



# Disclosure behavior of non-restating firms

A continuation of Rice and Weber (2012)

ERASMUS UNIVERSITY ROTTERDAM  
Erasmus School of Economics

Master thesis by **Gerwin Janssen**

Student number 379554

Thesis supervisor drs. T.P.M. Welten

Second assessor: Prof. de Groot

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## Abstract

This paper looks at the difference in disclosure behavior of material internal control weaknesses (MICW) between restating and non-restating firms. Although firms should disclose all the MICW they are aware of since the enactment of the Sarbanes-Oxley act section 404, firms with restatements still seem to react to disclosure incentives (Rice & Weber, 2012). To see if this disclosure behavior also extends to non-restating firms I expand the research of Rice and Weber by looking at non-restating firms with MICW disclosures. I also check for significant differences between non-restating and restating firms. I confirm a large part of the findings from Rice and Weber (2012) and I also find that the disclosure behavior of non-restating firms is very similar to the disclosure behavior of restating firms. The only reason it is difficult to extrapolate these results to all firms, including non-disclosing non-restating firms, is that I find several significant differences in firm characteristics between restating and non-restating firms. These differences can help identify the risk at a restatement conditional on the existence of a MICW disclosure. Also, these results might help explain why there is a drop in MICW disclosures in the past decade but not a drop in issued restatements.

## Contents

Abstract.....	2
Part 1 - Introduction.....	4
Part 2 – Theory.....	6
Part 2.1 Concepts.....	6
Part 2.2 Literature review .....	9
Part 2.3 Hypothesis development .....	13
Part 3 – Methodology .....	15
Part 3.1 Regression formula.....	15
Part 3.2 Regression analysis.....	16
Part 3.3 Variable definition .....	16
Part 3.4 Databases used.....	17
Part 3.5 Data transformation .....	18
Part 3.6 Libby boxes.....	21
Part 4 – Descriptive statistics .....	22
Part 4.1 General descriptives.....	22
Part 4.2 Descriptives per observation group .....	24
Part 4.3 Pearson and Spearman correlation.....	25
Part 5 – Results .....	27
Part 5.1 Disclosure behavior of restating firms .....	27
Part 5.2 Disclosure behavior of non-restating firms.....	30
Part 5.3 Between group variance significance.....	32
Part 5.4 Additional analyses.....	34
Part 6 – Discussion and conclusion .....	36
Part 6.1 – Recap methodology.....	36
Part 6.2 – Answering the research question.....	36
Part 6.3 – results related to previous literature .....	37
Part 6.4 – Similarities and differences with Rice and Weber (2012) .....	37
Part 6.5 – Management advise, research limitations and future research .....	37
References .....	39
Appendix .....	42
Appendix 1 – Variables definition .....	42
Appendix 2 – Comparison descriptive statistics of Rice and Weber (2012) .....	43
Appendix 3 – Alternative SIZE variables.....	44
Appendix 4 – Full sample regression output .....	45
Appendix 5 – Matched timeframe Rice and Weber (2012) comparison .....	46

## Part 1 - Introduction

This paper will look at the differences in disclosure behavior between firms that report a material internal control weakness (MICW) in their annual reports but do not issue a restatement later versus firms that report a MICW and also issue a restatement of the annual reports later on. This will be a continuation of the Rice and Weber (2012) paper where they identify that firms react to disclosure incentives while the disclosure of a MICW is simply obligated by law. As a sample group Rice and Weber look at firms with a restatement and check if they disclosed a MICW in the period of the restatement before actually issuing the restatement. At the end of their paper Rice and Weber state that they do not know whether their results hold for the group of firms that also disclose MICW but do not issue any restatement afterwards. It is important to identify the differences between these groups because these differences could help investors assess the risk related to the disclosure of MICW. Firms have incentives to remediate their existing MICW because the presence of ongoing problems with internal control can trigger a negative rating action against the firm (Hammersley, et al., 2012) (Jonas, et al., 2006). This study might also help to explain why a decline in the disclosure of MICW is noticeable in the recent decade (Calvin, 2017).

Sarbanes-Oxley (SOX) 404 legislation has received significant attention due to the perceived burden of the associated compliance costs. However, the reliability of the resulting reports identifying the weaknesses has remained largely overlooked in the academic literature (Rice & Weber, 2012). Multiple differences have been found between firms that first state that they have a MICW and issue a restatement later on versus the group of firms that only issue a restatement but never warned about any material control weakness beforehand. Differences are firstly found in the firm characteristics like firm size, non-audit fees and financial distress (Rice & Weber, 2012) that imply the existence of disclosure incentives for firms to report or not report MICW. Secondly, firms and management get punished differently when they issue a restatement based on the fact that they issued a MICW beforehand or not. Surprisingly, firms that do inform investors of a MICW receive more class action lawsuits and experience more management turnover than firms that do not warn investors of their MICW beforehand (Rice, et al., 2014). The possible explanation that is given is that firms that know about their MICW get punished for not solving this problem.

The question that arises is: if this disclosure behavior of firms that issue a MICW beforehand also extend to the group of firms that do issue a MICW but do not issue any restatements later on (Rice & Weber, 2012). With my thesis I am going to check if these firm characteristics indeed extend to the group of firms that do not issue restatements but do disclose the existence of MICW. This will help

us understand the risk associated with the disclosure of a MICW, why some companies have stronger incentives not to disclose MICW and maybe help explain why we see a drop in the number of MICW that have been disclosed in the past decade. My research question will thus be:

*Do non-restating firms have the same disclosure behavior related to their MICW as firms with a restatement?*

I will answer this research question with the following steps. First, I replicate the Rice and Weber (2012) study with an extended timeframe to see if their results still hold. For this step I will thus only use the observations in my data that have issued a restatement. In the second step I will swap the observations that issued a restatement and disclosed their MICW with observations that did not issue a restatement but did still disclose a MICW. In this second step I thus verify if the disclosure behavior of non-restating firms is equal to firms with a restatement. In the last step I will check if there are significant differences in the identified characteristics between the restating firms and the non-restating firms and check how these differences relate to the differences in disclosure behavior.

I find that the results of Rice and Weber (2012) hold for most of the disclosure incentives. The only difference I find is in the proxy for market scrutiny, firm size. Rice and Weber find a negative relation between firm size and MICW disclosure. I on the other hand find a positive relation between firm size and disclosure behavior. This positive relation is confirmed with multiple additional analyses.

Next to that I find that non-restating firms react to the disclosure incentives in a similar way as restating firms. This answers the question Rice and Weber asked at the end of their paper, if their results hold for firms that disclose a MICW but do not issue a restatement. In addition, I also find that there are some statistical significant differences between restating and non-restating firms. These differences relate to firm size, if firms are audited by a big four auditor, audit fees and non-audit fees firms pay. Due to differences in firm characteristics it is not a hundred percent certain that my findings imply that the disclosure behavior is equal for all firms, but it is certainly a sign in that direction.

In a broader view, this thesis will also add to the debate about the usefulness of internal control reporting in practice, since academics have questioned this since the introduction of SOX 404 itself (Cohen, et al., 2010). This concern is strengthened by the decline in the number of reported MICW, because the SEC worries that this is not a decline resulting from underlying business practices being improved in general but that it is only the result of less existing problems being reported (SEC, 2009). The good news is that when a problem is reported, in general, the auditor does a good job of assessing the severity of this problem (Aobdia, et al., 2016).

Since there appears to be minimal difference in disclosure behavior between restating and non-restating firms, my findings indicate that it is possible that non-disclosing non-restating firms also react to these disclosure incentives. This shines a light on the question the SEC asked, that a decline in reported MICW is not due to an improvement of underlying processes but due to a change in disclosure behavior of firms.

The structure of this thesis will be as following. In part two, the literature review, I will explain the concepts relevant to this thesis, discuss relevant literature and state my hypothesis. In part three I will describe my methodology. In part four I will discuss the data and descriptive statistics. Part five will be results. First checking the validity of the results of Rice and Weber (2012), then see if these results hold for non-restating firms. I next check if there are any significant differences between the groups and lastly, I perform several additional analyses to confirm my results. Part six is the discussion and conclusion of this thesis with recommendations for future research.

## Part 2 – Theory

### Part 2.1 Concepts

This part of the paper will consist of three segments. I will first elaborate on the concept of material internal control weakness, the concept of a restatement and how these concepts interact. In the second segment I discuss relevant literature. The relevant papers have to do with the consequences a firm might face of disclosing a material internal control weakness or of issuing a restatement. I will also discuss papers that have looked into the causes of disclosure of a material internal control weakness or of a restatement. In the last segment I will introduce the hypotheses that will be used to answer my research question.

A material internal control weakness can be described as the absence or malfunctioning of an internal control within a company which makes it possible that a material misstatement is present in the financial reports of that company (Cohen, et al., 2010). An internal control can be anything from a rule or a procedure within a company that helps to align the goals of its employees with that of its employers. Section 404 of the Sarbanes-Oxley act obligates top management in the US to assess whether their internal controls are sufficient to prevent any material misstatements in their financial reports. It also obligates auditors to express their own opinion about these internal controls. If either management or the auditor thinks that the internal controls are not sufficient then this has to be disclosed in the annual reports. The disclosure of a MICW is used as dependent variable in this paper.

A restatement can be a couple of different things: a non-reliance restatement, revision restatement or out-of-period adjustment (Analytics, 2018). The non-reliance restatement implies that the previous and current financial statements contain errors that are so large that they can no longer be used. The revision restatement means that there are errors present in previous financial statements, but those errors are not large enough that they undermine the usefulness of the financial statements. The out-of-period adjustment corrects errors in current financial statements. An out-of-period adjustment can only be used if the errors are so small that the correction does not significantly alter the financial statements. In my paper I will only use the non-reliance restatements since these trigger the greatest stock market reaction (Hennes, et al., 2008) and always go paired with the existence of a MICW (Rice & Weber, 2012). That last fact is very important for my research since I will be looking at the differences between firms that do disclose their MICW and firms that do not. Since it would be very hard to discover which firms that do not disclose a MICW still actually have a MICW I will use the group of firms that does not disclose a MICW until they issue a non-reliance restatement. I will take this non-reliance restatement as proxy for the fact that a MICW did exist in the related period of the restatement but that management and the auditor did not disclose the MICW.

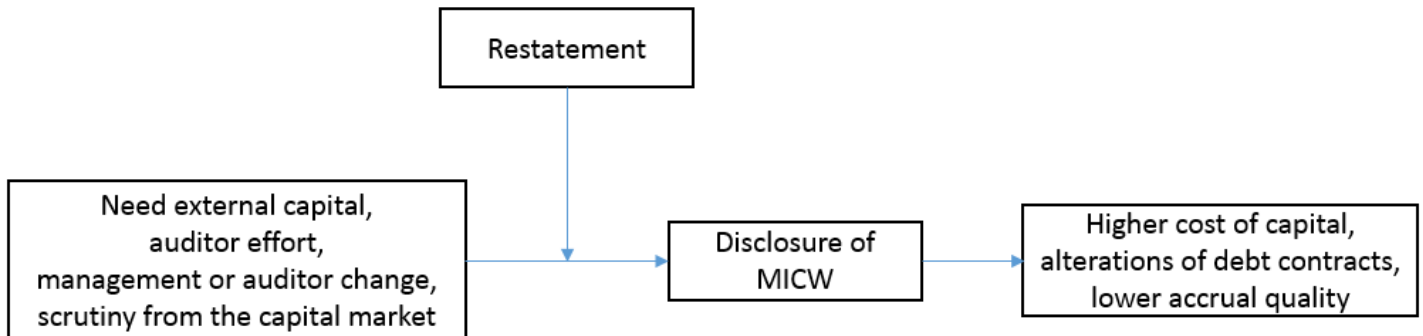
The relation between MICW and restatements is as follows: having a MICW within a company enables the possibility for a restatement. The Public Company Accounting Oversight Board (PCAOB) has stated that a restatement is a “strong indicator that a material weakness in internal controls over financial reporting exists” (PCAOB, 2009). Looking at the relation between MICW and restatements from the side of the MICW the PCAOB states that a material weakness is a deficiency in internal controls that creates a more than remote likelihood that a material misstatement in the financial statements will go undetected (PCAOB, 2008). Following this logic, I state that a MICW has to be present if a restatement is issued because a material misstatement did actually go undetected.

