingly, the quality of accounting standards. The improvements of IFRS lead to significantly lower amount of reported discretionary accruals (Navarro-García et al., 2014). This is an indicator that when modelling earnings management through discretionary accruals one needs to take the quality of accounting standards into account as well. It also suggests that firms will try to somehow compensate this effect. Actually, they tend to fully compensate the lost

level of earnings management by increasing real activities management (Evans et al., 2014). However, evidence from China suggests that the extent of this substitution varies across firms depending on its characteristics (Ho et al., 2015). Still, it seems that better regulation leads to a shift in favour of greater share of real activities management on earnings management rather than to overall less manipulated accounting.

Findings from previous paragraphs suggest that one should take only firms that face similar level of accounting standards, corporate governance and regulations into account in order to minimize the noise of virtually lower levels of abnormal accruals (i.e. firms within one country). Based on last paragraph it also seems as if research suggests that it is impossible to reduce earnings manipulation which is, however, not correct conclusion.

In example, we have evidence that better corporate governance can reduce the amount of earnings management. For instance, too many members of board of directors lead to larger amount of discretionary accruals (Ching et al., 2002). This is another result that suggests invalidity of market-timing theory as it is very unlikely that not optimal setting of board of directors would be associated with better operating performance. On the other hand, it is quite logical that it could lead to higher probability of earnings management. Another study suggests that institutional investor representation on the board of directors and the presence of independent outside directors negatively influences the extent of earnings management (Cornett et al., 2008). Even expertise and frequency of meeting of audit committee lead to lower level of discretionary accruals (Xie et al., 2003). On the other hand, the added value of audit committee could have only the same substitution effect as the independent auditors. Still, it seems that good setting of board of directors and supervisory board might be the solution. Therefore one should take the quality of corporate governance into account when trying to estimate earnings management.

Although, as shown in this sub-section, there is quite a wide pool of papers on earnings management there is only a little evidence of what components of accounting are being manipulated. Next sub-section reviews the existing papers on this topic.

2.4. Revenue management

The evidence that is available suggests that firms manage earnings upward or downward by managing sales, operating, and non-operating expenses in predictable directions (Plummer and Mest, 2001). But, revenues are the most common type of financial restatement (Turner, 2001). Also, we have evidence that firms, which were punished by SEC for manipulated earnings, were detected using discretionary revenues, but not discretionary accruals and that is the reason why discretionary revenues should be able to detect earnings management even where discretionary accruals cannot (Stubben, 2006).

Connecting all these pieces of information together we can see that firms in general should manage revenues as we would expect, majority of problematic activity should occur on revenue accounts and, taking the possibility of omitted variable bias into account, estimation of earnings management via revenues should be more reliable and efficient than the traditional ones. Discretionary revenue model, by nature, fails to detect earnings management when only expense manipulation is used but it also seems that the traditional accrual-based models have troubles with detecting expense management as well (Stubben, 2010). So, even in the corner case of pure expense management (which is highly unlikely due to the bound of expenses and revenues) where this kind of models would fail, the traditional ones will probably fail as well.

From previous paragraph it is clear that we have evidence suggesting that the discretionary revenues model should be more reliable and efficient than the traditional ones. This thesis suggests that, due to the unusual conditions that are linked with SEOs, the new equity issue should be one of the applications of discretionary revenues model where its added value will be maximised. Therefore, it is beneficial for current literature to closely examine the revenue management around SEOs and its consequences afterwards. Beneficial because the validity of estimating the extent of earnings management based on discretionary accrual have been extensively questioned and no existing paper examining earnings management theory around SEOs uses different methodology as far as I am aware. Moreover, there is a controversy over whether accrual-based earnings management in fact harms future value of the firm's shares or

whether the association exists only because it is correlated with real activity management (Cohen and Zarowin, 2010). Hence, it is important to examine the performance using more reliable measures of earnings management such as discretionary revenues.

No one has examined earnings management around SEO in particular from discretionary revenue point of view so far. Stubben showed that his conditional revenue model (Stubben, 2010), whose adjusted version will be applied in this thesis, outperforms accrual-based models both in Type I and Type II errors. In case that my research shows similar results using Stubben's conditional revenue model it can be interpreted such that the possible bias of accruals models did not have crucial impact on the past results. Therefore my contribution to the existing literature is not only adding new perspective – revenue management instead of earnings management - but getting the assurance over the reliability of past results as well. Moreover I am the first one ever to tell that revenue, one particular area of accounting, is manipulated around SEO somehow which can give investors chance to make better predictions about the extent of earnings management based on more reliable estimate of revenue manipulation.

In order to do so following hypotheses are formulated:

Hypothesis 1: *Firms that make Seasoned Equity Offering on average exhibit positive discretionary revenues in the year of the equity issue.*

As reviewed above, it was found that firms that issue SEOs exhibit evidence of earnings management (i.e. Rangan, 1998). According to statistics more than 70% actions taken by SEC in order to prevent misleading investors by manipulation with financial results was against manipulation with revenues (Dechow and Schrand, 2004). This finding gives insight why revenues are natural candidate for estimator of the extent of earnings management as we have strong evidence that revenue manipulation is generally used as one of the components of earnings management and we should get good proxy of general earnings management by taking only manipulation with revenues into account. Confirmation of this hypothesis is crucial in order to get positive answer on my research question and, combined with prior research, this finding could be further used to shed light on the structure of earnings management prior SEO.

