Unintended Consequences of Voluntary Clawback Adoption on Executive Compensation Structures and Non-GAAP Reporting: Empirical Evidence.

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A B S T R A C T

Prior research finds comprehensive and consistent evidence regarding the intended consequences of voluntary clawback adoption. In the contrary, using a propensity-score matching procedure combined with a difference-in-differences research design, I empirically investigate the unintended consequences of clawback adoption. Specifically, this thesis examines how the voluntary adoption of a clawback provision affects the executive compensation structure, and non-GAAP reporting. I find (1) a significant increase in total compensation after clawback adoption, mainly driven by an increase in non-incentive compensation, (2) an increase in non-GAAP reporting frequency, (3) a decrease in non-GAAP reporting quality, consistent with the view that executives use non-GAAP reporting more opportunistically after clawback adoption, and that (4) compensation-driven reasons explain the opportunistic usage of non-GAAP reporting. Collectively, clawback adoption causes a shift to trigger-insensitive compensation, which have implications for the performance of the firm and the effectiveness of clawback provisions in the long-term. Regulators should consider these unintended consequences of clawback provisions when designing and implementing mandatory clawback provisions.

Keywords: *Clawback provision, executive compensation structure, non-GAAP reporting, opportunistic financial reporting, financial reporting quality, propensity-score matching.*

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1. Introduction

A well-designed executive compensation structure attempts to align executive's incentives with the goals of shareholders, seeking to make the compensation more sensitive to performance (Bebchuck & Fried, 2003). However, financial reporting scandals and the financial crisis have increased the scrutiny of stakeholders on the incentives that financial reporting executives ("executives")[1] may have to engage in financial misreporting, because the executive compensation structure is found to be a cause for unrightfully misreporting financial information (e.g. Cheng & Warfield, 2005; Burns & Kedia, 2006; Efendi, Srivastava and Swanson, 2007). Regulators attempt to decrease the risk of executives misreporting the financial statements by adopting new rules, including clawback provisions.

Clawbacks are recovery of erroneously awarded incentive-based compensation, resulting from a pre-defined trigger event, including restatements, misconduct, criminal behavior, a breach of the contract or other actions that are perceived as harmful to the firm (e.g. Dehaan, Hodge & Shevlin, 2013; Erkens, Gan & Yurtoglu, 2018; Babenko, Bennett, Bizjak & Coles, 2017).[2] The objective of clawback provisions is to discourage executives to misreport the financial statements. The *ex post* consequences of clawbacks should deter executives to intentionally misstate earnings *ex ante*, and may incentivize executives to decrease the unintentional probability of misstatement of financial reporting.

Despite these benefits, clawback provisions may have unintended consequences for non-GAAP reporting. Non-GAAP reporting refer to financial information that deviates from generally accepted accounting principles through the exclusion of transitory items, including one-time, nonrecurring items or non-cash transactions (Black, Christensen, Ciesielski & Whipple, 2018). The objective of these exclusions is to inform stakeholders with a summary statistic that better reflect a sustainable, future operating performance, in essence making non-GAAP earnings a more informative summary statistic for stakeholders than GAAP-earnings (Black et al., 2018; Curtis, McVay & Whipple, 2014). In the contrary, Kyung, Lee and Marquardt (2013) find that executives tend to use non-GAAP reporting more

[1] Financial reporting executives are insiders that are responsible for the preparation of the financial statements. Clawback provisions general involve the chief executive officer (CEO), the chief financial officer (CFO) or all named executive officers (NEOs).

[2] Although clawbacks are subject to regulatory reforms, the adoption of clawbacks is to this date still voluntary for firms. The voluntary nature of the investigated clawback provisions enable firms to define their own pre-defined trigger event. Clawback provisions will be triggered after a restatement of the financial statements if clawback provisions become mandatory for firms, according to the Dodd-Frank Act Wall Street Reform and Consumer Protection Act of 2010 section 954 on "Erroneous Awarded Compensation".

opportunistically after clawback adoption, since executives perceive a reduction in the discretion over GAAP reporting.

This thesis examines how the voluntary adoption of a clawback provision affects the executive compensation structure and non-GAAP reporting. Prior research finds comprehensive and consistent evidence regarding the intended consequences of clawback provisions; increasing the financial reporting quality (e.g. Erkens et al., 2018; Dehaan et al., 2013; Chan, Chen, Chen & Yu, 2012; Chen, Greene & Owers, 2014). In the contrary, I empirically investigate the unintended consequences of clawback adoption. Specifically, I develop four hypotheses related to the effects of clawback adoption on the executive compensation structure and non-GAAP reporting. First, I predict and find a significant increase in executive compensation after clawback adoption, mainly driven by an increase in non-incentive compensation (e.g. cash or base compensation). This finding is consistent with executives demanding a higher compensation for the 'recoupment risk premium' associated with clawback provisions. For the second and third hypothesis, I predict and find (1) an increase in non-GAAP reporting frequency, and (2) a decrease in non-GAAP reporting quality, which is consistent with the view that executives use non-GAAP reporting more opportunistically after clawback adoption. Finally, I examine *why* executives use non-GAAP reporting more opportunistically, and find first evidence of executives reporting non-GAAP earnings opportunistically to base their compensation on after clawback adoption. Collectively, clawback adoption causes a deterioration of non-GAAP reporting quality, and a shift to trigger-insensitive compensation,[3] including non-incentive compensation, or compensation based on opportunistically reported non-GAAP earnings.

These findings have some important implications when considering the unintended consequences of clawback adoption. Following agency theory, the shift to non-incentive compensation will have negative consequences for the level of effort of the executive, and subsequently the performance of the firm. Moreover, the shift to trigger-insensitive compensation, including non-incentive compensation and non-GAAP earnings, is an unintended consequence of clawback adoption. More importantly, if this trend keeps

[3] Trigger-insensitive compensation is compensation that will not be recouped if a pre-defined trigger event in the clawback provision occurs. I choose the word "trigger" instead of "restatement" on purpose, since clawback adoption is still voluntary to this date. Therefore, "trigger" better captures all pre-defined events resulting from voluntary clawback provisions. Nevertheless, restatements are the most common trigger events in voluntary clawback provisions.

continuing, the effect of clawback adoption may not be as effective as initially found by prior research in the long-term, because the compensation sensitive to trigger events decreases.

The results are of interest for the users of the financial statements, the board of directors, auditors, regulators, executives, researchers, and any other organization that desires to obtain a better understanding of the consequences of clawback adoption. The users of the financial statements should interpret the non-GAAP earnings number with more caution after clawback adoption, since executives are more likely to use non-GAAP earnings number opportunistically. As a result, the board of directors and the auditors should undertake actions to mitigate the negative consequence of deteriorated non-GAAP earnings quality. Besides increasing the scrutiny on non-GAAP reporting, a potential action may be to limit the dependability of compensation on non-GAAP earnings, since compensation incentivizes to misreport these earnings. Regulators should consider the unintended costs in deciding whether and how to implement mandatory clawback regulation. Understanding the benefits and the costs of clawback provisions is necessary to decide how to design clawback provisions for listed firms, and whether to regulate non-GAAP reporting more strictly. Finally, the results suggest a potential decrease in effort and firm performance, and a potential ineffectiveness of clawback provisions in the long-term. Future research may further investigate these unintended consequences of clawback provisions.

Similar to prior research, I conduct a difference-in-differences design to evaluate the effect of clawback adoption on executive compensation structure, and non-GAAP reporting, relative to non-adopters (i.e. the control group). The parallel trend assumption must hold, and requires an identical control and treatment group. Generally, however, this is hard to assume using observational data. To mitigate the problem of the parallel trend assumption, I match the clawback adopters with non-adopters using a propensity-score matching procedure, which yields 'scores'[4] based on observable firm characteristics, including corporate governance, audit, and firm-specific characteristics. This procedure yields balanced, equally distributed covariates between clawback adopters and non-adopters, which allows to assume identical groups before clawback adoption, which mitigates the parallel trend assumption. Moreover, I conduct another robustness check to test for the parallel trend assumption, and find no evidence for violation of this assumption.