In summary, the existence of a MICW can lead to two things. First it can lead to the disclosure of the MICW. If the MICW is detected and the severity is estimated correctly, companies are obligated to disclose the MICW in their financial reports. Secondly, the existence of a MICW can lead to a restatement, since the existence of MICW implies that there is room for material error in the financial statements.

This paper will focus on the factors that influence the disclosure of MICW. Need for external capital, auditor effort, management or auditor change and scrutiny from the market all seem to influence the disclosure behavior of firms when an MICW exists (Rice & Weber, 2012). The question that this

paper is trying to answer is whether the presence of restatements alters the previously mentioned relation. This is visually presented in figure one:

Figure 1



Better understanding the factors that influence the disclosure behavior of firms is will help explain the decreasing trend in MICW disclosures over the past decade. Research has shown that not all existing MICW are in fact disclosed and that companies seem to react to disclosure incentives when (not) reporting their MICW (Rice & Weber, 2012). It is still unclear however, if the factors currently known affect all MICW disclosing companies or only the part that also issues a restatement in later periods. This paper will test the relation between restatements and the disclosure behavior of firms by running two parallel regressions, one with restating firms and the other without restating firms, to identify the differences in disclosure behavior. In figure one also the consequences of a disclosure of MICW are displayed. The disclosure incentives and consequences are further discussed in part 2.2 where relevant literature is discussed and the observation groups are further discussed in part 3 where the methodology of this study is explained.

The next segment of this part will explain how this paper relates to the Rice and Weber (2012) paper. The most noticeable part are the observation groups that are used in this study. Figure two clarifies these groups:

Figure 2

	Disclosure of a MICW	Restatement	
Group 1	No	No	} Scope of Rice and Weber (2012) } Scope of this paper
Group 2	Yes	No	
Group 3	Yes	Yes	
Group 4	No	Yes	



Where Rice and Weber (2012) tried to explain the (non-)disclosure of MICW by looking at the specific group of firms that issues restatements I will expand this by also including firms in group two, those that do not issue a restatement. I will then continue to build on these findings by checking if the identified factors that have to do with the (non-)disclosure of MICW are different between group two and group three. I will not be able to use observations of firms from group one in my research because it is unclear if any MICW are present but not disclosed or simply not present in these firms. The absence of firms in group one prevents me from using restatement as an interaction variable in the main regression, this is further explained in part 3.2 of the methodology.

## Part 2.2 Literature review

To better understand why some firms disclose their MICW the next section will discuss the relevant literature. First the consequences of the disclosure of a MICW are introduced. Thereafter the factors that seem to push firms to disclose their MICW will be discussed and finally some comments about restatements of firms are made.

The first consequence that has to be discussed is for the financing of the firm. The disclosure of a MICW seems to impact the cost of debt, the structure of debt contracts and the cost of equity. It has been indicated that firms experience higher costs of capital when they report internal control deficiencies (Costello & Wittenberg-Moerman, 2011). It is possible that this increase in cost of capital is driven by both an increase cost of equity (Ashbaugh-Skaife & Collins, 2009) as in an increase in cost of debt (Tang, et al., 2015). This is still ambiguous because there is conflicting literature on the direct effect of MICW on the cost equity (Ogneva, et al., 2007). However, in general however, I assume that higher cost of capital will pressure firms who need to raise new capital to not disclose their MICW. Costello and Wittenberg-Moerman also find that not only the financial costs of capital increases, but also that debt issuers alter the debt contract design once a firm has disclosed the existence of MICW. Interesting to mention is that these changes are different in the scenario of a disclosure of MICW versus the scenario of an actual restatement. Debt issuers do not decrease their use of financial statement numbers in the latter scenario while they do decrease it in the scenario of disclose of MICW (Costello & Wittenberg-Moerman, 2011).

The second consequence I want to mention is discussed in the Doyle et al (2007) paper. In this paper the researchers look at accrual quality and reporting MICW. If MICW are present the accruals of a company are more likely not to be driven by cash flow. This effect is largely driven by the disclosure of companywide material weaknesses. They use several other proxies for accrual quality, all confirming their main findings (Doyle, et al., 2007). The most interesting is their proxy 'historical accounting restatements' which is also found by Rice and Weber to indicate a higher chance at

disclosure of existing MICW. The main contribution of Doyle et al (2007) is that they confirm that high quality internal controls are needed when a firm wants to produce high quality accruals. It is important to mention that the Doyle et al (2007) paper is not undisputed in the literature. Some have raised questions that their results for example may be driven only by the small firms in their sample (Leone, 2007).

The upcoming papers all relate to factors that influence whether a firm discloses his MICW or not. The fact that existing MICW are not reported can have several explanations. Firstly because management simply doesn't know about the MICW. Secondly that the severity of a MICW is underestimated resulting in the fact that auditors and management do not classify the MICW as a material weakness. Some support is shown for the fact that management is not able to assess the importance of the internal control weakness because the classification of the weakness requires significant judgement from management (Bedard & Graham, 2011). On the other hand it is shown that auditors do in general classify the internal control weakness with the correct level of severity (Aobdia, et al., 2016). Lastly it can be true that management and the auditor detect the weakness but choose not to disclose it (Ashbaugh-Skaife, et al., 2008).

Rice and Weber (2012) have identified that firms seem to be influenced by incentives not to disclose their MICW, though they are obligated to disclose them by law. In other words, they are challenging the effectiveness of the SOX 404 legislation. As stated earlier this thesis will be a continuation of the Rice and Weber (2012) paper. In their paper they identify firms that have issued restatements that are blamed on material weaknesses in the internal controls of the company and check if these firms have disclosed the existence of those weaknesses beforehand. They find that only 32% of the firms disclose the MICW beforehand and that this percentage is declining when looking at more recent years (Rice & Weber, 2012). They also find that the following characteristics are negatively related to the disclosure of internal control weaknesses: need for external capital, firm size, non-audit fees and the presence of a large audit firm. Next to that they find characteristics that are positively related to reporting MICW namely: auditor effort, financial distress, previous restatements, previously reported MICW, recent management changes and recent auditor changes. They do not know however if these differences also hold when comparing firms that do not disclose MICW and do issue restatements with firms that do disclose MICW but do not issue restatements.

In a later paper Rice, Weber and Wu (2014) look at other differences between firms who disclose their MICW before issuing a restatement and firms who do not disclose any MICW. Surprisingly they find that firms might have another incentive not to disclose their MICW because firms who do face more management turnover and more class action lawsuits. They rationalize these results by stating

that if management is aware of the MICW than it gets punished for not solving the weakness (Rice, et al., 2014). The disclosure of MICW thus not only holds a direct effect by influencing cost of capital but also holds an indirect effect by increasing the negative results from a later restatement.

Another paper that looks into firms disclosing their MICW is the Ashbaugh-Skaife et al (2007) Paper. This paper focusses on identifying why some companies already disclosed their MICW before it was mandated by the Sarbanes-Oxley 302 and 404 legislation. They find that these firms are motivated to disclose their MICW because they often have a dominant audit firm, have more concentrated institutional ownership or have experienced more SEC enforcement action and financial restatements. Other things that characterize these firms are that they have complex operations, relatively high accounting risk, frequent auditor resignation and recent changes in the organization structure (Ashbaugh-Skaife, et al., 2007).

Also firm size can indirectly lead to more incentives to disclose a MICW. This has to do with the fact that, on average, larger firms face higher pressures from the capital market (Richardson, et al., 2003). Among other factors that they are in general followed by more analysts who push for more transparency from the firm (Lang & Lundholm, 1996).

The characteristics of the auditor also play a role in the disclosure of MICW. Although the literature regarding auditor size is inconclusive. In general I expect a positive relation between auditor size and audit quality, because larger auditors appear to lead to higher reporting quality (Zang, 2012) and a positive reaction can be observed on the stock market if companies switch from small to large audit partners (DeFond & Lennox, 2011). Next to that, I also expect a positive relation between audit quality and the disclosure of MICW. The statement that having an auditor from one of the big four audit companies leads to higher reporting quality is challenged. This is presumably because of self-selection biases of big four customers and client characteristics (Lawrence, et al., 2011). Whether this is true or not remains a debate in the current literature, with other researchers claiming that the results in the Lawrence et al paper are sensitive to research design choices related to propensity score matching (DeFond, et al., 2014).

The final part of this segment will relate to restatements. Not surprisingly, literature has indicated that firms disclosing MICW are more likely to issue restatements than firms who do not disclose MICW (Feng & Li, 2011) (Nagy, 2010). Although this correlation is to be expected, it is still important that this relation is significant for the relevance of this paper. As stated earlier, if the results of Rice and Weber (2012) don not hold for the group of firms that disclose a MICW but do not issue a restatement then these characteristics hold predictive value for the possibility of a future

restatement. This is only relevant if firms disclosing a MICW have a significantly higher chance at issuing a restatement than firms who do not disclose a MICW.

Finally, I will briefly mention the causes firms mention for their restatements. Although complexity in accounting standards is frequently mentioned as a possible cause for restatements in the literature, only 37% of firms issuing restatements blame complexity in accounting standards as the key reason for their restatements. The explanation most firms (57%) give is some internal company error (Plumlee & Yohn, 2010). Both reasons indicate a MICW, one being a lack in accounting personnel resources, competency/training and the other weaknesses can vary from untimely or inadequate account reconciliations to insufficient accounting documentation, policy and/or procedures.