Hypothesis 2: *There is negative association between discretionary revenues before Seasoned Equity Offering and after Seasoned Equity Offering.*

Significant drop to less than predicted revenues after SEO would be another practical manifestation of earnings management prior the equity issue. It is more convenient to shift real revenues in time rather than make fictional or artificial transaction, as shifting in time can be, in case of detection from the side of regulatory authority or external auditors, concealed as a mistake. That is much more difficult when fictional or artificial transactions are used. Assuming high positive correlation between discretionary revenues and the extent of manipulation with earnings, it is clear that the more discretionary revenues used in the years preceding SEOs, the greater this effect will have to be. This logic predicts negative effect of the presence of positive discretionary revenues before and in the year of the SEOs on the values of discretionary revenues afterwards, which is exactly what is needed to show in order to find evidence in favour of the research question. In other words this hypothesis is intended to check the presence of "borrowing from future effect" proposed by many researchers (e.g. Rangan, 1998, Cohen and Zarowin, 2010 or Shu et al., 2014)

Previous studies suggest that using modern tool focused on one particular component of earnings while modelling earnings management one should get more precise estimate of earnings management (i.e. Bernard et al., 1996; Healy et al., 1999 or Stubben, 2010). However, as discussed in earnings management estimation methods sub-section, proponents of pure market-timing theory argue that even if no manipulation is present in the accounting, then during exceptionally good periods positive discretion will be estimated. This might be true although it could be easily countered with question why the discretion generally became significantly negative after SEOs (under Hypothesis 2 one of the main driver is expected to be the past value of discretion, which cannot be sufficiently explained by market timing) even though exceptionally good periods should be followed by normal rather than exceptionally bad ones. Proponents of market-timing tend to explain it by persistency of the indicators – if they were on higher levels during good periods then return to their natural values could be captured as negative discretion.

So, the crucial discrimination between these two hypotheses can be made only by estimating association with variables that should be, by nature, opposite in each case. Level of corporate governance is a great candidate for such variable since under market-timing hypothesis the association should be naturally positive – better corporate governance includes higher ability of the management and therefore should induce higher peak of the economic cycle and more qualified selection of the period in which the new equity will be issued and thus induce higher level of discretionary revenues. On the other hand, as presented on example of several studies (e.g. Ching et al., 2002; Xie et al., 2003 or Cornett et al., 2008), this association is expected to be negative under the earnings management hypothesis. Hypothesis 3 is formulated such that the evidence in favour of it would be clearly against the pure market-timing hypothesis.

Hypothesis 3: *There is negative association between the quality of corporate governance and the extent of discretionary revenues prior Seasoned Equity Offering.*

3. Research Design

3.1. Methodology

In order to get an idea about how firms might behave around SEOs, revenue management in one year preceding SEOs, in the year of the SEOs and one year after the SEOs is investigated. To estimate discretionary revenues conditional revenue model (Stubben, 2010) which models premature revenue recognition and its effect on the relation between revenues and account receivables is applied. Premature revenue recognition composes of recording revenues from existing transactions earlier than it is required by GAAP or IFRS. Usage of premature revenue recognition therefore effectively means borrowing from the future. The conditional revenue model is adjusted by additional dummy variables identifying three subsequent years around SEOs such that it will be able to measure the mean residuals of this subset of data and its statistical significance.

According to previous research, premature revenue recognition is expected to be the most commonly used form of revenue management (Feroz, 1991), resulting in believe that we can get adequate proxy of revenue management by modelling only its premature recognition. The expectation is that the estimate will be positive in the year before SEOs with the peak in the year in which SEOs take place and negative in the following year. This follows expectation that firms will try to gradually increase their revenues in order to show sustainable growth and also will be keen on maximising the return on share at the time of the investment. If any manipulation is used, it will subsequently lower the future revenue, which will lead to discrepancies between true values and those predicted by the model.

The baseline idea of Stubben's conditional revenue model is that in case that the revenues will be recognized prematurely, all (or at least significant part) of the amount will be stored on account receivables, since the customer is unlikely to pay more than small down payment before the delivery (which is, most of the time, the boundary for appropriate revenue recognition). Both cash and receivables accounts are mirrors for the revenue ones and majority of revenues are generally collected in cash before the end of a year. Therefore, the noise that can be caused by appropriately recognized revenues

should be mostly offset by trying to explain what is happening on receivables account only.

While the baseline idea is rather logical the non-trivial part is to properly estimate it. Technical assumption is that the yearly change in receivables is a function of the firm's financial strength, its stage in the business cycle and its operational performance relative to the industry competitors (Stubben, 2010). This assumption seems to be reasonable as those variables should indeed indirectly determine the level of account receivables since they are determinants of the firm's credit policy. Combined with the amount of revenues credit policy is the main determinant of the level of account receivables but, as opposed to revenues, the policy cannot be numerically measured and therefore we need to rely on those indirect effects.