This thesis makes several contributions to the existing. First, I extend the number of fiscal years investigated by examining the sample period 2007 – 2015. Second, I contribute to

[4] The score of a firm is summary statistic of the firm-characteristics weighted by their importance, which is indicated by the significance of the covariate in a logistic-ordered regression model.

the literature on the determinants of clawback adoption by finding a significant quadratic relation between the age of directors, and a significant positive effect of non-GAAP reporting in determining whether to adopt a clawback. Future research on voluntary adoption of clawback provisions may consider to include these determinants to estimate the propensity-score. Third, whereas prior research estimates non-GAAP earnings using I/B/E/S *analysts'* actual earnings, this thesis directly measures the *executive's* diluted non-GAAP earnings, as reported in the financial statements. Therefore, this thesis better captures *executive's* opportunism in non-GAAP reporting than prior research. Fourth, this thesis provides first evidence that executives report non-GAAP earnings opportunistically to base their compensation on after clawback adoption. Fifth, I add evidence to the existing, dispersed literature on the effect of clawback adoption on executive compensation structure. Collectively, I contribute to a better understanding of unintended consequences of clawback adoption.

I organize the remainder of the study as follows. Section 2 presents the theoretical framework, followed by a presentation of prior literature. Thereafter, based on the theoretical framework and prior literature, section 3 discusses the main hypotheses. Section 4 presents the sample construction, and data descriptives; section 5 describes the propensity-score matching procedure and the difference-in-differences design with regard to the hypotheses, and section 6 presents the main results. Finally, section 7 presents the conclusions, the recommendations for future research, and the limitations.

2. Theoretical Framework and Literature Review

2.1 Theoretical Framework

This thesis examines three literature streams: executive compensation structures, clawbacks, and non-GAAP reporting. These literature streams are not stand-alone, but are strongly related, which follows from the theoretical framework in figure 1. This paragraph discusses the theoretical framework and underlying theory. The remainder of this section discusses the links within this theoretical framework and provides empirical evidence for these links.

The underlying theory is agency theory, first proposed by Jensen and Meckling (1976). According to agency theory, the executive (agent) and the shareholders (principal) are utility maximizers, and the compensation contracts of executives attempt to align the executive's self-interest with the interest of the shareholder. Following Jensen and Meckling (1976), an important assumption in this thesis is that executive are rational, risk averse, utility-maximizing agents by increasing their total compensation.[5] Therefore, I assume a positive relation between utility and the compensation of executives.

Nevertheless, problems may occur when the executive has an information advantage over the shareholders about the firm due to the separation of ownership and control, leading to information asymmetry. On the one hand, an incentive-based contract gives rise to increased effort of the executive, which aligns executives' actions with the interest of the shareholders. Alternatively, more information asymmetry between the executive and stakeholder enables the executive to exert significant discretion to manage earnings (Beatty and Harris, 1999, Cheng & Warfield, 2005). One expects that inflating earnings by the executives increase their incentive-based compensation and utility at the expense of stakeholders. Concluding, the higher the incentive-based compensation, the more likely executives attempt to inflate earnings, decreasing the financial reporting quality (link 2.2.2).

Clawbacks may alleviate this agency problem. Clawbacks increase the costs of manipulating earnings by the threat of recouping compensation of executives, thereby reducing executives' incentives to manipulate earnings to boost their compensation (link 2.2.3). Conceptually, clawbacks have a positive impact on financial reporting quality. As discussed, clawbacks impose a cost to executives (e.g. increased risk of recoupment of

[5] For analysis purposes, Jensen and Meckling (1976) follow a set of assumptions, including "No outside owner gains utility from ownership in a firm in any way other than through its effect on his wealth or cash flows" (permanent assumption 5, p. 314). Subsequent research also include executive compensation as determinant of his utility function (e.g. Murphy, 1999, Erkens et al., 2018).

compensation, and a decreased GAAP reporting discretion), which decreases their utility. Therefore, the executive needs to be compensated for the increased cost to remain at the same level of effort, otherwise the clawbacks will lead to lower effort, lower firm performance, and ultimately lower shareholder value. However, empirical research finds mixed evidence (see paragraph 2.3.1).

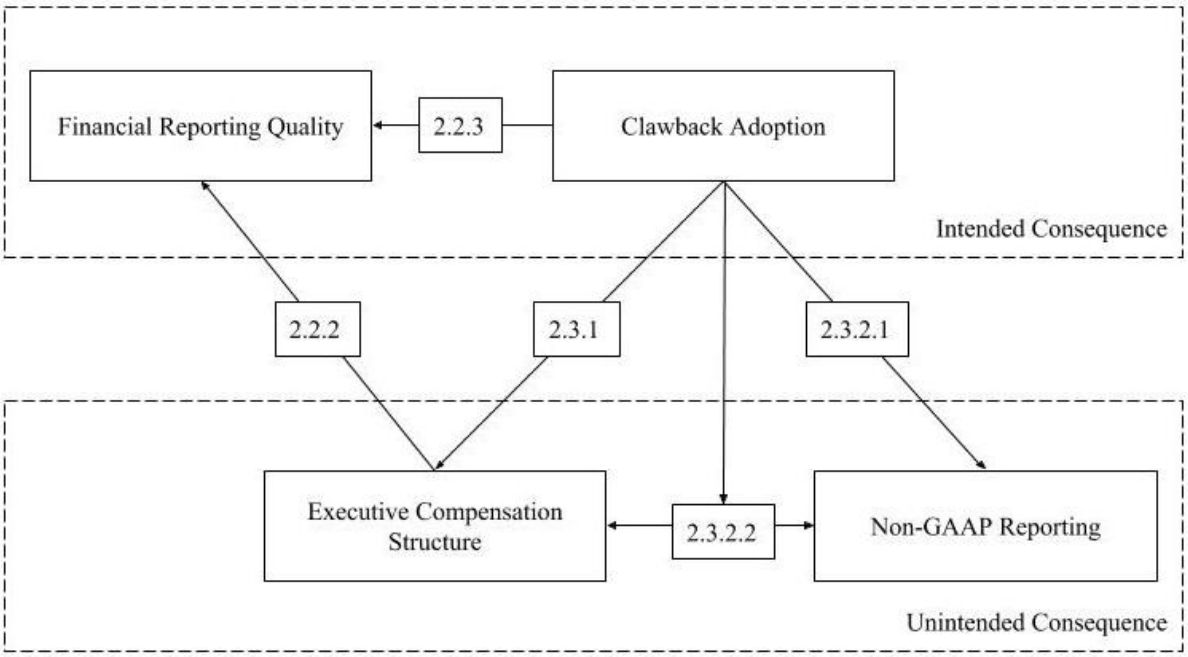

Figure 1. Theoretical framework of the relations between executive compensation structure, clawback adoption and non-GAAP earnings disclosures. The framework refers to the paragraph in which the link between two concepts is explained, accompanied with empirical evidence. The relations are divided in an intended consequence and unintended consequence of clawback adoption, where clawback adoption on financial reporting quality is the intended consequence. This thesis focuses on the unintended consequences of clawback adoption on the relation between executive compensation structure and non-GAAP reporting, discussed in paragraph 3.3.

Executives seek ways to maximize their utility by using discretion in the measurement of financial information on which their compensation is based. Another unintended consequence of the adoption of clawbacks is that utility-maximizing executives tend to shift their incentive-based compensation to *trigger-insensitive compensation.* The relative unregulated and unaudited nature of non-GAAP earnings may incentivize executives to use discretion in this type of reporting to achieve personal goals. Thus, I expect that executives use non-GAAP earnings more opportunistically when clawbacks are in place (see paragraph 2.3.2.1). Since I assume compensation to be the most prominent driver of utility, I expect executives to use non-GAAP earnings more opportunistically to increase executives' compensation (see paragraph 2.3.2.2).