Table one summarizes this literature part by listing all mentioned papers, their most important variables and their main results:

Table 1

<b>Authors and year</b>	<b>Dependent variable</b>	<b>Independent variable</b>	<b>Results</b>
Costello & Wittenberg-Moerman (2011)	Cost of capital	MICW disclosure	Higher cost of debt and different structure debt contracts (less reliance on financial numbers)
Ashbaugh-skaife & Collins (2009)	Cost of equity	MICW disclosure	MICW leads to higher cost of equity
Tang, et al (2015)	Cost of debt	MICW disclosure	MICW disclosure leads to higher cost of debt
Oneva, et al (2007)	Cost of equity	MICW disclosure	MICW disclosure does not lead to higher cost of equity
Doyle, et al (2007)	Accrual quality	MICW disclosure	Accruals are less driven by cash flow in the presence of MICW
Leone (2007)	Accrual quality	MICW disclosure	Only small firms have lower accrual quality in the presence of MICW
Bedard & Graham (2011)	Severity of MICW	Managers judgement	Significant judgement from managers is needed to correctly asses the scale of a MICW
Aobdia, et al (2016)	Severity of MICW	Auditor quality	In most cases auditors are successfully able to identify the level of severity for an internal control weakness
Ashbaugh-skaife, et al (2008)	Accrual quality	MICW disclosure	Firms disclosing MICW have more accrual noise and a higher level of abnormal accruals
Rice and Weber (2012)	MICW disclosure	External capital, Auditor effort, scrutiny	Although firms are obligated to disclose their MICW, they behave as if they react to disclosure incentives
Rice, et al (2014)	Management turnover,	MICW disclosure	Firms who first disclose their MICW and later issue a restatement over the same period face more class action lawsuits and management

	class action lawsuits		turnover than firms who do not report the MICW in the firms place
Ashbaugh-Skaife, et al (2007)	MICW disclosure	Dominant auditor, institutional ownership, SEC enforcement action	Firms are more likely to disclose their MICW when they have a dominant audit firm, relatively more institutional ownership or previous SEC enforcement actions
Zang (2012)	Reporting quality	Auditor size	Larger audit firms seem to lead to higher reporting quality
DeFond & Lennox (2001)	Stock market return	Auditor size	Firms stock return jumps up when firms switch from a small to a large auditor
Lawrence, et al (2011)	Audit quality	Auditor size	Higher audit quality is probably because of self-selection bias in the sample of large auditor customers
DeFond et al (2014)	Audit quality	Auditor size	The results of Lawrence, et al (2011) can be driven by design choices in the propensity score matching method
Feng & Li (2011)	Restatements	MICW disclosure	Firms that disclose a MICW have a higher chance to issue a restatement than firms who do not
Nagy (2010)	Restatements	MICW disclosure	Firms that disclose a MICW have a higher chance to issue a restatement than firms who do not
Plumlee & Yohn (2010)	Restatements	-	In 57% of the restatements firms blame internal errors while in 37% of the restatements firms blame complexity of the accounting standard

### Part 2.3 Hypothesis development

In the next segment the hypothesis that support my research section will be discussed. As previously stated, if I find that the differences between firms in group 3 and firms in group 4 hold true for the differences between firms in group 2 and firms in group 4, then this thesis shows that the results of Rice and Weber (2012) can be generalized to all firms that disclose MICW and possibly also to non-disclosing, non-restating firms. The other scenario, when the results of Rice and Weber (2012) cannot be generalized to firms in group 2, is more complex. I will now hypothesize what the possible origin of these differences can be.

The first two hypothesis relate to the concept of market scrutiny. As explained in the literature section I expect that larger firms and loss making firms face more scrutiny from the capital market and are thus more likely to disclose their MICW. If I find that restating and non-restating firms have

different disclosure behaviours than this could imply that larger firms apply more resources to fixing the MICW. This ambiguity leads to the following hypothesis:

*H1a: there is no relation between firm size and the disclosure of a MICW*

The second proxy for market scrutiny is accounting losses. While theory suggests that larger firms face more scrutiny from the market because they are followed by more analysts, accounting losses tend to be a red flag for all investors in the market. When non-restating firms tend to be less lossmaking than restating firms it could be that firms in group two only disclose the MICW that are less likely to lead to a restatement. In turn implying that not all MICW disclosures are equal, which is consistent with the contingency theory (Bedard & Graham, 2011). This leads to the hypothesis:

*H1b: There is no relation between accounting losses and the disclosure of MICW*

As discussed earlier, firms disclosing MICW face higher costs of capital. Not surprisingly that firms who are in need of raising external capital are less likely to report existing weaknesses. If I find that firms in group 2 are more often in need of external capital than firms in group 3 then this means that the pressure from the need for external capital might lead to firms solving their reported MICW, preventing the possible future restatements. Leading to the hypothesis:

*H2: there is no relation between the need for external capital and the disclosure of a MICW*

Related to the auditor, Rice and Weber found that larger audit fees and lower non-audit fees related to more disclosure of MICW. High audit fees are often found to proxy for higher audit quality (Behn, et al., 2008). If the audit quality in group 2 is on average lower than in group 3 this could indicate that the MICW disclosed by group 2 are easier to identify and thus also probably easier to fix, reducing the chance that the company has to issue a restatement later on. A different explanation can be reversed causality, meaning that the presence of MICW leads to higher audit fees (Raghunandan & R, 2006). The second explanation is more likely to be true if there is no difference in audit fees between group 2 and group 3. Non-audit fees are more ambiguous. Some state that non-audit fees relate to activities that decrease the auditor's independence and thus lead to lower audit quality, on the other hand it has been indicated in the literature that non-audit fees related to tax services might actually lead to a higher audit quality (De Simone, et al., 2015). It is also still ambiguous if audits from big four audit firms are on average of higher quality than non-big four audits, but it is shown that the presence of a big four auditor could lead to less disclosure of a MICW (Rice & Weber, 2012). It is possible that these auditors might be able to audit around the MICW. If this is true and the auditors of group 2 are not characterised by being from the big-4 then it could be that the inability of the auditor to audit around the internal control weakness increases the sense of

urgency among management to fix the existing MICW. These factors lead to the following hypotheses:

*H3a: There is no relation between having a big four auditor and the disclosure of MICW*

*H3b: There is no relation between audit fees and the disclosure of MICW*

*H3c: There is no relation between non-audit fees and the disclosure of MICW*

Also related to the auditor, it is stated that recent auditor changes lead to more MICW disclosure. This is because the new auditor can blame the lack of MICW disclosure on the previous auditor. I will therefore look to recent auditor changes. If group 3 has more auditor changes than group 2 this might mean that incumbent auditors only report the MICW that do not lead to restatements. Thus these are the MICW that apparently bear on average less risk than the MICW that group 3 discloses. The same reasoning can be applied to the characteristic of recent management changes. These factors lead to the following hypotheses:

*H4a: There is no relation between recent auditor changes and the disclosure of MICW*

*H4b: There is no relation between recent management changes and the disclosure of MICW*

## Part 3 – Methodology

The methodology part consists of the following sections: a description of the main regression formula, the regression analysis, explanation of the variables used, a description from which databases the data is retrieved, a detailed description on the use and transformation of the data and to summarize this research the Libby boxes are presented.

### Part 3.1 Regression formula

In order to find an answer on my hypothesis and research question my research will consist of three different parts. I will first replicate the study of Rice and Weber (2012) using an extended time frame. I will thus only use the observations that have a restatement, thus the ones in group three and group four. The regression formula in step one is as follows:

$$MICW = \beta_0 + \beta_1 SIZE + \beta_2 LOSS + \beta_3 \Delta XFIN + \beta_4 BIG4 + \beta_5 AUDITFEES + \beta_6 NONAUDITFEES + \beta_7 MNGTCHANGE + \beta_8 AUDITCHANGE + \varepsilon$$

I will thus look at all the factors that could influence the disclosure of a MICW in a multivariate probit regression. In the second part of my research I will change the observation groups that are used in the previous regression to group two and group four in order to see if the results of this regression differ. In the third step of my research I will use an ANOVA model to check if there are significant

differences between the characteristics of group two and group three. As additional analyses I will use different proxies for firm size, run the regression model with all observations included and alter the timeframe of my data to better compare the results in part 5.1 with the results presented by Rice and Weber.

### Part 3.2 Regression analysis

Since MICW is a dummy variable I need a model that models binary outcome variables. The two most well-known options are the Probit regression and the Logit regression. There are only minor differences between these two models. The reason the Logit model is more popular in the health sciences is because the coefficients can be seen as odds ratios. The Probit model on the other hand can account for non-constant error variances. This is only relevant in more advanced econometric settings, which are not present in this paper. Hence it is more often used in the political and economic sciences. For this paper it should not matter if the Logit or Probit regression is used because the regression output would be very similar.

The second remark about the regression used is the lack of the interaction variable restatement. The goals of this paper is to identify differences between restating and non-restating firms, but due to the fact that all non-disclosing firms are firms with a restatement the variable restatement becomes perfectly correlated for the disclosure if MICW for all observations without a restatement, group 2. There is thus no direct way to insert the variable RESTATEMENT in the regression. I thus came up with an alternative research method where I swap the observation groups two and three and directly compare the regression output to identify differences between restating and non-restating firms.

### Part 3.3 Variable definition

The next section will explain the variables used in these regressions. As a remark, a period is defined as a quarter of a fiscal year.

MICW, a dummy variable equal to one if a firm discloses a material internal control weakness

MNGTCHANGE a dummy variable equal to one if the CEO or CFO is changed in the two years prior to the end of the restatement period or two years prior to the disclosure of the material weakness for firms in group 2

AUDITCHANGE a dummy variable equal to one if the firm has changed from auditor in the two years prior to the end of the restatement period or two years prior to the disclosure of the material weakness for firms in group 2

SIZE, Natural log of total market value of common equity at the end of the period of the restatement or at the end of the period where it issues a MICW



LOSS a dummy variable equal to one if the firms reports negative income before extraordinary items in the final year of the restatement period or in the year of the disclosure of the MICW

$\Delta$ XFIN is the net change in external financing computed by adding cash received from issuance of long-term debt and the sale of stock, minus payment of dividends, cash used in repurchase of stock and reduction of debt, scaled by square root of total assets

BIG4 a dummy variable equal to one if the audit opinion in the final period of the restatement or in the period that the MICW is disclosed is issued by an auditor from either Deloitte, KPMG, EY or PwC

AUDITFEES are the audit fees, scales by the square root of total assets

NONAUDITFEES are the non-audit fees, scales by the square root of total assets

RESTAT, a dummy variable equal to one if the firm issues a restatement

$\epsilon$  is the residual value

### Part 3.4 Databases used

The data used to generate these variables is found in two databases. The Audit Analytics database and the Compustat North America database. Since the disclosure of MICW is obligated by the Sarbanes-Oxley Act section 404 (SOX 404) and this legislation only affects companies located and listed in the Unites States only US companies are used. The SOX 404 came into effect on November 15, 2004. The observations used either have a restatement period that lasts till after that date or reported their MICW after November 15, 2004. The most recent data available in the Audit Analytics database is up until December 31, 2016 so the observation period of this study is November 15, 2004 up until December 31, 2016.

Table two lists which variables where used to generate the variables for the regression and from which database they were obtained.

Table 2

Regression variable	Database variable	Database
	Company ticker (identifier)	Audit Analytics & Compustat NA
	End date matching fiscal year (identifier)	Audit Analytics & Compustat NA
MICW	Internal control opinion, Count weakness	Audit Analytics
MNGTCHANGE	Is CEO, Is CFO, Effective engagement date,	Audit Analytics

	Restatement end date, File date MICW	
AUDITCHANGE	Effective engagement date, Auditor name & key, Restatement end date, File date MICW	Audit Analytics  Audit Analytics
SIZE	Common shares outstanding, Price end of fiscal year	Audit Analytics
LOSS	income before extraordinary items	Compustat North America
ΔXFIN	Cash flow sale of stock, Cash flow issuance long term debt, Dividend payments, Cash flow repurchase of stock, Cash flow reduction of debt Total assets	Compustat North America
BIG4	IC opinion auditor, Auditor restatement name and key	Audit Analytics
AUDITFEES	Match fiscal year audit fees, Total assets	Audit Analytics Compustat North America
NONAUDITFEES	Match fiscal year non-audit fees, Total assets	Audit Analytics Compustat North America
RESTAT	restatement accounting, restatement fraud, restatement clerical error, restatement other	Audit Analytics

### Part 3.5 Data transformation

In total 13671 restatements observations are retrieved from the Audit Analytics database. First all observations missing key inputs needed to compute the variables for the regression are dropped. This leaves 3860 observations. Next, in order to prevent over representation of individual companies only the first restatement of each company is kept in the data, leaving 2204 company restatement observations. After checking for outliers, duplicates and anomalies in the dataset an additional 75 observations are dropped. Leaving 2129 usable company restatement observations.