As a proxy of the firm's financial strength acts variable *SIZE* (natural log of the firm's assets) – higher amount of assets should in general induce higher financial strength. Estimated stage of the business cycle is covered by variables *SIZE* and *AGE* (natural log of firm's age in years) – following the definition of business cycle (association of firm's size and age). The rest of the explanatory variables (change in revenues, its growth rate and gross margin) aim to assess the operational performance relative to the industry competitors.

The relativity is absolutely crucial since these variables are likely industry-specific, which could cause biased estimation when firms from various industries would be present in the cross-sectional data. However, once this effect is controlled for by industry-median adjustment, it allows us to include this effect in the estimation which will no longer suffer from bias. There is no reason to believe that the average deviation from industry-median should be dependent on the industry. There is no need for such adjustment in case of variables *AGE*, *SIZE* and *R* (revenues) since they are, by nature, hardly dependent on industry even in the nominal values. The squares of variables *AGE* and *GRM* (gross profit margin) are included in order to allow change of marginal effect based on the level of these variables. Split of growth rates of revenues based on the positive/negative sign is done because the effect on accounts receivables is, by definition, opposite in each case which might cause problems if they were measured

jointly. All of the variables are included in interaction with revenues as follows from the logic of joint effect of revenues and credit policy on the level of account receivables.

The original conditional revenue model (Stubben, 2010) was not constructed such that it would directly allow observing the effect of time. The time dimension of pooled cross-sectional data (cross sections for multiple periods estimated at once) was not used at all and the multiple periods were included in order to increase the number of observations only. However, the effect of time is the core objective of this thesis and therefore the model is adjusted by additional variables $YEAR_{-1}$, $YEAR_0$ and $YEAR_1$. These variables are dummies identifying the three subsequent years around SEO. By the definition of dummy variable they select a subset of observations. Each observation of the subset somehow (by the value of relevant residual) differs from the regression prediction. The coefficient of the dummy variable measure how much the estimated intercept must be shifted such that the prediction line would be applicable for this particular subset of the data. In other words it measure how much the line must be shifted such that the mean residual would be zero. Therefore it measures the actual value of the mean residual of the particular subset of data as well as its statistical significance.

To summarize previous three paragraphs, using the Stubben's conditional revenue model adjusted with additional *YEAR* variables the estimate of a firm's discretionary revenue is the residual from model

$$\Delta AR = \alpha + \beta_1 * \Delta R + \beta_2 * \Delta R * SIZE + \beta_3 * \Delta R * AGE + \beta_4 * \Delta R * AGE\_SQ + \beta_5 * \Delta R * GRRP + \beta_6 * \Delta R * GRRN + \beta_7 * \Delta R * GRM + \beta_8 * \Delta R * GRM\_SQ + \beta_9 * YEAR_{-1} + \beta_{10} * YEAR_0 + \beta_{11} * YEAR_1 + \varepsilon,$$

applied on pooled cross-sectional data. Where ΔAR is change in account receivables, ΔR is change in revenues, *SIZE* is the natural log of total assets, *AGE* is the natural log of the firm's age in years, *AGE_SQ* is its square, *GRRP(N)* is the positive (negative) industry-median-adjusted growth rate in revenues, *GRM* is the industry-median-adjusted gross profit margin and *GRM_SQ* its square. Variables *YEAR* are dummies identifying three years around SEO issue.

It is also very important to properly define the variables and how their values are computed because some variables can be defined in numerous ways (i.e. *GRM*). Changes in account receivables and revenues are computed as a difference of values reported at the end of the two subsequent years. Size is estimated by taking natural logarithm of total assets reported in the end of relevant year. As a proxy of a firm's age natural log of number of years since the first occurrence in the database plus one year is used. The logic of adding one additional year is that if the firm is present in the database it must have produced some yearly data already and therefore it must have been operating for at least one year before the first occurrence in the database. With computation of industry-median-adjusted growth rate in revenues is proceeded as follows: using variable change in revenues it is not difficult to get the yearly growth rate of revenues. Then, using Fama and French industry classification (Fama and French, 2008), median growth rate for each industry is computed. In the next step vector of these industry specific growth rates of revenues is created, integrated in the dataset and subtracted from the original vector of growth rates of revenues. Finally, to finish the adjustment the new vector is added to the testing dataset twice. In the one that represents positive industry-median-adjusted growth rate in revenues every negative value is replaced by 0 and in the one representing negative industry-median-adjusted growth rate of revenues the same substitution for positive values is done. Gross profit margin is computed as

$$GRM = \frac{|R|-|COGS|}{|R|},$$

where R is the firm's yearly revenues and $COGS$ firm's yearly cost of goods sold. The industry-median-adjustment is done as in case of growth rate of revenues, only the last step (split of positive and negative values) is skipped.

The adjusted conditional revenue model is applied on the whole testing sample. After that the residuals are mapped to appropriate observations in the sample. This leads to creation of new variable – discretionary revenues (*DR*) – which identifies the extent of discretionary revenues estimated for each observation in the sample. The mean of all discretionary revenues in each of the three examined years is defined as proxy of general level of the revenue management around SEOs.

The evidence in favour or against the first hypothesis is obtained directly from the adjusted conditional revenue model. In order to consider the evidence to be in favour of Hypothesis 1 it is necessary to obtain positive and statistically significant effect of variable $YEAR_0$.