2.2 Cause and Consequence of Clawback Provisions

This section describes the background and institutional setting of clawback adoption (paragraph 2.2.1). Thereafter, the cause (paragraph 2.2.2) and the intended consequence of clawback provisions on financial reporting quality is discussed (paragraph 2.2.3). Although I do not empirically investigate the relation on financial reporting quality, it is relevant for understanding *why* clawbacks exist. Therefore, this literature review includes evidence from prior research how executive compensation structure and clawback adoption affect financial reporting quality.

2.2.1 Clawback Adoption

The Sarbanes-Oxley Act of 2002 Section 304 Forfeiture of Certain Bonuses and Profits ("SOX 304") first proposed the use of clawbacks after allegations that executive compensation increased financial misreporting. These allegations were the start of extensive research to the effect of executive compensation structure on financial reporting quality (see paragraph 2.2.2). This regulation permitted the Securities and Exchange Commission (SEC) to recoup compensation of executives. However, the regulation lacked enforcement, because the SEC should prove that the executive is guilty to misconduct (Fried & Shilon, 2011). After the financial crises, an increasing amount of companies voluntarily adopted firm-initiated clawback provisions in their compensation policy, which the firm enforced via the board of directors, compensation committee or other committees.

The enforcement problems of the SEC led to a compensation clawback rule imposed by the Dodd-Frank Act Wall Street Reform and Consumer Protection Act of 2010 section 954 on "Erroneous Awarded Compensation ("DFA 954"). DFA 954 requires firms to recoup erroneously awarded compensation following a financial restatement due to a material noncompliance with accounting standards. A restatement of the financial statements includes situations where material errors, fraud, and illegal acts occur (Mintz & Roselyn, 2016). Therefore, this regulation will increase the liability of executives with regard to financial reporting, since both intentional and unintentional errors in the financial reporting have consequences for the compensation of executives.

On July 1, 2015, the SEC proposed new rules and amendments to the DFA 954. Specifically, the requirements of Section 10D apply to all listed companies. The requirements consist of:

(1) the disclosure of the amount of incentive-based compensation to current or former executives;

(2) recovery of incentive-based compensation (including stock options) that is in excess of what would have been received under the restated numbers during a three-year period preceding the date the issuer is required to prepare the accounting restatement, and;

(3) the disclosure of these recovery policies in accordance with the rules of the SEC.

Non-compliance with these requirements result in the prohibition of listing, or delisting. However, mandatory clawback provisions are still pending to become mandatory for all listed companies.[6] Since firms have voluntarily adopted clawback provisions, there is no obstruction in conducting empirical research to clawback provisions.

2.2.2 Executive Compensation Structure on Financial Reporting Quality

A large body of research has found evidence for a negative relation between executive compensation structures and financial reporting quality, consistent with agency theory. In this context, both executive compensation structure and financial reporting quality are broadly defined and measured. Murphy (1999) divides executive compensation structure in four components: (1) base pay (non-incentive compensation), (2) annual bonus pay tied to accounting performance, (3) equity incentives (e.g. options, restricted stock grants, stock ownership), and (4) long-term incentive plans (restricted stock plans and multi-year accounting-based performance plans (MAPs)). These components are generally the starting point in subsequent research, and are used to compute sensitivities (Burns & Kedia, 2006; Bergstresser & Philippon, 2006, Core & Guay, 2002), and to examine in-the-money stock options (Efendi et al., 2007). Figure 2 provides a general overview of the terminology used for executive compensation structure. Moreover, prior research measures financial reporting quality as the probability of a restatement or misstatement, earnings management (e.g. discretionary accruals), meet-or-beat benchmarks, (unexplained) audit fees (Erkens et al., 2018), or subsequent class-action lawsuits (Babenko et al., 2017).

Cheng and Warfield (2005) examine the relation between equity incentives and earnings management and find that high equity incentivized executives report a higher incidence of meeting or beating analysts' forecasts and more earnings smoothing than low

[6] The proposed rules "Listing Standard for Recovery of Erroneously Awarded Compensation" of the SEC can be found via https://www.sec.gov/rules/proposed/2015/33-9861.pdf.

equity incentivized executives, indicating the opportunistic use of accounting numbers (i.e. decreased financial reporting quality) to increase compensation. Consistent with agency theory and the existing information asymmetry between executives and shareholders, equity incentives are not only useful to align their goals, but may also induce opportunistic earnings management. Furthermore, these results are consistent when estimating earnings management with discretionary accruals (Bergstresser & Philippon, 2006), the propensity to misreport (Burns & Kedia, 2006), and the propensity of restatements (Efendi et al., 2007). Moreover, prior research suggests that executives also manipulate financial reporting to increase bonuses (e.g. Healy, 1985; Gaver, Gaver & Austin, 1995; Cornett, Marcus & Theranian, 2008). Lastly, Li and Wang (2016) find an increasing percentage of firms considering multi-year accounting-based performance over time, suggesting an increased dependence on accounting information in compensation contracts (e.g. Bennett, Bettis, Gopalan & Milbourn, 2017; Erkens et al., 2018).

Two prevalent studies (Cornett et al., 2008; Laux & Laux, 2009) provide significant evidence of monitoring effects of management discretion on the relation between financial reporting quality and compensation. Cornett et al. (2008) suggest that corporate governance, including effective monitoring, decreases discretionary accruals from the modified Jones model, but do not impair firm performance. These results imply that incentive-based compensation merely encourage earnings management, rather than increase firm performance (and executives' effort). In contrary to prior literature, Laux and Laux (2009) suggest that an increase in incentive-based compensation does not decrease financial reporting quality, as the level of monitoring is increased simultaneously, preventing manipulation of financial information. Although not specifically addressed by these studies, clawbacks fulfil a similar role as other corporate governance mechanisms, increasing financial reporting quality (Dehaan et al, 2013).

2.2.3 Clawback Adoption on Financial Reporting Quality

Prior literature mostly confirms the positive relation between clawback adoption and financial reporting quality, suggesting that the *ex post* cost of clawback reduce the *ex ante* adverse incentives of executives to manipulate earnings, addressing agency problems and aligning objectives with the shareholders (Chan et al., 2012; Dehaan et al., 2012; Iskandar-Datta & Jia, 2013; Chen et al., 2014). More importantly, these findings are in line with the intent of clawback provisions; discouraging intentional misstatements by executives.

Moreover, Beck (2015) and Erkens et al. (2018) examine the strength of the clawback provision, rather than clawback adoption. Using an OLS-regression, Beck (2015) finds a negative relation between clawback stringency and earnings management, implying a higher reporting quality. Using a propensity-score matching procedure and using a clawback strength index, Erkens et al. (2018) find that only strong clawbacks increase financial reporting quality. These findings imply that firms adopt weak clawbacks for reasons other than increasing the financial reporting quality, including giving investors a false sense of financial reporting quality.

To my knowledge, Babenko et al. (2017) is the only paper that find no robust evidence for an increased financial reporting quality. However, these results are explained by using a different sample size (2,115 firm-years), and sample period (2000 - 2011). Furthermore, usage of a multivariate OLS-regression to estimate the results makes endogeneity problems (e.g. omitted variable bias and self-selection bias) more likely, compared to a propensity-score match in combination with a difference-in-difference approach, as used in other research.

2.3 Unintended Consequence of Clawback Provisions

This section describes the unintended consequences of clawback provisions. The unintended consequences consist of a direct effect on executive compensation structure (paragraph 2.3.1), and an examination of the informativeness of non-GAAP reporting in general (paragraph 2.3.2) and in a clawback setting (paragraph 2.3.2.1). This section concludes with evidence regarding the relation between executive compensation structure and non-GAAP reporting (paragraph 2.3.2.2).