From the 149201 SOX404 reports that can be found in the Audit analytics database, only 76816 observations have the identifier variable TICKER non-missing. From those observations 76705 had disclosed their MICW opinion. Of the disclosed opinions only 4833 observations disclosed that they had an ineffective internal control, with weaknesses present being either 1 or more than 1. After deleting duplicate observations 2949 company observations are left. The high number of duplicates is because most companies issue both a management report and the auditor report separately, resulting in two observations of most companies relevant for the same fiscal year. If a MICW is disclosed by either the management report or the auditor report the observation is kept.

The two datasets are merged on TICKER and end fiscal year date. There is now no match between observation from which the begin date of the restatement period is in an earlier fiscal year than the end date of the restatement period and where the restatement period is longer than one fiscal year. This is manually corrected and this leaves 4628 observations of which 450 are matched between the MICW data and the restatement data indicating that these observations first disclosed the presence of the MICW and afterwards issued a restatement for (a part) of the same fiscal period. Next, observations are deleted where the MICW is not solved within the fiscal year. Implies that there is an observation of a company disclosing a MICW in year  $t$ , year  $t+1$  and possibly also in year  $t+2$  and higher. Just like companies with multiple restatements, now of companies with multiple MICW disclosures all non-first observations are dropped. This leaves 3638 observations. Using the histogram of the end fiscal year date I confirm that there is only a small shift in density of observations to earlier years, implying that most MICW “disclosure periods” only lasted two or three fiscal years.

This data is now matched with the data from the management change database and the auditor change database. Observations that were only present in the management database or audit change database are dropped. Successful merges between the master data and audit or management change database are used to create the dummy variables AUDITCHANGE and MNGTCHANGE, conditional on the change being between 0 and -730 days of the end of restatement period or MICW disclosure file date. Still leaving 3638 usable observations.

Finally within the Compustat data the variables  $\Delta XFIN$ , LOSS, SIZE and Total Assets are obtained or generated following the variable definition explained in part 3.2 and appendix one. Matching the Compustat data with the Audit Analytics data and deleting observations that did not match and thus lack input variables results in 3201 observations that can be used in the regression model. After this match, audit and non-audit fees are scaled by the square root of total assets. To prevent outliers affecting the regression result I winsorize the top and bottom one percent of the observations. Of

the 3201 observations 1385 observations belong to group 2, only disclosing a MICW, 427 observations belong to group 3, both disclosing a MICW and later issuing a restatement over the period where one or more MICW were disclosed and 1389 observations that issued a restatement but did not disclose the existence of any MICW during the period of the restatement.

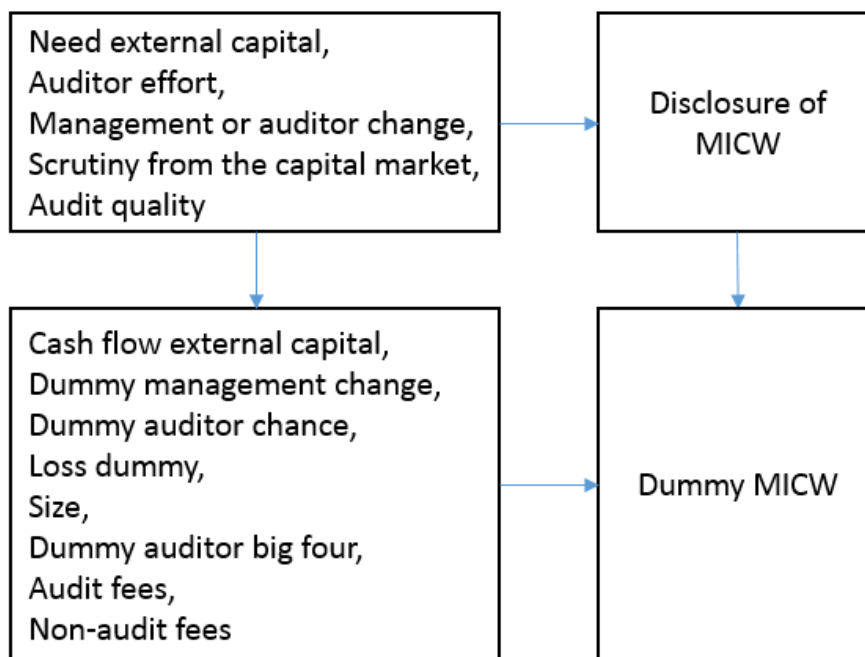
Within the data several company observation appear in more than one group. This is because a company can report a MICW in a year that is not related to an earlier or later restatement. I assume that once a MICW is disclosed in year  $t$  but it is not disclosed in year  $t+1$  that this MICW is no longer present and is thus unrelated to other restatements by the same company in different years. Therefore if a company discloses a MICW in year  $t$  but issues a restatement relevant to year  $t+4$  and  $T+5$  then both the disclosure and the restatement are treated like individual observations.

Since MICW is a dummy variable I will use a Probit regression. This means that I model the disclosure of a MICW as a combined, single process of the independent variables. The coefficients can be interpreted as the change in the chance of disclosure of a MICW by a one unit change in the independent variable. By looking at the differences in coefficients between the sample groups of group two and group three the possible difference in strength of disclosure incentives on the actual disclosure of MICW can be identified. As a robustness check I will not only look at the differences in coefficients, but also check whether the difference in means is significant. For this test I will use the ANOVA model, specifically designed to indicate if the sample means of different sample groups are significantly different.

### Part 3.6 Libby boxes

To summarize the methodology figure three presents the relevant Libby Boxes for this paper. As explained earlier I will look at several factors that influence the disclosure behavior of firms. As explained earlier the concept of restatements is not included in the regression but is present in the sample groups used in the regression and thus not displayed in the Libby boxes.

Figure 3



## Part 4 – Descriptive statistics

### Part 4.1 General descriptives

This part of the paper describes the data used in the regression models and identifies some of the differences between the sample groups used in this research. I will analyze these differences in part 5 where the results of the regression model are discussed. Table three shows some of the key statistics of the data.

Table 3

Descriptive statistics					
Variables	Mean	St. Dev	Q 1	Median	Q 3
MICW	0.566	0.496	0.000	1.000	1.000
Restatement	0.567	0.496	0.000	1.000	1.000
BIG 4	0.681	0.466	0.000	1.000	1.000
Audit fees	64753.42	59388.74	26329.81	49091.07	84082.58
Non-audit fees	10364.70	15360.59	988.54	4656.96	1359.67
audit change	0.135	0.342	0.000	0.000	0.000
mngt change	0.327	0.469	0.000	0.000	1.000
Loss	0.375	0.484	0.000	0.000	1.000
Size	6.097	1.928	4.901	6.097	7.295
XFIN	0.121	1.031	-0.018	0.007	0.092
<i>N</i> = 3201					

Within the sample 56,6% of the observations report a restatement, this indicates that group two and group three together account for 56,6% of the observations. A similar statement can be made about the firms who issued a restatement. In total 56,7% of the observations has issued a restatement, accounting for the observations of group three and group four combined. The majority of the observations have their audit opinion issued by Deloitte, PricewaterhouseCoopers, Ernst & Young or KPMG. 68,1% of the observations to be exact. Hypothetical, there could be sufficient variance within these variables to possibly find a significant correlation.

Although the variables Audit fees and non-audit fees are scaled by the root of total assets and have been winsorized at the 1% level we can still see signs of right-skewed data since there is quite a difference between the means and medians of these continuous variables. The mean of Audit fees is 31,9% higher than the median of Audit fees and the mean of Non-audit fees is 122,6% higher than the median Non-audit fees.

It appears that firms experience a CEO or CFO change more often than an auditor change. At least in the two years before the end of a restatement period or before a MICW is disclosed only 13,5% of

the total observations has experienced an auditor change while 32,7% has experienced a CEO or CFO change. The percentage of auditor change would be consistent

More than a third of the observations is lossmaking at the moment of MICW disclosure or at the end of the restatement period. It is not fully surprising that 37,5% of the observations is lossmaking since restatements often have a negative effect on the company or reveal bad performance that was previously hidden.

Since SIZE is defined as the square root of market value of common stock the mean and median of this variable are not very informative. Both based on the reported values at the 25<sup>th</sup> and 75<sup>th</sup> percentile and by the histogram of the variable I confirm that the transformation by taking the square root has successfully transformed a variable with significant large outliers into a variable that has a fairly normal distribution.

Lastly not much can be said about the values of the  $\Delta XFIN$  variable, which measures the cash flows from external financing activities and thus proxies for the need for external finance. The standard deviation is 8,5 times larger than the mean and the mean is close to zero. This implies that part of the observations experiences a positive cash flow from external financing activities and the other part experiences a negative cash flow from external financing activities. This is also indicated by the 25<sup>th</sup> and 75<sup>th</sup> percentile observation.

## Part 4.2 Descriptives per observation group

Regarding the groups I defined in the methodology section, table four shows the means and standard deviations of the variables when looking at each group separately.

Table 4

Descriptive statistics								
group	2		3		4		All	
Variable	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
MICW	1.000	0.000	1.000	0.000	0.000	0.000	0.566	0.496
Restatement	0.000	0.000	1.000	0.000	1.000	0.000	0.567	0.496
BIG 4	0.533	0.499	0.724	0.448	0.815	0.388	0.681	0.466
Audit fees	70907.30	61816.06	80071.87	68742.03	53908.14	51412.50	64753.42	59388.74
Non-audit fees	8803.29	12940.52	11198.56	16029.61	11665.26	17140.49	10364.70	15360.59
audit change	0.188	0.391	0.152	0.360	0.078	0.268	0.135	0.342
mngt change	0.399	0.490	0.361	0.481	0.245	0.430	0.327	0.469
Loss	0.480	0.500	0.473	0.500	0.240	0.428	0.375	0.484
Size	5.740	1.893	6.157	1.805	6.434	1.969	6.097	1.928
XFIN	0.145	1.505	0.127	0.566	0.096	0.304	0.121	1.031
N =	1385		427		1389		3201	

The values of the variables MICW and Restatement confirm that only observations with a MICW disclosure and without a restatement are present in group two. Regarding group three, the standard deviation of 0,000 and the mean of 1 for the variables MICW and Restatement indicates that only firms with both a MICW disclosure and a restatement are present in group three. Lastly, as expected, only observations without a MICW disclosure and with a restatement are present in group four.

The first difference regarding the independent variables that can be observed between the sample groups is the difference in Big four coverage of the sample. In group two only slightly more than half of the observations had their audit opinion issued by one of the big four firms while the majority of the firms with a restatement has partnered with one of the big four companies. It is interesting to see that group four has the highest percentage of big four audits, but the lowest mean audit fees. This result might be driven by the size of the companies, since there may be economies of scale present when auditing firms (DeFond, et al., 2014). Group three experiences on average the highest audit fees, while the means of group two and group four are fairly close to the mean of all observations. Since audit fees do not have a value below zero, the fact that the value of one standard deviation is close to the mean value of audit fees in all groups indicates a possible right side tail in the observations.

This right side tail in observations is even larger within the Non-audit fees variable. This is true for all the observation groups. Where the value of one standard deviation is close but never bigger than



the mean of the Audit fees variable, it is bigger than the mean for the Non-audit variable in all observation groups. Observations without restatement seem to have lower non-audit fees than observations with a restatement since the mean of scaled non-audit fees in group two is equal to 8803,3 versus 11198,6 and 11665,3 for groups three and four respectively.