In order to test the second hypothesis it is proceeded as follows: first of all three vectors – DR_{-1}, DR_0 and DR_1 – are created. These vectors compose of the discretionary revenues from the three subsequent years around SEO. After that model

$$DR_0 = \alpha + \beta_1 * DR_{-1} + \beta_2 * DR_1 + \omega$$

is estimated. The logic of formulating such model is that, as presented on many studies in the literature review section, firms are expected to manage the revenues upwards in the period -1 (in case of premature revenue recognition borrowing from period 0) and in the period 0 (borrowing from period 1). Therefore, both of the beta coefficients are expected to be negative – the more revenues transferred to the previous period the smaller discretionary revenues in the contemporaneous period must be. Therefore positive discretionary revenues in the year before SEO should lower the discretionary revenues in the year of SEO and if the discretionary revenues in the year of the SEO remain significantly positive nevertheless it need to be offset by even more negative values of discretionary revenues afterwards. If both beta coefficients are negative and significant the evidence can be interpreted as in favour of the Hypothesis 2.

In order to test Hypothesis 3 model

$$DR = \alpha + \beta_1 * GIX + \beta_2 * YEAR_0 + \beta_3 * GIX * YEAR_0 + \mu,$$

where DR is vector of discretionary revenues, $YEAR_0$ is dummy variable identifying the SEO issuers and GIX is a vector of inverted normalized index of corporate governance quality, is formulated. Originally, the index of corporate governance quality (Gompers, Ishii and Metric; 2003) was created for sample of 1500 large firms listed on US stock exchanges. This index examines 28 variables related to the corporate governance quality (out of which 24 are unique, i.e. without mirror variable) from 5 categories including protection of director's contracts, accessibility of information about the company's

operations, voting rules in boards, effect of the state legislation and others. In order to find evidence in favour of the third hypothesis the estimated effect of the interaction term needs to be negative and significant.

3.2. Data Sample

The original data consists of two datasets. One of them, downloaded from Compustat, contains 283502 observations of financial statements of 16569 firms from various industries. In fact the sample contains 45 out of 49 industries according to Fama and French industry classification (Fama and French, 2008). The data about the firms are collected for period from 1960 to 2014 and only firms listed on the US stock exchanges are included. Restricting sample to this particular subset of the universe of publicly listed firms will prevent any distortions that could be caused by differences in reporting standards as all of the firms in the sample should report their numbers under US GAAP.

Another dataset containing information about the time of new equity issuances is downloaded from Securities Data Company (SDC) database. This dataset contains 16055 observations of seasoned offerings of US firms for period from 1995 to 2016. Based on the information from this dataset a set of three variables – identification number of a firm (CUSIP), year of the SEO and vector of ones is created. Using this set of variables and the data from Compustat testing dataset is created by the creation of *YEAR* variables (mapping ones to the appropriate financial information from Compustat using variables ID and year as a link, adjusting years to identify periods -1, 0 and 1 respectively). As expected, the dataset obtained from Compustat does not overlap completely with the one from SDC database which results in 5063 observations of three subsequent years around SEOs in the final sample.

The original testing dataset needs to be transformed into structured pooled cross-section form so that it could be used to test the hypotheses. As some variables used in conditional revenue model capture development (i.e. change in accounts receivables) it is necessary to obtain data for one year prior each particular observation in the dataset. As expected, for many observations it is not possible to obtain this information or, due

to manual computation of variables, some of the information are nonsensical (i.e. plus or minus infinity). Any such observation is dropped from testing dataset as it is useless for testing.

After the transformation described above my testing dataset consists of 220007 observations of pooled-cross sectional data that contains full rank of 12 variables used in adjusted conditional revenue model without any missing values. However, after the examination of the composition of the dataset it is clear that reliability of any results derived from this dataset will suffer due to few extreme values that deviate from majority of observations by several orders. Because usual regression put too much pressure on such outliers the results will be very likely imprecise and biased. As a solution to this problem winsorization of the dataset is selected. Winsorization is believed to be less disturbing than truncation as it takes the existence of extremely large and extremely small values into account while limiting its effect on regression results by censoring its values to selected percentile of the data whereas truncation completely omits them as if they never existed. The winsorization level is set to top and bottom 1%, meaning that all values out of the range between 1^{st} and 99^{th} percentile are censored to the bound values. Such winsorization level seems to be in line with other researchers. Therefore, taking into account the relatively high number of observation in the dataset, conclusions made from censored samples should be in general valid and more precise than those from unwinsorized data.

From previous paragraph is clear that 220007 observations in total are used to model discretionary revenues. Since the sample size is nearly three times higher than the one Stubben used when he created the model, results of this thesis should be even more precise than his. For descriptive statics of the final testing dataset and the matrix of variances, covariances and correlations please see *Table 1* and *Table 2*.