2.3.1 Clawback Adoption on Executive Compensation Structure

Agency theory predicts a positive effect of clawback adoption on executive compensation, since the executive demands compensation for the increased costs. An important aspect of clawbacks triggered by restatements is the characteristic of the clawback to recoup compensation after both intentional and unintentional errors (e.g. complex accounting or new accounting standards). Even though executives are willing to increase the financial reporting quality, recoupment may still arise after unintentional errors. To maintain the same level of utility and effort, the executive demands a compensation for the increased exposure to unintentional errors. However, prior research finds mixed evidence regarding this relation.

Consistent with increased risk premium and compensation, Babenko et al. (2017) find a positive association between clawback adoption and (1) total compensation (also in Chen et al., (2014) and Dehaan et al., 2013), (2) the proportion of equity incentives, and (3) long-term compensation. Therefore, clawback provisions lead to compensation of the increased risk, and the firm is more able to increase accounting-based compensation while mitigating earnings manipulation. Moreover, Chen et al. (2014) find a higher pay-performance sensitivity after clawback adoption and a negative relation with non-incentive compensation (e.g. base salary). Finally, Dehaan et al. (2013) concludes that an *increase* in non-incentive compensation drives total compensation after clawback adoption.

In contrary to these findings, Erkens et al. (2018) find a negative effect of clawback adoption on executive compensation structure, testing total compensation, incentive compensation, and no effect on non-incentive compensation. Although these findings contradict the findings in the previous paragraph, it does not necessarily contradict the underlying theory. The adoption of clawbacks is not a standalone governance mechanism, but is part of a broader governance reform package. By simultaneously adopting other corporate governance mechanisms and clawbacks, this package reduces both the intentional errors due to the clawback, and unintentional error due to the other mechanisms, therefore reducing the risk premium and executive's compensation (Dicks, 2012). Finally, Erkens et al. (2018) find a reduction in compensation when a restatement occurs and strong clawbacks are in place, indicating that clawbacks truly have an effect on the total compensation.

Lastly, Iskandar-Datta and Jia (2013) find no evidence for a change of the executive compensation structure, because re-negotiation simply does not occur in the post-period to compensate for the change in risk. They argue that firms with a restatement history adopt clawbacks to improve their damaged reporting reputation, whereas well-established firms use clawbacks to maintain their good reputation without consequences for the executive compensation structure. Concluding, although prior research finds dispersed evidence of the relation between clawbacks and executive compensation structure, their interpretation is consistent with agency theory. Changes in the compensation contract generally depend on adjustments due to a change in risk premium and costs for the executive, or are not re-negotiated at all.

2.3.2 Non-GAAP Reporting

Non-GAAP reporting and earnings are financial information that deviates from generally accepted accounting principles, initially providing a more reliable picture of the underlying

profitability of the disclosing company. Non-GAAP reporting is relatively unregulated and unaudited accounting information. More specifically, auditors are not required to audit the non-GAAP numbers, and the first regulation regarding non-GAAP reporting has become effective on March 28, 2003: Regulation G ("Reg. G"). Reg. G requires reconciliation with the most directly comparable GAAP financial measures, making non-GAAP reporting more reliable (Elliott, 2006). Moreover, Reg. G requires an equal or greater prominence in the presentation of the most directly comparable GAAP measure compared to the non-GAAP measure, and a disclosure of the reasons why management believes the non-GAAP measure is more informative to stakeholders. However, the executive still has considerable freedom in using non-GAAP reporting. Management has discretion to choose any line item, including special items, to exclude or include in its non-GAAP reporting disclosures (Doyle, Lundholm & Soliman, 2003). Non-GAAP reporting typically excludes transitory items, including one-time losses and non-cash transactions (Black et al., 2018).

Prior literature heavily debates the quality non-GAAP reporting in terms of usefulness to stakeholders. Research finds non-GAAP reporting *on average* more informative and value relevant than GAAP earnings by informing stakeholders better about the "core earnings" (e.g. Bradshaw & Sloan, 2002; Bhattacharya, Black, Christensen & Larson, 2003). Moreover, Kolev, Marquardt & McVay (2008) find increased non-GAAP reporting quality after Reg. G, since executives exclude transitory items more often. Complementary to this finding, Curtis et al., (2014) investigate the exclusion of transitory *gains* by executives and find non-GAAP reporting to be more useful, because excluding transitory gains informs the users of the financial statements about the sustainability of the earnings. Nevertheless, an economically significant proportion also use non-GAAP earnings opportunistically in an attempt to manipulate stakeholders' perception of the core operations.

Contrary to an informative use of non-GAAP reporting, research also finds that in particular settings, the quality of non-GAAP reporting is lower, implying an opportunistic and self-serving use of non-GAAP disclosures by executives. Doyle et al. (2003) find early evidence of exclusion of important and recurring items, as exclusions have predictive value for future cash flows, indicating a lower non-GAAP quality. However, using predictive value of future cash flows is found to be controversial. Kolev et al. (2008) regress future operating *earnings* instead of cash flows on exclusions. An increasing amount of firms over time excludes recurring items, including depreciation, amortization, R&D expenses, and stock-based compensation items. Whipple (2015) justifies these exclusions by arguing that these are

"non-cash" in nature, and strongly discounted by analysts. Therefore, excluding these recurring items would increase the informativeness of non-GAAP Reporting.

The opportunistic use of non-GAAP earnings is found to be, among others, more likely in the presence of (1) lower board independence and few institutional investors, (2) unfavorable GAAP earnings, (3) meeting strategic earnings targets, (4) as substitute for accruals management, and (5) meeting or beating analyst forecasts incentives (respectively Frankel, McVay & Soliman, 2011; Jennings & Marques, 2011; Lougee & Marquardt, 2004; Brown, Christensen, Menini and Steffen, 2017; Black & Christensen, 2009; Black, Christensen, Joo & Schmardebeck, 2017; Doyle, Jennings & Soliman, 2013). Although Dichev, Graham, Harvey & Rajgopal, 2013 do not specifically investigate non-GAAP reporting, they find that increasing stock prices is a reason to misreport earnings. This may also be a reason to misreport non-GAAP earnings if executives perceive non-GAAP earnings as influential on stock prices. Concluding, non-GAAP reporting is not always used opportunistically, but depends on the circumstances under which they are disclosed.

2.3.2.1 Clawback Adoption on Non-GAAP Reporting

Theoretically, the costs of clawbacks for executives is a reduction in reporting discretion and a decrease in utility. These costs may induce opportunistic disclosure through non-GAAP reporting, because non-GAAP reporting is typically unaffected by clawback provisions, and therefore a tool to mislead stakeholders after clawback adoption.

Kyung et al. (2013) is the only (working) paper examining the informativeness of non-GAAP reporting after clawback adoption by examining the joint effect of non-GAAP frequency and non-GAAP quality. Their results suggest that clawbacks increase the frequency of non-GAAP reporting and decrease the non-GAAP reporting quality. These findings are consistent with the notion that executives explore ways to maximize their utility by opportunistically reporting non-GAAP earnings. More specifically, executives have incentives to misreport non-GAAP earnings. These incentives arise from previously discussed opportunistic reasons: unfavorable GAAP earnings, meeting or beating analyst forecasts and the existence of monitoring deficiencies. This thesis examines another incentive not yet explored by prior research in the presence of clawback adoption: executive compensation structure.

2.3.2.2 Non-GAAP Reporting and Executive Compensation Structure

Consistent with agency theory, compensation incentivizes executives to engage in opportunistic reporting. Since clawbacks restrict executives in doing so, clawback adoption may incentivize executives to base compensation on trigger-insensitive financial information measures. Therefore, agency theory predicts that executives shift incentive-based compensation to trigger-insensitive financial information measures, including non-GAAP, to maximize the executive's utility after clawback adoption.