Regarding Audit change, firms who do disclose their MICW appear to have experienced an audit change more often than firms who do not disclose their MICW. This can be observed by comparing the means from group two, being 0.188, and group three, being 0.152, to the mean of group four, being 0.078. Similar to Audit change, the variables Management change and Loss show a similar pattern, although the relative differences to the mean of all groups combined is smaller with the Management change and Loss variable compared to the Audit change variable.

It appears that companies who disclose MICW are smaller than companies who do not disclose their MICW. Since the values of these variables have been transformed from their original value by taking the natural logarithm of the market value of common equity, it is less clear what the differences in means imply for the actual observations and is the difference in means has any economic value.

The most important observation related to my proxy for the need for external financing is not related to the sample means of group two, three and four but to the standard deviation of each group. The standard deviation within group two is 2,66 times larger than the standard deviation within group three and 4,95 times larger than in group four. Thus although the sample means seem to have a comparable value, there still appears to be a difference in need for external financing between the sample groups.

#### Part 4.3 Pearson and Spearman correlation

In this last segment of the descriptive statistics the Pearson and Spearman correlation table will be discussed. Both tables show the correlation that exists between the individual independent variables. When a significant correlation between the independent variables is present, the results of a regression model could be biased upwards or downwards depending on the sign of the correlation between the independent variables and the effect both variables have in the dependent variable (Adler & Parmryd, 2010). It is thus important to take the correlations between the independent variables into account when interpreting the results of the regression model later in this paper.

Both the Pearson and Spearman correlation coefficients indicate a correlation between variables. The difference between the two tables is that the Pearson correlation coefficient holds stricter assumptions for the calculation and thus also for the data that can be used. The Pearson correlation coefficient is meant to calculate the correlation between two variables that are continuous, have a

linear relation, do not have significant outliers and hold an approximately normal distribution (Moore, et al., 2016). The Spearman correlation coefficient on the other hand relaxes most of these assumptions and only states the following two: the variables must be measured on an ordinal or continuous scale and the relation between the variables must be monotonic (Moore, et al., 2016).

Since most of the variables used in this study are dummy variables and are thus not continuous, the spearman correlation coefficients are better suited to analyze the data. Table five presents both the Pearson and the Spearman correlation coefficients.

Table 5

	MICW	SIZE	LOSS	ΔXFIN	BIG4	AUDITFEES	NON-A.FEES	AUDITCHA.	MNGTCHA.
MICW		<b>-0.0612</b>	<b>0.0747</b>	0.0117	<b>-0.0957</b>	<b>0.0906</b>	-0.0005	<b>0.1076</b>	<b>0.1104</b>
SIZE	<b>-0.0614</b>		<b>-0.3186</b>	<b>-0.0859</b>	<b>0.4836</b>	<b>0.1219</b>	<b>0.2023</b>	<b>-0.1362</b>	0.0305
LOSS	<b>0.0747</b>	<b>-0.3224</b>		<b>0.236</b>	<b>-0.1991</b>	<b>0.1273</b>	0.0013	<b>0.1006</b>	<b>0.0722</b>
ΔXFIN	0.0342	<b>-0.1779</b>	<b>0.2996</b>		<b>-0.1128</b>	<b>0.1127</b>	0.0455	<b>0.0564</b>	-0.0359
BIG4	<b>-0.0957</b>	<b>0.4806</b>	<b>-0.1991</b>	<b>-0.199</b>		<b>0.2282</b>	<b>0.1473</b>	<b>-0.2191</b>	-0.0428
AUDITFEES	0.0396	0.0273	<b>0.0928</b>	<b>0.1289</b>	<b>0.096</b>		<b>0.4091</b>	-0.043	<b>0.0901</b>
NONAUDITFEES	-0.0122	<b>0.0874</b>	<b>0.0473</b>	<b>0.1212</b>	<b>0.0587</b>	<b>0.3548</b>		<b>-0.0566</b>	0.0407
AUDITCHANGE	<b>0.1076</b>	<b>-0.1383</b>	<b>0.1006</b>	<b>0.0947</b>	<b>-0.2191</b>	-0.0007	-0.0252		<b>0.0967</b>
MNGTCHANGE	<b>0.1104</b>	0.0246	<b>0.0722</b>	-0.0319	-0.0428	0.019	0.0298	<b>0.0967</b>	

Number of observations (N) = 3201. All bolded values are significant at the 5% significance level. The top-right half of the table represents the results from the Spearman table and the bottom left half represents the Pearson correlation coefficients.

The variable MICW is a dummy variable equal to 1 if the observation has disclosed a MICW. SIZE is computed by taking the natural logarithm of the market value of total common equity. LOSS is a dummy variable equal to one if the firms reports negative income before extraordinary items in the final year of the restatement period or in the year of the disclosure of the MICW. ΔXFIN is the net change in external financing computed by adding cash received from issuance of long-term debt and the sale of stock, minus payment of dividends, cash used in repurchase of stock and reduction of debt, scaled by square root of total assets. BIG4 a dummy variable equal to one if the audit opinion in the final period of the restatement or in the period that the MICW is disclosed is issued by an auditor from either Deloitte, KPMG, EY or PwC. AUDITFEES are the audit fees, scales by the square root of total assets. NONAUDITFEES are the non-audit fees, scales by the square root of total assets. AUDITCHANGE a dummy variable equal to one if the firm has changed from auditor in the two years prior to the end of the restatement period or two years prior to the disclosure of the material weakness for firms in group two. MNGTCHANGE a dummy variable equal to one if the CEO or CFO is changed in the two years prior to the end of the restatement period or two years prior to the disclosure of the material weakness for firms in group two.

Most of the coefficients have a similar value in the Pearson as in the Spearman correlation and hold at a similar significance level, being the 5% level. The only differences that are to be noted are that the correlation coefficients between AUDITFEES & MICW, AUDITFEES & SIZE, AUDITCHANGE & NONAUDITFEES and MNGTCHANGE & AUDITFEES is not significant as Pearson correlation coefficient, but is significant as Spearman correlation coefficient. The opposite can be stated about the correlation coefficients between NONAUDITFEES & LOSS and NONAUDITFEES & ΔXFIN.

The output from the Pearson table is also quite comparable to the Pearson table presented in Rice and Weber (2012). Only the variables related to MNGTCHANGE & SIZE and MNGTCHANGE & BIG4 differ in sign, changing from a positive correlation to a negative or vice versa. Related to the significance, the coefficients related to MNGTCHANGE & AUDITFEES, MNGTCHANGE &

NONAUDITFEES, MNGTCHANGE & AUDITCHANGE, AUDITFEES & ΔXFIN, AUDITFEES & BIG4 and AUDITFEES & AUDITCHANGE change from being significant at the 5% level to insignificant or from being insignificant at the 5% level to significant.

The actual results from the Spearman correlation coefficient are largely consistent with intuition. Larger firms tend to be profitable more often than smaller firms. Larger firms have more chance to have an auditor from one of the big four companies and also seem to pay higher audit and non-audit fees. Losses tend to go paired with a higher need for external financing, higher audit fees and also more auditor and management changes. In turn, observations that have an auditor from the big four also report higher audit fees and higher non-audit fees, next to that auditors from the big four appear to switch clients less often than non-big four auditors. The other significant relations are less intuitive to interpret, again prompting careful interpretation of the results represented in the next section of this paper.

## Part 5 – Results

This part of the paper will consist of different segments. In part 5.1 I will replicate the results of the Rice and Weber (2012) paper by using sample group three and sample group four within the regression model. This step is to see if the extended timeframe of my paper produces results that challenge the findings of Rice and Weber (2012). The segment thereafter will substitute sample group three with sample group two within the regression model. The results of the second regression will indicate any differences that might exist between group two and group three. Part 5.3, will present the results of an ANOVA test that will check if there indeed are any significant differences between group two and group three. The final part, part 5.4 will discuss a couple of additional analysis.

### Part 5.1 Disclosure behavior of restating firms

When comparing the results from sample group two and three to the main results presented by the Rice and Weber (2012) paper a couple of factors need to be mentioned. The descriptive statistics from both datasets look fairly similar. Both are provided in appendix 2. The first issue when comparing the two datasets is the difference in number of observations. Group three and four together are good for 1816 observations while the dataset of Rice and Weber (2012) consists of 488 observations. This difference is the result of three factors. Factor one is the difference in observation period. Where the data from Rice and Weber (2012) is collected from November 15, 2004 until the end of 2009, the data in this paper is collected from November 24, 2004 until the end of 2016. The second factor is that Rice and Weber manually checked all reports from the observations that issued a restatement without disclosing a MICW to see if the restatement is attributed to an issue with an

internal control of a company. In this step they fail to verify that the restatement is caused by a failure of an internal control for 22% of their sample. Since this step is not included in the methodology of this paper, less observations are dropped. The final factor has to do with data availability. Since the databases used in this research have been updated more recently than once Rice and Weber used the databases, I assume that I had to drop less variables due to unavailable data needed to compute the independent variables. The output from the regression model when using only observation group three and four is presented in table 6.

Table 6

**Determinants of reporting existing MICW**

Variables	Predicted sign	Coefficient	Standard Err.	Z value	P value
Constant	+/-	-1,1399	0,1379	-8,26	0,000
SIZE	-	0,0272	0,0213	1,28	0,202
LOSS	+	<b>0,5326</b>	0,0761	7,00	0,000
$\Delta$ XFIN	-	<b>-0,1735</b>	0,0818	-2,12	0,034
BIG4	-	<b>-0,3371</b>	0,0963	-3,50	0,000
AUDITFEES	+	<b>4,97E-06</b>	6,17E-07	8,06	0,000
NONAUDITFEES	-	<b>-6,79E-06</b>	2,22E-06	-3,06	0,002
AUDITCHANGE	+	<b>0,2998</b>	0,1098	2,07	0,006
MNGTCHANGE	+	<b>0,2414</b>	0,0740	3,26	0,001

N = 1816

Psued-R<sup>2</sup> = 0.0895

Signs are predicted based on the results of Rice and Weber (2012)

Dependent variable is MICW, the table presents the results from the probit regression described in part 3.1

Bold coefficients are significant at the 5% level, based on a two tailed significance test

Variables as defined in appendix 1

The positive coefficient of SIZE is consistent with the literature stating that larger firms receive more scrutiny from the capital market which can act as an incentive to disclose the MICW. However, when looking at the related P value, the size of a company does not seem to impact the chance at a MICW disclosure in a significant way. The rest of the coefficients are significant at least at the 5% level, most even at the 1% level.

Just like SIZE, LOSS also acted as a proxy for scrutiny from the capital market. Contrary to SIZE, LOSS is significant at the 1% level. The biggest question that arises when interpreting the relation between LOSS and MICW is reverse causality. From the regression model on one hand it does not become clear whether loss making firms receive more scrutiny from the market and are thus pushed to disclosing their MICW. Or on the other hand, the type of MICW that are disclosed could be more

severe making them easier to detect but at the same time they could prevent the company from operating in an efficient way, leading to possible losses for the company.

The  $\Delta XFIN$  variable which indicates the firms need for external capital is the only variable that is not significant on the 1% level, but is significant on the 5% level. The negative coefficient is consistent with the theory that firms disclosing MICW experiencing higher cost of capital, incentivizing firms in need of external capital not to disclose their MICW.

The negative and significant coefficient of BIG4 seems counter intuitive at first. Since BIG4 is often used as a proxy for audit quality (Behn, et al., 2008) and the hypothesis that higher audit quality leads to more disclosure of MICW, a positive coefficient would have been expected. The argument that is provided within Rice and Weber (2012) to justify the negative coefficient of BIG4 is that BIG4 auditors have more resources and in-house knowledge at their disposal and can thus “audit around” the MICW. This means that these auditors have the ability to verify the financial statements despite the existence of the MICW and is convinced that the company in question is also able to do so.