Table 1 – Sample descriptive statics

	ΔAR	*SIZE*	*AGE*	*AGE_SQ*	ΔR	*GRM*	*GRM_SQ*	*GRRP*	*GRRN*
Min	*-209.00*	*-0.70*	*0.00*	*0.00*	*-889.00*	*-9.16*	*0.00*	*0.00*	*-0.85*
1st Qu.	*0.00*	*2.98*	*1.39*	*1.92*	*0.00*	*-0.10*	*0.00*	*0.00*	*-0.12*
Median	*0.00*	*4.52*	*2.20*	*4.83*	*5.00*	*0.00*	*0.00*	*0.00*	*0.00*
Mean	*0.46*	*0.17*	*0.08*	*0.21*	*83.00*	*-0.14*	*0.04*	*0.00*	*-0.09*
3rd Qu.	*5.00*	*6.26*	*2.77*	*7.69*	*38.00*	*0.12*	*0.00*	*0.15*	*0.00*
Max	*494.00*	*10.52*	*3.81*	*14.49*	*2836.00*	*0.52*	*83.90*	*4.59*	*0.00*

Note: Sample consists of 220007 pooled cross-sectional observations (years 1960 – 2014 covered) out of which 5063 are SEO issuers (years 1995 – 2014 covered). All data (apart from identification of SEO issuers) comes from Compustat database and only firms listed at US SE are considered therefore all figures are reported under US GAAP. 1% of top and 1% of bottom values are winsorized, industry-variant variables are standardized by industry-median adjustment. ΔAR is change in account receivables, ΔR is change in revenues, *SIZE* is the natural log of total assets, *AGE* is the natural log of the firm's age in years, *AGE_SQ* is its square, *GRRP(N)* is the positive (negative) industry-median-adjusted growth rate in revenues, *GRM* is the industry-median-adjusted gross profit margin and *GRM_SQ* its square,

Table 2 – Matrix of correlations and covariances

	ΔAR	*SIZE*	*AGE*	*AGE_SQ*	ΔR	*GRM*	*GRM_SQ*	*GRRP*	*GRRN*
ΔAR	*1.00 | 4972.42*								
SIZE	*0.28 | 46.71*	*1.00 | 5.68*							
AGE	*0.08 | 5.75*	*0.35 | 0.84*	*1.00 | 1.02*						
AGE_SQ	*0.09 | 25.72*	*0.38 | 3.54*	*0.96 | 3.72*	*1.00 | 14.91*					
ΔR	*0.61 | 16818.07*	*0.36 | 338.34*	*0.11 | 44.17*	*0.13 | 197.39*	*1.00 | 154747.17*				
GRM	*0.02 | 1.88*	*0.14 | 0.36*	*0.08 | 0.09*	*0.08 | 0.31*	*0.03 | 12.46*	*1.00 | 1.14*			
GRM_SQ	*-0.02 | -13.00*	*-0.12 | -2.55*	*-0.07 | -0.67*	*-0.07 | -2.43*	*-0.03 | -97.03*	*-0.96 | -9.14*	*1.00 | 79.69*		
GRRP	*0.03 | 1.34*	*-0.11 | -0.16*	*-0.20 | -0.12*	*-0.17 | -0.40*	*0.04 | 10.62*	*-0.11 | -0.07*	*0.09 | 0.48*	*1.00 | 0.36*	
GRRN	*0.14 | 1.61*	*0.20 | 0.08*	*-0.02 | 0.00*	*0.00 | 0.00*	*0.21 | 13.70*	*0.26 | 0.05*	*-0.24 | -0.35*	*0.19 | 0.02*	*1.00 | 0.03*

Note: The correlations and covariances matrix presents pairwise "correlation | covariance" coefficients based on whole sample of 220007 observations. All variables are winsorized (1% top and 1% bottom values) and industry-variant variables are standardized by industry-median adjustment. Δ*AR* is change in account receivables, Δ*R* is change in revenues, *SIZE* is the natural log of total assets, *AGE* is the natural log of the firm's age in years, *AGE_SQ* is its square, *GRRP(N)* is the positive (negative) industry-median-adjusted growth rate in revenues, *GRM* is the industry-median-adjusted gross profit margin and *GRM_SQ* its square.

Even though discretionary revenues are modelled on dataset described above, results of the second model are derived from dataset restricted to SEO issuers only which sums up to 5063 observations and results of the third model are derived from the intersection of the original testing dataset and the sample of 1500 large firms (times number of years) for which the governance quality index was created (meaning 21134 observations in total).

Since it was found that small and big firms behave differently around SEOs (Shu et al., 2014) two more datasets are created from the final testing one. First dataset contains 50% largest firms and the other 50% smallest firms. These datasets are used to get complementary results derived from adjusted conditional revenue model and intertemporal association of discretionary revenues model in order to check this conclusion from discretionary revenues point of view. These datasets are not used to produce complementary results in case of association of discretionary revenues and corporate governance model because there is no reason to believe that the effect of corporate governance is dependent on size and because the indexes of corporate governance quality are available for large firms only.