Prior research investigates the relation between executive compensation structure, as independent variable, and non-GAAP reporting. First, Black, Black, Christensen and Waegelein (2011) find a negative relation between the tenure of an executive compensation contract and the opportunism in non-GAAP reporting: the larger the focus on long-term performance plans, the less likely that non-GAAP reporting is used opportunistically. Second, Black, Black, Christensen and Gee (2017) find compensation contracts that explicitly states remuneration based on non-GAAP earnings leads to less opportunistic non-GAAP reporting, consistent with boards simultaneously limiting the executives' ability to increase their own compensation.

Moreover, prior research finds a mediating relation between executive compensation structure and non-GAAP reporting. Isidro and Marques (2013) find a positive relation between performance-based compensation of board directors and non-GAAP reporting frequency. This finding suggests that firms are aware of the strategic use of non-GAAP disclosures to increase the market value of the firm, which in turn increases equity-based compensation. This reasoning is also consistent with Cheng and Warfield (2005). Finally, Matsunaga and Park (2001) find a significant positive relation between CEO annual bonus and meeting or beating benchmarks, suggesting that non-GAAP reporting may be used opportunistically to increase the bonus compensation by meeting benchmarks (Doyle et al., 2013). Concluding, stock price reactions and meeting or beating benchmarks are mediating effects for the relation between compensation and opportunistic use of non-GAAP reporting.

In contrary to prior research, this thesis differs in investigating the relation between non-GAAP earnings and executive compensation structure in that: (1) non-GAAP earnings is the lagged independent variable to explain compensation structure, (2) the reported non-GAAP exclusions are examined instead of non-GAAP frequency, and (3) a setting conditional on clawback provisions is investigated.

3. Hypothesis development

The theoretical framework (paragraph 2.1 and specifically figure 1) and the literature review show three literature streams on which prior research lacks consistent evidence on certain relations. First, prior research finds ambiguities around the effect of clawback adoption on executive compensation, as discussed in paragraph 2.3.1 & 3.1. Second, little research has been conducted to the opportunistic use of non-GAAP reporting in a clawback setting, as discussed in paragraph 2.3.2.1 and 3.2. Specifically, Kyung et al. (2013) is the only working paper to examine this relation. Last, no prior research has examined the relation between non-GAAP and compensation structure in a clawback setting, as discussed in paragraph 2.3.2.2 and 3.3. Finally, this section ends with the summarizing figure 1A in the Appendix.

3.1 Clawback Adoption on Executive Compensation Structure

The first hypothesis relates to the effect of clawback adoption on executive compensation. Theoretically, executives demand compensation for the increased costs by clawbacks to maintain the same level of effort. Prior research finds two reasons for the perceived increase in costs. First, both intentional and unintentional errors may increase the recoupment risk premium of executives. Besides recoupment of compensation after intentional manipulation of financial information, the executive is also 'punished' through a restatement after unintentional errors, since the restatement may also be a consequence of uncontrollable circumstances (Dehaan et al., 2013). Therefore, a clawback provision also increase effort to avoid unintended errors, which increases the perceived costs of executives, and subsequently decreases their utility. According to agency theory, the consequence of decreased utility is a lower effort, lower firm performance, and ultimately lower shareholder value. Second, clawback adoption decreases the reporting discretion, decreasing the possibility to manage earnings, and lowers total compensation and utility.

For formulating purposes, I distinguish two dynamics for the executive compensation structure: executive compensation level and executive compensation ratio, presented in figure 2. Executive compensation level is the absolute level of the consecutive components of compensation, including total compensation, non-incentive compensation, equity incentives, bonus compensation and long-term incentive plans (Murphy, 1999). The executive compensation level is the starting point to compute executive compensation ratios; the proportion of incentive-based compensation (the sum of equity incentives and bonus compensation, divided by total compensation).

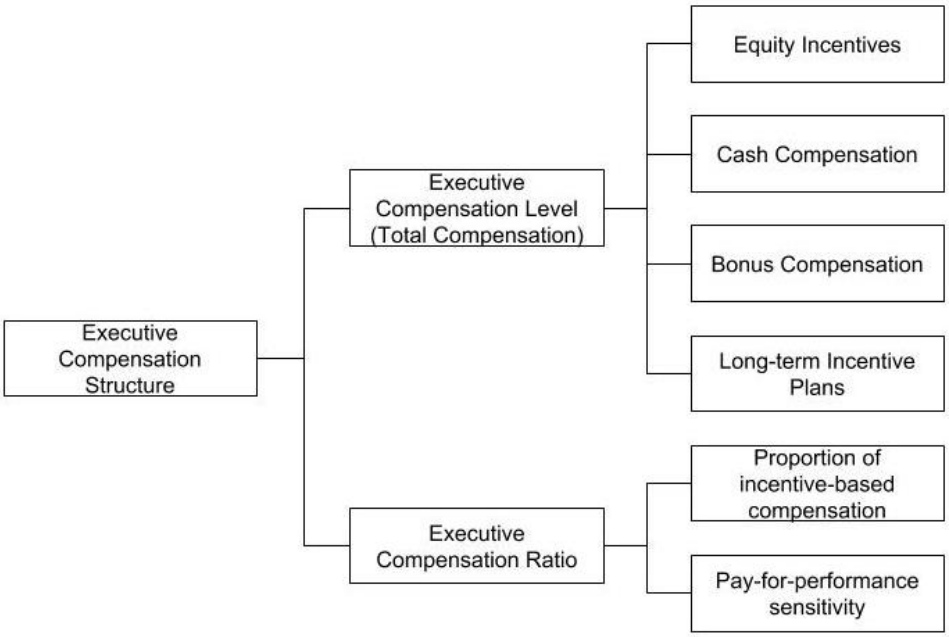

Figure 2. Visual representation of the composition of the executive compensation structure. The executive compensation level and ratio respectively relates to absolute values and relative values of compensation. The total compensation is generally decomposed in 4 components: equity incentives (e.g. options, restricted stock, phantom stock, common stock equivalents, rights and other instruments with option-like features), non-incentive compensation (e.g. base salary), bonus compensation (and other non-equity incentives) and long-term incentive plans. This thesis does not investigate long-term incentive plans due to the lack of suitable data. The pay-for-performance sensitivity is the change in compensation after a one-percent increase in stock price, first used by Core and Guay (2002). I report the pay-for-performance sensitivity only for completeness in this overview.

Specifically, the findings regarding total compensation are mixed. Consistent with the view that executives require a compensation for the increased exposure to (un)intentional errors, research finds a positive effect of clawback adoption on executive compensation structure (Chen et al., 2014; Dehaan et al., 2013; Babenko et al., 2017). Moreover, Erkens et al. (2018) even find a decrease in total compensation after clawback adoption. Although the findings differ, they can be in line with agency theory. Denis (2012) argues that firms simultaneously adopt clawbacks with other corporate governance mechanisms without requiring executives to exert additional effort, which decreases the risk of executives. This explanation is plausible when considering the implementation of the Dodd-Frank Act in 2010, because this Act requires firms to improve their corporate governance. Iskandar-Datta and Jia (2012) find no evidence for an increase in total compensation, arguing that firms do not re-negotiate executive compensation contracts, since they view clawbacks as a signal to stakeholders to repair or maintain the reporting reputation of the firm.

Examining specific components of compensation also give mixed results. With regard to non-incentive compensation, both Erkens et al. (2018) and Iskandar-Datta and Jia (2012)

find no effect after clawback adoption, whereas Dehaan et al. (2013) find a positive effect. Moreover, Chen et al. (2014) find a negative effect on non-incentive compensation, indicating a substitution-effect from non-incentive compensation to incentive-based compensation after clawback adoption. Of course, these results imply a different explanation, although this research does not explicitly explain the change in non-incentive compensation. Theoretically, non-incentive compensation do not increase effort, because of the absence of increased benefits for the executive after increasing effort. Therefore, non-incentive compensation would not be a solution for maintaining the same level of effort. However, the possibility that equity incentives encourage financial misreporting, give firms a reason to substitute incentive-based compensation for compensation not tied to financial information. Executives may want to substitute their compensation-at-risk after clawback adoption to recoupment-insensitive compensation (Babenko et al., 2017).