The results related to audit fees and non-audit fees are consistent with the notion that audit fees can proxy for auditor effort and higher auditor effort leads to higher audit quality. Also, non-audit fees compromise the auditor independence, resulting in lower audit quality. Both results are thus consistent with the hypothesis that higher audit quality results in more MICW disclosure.

The final two variables, AUDITCHANGE and MNGTCHANGE are both positive and significant. This is consistent with the logic that new auditors and management can blame the existence but non-disclosure of a MICW on the previous auditor or on previous management. Turning the argument around, if an auditor or management has to acknowledge the existence of a MICW that has also been present in previous years than they acknowledge at the same time that they were incapable of detecting this weakness earlier or have chosen not to disclose the weakness, which is against the SOX 404 legislation.

Comparing these results to the results of Rice and Weber (2012) the following differences can be observed. The larger time frame and the differences in data selection do not appear to alter the results of the regression formula in a major way. The signs of the coefficients are similar to the results presented in the Rice and Weber (2012) paper, except for the variable SIZE. The coefficient of the variable SIZE was negative and significant at the 10% level in the Rice and Weber (2012) paper but is positive and insignificant in the results of this paper. Compared to the Rice and Weber (2012) paper, the variables NONAUDITFEES, AUDITCHANGE and MNGTCHANGE increased in significance from the 10% or 5% level to the 1% level. In summary, ignoring the insignificant variable SIZE and

accepting the changes in significance of the previously mentioned variables I confirm that the results of Rice and Weber (2012) stay consistent when a longer timeframe for data collection is used.

### Part 5.2 Disclosure behavior of non-restating firms

This part of the paper will be the first of two steps to answer the question Rice and Weber (2012) asked in the discussion part of their paper. Do their results hold for firms who disclose their MICW, but do not issue a restatement? Logically the lack of restatements already indicates that there is a significant difference between firms in group three and firms in group four. The descriptive statistics of both groups also hinted at some differences. The biggest question that remains is if those differences influence their disclosure behavior. Next to that, if major differences are found between group two and group three than this paper can be a stepping stone for future research that focusses on finding predictive values for future restatements.

Table seven presents the results of the regression model, this time using all observations within group two and group four as a sample.

Table 7

#### Determinants of reporting existing MICW

Variables	Predicted sign	Coefficient	Standard Err.	Z value	P value
Constant	+/-	-1,0026	0,0999	-1,00	0,300
SIZE	+	0,0279	0,0161	1,73	0,074
LOSS	+	<b>0,4270</b>	0,0572	7,47	0,000
ΔXFIN	-	-0,0520	0,0212	-2,46	0,065
BIG4	-	<b>-0,7988</b>	0,0673	-11,87	0,000
AUDITFEES	+	<b>5,07E-06</b>	5,21E-07	9,73	0,000
NONAUDITFEES	-	<b>-1,16E-05</b>	1,85E-06	-6,30	0,000
AUDITCHANGE	+	<b>0,3311</b>	0,0797	4,15	0,000
MNGTCHANGE	+	<b>0,2973</b>	0,0554	5,37	0,000

N = 2774

Psued-R<sup>2</sup> = 0.1377

Signs are predicted based on the results of the group three and four regression

Dependent variable is MICW, the table presents the results from the probit regression described in part 3.1

Bold coefficients are significant at the 5% level, based on a two tailed significance test

Variables as defined in appendix 1

The results in table seven present a fairly similar picture as the results in table six. None of the signs of the coefficients have changed and also most coefficients are significant at a similar level. This would imply that the results found by Rice and Weber (2012) also represent the disclosure behavior of firm who do not issue a restatement after disclosing the existence of a MICW. Some differences between the two regression results have to be noted however. Most important, two coefficients

have changed in the level of significance. SIZE, which was insignificant in the previous regression, is now significant at the 10% level, thus becoming more significant.

The differences in output relate to the differences earlier observed in the descriptive statistics. Observations in group two were on average smaller than the observations in group three. With the observations in group four being the largest, the differences in SIZE between firms disclosing MICW and not disclosing MICW increased from the first regression compared to the second regression. This increased difference in mean SIZE is probably the reason the variable SIZE increased in significance from the first regression to the second. Regarding the drop in significance of the  $\Delta XFIN$  variable, a large difference in standard deviation exists when comparing group two to group three. It was unclear if this difference in standard deviation would affect the outcome of the regression model and now it appears that this increase in standard deviation leads to a lower significance level of the variable  $\Delta XFIN$  and a smaller absolute value of the coefficient. The same arguments can be made for the increasing difference in sample means from the variables BIG4 and NONAUDITFEES, resulting in larger absolute values of the coefficients in the second regression model.

The results from the second regression would reject hypothesis one in favor of the alternative hypothesis that size of a company is positively related to the disclosure of MICW. However, since only a part of the observations disclosing MICW is used in the second regression and the results from regression one where insignificant related to size, further research is needed see if H1a needs to be rejected or not. In the additional analysis one and two, different proxies for size are used. In additional hypothesis three, regression one is repeated with both sample group two, three and four used as data. Size is positive and significant in all regression outputs except with the second alternative SIZE proxy when using observation group three and four in the regression. These results thus confirm the findings in part 5.2 and lead me to reject hypothesis one and accept the alternative hypothesis that firm size is positively related to MICW disclosure.

Loss making firms seem to disclose their MICW significantly more often than profitable firms. Regression one confirmed the positive relation between LOSS and MICW disclosure that was previously found by Rice and Weber. Regression two confirmed that this relation holds when firms without restatements are used in the regression model. I thus reject hypothesis two and accept the alternative hypothesis, there is a significant positive relation between losses and MICW disclosure. Consistent with theory that loss making firms face more scrutiny from the market.

Contrary to SIZE,  $\Delta XFIN$  dropped in significance. Being significant at the 5% level in the previous regression, it is now only significant at the 10% level. Besides changes in the significance level also changes in the coefficients themselves can be noted. The coefficient  $\Delta XFIN$  dropped in size, and is

now three times smaller than the value of the coefficient  $\Delta X_{FIN}$  in the first regression. Contrary to that, the coefficients BIG4 and NONAUDITFEES grew with a factor 2,4 and 1,7 respectively. Overall these results still lead me to reject H2 and accept the alternative hypothesis that the need for external capital is negatively related to the disclosure of MICW. This is consistent with the theory that firms have an incentive to hide their MICW to prevent higher costs of capital.

The literature related to the BIG4 variable was inconclusive about the question if it would proxy for audit quality or if self-selection of companies would hinder any inferences that could be made about the BIG4 proxy variable. The results of regression one and two are in line with the results of Rice and Weber and consistent with their theory that big four auditors are probably able to audit around the MICW. On the other hand it can still be true that some self-selection problems are present and that firms who have a big four auditor differ significantly in their incentives to (not) disclose their MICW. For this paper the results only indicate that a significant negative relation exists thus I reject H3a and accept the alternative hypothesis that having a big four auditor is negatively related to the disclosure of MICW.

Regarding audit fees and non-audit fees some disputes in the literature were mentioned about non-audit fees lowering audit quality or not. My results are consistent with the theory that higher audit fees relate to higher audit quality and higher non-audit fees impair audit quality. These results are in line with the results of Rice and Weber and lead me to reject H3b and H3c thus accepting the alternative hypotheses that audit fees have a positive relation with MICW disclosure and non-audit fees have a negative relation with MICW disclosure.

The results related to audit change and management change are consistent with both intuition and the results of Rice and Weber. In the two years after a change of management or auditor more companies with a MICW also disclose the MICW. The previously mentioned intuition is that new managers or new auditors can blame the existence of the MICW on the previous auditor or on previous management. The hypothesis H4a and H4b are rejected in favor of the alternative hypothesis that auditor change is positively correlated with MICW disclosure and management change is also positively related with MICW disclosure.

### Part 5.3 Between group variance significance

To confirm if there are indeed significant differences between the two groups that disclose MICW this part will test the differences in means of the variables using the ANOVA test. The ANOVA test compares how much of the variance between observations is caused by between sample variance as opposed to within sample variance. The results of the ANOVA tests of all variables are presented in table eight.



Table 8

Difference in sample means					
Variables	Group 2 mean	Group3 mean	Difference	F statistics	probability
SIZE	5.740	6.157	<b>0.418</b>	16.230	0.000
LOSS	0.481	0.473	0.008	0.070	0.798
$\Delta$ XFIN	0.145	0.127	0.018	0.060	0.811
BIG4	0.533	0.724	<b>0.191</b>	50.000	0.000
AUDITFEES	70907	80072	<b>9165</b>	6.800	0.009
NONAUDITFEES	8803	11199	<b>2395</b>	9.930	0.002
AUDITCHANGE	0.188	0.152	0.036	2.800	0.095
MNGTCHANGE	0.399	0.361	0.039	2.050	0.153
	N = 1385	N = 427			

Results are based on the ANOVA difference in means test for each variable

Bolded values highlight results significant at the 5% significance level

When comparing group two to group three, differences in the regression output were observed in the variables SIZE,  $\Delta$ XFIN, BIG4 and NONAUDITFEES. The ANOVA output confirms that some of these variables indeed have significantly different values within the sample groups. The variables SIZE, BIG4 and NONAUDITFEES seems to be significantly different between restating and non-restating firms. This would be consistent with the statement that if firms disclose a MICW, relatively large firms, firms with a BIG 4 auditor or firms paying high non-audit fees have a higher chance to issue a future restatement. This statement cannot be verified by this paper, since the regression formula is based on events data, not time series data thus inferences about causality cannot be made. In summary, regression two in part 5.2 confirm that the results of Rice and Weber (2012) generally hold for the sample group without restatements. But, the ANOVA comparison in part 5.3 also indicated that there are some significant differences between the sample groups.