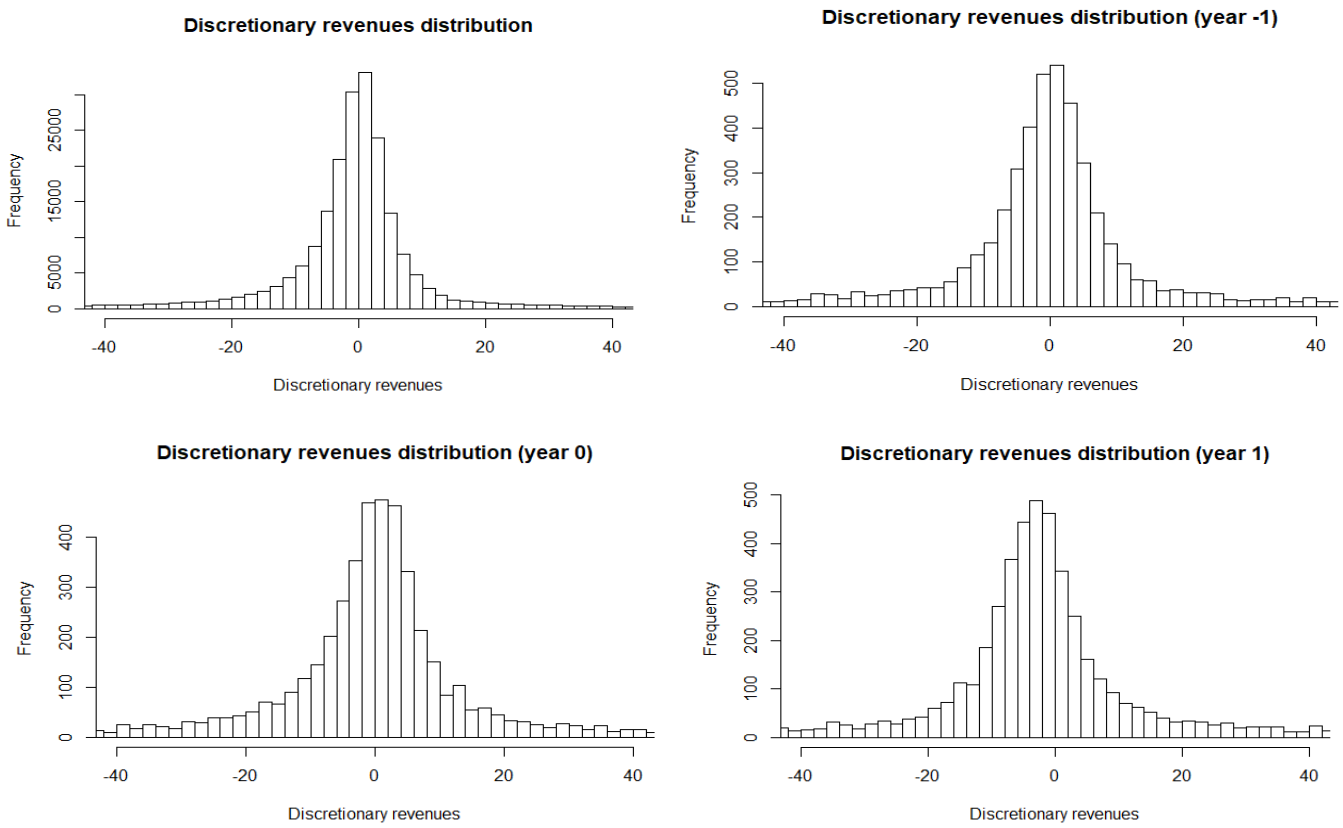
4. Empirical results

As described in the previous section this thesis estimate discretionary revenues using adjusted conditional revenue model. As shown in *Table 1*, the estimation on the winsorized pooled cross-sectional testing data provide results that are in line with the economic intuition about the effects on the change in accounts receivables – size, age, positive growth rate in revenues and gross profit margin have positive effect and negative growth rate in revenues has negative effect (all of them statistically significant at 0.1% level). Since the figures are very similar to those reported in the study where the original model was developed (Stubben, 2010) it seems that the application of the adjusted model on the testing sample is consistent with the one that is suggested to be more precise and efficient than the accrual-based methods.

Even the simplest graphical analysis of the distribution of the discretionary revenues derived from the adjusted conditional revenue model (please refer to *Figure 1*) provides some insight into the possible development of the discretionary revenues around SEOs. The distribution in the year before SEO does not significantly differ from the distribution of the whole sample, which seems to be nearly standard distribution with zero mean, whereas the distribution in the year of the SEO has mean slightly positive and mean of the distribution in the year after the SEO is clearly negative. Such observation suggests that in the year of the SEO the mean discretionary revenue should be on average positive, in the year after on average negative and in the year before on average almost zero, which is expected based on the previous research.

However, formal test reveals something slightly different. As expected, positive mean discretionary revenue is found in the year of the SEO and negative afterwards (statistically significant at 5% and 1% level respectively). But, it is also found that the mean discretionary revenue in the year before SEO is negative, statistically significant at 5% level and in absolute value almost the same as the mean discretionary revenue in the year of the SEO (for detailed results please see *Table 3*). That is something that was, as far as I am aware, never observed before. Previous studies found either insignificant or significantly positive discretionary accruals in the year before the SEO. After the

Figure 1: Discretionary revenues distribution



Note: Discretionary revenues measured as residuals from the adjusted conditional revenue model. Total distribution created based on all 220007 observations, distributions around SEOs (year -1, year 0 and year 1) are based on appropriate subset of 5063 observations.

separate examination of small and large firms, which are expected to behave differently around SEOs (Shu et al., 2014), we can see that in case of large firms the development of the mean discretionary revenues is rather similar to the whole sample (even though the statistical significance of these results is relatively low due to high variance of the estimated coefficients). In case of small firms the development is consistent with the findings of past papers – positive discretionary revenues before and in the year of the SEO and negative afterwards (all of them statistically significant on at least 1% level). These findings are indeed in favour of the claim that small and large firms are behaving differently around SEOs.