Regarding equity incentives, both Babenko et al. (2017) and Chen et al. (2014) find a positive effect after clawback adoption. These results indicate that it becomes more advantageous for firms to increase equity incentives after improving the financial reporting quality. This is, because executives are less likely to misreport financial information to increase their compensation. Again, these results are not consistent throughout the literature. Dehaan et al. (2013) find no evidence for this relation.

Empirical evidence with regard to executive compensation ratios is more consistent. Babenko et al. (2017) finds that the proportion of *equity*-based compensation increases after clawback adoption. Moreover, Chen et al. (2014) uses a regression-based approach of Jensen and Murphy (1990) to measure the pay-for-performance sensitivity, and find a positive effect. Finally, Dehaan et al. (2013) uses the approach of Core and Guay (2002) to compute the pay-for-performance sensitivity. Although the results are consistent, a limitation may be that all these studies also show an increase in executive compensation level, and that not all studies investigate the executive compensation ratio.

Concluding, both theoretical and empirical arguments do not exclude alternative interpretations. The effect of clawback adoption on executive compensation level and ratio remains an empirical question. Therefore, the second hypothesis follows (in alternative form, non-directional):

H1a: The executive compensation level differs after clawback adoption.

H1b: The executive compensation ratio differs after clawback adoption.

3.2 Clawback Adoption on Non-GAAP Reporting

To the extent that clawbacks affect executive compensation structure, clawbacks may initiate executives to use discretion in disclosures, which are less sensitive to financial reporting restatements. Executives may aim to use this discretion to achieve personal goals, including meeting or beating benchmarks, or increasing their compensation. The second hypothesis relates to the effect of clawback adoption on non-GAAP reporting. From a theoretical perspective, one may expect to use non-GAAP reporting more opportunistically or self-serving after clawback adoption. An explanation might be that executives seek ways to maximize their utility by using discretion in financial reporting. The consequence of clawback adoption is a decrease in discretion, except for trigger-insensitive disclosures, including non-GAAP disclosures.[7]

Consistent with this view, Kyung, et al. (2013) find a more opportunistic use of non-GAAP reporting after clawback adoption. Specifically, Kyung et al. (2013) provide evidence of an increase in non-GAAP reporting frequency after clawback adoption and a decrease in non-GAAP reporting quality after clawback adoption. Thus, executives increasingly use non-GAAP reporting, and deteriorate its quality after clawback adoption. These findings are consistent with the theoretical prediction that executives have incentives to misreport non-GAAP reporting and seek ways to maximize their utility. Consistent with other research, these findings suggest that executives use non-GAAP reporting opportunistically in particular settings, including a setting of clawback adoption. Therefore, I formulate the following two hypotheses, which contribute to an opportunistic view of non-GAAP reporting (in alternative form):

H2: The frequency of non-GAAP reporting increases after the adoption of clawbacks.

H3: The quality of non-GAAP reporting decreases after the adoption of clawbacks.

3.3 Non-GAAP Reporting on Executive Compensation Structure

Incentives arising from previously discussed opportunistic use of non-GAAP reporting are, among others: unfavorable GAAP earnings, meeting or beating analyst forecasts and the existence of monitoring deficiencies. This thesis examines another incentive, not yet explored by prior research in the presence of clawback adoption: executive compensation structure.

[7] Note that auditors are primarily responsible for the choice to restate the financial statements. However, Reg. G only requires auditors to check whether non-GAAP earnings are reconciled with GAAP earnings, but not to the extent that non-GAAP reporting truly better report the "core earnings" by excluding non-cash or transitory items.

Consistent with the agency theory and found by prior literature, compensation incentivizes executives to engage in opportunistic reporting (e.g. Cheng & Warfield, 2005; Efendi et al., 2007; Dichev et al., 2013). An argument not taken into account in prior research is that clawbacks incentivize to base compensation on trigger-insensitive financial information measures, including non-GAAP earnings. I assume compensation to be the most prominent driver of utility, thus I expect that executives use non-GAAP earnings more opportunistically to increase executives' compensation.

Although this assumption is in line with the theory, it is not necessarily true that non-GAAP reporting is opportunistically *per se*. By following a similar approach as Kyung et al., (2013). Black et al. (2017) find less opportunistic non-GAAP reporting, when non-GAAP reporting is *explicitly* stated in compensation contracts, because the board of directors increase their scrutiny on non-GAAP reporting. Thus, explicitly including non-GAAP reporting in the compensation contract limits (1) the ability of the executives to increase their own compensation, and (2) the use of opportunistic non-GAAP reporting. However, non-GAAP earnings are usually not directly tied to compensation contracts.

Since I investigate the unintended cost of clawback adoption, the relation with compensation ratios is irrelevant. Most important, this thesis examines whether executive compensation levels is an explanation for the opportunistic use of non-GAAP earnings. However, it is ambiguous which component causes this relation. More specifically, non-incentive compensation would typically not change, and bonus compensation may be directly linked to non-GAAP earnings. Moreover, stock price reactions on non-GAAP earnings may act as mediating effect for the relation between non-GAAP earnings and equity-based compensation. Since I examine whether executives use non-GAAP earnings more opportunistically to increase their compensation level after clawback adoption, I formulate the following hypothesis (in alternative form):

H4: Non-GAAP earnings increases the executive compensation level after clawback adoption.

4. Sample and Data Descriptives

4.1 Sample Construction

I obtain the data from various sources. I collect data on compensation data from ExecuComp, firm-specific financial information from Compustat, auditor and restatement information from Audit Analytics, and governance characteristics from Institutional Shareholder Services (ISS). I obtain these databases from Wharton Research Data Services (WRDS), which is a renowned data provider. Data on clawback adoption and non-GAAP data is provided by my supervisor dr. Erkens. Dr. Erkens is assistant professor at the Erasmus School of Economics and is specialized in, among others, corporate governance and executive compensation. Moreover, he recently conducted a research on clawback adoption. Finally, I checked some observations on both the clawback and non-GAAP data, and concluded that the data accurately represents the reality. Therefore, the data used in this thesis is a reliable source.

Before merging, the sample is limited to a random sample of RUSSELL 3000 firms in the clawback database. I identify 666 unique firms and over 4800 firm-years over a period of 2007 – 2016, which is the most recent fiscal reporting year. In this reporting period, 413 unique firms are a clawback adopter (the treatment firm), and 253 firms are a non-adopter (the control firm). Due to the relatively small sample, I assume that no clawback provision is in place if a firm has not adopted a clawback in the subsequent fiscal year. Moreover, Erkens et al. (2018) and Beck (2015) examined the strength of the clawback adoption, and concluded that the strength of a clawback provision is an important determinant in the effectiveness of the clawback. Although I do not empirically investigate the strength of a clawback, I assume that if a firm has adopted a clawback for only one year, the firm is no 'hard' adopter and has no real incentive to use the clawback. Therefore, I drop the clawback firm-year from the sample and classify the firm as a non-adopter (i.e. control firm).

Table 1 outlines the sample selection procedure to conduct the analysis of the effect of clawback adoption on the outcome variable. The table shows the criteria necessary for a suitable and useful sample. First, I drop 109 unique clawback adopters (i.e. treatment firms) if the pre-adoption year is missing, because the pre-adoption year is used to match treatment firms with control firms during the propensity-score matching procedure. Therefore, these clawback adopters are unsuitable for the analysis. Second, firm-years with no clawback provision after clawback adoption are dropped, and I require firms to have at least one year before and after clawback adoption to ensure the validity of the DiD-design. Untabulated

results show that requiring at least two firm-years before and after clawback adoption does not significantly affect the results. However, for the presentation of the results, I do not require at least two years, because doing so would significantly reduce the number of observations. Third, I drop financial firms from the sample, because of the mandatory adoption of a clawback provision following the Troubled Asset Relief Program (TARP) as part of the Emergency Economic Stabilization Act (EESA) in 2008. Moreover, the financial crises causes prudency and other stringent regulation on financial institutions, including the executive compensation structure. Thus, including financial institutions is likely to bias the results. Finally, all continuous variables are winsorized at the top and bottom 2 percent of the distribution to account for outliers.