To summarize, all hypothesis were stated in the null form, implying that there is no relation between the independent variable and the dependent variable. After running all regressions and also including the results from upcoming additional analyses I conclude that there is a significant relation between all the independent variables and the dependent variable. I thus reject all the initial hypothesis in favor of the alternative hypothesis with the relation between the independent variables and the dependent variable either being significantly positive or significantly negative. I find a positive relation between both market scrutiny proxies, SIZE and LOSS, and MICW disclosure. Secondly, the need for external capital is negatively related with MICW disclosure. The results related to audit quality require more explanation. Theory, although debated, suggested that BIG4

and AUDITFEES increase audit quality while NONAUDITFEES could harm audit quality. The positive relation between AUDITFEES and MICW disclosure and the negative relation between NONAUDITFEES and MICW disclosure are in line with this theory, but I also find a negative relation between BIG4 and MICW disclosure. In the literature it is indeed debated if BIG4 is a good proxy for audit quality and the counterintuitive relation I find in my results will add to this debate. Finally the significant positive relation between both AUDITCHANGE and MNGTCHANGE and MICW disclosure is consistent with the theory that both the new auditor or the new management is more willing to disclose the existing MICW because they can blame it on their predecessor. These conclusions are again summarized in table 9:

Hypothesis	Independent variable	Rejected?	Accepted alternative hypothesis
H1a	SIZE	Yes	Firm size is positively related to MICW disclosure
H1b	LOSS	Yes	Losses are positively related to MICW disclosure
H2	$\Delta$ XFIN	Yes	Need for external capital is negatively related to MICW disclosure
H3a	BIG4	Yes	Having a big four auditor is negatively related to MICW disclosure
H3b	AUDITFEES	Yes	Audit fees are positively related to MICW disclosure
H3c	NONAUDITFEES	Yes	Non-audit fees are negatively related to MICW disclosure
H4a	AUDITORCHANGE	Yes	Auditor change is positively related to MICW disclosure
H4b	MNGTCHANGE	Yes	Management change is positively related to MICW disclosure

#### Part 5.4 Additional analyses

In part 5.1 of this paper I checked whether the results of Rice and Weber (2012) also hold when a larger timeframe is considered. Only the variable SIZE changed from indicating a negative to a positive relation with MICW disclosure. This positive relation is also present when I swap observations disclosing MICW with a restatement for observations disclosing MICW without a restatement. Because these results are not in line with the Rice and Weber (2012) paper I repeat the regressions in part 5.1 and 5.2 with two alternative proxies for size as a robustness check. In the first proxy SIZE is defined as natural logarithm of the balance sheet item total assets, creating the

variable SIZENEW. In the second additional analysis I define SIZE as the natural logarithm of total sales revenue, creating the variable SIZENEW2. Sales appears to be a better proxy for company size than net income, because matching problems between revenues and costs can be present (Wagenhofer, 2014). Both SIZENEW as SIZENEW2 are winsorized for the top and bottom 1%. For the SIZENEW2 regressions 116 observations are dropped due to a lack in necessary data to compute the variable NEWSIZE2. The regression output with the variables SIZENEW and SIZENEW2 can be found in appendix three. The additional results are comparable to the results presented in part 5.1 and part 5.2 with SIZE even being significant in the regression using group three and four with the alternative SIZE variable SIZENEW.

In the third additional analyses I am including all observations in the regression model. This gives a total number of observations being used of 3201 observations. The results are presented in appendix four. When comparing the results to the results presented in part 5.1 and part 5.2 it is very clear that the results are almost identical to the results presented in part 5.2. To check if this is because there are relatively more observations in group two compared to group three I randomly drop 958 observations from group two and run the regression again. I repeat this process three times to make sure the drop in observations does not significantly affect the results. The untabulated results indicate that the variable SIZE sometimes has a P value slightly above the 10% significance level and sometime below the 10% significance level. The results of the above mentioned additional analysis are all generally comparable to the results presented in part 5.2. This leads me to reject hypothesis one and accept the alternative hypothesis that SIZE has a positive relation with MICW disclosure. This is opposite to the results Rice and Weber presented in their paper.

In this final additional analysis I will check if the difference in results between Rice and Weber (2012) and the results presented in part 5.1 are due to the extended timeframe the data is collected. Thus as another robustness check I will repeat the regression in part 5.1 and exclude all observations that are reported outside the timeframe used by Rice and Weber (2012). The timeframe for the data in this regression will thus be November 15, 2004 until the end of 2009. A total of 764 observations is dropped compared to the sample used in part 5.1. The results of this regression are presented in appendix five. There are two important observations to be made when comparing these results to the results in part 5.1. Firstly the significance level of SIZE increased and SIZE is now significant at the 1% level. The second important difference is the change in significance of the BIG4 variable. This variable had been significant at the 1% level in all previous regression outputs but holds a P value of 0.448 in the matched timeframe regression, thus not even being significant at the 10% level. Although I assumed that the output from the matched timeframe regression would be most

comparable with the results presented by Rice and Weber (2012) it appears that there still are significant differences between their results and the results created by the regression and data used in this paper. The most important conclusion from this additional analysis is that it supports my rejection of the hypothesis that SIZE has a negative relation with MICW disclosure since even the most comparable regression output shows a significant positive relation between SIZE and MICW disclosure.

## Part 6 – Discussion and conclusion

### Part 6.1 – Recap methodology

The aim of this paper is to extend our knowledge about the disclosure behavior of firms related to their possible MICW. Although it is obligated by the Sarbanes-Oxley act section 404 to disclose any MICW that exist it appears that companies react to disclosure incentives related to their MICW.

The first argument that can be made to defend the fact that not all existing MICW are disclosed is that companies and auditors do not know about the MICW until it caused the issuance of a restatement. Rice and Weber provided a counter argument by showing that companies appear to react to disclosure incentives as if they have a choice in disclosing a MICW or not. The problem at the time was that we did not know if their results were only relevant for firms who issued restatements or that they are relevant for all firms that possibly deal with MICW. The reason this question could not be answered by Rice and Weber is because next to their sample group, firms with restatements, there are also firms without restatements.

Following the definitions of MICW and restatements by the PCAOB, it can be concluded that a MICW is present in all firms that issue a restatement. The only reason I am not able to look at all non-restating firms in my research is because it is unknown how many firms without restatement or MICW disclosure might actually still have an MICW present in their company. This does leave the observation group non-restating MICW disclosing firms.

### Part 6.2 – Answering the research question

I used these firms in my paper to identify if the disclosure behavior of non-restating firms differs from firms with a restatement and thus answer my research question:

*Do non-restating firms have the same disclosure behavior related to their MICW as firms with a restatement?*

The main conclusion of this paper is that the disclosure behavior of non-restating firms is equal to the disclosure behavior of restating firms. Since all firms appear to react to disclosure incentives this implies that the SEC is probably right in worrying about the effectiveness of the SOX 404 legislation.

Related to this answer of the research question the following remark has to be made: the results in part 5.3 shows that there are some significant differences between restating and non-restating firms. Although the results in my paper imply that both restating and non-restating firms react to disclosure incentives in a similar way, the fact that there are some significant differences between the groups means that caution is needed when extrapolating the results to non-restating non-disclosing firms .

### [Part 6.3 – results related to previous literature](#)

The results of this paper are in line with most of the theory presented in related papers about the origins and consequences of MICW disclosure. Market scrutiny seems to affect the disclosure behavior in a positive way, while the higher costs of capital due to MICW disclosure seems to pressure firms in need of external capital not to disclose their MICW. It is also interesting to see that the proxy for audit quality, BIG4, is debated in the literature and the results in this paper also seems to implicate that auditors from the big 4 do not provide higher audit quality. At the same time this statement might be incorrect since there is a possible self-selection bias regarding clients of big four audit firms. Lastly, as suggested by Rice and Weber in their paper, audit change and management change seem to affect disclosure behavior in a logical way. New auditors or new management tend to disclose MICW more often because they can blame the existence on their predecessors.

### [Part 6.4 – Similarities and differences with Rice and Weber \(2012\)](#)

Another implication made by the results in this paper is that I question some of the conclusions presented in Rice and Weber (2012). Their significant negative relation between SIZE and MICW disclosure is opposite to all the results discussed in this paper. Even when multiple different proxies for size are used or the Rice and Weber is imitated by taking the same observation period I either find an insignificant positive relation between SIZE and MICW disclosure or a significant positive relation between SIZE and MICW disclosure. These differences could be explained by the methodology used in the Rice and Weber paper since they manually check all restatement notifications of their observations to see if the company blames the restatement on a MICW or not. For 78% of their observations they are able to confirm that the restatement is indeed caused by a MICW and they drop the 22% of observations where the relation between the restatement and a possible MICW stays ambiguous. In my paper I take the statements from the PCAOB literally and state that a MICW is always present if the observations issued a restatement. There is further research needed to determine the exact relation between SIZE and MICW.

### [Part 6.5 – Management advise, research limitations and future research](#)

The conclusions of this paper, that probably all firms react to disclosure incentives, lead me to the following statements. Since research has indicated that firms not simply disclose all their existing

MICW, but react to disclosure incentives it becomes important for oversight organs like the SEC or individual investors to place extra scrutiny on those firms that are less likely to report their MICW. Since the SOX 404 legislation is heavily criticized for the compliance burden it places on companies it would be a real problem if the effectiveness of that legislation is minimal since managers might think that it doesn't matter whether they report their MICW or not. For the managers of those companies it is important to be aware of the possible disclosure incentives that might be present within their company to be able to act in an ethical way and comply with the SOX 404 legislation.

As a concluding note, this the research in this paper has several limitations. Firstly the previously mentioned lack of manual checks to confirm that all the observations that did not disclose a MICW actually have a MICW. The second limitation is that I did not include group one, non-disclosing non-restating firms, in the sample groups of this paper. This places restrictions in the type and structure of the regressions that I can use for the data analysis. In the ideal scenario we are sure that non-disclosing, non-restating firms indeed have no MICW and we can include those firms in our sample. The next step can then be to model the dummy variable Restatement as an interaction variable in the main regression. Due to perfect multicollinearity this is not possible in this paper and I thus have to use a different, less statistical sophisticated approach. Future research could focus on finding different MICW identification methods. With such a method the external validity of this research could be extended to companies within group one.

Next to that, future research could look further into the differences between group two and three to see if there is any predictive value to the characteristics identified in this paper that might help predict the possibility that a MICW disclosing firm will also report a restatement in the future. This would help in assessing the risk of a disclosed MICW and this could possibly remediate the negative effects of MICW disclosure for some companies. This research could then in turn be expanded by also looking at other variables, not only those that are discussed in this paper.

## References

- Adler, J. & Parmryd, I., 2010. Quantifying Colocalization by Correlation: The Pearson Correlation Coefficient is Superior to the Mander's Overlap Coefficient. *Cytometry*, Volume 77, pp. 733-742.
- Analytics, A., 2018. *Different Types of Financial Statement Error Corrections*. [Online] Available at: <https://www.auditanalytics.com/blog/different-types-of-financial-statement-error-corrections/> [Accessed 30 04 2018].
- Aobdia, D., Choudhary, P. & Sadka, G., 2016. Do Auditors Correctly Identify and Assess Internal Control Deficiencies? Evidence from the PCAOB Data. *Working paper SSRN*.
- Ashbaugh-Skaife, H. & Collins, D., 2009. The effect of SOX internal control deficiencies on firm risk and cost of equity. *Journal of Accounting Research*.
- Ashbaugh-Skaife, H., Collins, D., Kinney Jr, W. & LaFond, R., 2008. The Effect of SOX Internal Control Deficiencies and Their Remediation on Accrual Quality. *The Accounting Review*, 83(1), pp. 217-250.
- Ashbaugh-Skaife, H., Collins, D. W. & Kinney, W. R., 2007. The discovery and reporting of internal control deficiencies prior to SOX-mandated audits. *Journal of Accounting and Economics*, pp. 166-192.
- Bedard, J. & Graham, L., 2011. Detection and severity classifications of Sarbanes-Oxley Section 404 internal control deficiencies. *The Accounting Review*, pp. 825-855.
- Behn, B., Choi, J. & Kang, T., 2008. Audit quality and properties of analyst earnings forecasts. *The Accounting Review*.
- Calvin, C. G., 2017. Material Weakness Discovery Lag and Misstatement Risk in a Constrained Control Testing Environment. *ProQuest LLC*, pp. 1-75.
- Cohen, J., Krisnamoorthy, G. & Wricht, A., 2010. Corporate Governance in the Post-Sarbanes-Oxley Era: Auditors' Experiences. *Contemporary accounting research*.
- Costello, A. & Wittenberg-Moerman, R., 2011. The Impact of Financial Reporting Quality on Debt Contracting: Evidence from Internal Control Weakness Reports. *Journal of Accounting Research*, pp. 97-136.
- De Simone, L., Ege, M. S. & Stomberg, B., 2015. Internal Control Quality: The Role of Auditor-Provided Tax Services. *The Accounting Review*, pp. 1469-1496.
- Defond, M. & Jiambalvo, J., 1991. Incidence and Circumstances of Accounting Errors. *The Accounting Review*, p. 643-655.
- DeFond, M. & Lennox, C. S., 2011. The effect of SOX on small auditor exits and audit quality. *Journal of Accounting and Economics*, pp. 21-40.
- DeFond, M. L., Erkens, D. H. & Zhang, J., 2014. Do client characteristics really drive Big Four quality differentiation? - Working paper. *SSRN*.
- Doyle, J. T., Ge, W. & McVay, S., 2007. Accruals quality and internal control over financial reporting. *The Accounting Review*, pp. 1141-1170.