One of the possible explanations of the observed development in mean discretionary revenue in case of whole sample and large firms is that, in order to maximize the revenues in the year of the SEO, firms accept more prudent approach to revenue recognition in the year before. This way, they might be using exceptionally good market conditions to artificially shift the revenues into the subsequent period and creating revenue buffer while still showing growth of revenues when compared to the previous period. At the same time, they are soothing the regulators and auditors before the planned SEO which is expected to attract their attention. When asked about the revenue recognition practices they can always appeal on the prudency in case of revenue recognition required by the accounting standards. Therefore creation of revenue buffer should be easier and, most importantly, safer than borrowing from the future. However, if the buffer is not sufficient to meet their needs they acquire additional revenues by premature recognition and therefore "borrowing from future" as already observed by past researchers. Small firms, however, can either be relying on the market timing only as proposed by previous research or be fully dependent on "borrowing from future". This explanation is also supported by the results of the second regression performed in this thesis.

Second model tries to explain the level of the discretionary revenues in the year of the SEO by the level of discretionary revenues around SEO. As presented in *Table 4*, in case of whole sample both beta coefficients are negative and significant, which was expected. But, combined with findings above, the implications are quite different. The size of the downward-oriented adjustment in the year before SEO seems to be more important with respect to the upward oriented adjustment in the year of the SEO than

Table 3 – Adjusted conditional revenue model results						
	Whole sample		*Large firms*		*Small firms*	
(Intercept)	*-5.85*	***	*-33.61*	***	*0.33*	***
	(0.46)		*(1.54)*		*(0.03)*	
R	*0.00*		*-0.02*	***	*0.05*	***
	(0.00)		*(0.01)*		*(0.00)*	
Year$_{-1}$	***-1.63***	*	*-1.86*		*0.33*	***
	(0.81)		*(1.40)*		*(0.08)*	
Year$_0$	***1.62***	*	*2.09*		*0.23*	**
	(0.82)		*(1.33)*		*(0.09)*	
Year$_1$	***-2.51***	**	*-3.41*	*	*-0.25*	**
	(0.81)		*(1.34)*		*(0.08)*	
R:SIZE	*0.01*	***	*0.01*	***	*0.01*	***
	(0.00)		*(0.00)*		*(0.00)*	
R:AGE	*0.01*	***	*0.00*	*	*-0.01*	***
	(0.00)		*(0.00)*		*(0.00)*	
R:AGE_SQ	*0.00*	***	*0.00*	**	*0.00*	***
	(0.00)		*(0.00)*		*(0.00)*	
R:GRRP	*0.01*	***	*0.01*	***	*-0.00*	***
	(0.00)		*(0.00)*		*(0.00)*	
R:GRRN	*-0.03*	***	*-0.04*	***	*0.02*	***
	(0.00)		*(0.01)*		*(0.00)*	
R:GRM	*0.04*	***	*0.03*	***	*0.00*	
	(0.00)		*(0.00)*		*(0.00)*	
R:GRM_SQ	*0.00*	***	*0.00*	***	*-0.00*	
	(0.00)		*(0.00)*		*(0.00)*	
R – Squared	*0.38*		*0.37*		*0.22*	
DF	*219988*		*109986*		*109983*	

Note: *Table 3* presents detailed list of adjusted conditional revenue model coefficients and their standard errors (in parentheses). The model was estimated based on whole sample of 220007 observations. Significance codes: *0 '***' 0.001 '**' 0.01 '*' 0.05*. Sign *variable:variable* represents interaction term. Variables measuring discretion around SEO are highlighted in bold. All continuous variables are winsorized (1% top and 1% bottom values) and industry-variant variables are standardized by industry-median adjustment. ΔAR is change in account receivables, ΔR is change in revenues, *SIZE* is the natural log of total assets, *AGE* is the natural log of the firm's age in years, *AGE_SQ* is its square, *GRRP(N)* is the positive (negative) industry-median-adjusted growth rate in revenues, *GRM* is the industry-median-adjusted gross profit margin and *GRM_SQ* its square.

the drop in revenues afterwards (the volume of the effect is nearly seven times higher than in case of the in the year afterwards and it is statistically significant at 0.1% level whereas the latter effect is significant at mere 5%). We can see that also in case of large and small firms the results match our expectations. The level of discretionary revenues in the year of SEO in case of large firms is driven by the downward-oriented adjustment in the year before (significant at 5%) and the level of discretionary revenues in case of small firms seems to be associated only with the negative values afterwards (significant at 5% as well)

Table 4 – Intertemporal association of discretionary revenues

	Whole sample		*Large firms*		*Small firms*	
(Intercept)	*0.00*		*-0.58*		*0.12*	
	(0.89)		*(1.96)*		*(0.17)*	
***DR*$_{-1}$**	***-0.21***	***	*-0.05*	*	*0.03*	
	(0.01)		*(0.02)*		*(0.05)*	
***DR*$_1$**	***-0.03***	*	*0.02*		*-0.11*	*
	(0.01)		*(0.03)*		*(0.05)*	
R – Squared	*0.05*		*0.004*		*0.02*	
DF	*5060*		*3851*		*1206*	

Note: *Table 4* presents detailed list of regression coefficients and their standard errors (in parentheses). The model was estimated based on whole sample of SEO issuers – 5063 observations. Significance codes: *0 '***' 0.001 '**' 0.01 '*' 0.05*. Explained variable is discretionary revenues in the year of SEO, DR_{-1} represents discretionary revenues in the year before SEO and DR_1 discretionary revenues in the year after SEO.