Table 1. Sample selection procedures. The final refinement of the clawback sample is the sample that will be used for propensity-score matching. I drop observations with missing values from the sample during the merge of the databases and after deleting unsuitable observations for propensity-score matching. Unsuitable treatment firm-years (1) lack the identification of the pre- and post-adoption years, (2) have missing values, or (3) are financial firms. Finally, I require a firm to have at least one year before and after clawback adoption. The final dataset available for propensity-score matching consists of 839 firm-years.

Sample Selection Procedure	**Unique firms**		**Unique firm-years**	
	Total firms	# Clawback adopters	# Clawback provisions	# Reporting Non-GAAP
Merging clawback database	**666**	**413**	**1937**	**-**
Less: Merging clawback database with Compustat	-101	-92	-225	-
Less: Merging clawback database with non-GAAP dataset	-61	-29	-727	+1875
Database before generating other variables	**504**	**292**	**985**	**1875**
Less: Merging with Audit Analytics	-12	-4	-3	-247
Less: Merging with ExecuComp	-162	-49	-26	-369
Less: Merging with ISS	-46	-36	-238	-378
Database after merging	**284**	**203**	**718**	**881**
Less: Drop treatment firms without pre-adoption year	-109	-109	-397	-300
Less: Drop firm years with no clawback provision after clawback adoption	0	0	0	-18
Less: Clawback adopters with less than one firm-year before or after clawback adoption	-6	-6	-15	-5
Less: Deleting financial services	-26	-19	-72	-62
Less: Dropping missing values	0	0	-1	-7
Final sample: Dataset available for propensity-score matching	**149**	**75**	**248**	**489**

4.2 Descriptive Statistics

Table 2 presents the frequency distribution of clawback adoption by fiscal year-ending for the final sample. The number of firms adopting a clawback increases from 1.4% in 2007 up to 58.3% in 2015. Compared to the initial clawback database, approximately the same clawback adoption rate applies. Although the final sample underrepresents the number of clawback provisions in 2007 to 2009, 2010 and onward is relatively the same. The underrepresentation is explained by the exclusion of treatment firms due to missing pre-adoption years (see the sample selection procedure in table 1). The increase in clawback adoption can be explained by the expectation of mandatory clawback adoption in future years following the DFA 954, and is consistent with the samples in prior research (e.g. Babenko et al., 2017; Erkens et al., 2018; Kyung et al., 2013).

Table 2. Usage of clawback provisions and non-GAAP reporting over the years for propensity-score matching sample. For comparison reasons, the clawback adoption rate of the full clawback database sample is included in the last column.

Fiscal year-end	*Number of firms with clawbacks*	*Number of firms with non-GAAP reporting*	*Clawback adoption rate*	*Non-GAAP adoption rate*	*Total number of firms*	*Compared adoption rate*
2007	1	27	1.4%	39.1%	69	14,9%
2008	2	49	2.1%	51.0%	96	20,9%
2009	13	52	13.0%	52.0%	100	25,0%
2010	23	52	22.8%	51.5%	101	33,6%
2011	31	54	30.4%	52.9%	102	43,8%
2012	34	60	36.2%	63.8%	94	56,3%
2013	47	63	48.5%	64.9%	97	50,2%
2014	48	69	50.0%	71.9%	96	52,3%
2015	49	63	58.3%	75.0%	84	58,7%
Total	248	489	29.6%	58.3%	839	63,6%

Table 2A provides a correlation matrix among total compensation and the used covariates for the logistic-regression model in equation 1 (EQ1). Table 1A provides the variable definitions. The correlation matrix makes clear that in general there is no very strong linear relation between variables (correlation R stronger than 0.75), so that collinearity in the model is ruled out. Moreover, it becomes clear that governance variables are significantly linearly related, which is in line with the broader reform explanation. Usually, a firm adopts broader set of changes, including changes in the composition of the board of directors (*DIRECTORS*, *INDEPENDENT*, *CGCOMM*, *COMPCOMM*, and *AUDCOMM*). Intuitively, a strong positive

relation (R = 0.745) between firm size (*LNASSETS*) and total executive compensation (*TOTCOMP*) is found. The same applies to the relation between growth opportunities (*TOBIN'S Q*) and the market-to-book ratio (*MTB*). Investors incorporate a higher growth rate into the present (market) value of the firm if the growth opportunities of a firm are significant, which in turn increases the market-to-book ratio.

Table 3A provides descriptive statistics of the final sample available for propensity-score matching. The sample consists of 485 clawback adopters, and 354 non-adopters. The independent sample t-test show that clawback adopters have a significantly stronger corporate governance, in line with the presumption that a clawback provision is part of a broader reform package (Erkens et al., 2018; Denis, 2012). Moreover, clawback adopters report significantly more non-GAAP earnings numbers, consistent with the theoretical prediction that executives have incentives to use non-GAAP reporting opportunistically. On average 64.9% of the clawback adopters report non-GAAP earnings (*NG*), whereas only 49.2% of the non-adopters report non-GAAP earnings. Also consistent with an opportunistic view of non-GAAP earnings is the significantly higher positive exclusions from the GAAP earnings per share (*NG_EXC*) by clawback adopters. In general, the significant differences between clawback adopters and non-adopters indicate the necessity of propensity-score matching to mitigate endogeneity concerns, including self-selection bias and omitted variable bias.

5. Research Design

I conduct a difference-in-differences design to evaluate the effect of a treatment on the outcome variable. The treatment, the adoption of a clawback provisions, differs per firm, and is typically not random due to self-selection. Firm-specific characteristics may differ between firms who did and did not adopt clawbacks, which makes it more difficult to make a reliable comparison of the outcome of clawback adopters with non-adopters. This section presents the propensity-score matching model (paragraph 5.1), its estimate (paragraph 5.1.1), the procedure of selecting control firms (paragraph 5.1.2), and the DiD-design (paragraph 5.2) for the several hypotheses.

5.1 Propensity-Score Matching

To mitigate the problem of the parallel trend assumption used in the DiD-design, I match the clawback adopters with a control group using a propensity-score matching model. The conditional fitted values (e.g. the propensity-score) is the probability of voluntarily adopting a clawback provision, which is conditional on firm-specific characteristics. First, I model pre-treatment covariates that influence clawback adoption. The following ordered logistic-regression model estimates the likelihood of clawback adoption by matching the pre-adoption year with non-adopter firm-years:

$$\begin{aligned}\Pr(CLAWBACK_i) = {} & \alpha_0 + \beta_1 NG_i + \beta_2 DIRECTORS_i + \beta_3 DIRFEM_i + \\ & \beta_4 INDEPENDENT_i + \beta_5 CGCOMM_i + \beta_6 COMPCOMM_i + \\ & \beta_7 AUDCOMM_i + \beta_{8A} DIRAGEE_i + \beta_{8B} DIRAGE_i^2 + \\ & \beta_9 INSIDERPERC_i + \beta_{10} CEOCHAIR_i + \beta_{11} CEOAGE_i + \\ & \beta_{12} INTANGIBLES_i + \beta_{13} TENURE_i + \beta_{14} LNASSETS_i + \\ & \beta_{15} LEVERAGE_i + \beta_{16} GAAPEPS_i + \beta_{17} ROASD_i + \beta_{18} MTB_i + \\ & \beta_{19} CASHRETURBN_i + \beta_{20} TOBIN'S\ Q_i + \beta_{21} LOSS_i + \\ & \beta_{22} PRIORRESTATE_i + \beta_{23} LITIGATION_i + \Sigma\beta_k IND10 + \\ & \Sigma\beta_k YEAR + \varepsilon_{it}\end{aligned} \qquad \text{(EQ1)}$$