- Feng, M. & Li, C., 2011. Does SOX Section 404 Curb Material Misstatements?. *SSRN working paper*, pp. 1-54.
- Hammersley, J. S., Myers, L. A. & Zhou, J., 2012. The Failure to Remediate Previously Disclosed Material Weaknesses in Internal Controls. *Auditing: A Journal of Practice & Theory*, pp. 73-111.
- Hennes, K. M., Leone, A. J. & Miller, B. P., 2008. The Importance of Distinguishing Errors from Irregularities in Restatement Research: The Case of Restatements and CEO/CFO Turnover. *The Accounting Review*, pp. 1487-1519.
- Jonas, G., Rosenberg, A. & Gale, M., 2006. The second year of section 404 reporting on internal control - working paper. *SSRN*.
- Lang, M. H. & Lundholm, R. J., 1996. Corporate Disclosure Policy and Analyst Behavior. *The Accounting Review*, pp. 467-492.
- Lawrence, A., Minutti-Meza, M. & Zhang, P., 2011. Can Big 4 versus non-Big 4 differences in audit-quality proxies be attributed to client characteristics?. *The Accounting Review*, pp. 259-286.
- Leone, A. J., 2007. Factors related to internal control disclosure: A discussion of Ashbaugh, Collins, and Kinney (2007) and Doyle, Ge, and McVay (2007). *Journal of Accounting and Economics*, pp. 224-237.
- Moore, D. S., McCabe, G. P., Alwan, L. & Craig, B., 2016. *The Practice of Statistics for Business and Economics*. 4th ed. New York: Freeman.
- Nagy, A., 2010. Section 404 Compliance and Financial Reporting Quality.. *Accounting Horizons*, pp. 441-454.
- Ogneva, M., Subramanyam, K. R. & Raghunandan, K., 2007. Internal Control Weakness and Cost of Equity: Evidence from SOX Section 404 Disclosures. *The Accounting Review*, pp. 1255-1297.
- PCAOB, 2008. *Auditing Standard No. 6 - Evaluating Consistency of Financial Statements and Conforming Amendments*, Washington D. C.: PCAOB.
- PCAOB, 2009. *Report on the first-year implementation of audit standard nr. 5*, Washington D. C. : PCAOB.
- Plumlee, M. & Yohn, T. L., 2010. An Analysis of the Underlying Causes Attributed to Restatements. *Accounting Horizons*, pp. 41-64.
- Raghunandan, K. & R, D. V., 2006. SOX Section 404 Material Weakness Disclosures and Audit Fees. *Auditing: A Journal of Practice & Theory*, pp. 99-114.
- Rice, S. & Weber, D., 2012. How Effective Is Internal Control Reporting under SOX 404? Determinants of the (Non-)Disclosure of Existing Material Weaknesses. *Journal of Accounting Research*, pp. 811-844.
- Rice, S., Weber, D. & Wu, B., 2014. Does SOX 404 Have Teeth? Consequences of the Failure to Report Existing Internal Control Weaknesses. *Working paper*.
- Richardson, S., Tuna, I. & Wu, M., 2003. Capital Market Pressures and Earnings Management: The Case of Earnings Restatements. *SSRN Working paper*.



SEC, S. a. E. C., 2009. *Remarks before the 2009 AICPA National Conference on Current SEC and PCAOB Developments*. [Online]  
Available at: <https://www.sec.gov/news/speech/2009/spch120709db.htm>  
[Accessed 07 04 2018].

Tang, D., Tian, F. & Yan, H., 2015. Internal Control Quality and Credit Default Swap Spreads. *Accounting Horizons*, pp. 603-629.

Wagenhofer, A., 2014. The role of revenue recognition in performance reporting. *Accounting and Business Research*, pp. 349-379.

Zang, A., 2012. Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The Accounting Review*, pp. 675-703.

## Appendix

### Appendix 1 – Variables definition

The next section will explain the variables used in these regressions. As a remark, a period is defined as a quarter of a fiscal year.

MICW	A dummy variable equal to one if a firm discloses a material internal control weakness
RESTAT	A dummy variable equal to one if the firm issues a restatement
MNGTCHANGE	A dummy variable equal to one if the CEO or CFO is changed in the two years prior to the end of the restatement period or two years prior to the disclosure of the material weakness for firms in group two
AUDITCHANGE	A dummy variable equal to one if the firm has changed from auditor in the two years prior to the end of the restatement period or two years prior to the disclosure of the material weakness for firms in group two
SIZE	Natural log of total market value of common equity at the end of the period of the restatement or at the end of the period where it issues a MICW
LOSS	A dummy variable equal to one if the firms reports negative income before extraordinary items in the final year of the restatement period or in the year of the disclosure of the MICW
$\Delta$ XFIN	Net change in external financing computed by adding cash received from issuance of long-term debt and the sale of stock, minus payment of dividends, cash used in repurchase of stock and reduction of debt, scaled by square root of total assets
BIG4	A dummy variable equal to one if the audit opinion in the final period of the restatement or in the period that the MICW is disclosed is issued by an auditor from either Deloitte, KPMG, EY or PwC
AUDITFEES	The year matched audit fees, scaled by the square root of total assets
NONAUDITFEES	The year matched non-audit fees, scales by the square root of total assets

Appendix 2 – Comparison descriptive statistics of Rice and Weber (2012)

Descriptive statistics group 3 & 4							Data used in Rice and Weber (2012)				
Variables	data used in Janssen (2018)						Mean	St. Dev	Q 1	Median	Q 3
	Mean	St. Dev	Q 1	Median	Q 3						
MICW	0.235	0.424	0.000	0.000	0.000	0.676	0.497	0.000	1.000	1.000	
Restatement	1.000	0.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	
BIG 4	0.794	0.405	1.000	1.000	1.000	0.836	0.371	1.000	1.000	1.000	
Audit fees	60060	57041	24207	44343	77306	64342	58279	31715	50492	79976	
Non-audit fees	11556	16883	1211	5148	14039	13182	22423	1741	6171	15382	
audit change	0.095	0.294	0.000	0.000	0.000	0.115	0.319	0.000	0.000	0.000	
mngt change	0.272	0.445	0.000	0.000	1.000	0.455	0.498	0.000	0.000	1.000	
Loss	0.295	0.456	0.000	0.000	1.000	0.311	0.464	0.000	0.000	1.000	
Size	6.369	1.910	5.248	6.136	7.523	6.482	1.546	5.417	6.417	7.272	
XFIN	0.103	0.382	-0.016	0.006	0.087	0.026	0.208	-0.041	-0.001	0.048	
<b>N = 1816</b>						<b>N = 488</b>					

## Determinants of reporting existing MICW

Variables	Predicted sign	Group 3 & 4		Group 2 & 4		Group 3 & 4		Group 2 & 4	
		Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value
Constant	+/-	-1.2872	0.000	-0.4023	0.000	-1.0743	0.000	-0.1693	0.040
SIZENEW	-	<b>0.0519</b>	0.004	<b>0.0826</b>	0.000	0.0174	0.331	<b>0.0621</b>	0.000
LOSS	+	<b>0.5450</b>	0.000	<b>0.4776</b>	0.000	<b>0.5098</b>	0.000	<b>0.4551</b>	0.000
ΔXFIN	-	-0.1117	0.367	-0.0411	0.086	-0.1575	0.235	-0.0453	0.067
BIG4	-	-0.3980	0.000	-0.9460	0.000	-0.2862	0.004	-0.8875	0.000
AUDITFEES	+	5.29E-06	0.000	5.63E-06	0.000	5.10E-06	0.000	5.03E-06	0.000
NONAUDITFEES	-	-6.80E-06	0.003	-1.16E-05	0.000	-6.72E-06	0.003	-1.23E-05	0.000
AUDITCHANGE	+	<b>0.3040</b>	0.006	<b>0.3441</b>	0.000	<b>0.2819</b>	0.012	<b>0.3361</b>	0.000
MNGTCHANGE	+	<b>0.2342</b>	0.001	<b>0.2810</b>	0.000	<b>0.2022</b>	0.006	<b>0.2496</b>	0.000

N = 1816

Psued-R<sup>2</sup> = 0.0926

Signs are predicted based on the results of Rice and Weber (2012)

Dependent variable is MICW, the table presents the results from the probit regression described in part 3.1

Bold coefficients are significant at the 5% level, based on a two tailed significance test

Variables as defined in appendix 1

N = 2774

Psued-R<sup>2</sup> = 0.1459

N = 1706

Psued-R<sup>2</sup> = 0.0824

N = 2665

Psued-R<sup>2</sup> = 0.1329

#### Appendix 4 – Full sample regression output

##### Determinants of reporting existing MICW

Variables	Predicted sign	Coefficient	Standard Err.	Z value	P value
Constant	+/-	-0,0071	0,0920	0,98	0,938
SIZE	-	0,0260	0,0149	1,61	0,077
LOSS	+	<b>0,4509</b>	0,0521	9,82	0,000
ΔXFIN	-	<b>-0,0547</b>	0,0254	-4,57	0,042
BIG4	-	<b>-0,6945</b>	0,0625	-10,26	0,000
AUDITFEES	+	<b>5,23E-06</b>	2,90E-07	7,44	0,000
NONAUDITFEES	-	<b>-1,06E-05</b>	1,15E-06	-5,17	0,000
AUDITCHANGE	+	<b>0,3227</b>	0,0747	4,21	0,000
MNGTCHANGE	+	<b>0,2828</b>	0,0511	5,80	0,000

N = 3201

Pseud-R<sup>2</sup> = 0.1223

Signs are predicted based on the results of Rice and Weber (2012)

Dependent variable is MICW, the table presents the results from the probit regression described in part 3.1

Bold coefficients are significant at the 5% level, based on a two tailed significance test

Variables as defined in appendix 1

## Appendix 5 – Matched timeframe Rice and Weber (2012) comparison

### Determinants of reporting existing MICW

Variables	Predicted sign	Coefficient	Standard Err.	Z value	P value
Constant	+/-	-1,5778	0,1822	-8,66	0,000
SIZE	-	<b>0,0745</b>	0,0271	2,75	0,003
LOSS	+	<b>0,5895</b>	0,1004	5,87	0,000
ΔXFIN	-	<b>-0,4895</b>	0,1542	-3,17	0,027
BIG4	-	-0,0980	0,1296	-0,76	0,448
AUDITFEES	+	<b>6,43E-06</b>	8,47E-07	7,59	0,000
NONAUDITFEES	-	<b>-8,04E-06</b>	2,99E-06	-2,69	0,013
AUDITCHANGE	+	<b>0,3445</b>	0,1372	2,51	0,011
MNGTCHANGE	+	<b>0,2122</b>	0,1002	2,12	0,035

N = 1052

Pseud-R<sup>2</sup> = 0.1050

Signs are predicted based on the results of Rice and Weber (2012)

Dependent variable is MICW, the table presents the results from the probit regression described in part 3.1

Bold coefficients are significant at the 5% level, based on a two tailed significance test

Variables as defined in appendix 1