There is one important question arising from the discussion above: how is it possible that previous research suggested that the artificial adjustments in the year before SEO is upward oriented? Of course, it would be easy to dismiss those findings as wrong interpretation caused by positive bias of discretionary accruals or that they could use only limited sample of smaller firms. However, other explanation is also possible. As mentioned already, conditional revenue model fails to detect pure expense manipulation whereas discretionary accruals might be affected by it. In case that those firms postpone e.g. research and development projects or investments in the relationships with their vendors, it need not have any effect on revenues in the

contemporaneous period. In the longer horizon, however, taking into account that the extent of such manipulation would have to be high enough to more than offset the revenue buffer creation, it would very likely negatively influence the revenues in the future. That could also explain the relatively low association of the positive values in the year of the SEO and negative values in the year afterwards. The negative effect could be caused by past expense manipulation rather than the premature revenue recognition and such effect cannot be assessed by the conditional revenue model resulting in low estimated association of these variables.

Furthermore, the results of the third model (see *Table 5*) are quite useful for discrimination between pure market-timing and opportunistic earnings management theories. As mentioned already, only large firms are taken into account in this regression and therefore the estimated effects might be slightly different for small firms, but there is no reason to believe that the sign of the effect should change. The effect of corporate governance quality on the extent of discretionary revenues is negative even in normal times (statistical significance of 1%) and, as shown by interaction term, even more negative at the time of the SEO issuance (even though the statistical significance of this effect is only 5%). The lower statistical significance is not surprising because, as already mentioned, the operations around events such as SEOs are by definition unusual and therefore harder to estimate. Most importantly, the effect of corporate governance is strictly negative and that is clearly a rejection of the pure market timing hypothesis. In other words, the development of the mean discretionary revenue should be indeed a good proxy of earnings management and, apart from timing the market, firms also seem to be opportunistically adjusting their numbers upwards at the time of the SEO.

Table 5 – Association of discretionary revenues and corporate governance		
(Intercept)	*8.60* *(3.50)*	*
GIX	***-15.18*** ***(5.53)***	**
$Year_0$	*46.90* *(18.49)*	*
$\boldsymbol{Year_0:GIX}$	***-64.69*** ***(28.67)***	*
R - Squared	*0.0009*	
DF	*21130*	

Note: *Table 5* presents detailed list of regression coefficients and their standard errors (in parentheses). The model was estimated based on the intersection of the original sample and the set of available corporate governance quality indexes – 21134 observations in total. Significance codes: *0 '***' 0.001 '**' 0.01 '*' 0.05*. Explained variable is discretionary revenues, *GIX* represents corporate governance quality index, $Year_0$ identifies SEO issuers and $Year_0:GIX$ represents interaction between these two variables.

5. Conclusion

The results of this thesis are in favour of the earnings management theory. Not only it is able to find evidence of opportunistic earnings management using discretionary revenues and therefore addressing the critique of discretionary accruals, the measurement method traditionally used, but it directly discriminates between two possible explanations – earnings management and pure market timing – via the effect of corporate governance on the level of discretionary revenues.

In addition, it is found that firms tend to manage revenues downward in the year before SEO issue in order to create revenue buffer that can be used to upward-oriented adjustments in the year of the SEO issue. This way of adjustments seems to be used rather by larger firms, small firms on the other hand prefer "borrowing from the future". This finding is the only one in contrast with the results derived by the methods based on discretionary accruals that found strictly upward-oriented adjustment in the year before new equity issue.

Since it is the only difference this thesis argues that past results were not driven only by the bias of accrual-based methods of estimation and thus they should not be discarded and rather used as complementary measure. Therefore, combined with the results of past studies it is suggested that, due to the inability of discretionary revenue based method to take pure expense management into consideration (which is not the case of discretionary accruals), firms may postpone representation and investment costs before the SEOs and that the absence of these investments is in fact the main factor that harms future operating performance and the firm's value.

The above finding also implicitly sheds light on the structure of the earnings management around SEO in time (in terms of the accounting components). If the revenue buffer hypothesis holds, than firms tend to use higher extent of expense management when compared to revenue management before the SEO and vice versa at the time of the SEO issue. Also, expense management would have more devastating effect on the future performance than the revenue one under the suggested revenue buffer hypothesis. The hypothesis, however, needs to be further tested as it is proposed

based on results of one study only and therefore, due to the insufficient evidence, cannot be generally accepted yet. In case that further research will indeed observe evidence in favour of the revenue buffer hypothesis, it would be interesting to find how exactly firms may create revenue buffer. Or, subsequent research could for instance formally test whether the suggested preferences over the accounting components used to manipulate earnings indeed holds.

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