Pr(*CLAWBACK*) is an indicator variable equal to one if firm *i* is a clawback adopter, and zero otherwise. Drawing on prior literature, I include governance (β_2 to β_{11}), audit (*PRIORRESTATE* and *LITIGATION*) and firm-specific characteristics (β_{12} to β_{21}) to estimate the likelihood of clawback adoption. In contrary to prior research, I include more variables on

corporate governance characteristics, including the non-GAAP reporting (*NG*) fraction of females in the board of directors (*DIRFRM*), corporate governance committee size (*CGCOMM*) and compensation committee size (*COMPCOMM*). Moreover, I include proxies for size (*LNASSETS*), complexity (*LEVERAGE*, *INTANGIBLES*), influence of the CEO (*CEOAGE*, *CEOCHAIR*, *TENURE*), CEO incentives (*INSIDERPERC*), firm performance (*GAAP_EPS*, *LOSS*, *CASHRETURN*, *TOBIN'S Q*), riskiness (*LITIGATION*, *ROASD*), and financial reporting tendencies (*MTB*, *PRIORRESTATE*). Finally, I include industry-fixed effects (*IND10*) of the ten major group industries, and year-fixed effects (*YEAR*). In contrary to prior research, I include *YEAR* for three reasons. First, in contrary to prior research, I do not run the ordered logistic-regression per year due to the lack of sufficient data per year. Second, including year-fixed effects reduces bias in the coefficients of other covariates. Third, the fiscal year contains usable information that influences clawback adoption, including macroeconomic events. For example, although no implementation of the DFA 954 occurred in 2010, the regulation may have a positive effect on the voluntary adoption of clawback provisions as a way to prepare for the future. Untabulated results for table 3 show that this is indeed the case, where the announcement of DFA 954 in 2009, the implementation of DFA in 2010 and the reaction of firms on the DFA in 2011 is significantly higher than the other years.

An important assumption for the use of propensity-scores to match clawback adopters with non-adopters is conditional independence; all the selection occurs only through the observed characteristics in the order logistic-regression model. The outcome of the logistic-regression, the probability of adopting a clawback, is a summary statistic of the firm-characteristics weighted by their importance, which is indicated by the significance of the covariate. Thus, assuming unconfoundedness leads to the unnecessity of adding more variables, since all selection has been captured in the model.

5.1.1 Propensity-Score Estimate

Table 3 presents the estimation of the ordered logistic-regression. Although prior research estimates the ordered logistic-regression per year, this approach is empirically unavailable due to the relatively small sample (388 observations). Therefore, the propensity-score is based on the estimation of the score in table 3, including year-fixed effects.

Generally, the findings are consistent with prior research. First, I find non-GAAP reporting significantly explains clawback adoption. Since I match on the pre-adoption year, executives start reporting non-GAAP reporting, possibly to use this earnings number more

Table 3. Propensity-score estimation using ordered logistic-regression. The 388 firm-years included in the estimation consist of 308 control firm-years and 70 pre-adoption firm-years for clawback adopters. After dropping unsuitable data, still 5 of the 75 clawback adopters were found to be unsuitable for matching. P is the two-tailed p-value used in testing the null-hypothesis that the coefficient is equal to zero. I use robust standard errors to mitigate heteroscedasticity in the residuals. 35 control firms are dropped, because of collinearity. * Indicates significance level at 10%, ** at 5%, *** at 1%, based on two-tailed t-test.

Dependent variable: Pr(*CLAWBACK*)	*Coefficient*		*Robust Std. Error*	*z-statistic*	*P>|z|*
NG	1.035	***	0.380	2.73	0.006
DIRECTORS	0.548	***	0.171	3.21	0.001
DIRFEM	-0.169		2.185	-0.08	0.938
INDEPENDENT	-0.602	**	0.241	-2.49	0.013
CGCOMM	0.085		0.163	0.52	0.604
COMPCOMM	0.347		0.273	1.27	0.204
AUDCOMM	-0.415		0.304	-1.36	0.173
DIRAGE	3.980	***	1.500	2.65	0.008
DIRAGE2	-0.032	***	0.012	-2.68	0.007
INSIDERPERC	0.115		0.263	0.44	0.662
CEOCHAIR	0.852	**	0.407	2.09	0.037
CEOAGE	0.067	**	0.027	2.43	0.015
INTANGIBLES	0.739		1.043	0.71	0.479
TENURE	-0.554		0.363	-1.53	0.127
LNASSETS	0.628	***	0.239	2.63	0.009
LEVERAGE	0.016		0.016	1.03	0.304
GAAP_EPS	0.203	**	0.101	2.01	0.044
ROASD	0.143		0.230	0.62	0.535
MTB	-0.183		0.139	-1.31	0.189
CASHRETURN	-2.423		2.593	-0.93	0.350
TOBIN'S Q	0.859	***	0.265	3.24	0.001
LOSS	0.309		0.612	0.50	0.614
PRIORRESTATE	-0.084		0.458	-0.18	0.855
LITIGATION	0.329		0.664	0.50	0.620
IND10	Yes				
YEAR	Yes				
N (firm-years)	388				
Pseudo R^2	0.2700				
Prob. > Chi^2	0.000				

opportunistically after clawback adoption. Second, I find a significant positive relation between the total members in the board of directors (*DIRECTORS*). However, the fraction of female does not significantly affect clawback adoption, indicating that female directors do not

significantly push adoption of clawback relative to male directors. Testing on joint significance, the size of the committees (*CGCOMM*, *COMPCOMM*, *AUDCOMM*) does affect clawback adoption (p = 0.507). Another interesting finding is the quadratic effect of the average age of the board of directors on clawback adoption. The significant negative coefficient of *DIRAGE2* indicates that relatively young and relatively old directors has less chance to adopt a clawback provision. Reasons vary for young and old directors, including inexperience of the board, the power of the CEO on a relatively young board, the conservatism in an old board, the (dis)incentives of old board members to monitor the executives, and other characteristics that come along with age (e.g. Anderson, Mansi & Reeb, 2004). Also consistent with prior research, CEO characteristics (*CEOAGE*) and firm-specific characteristics (*LNASSETS*), and firm performance (*GAAP_EPS*, *TOBIN'S Q*) turn out to be positively related to clawback adoption. The model has reasonable explanatory power, with a pseudo-R^2 of 27.00 percent.

I tested other variables used in prior research, including (1) if the auditor has a Big 4 status, (2) an adverse audit opinion is issued, (3) the sales growth rate, (4) the change in accounts receivables, (5) the level of soft assets, (6) institutional ownership, (7) and the total number of financial experts within a firm. However, these variables appeared to be very insignificant (p > 0.900), required a significant reduction in observations (e.g. institutional ownership), or were perfect collinear with non-adopters (e.g. adverse issued audit opinion). Therefore, the ordered logistic-regression model excludes these variables.

5.1.2 Selecting Non-Adopters

Next, I match pairs of pre-adoption firm-years for clawback adopters and control firm-years. Similar to Erkens et al. (2018), the matching procedures is without replacement and require a maximum difference in propensity-score between the clawback adopter and non-adopter of 0.03. The procedure matches pairs by year, and yields 31 matches. Thereafter, the matched control firms are assigned pseudo pre-adoption years, and subsequent 'clawback years' to measure the counterfactual for non-adopters. I ensured that non-adopters are not matched with more than one treatment firm to prevent erroneous assignment in identifying the pseudo pre- and post-adoption period.

Panel A of table 4A presents the covariate balance between the 31 matched clawback adopters and non-adopters. The panel shows the mean and median differences between the two groups. The observed firm characteristics do not significantly differ between the 23 covariates (p-value > 0.100), implying that the covariates are in balance. This outcome

follows the purpose of propensity-score matching; creating identical treatment and control firms to observe the effect of the treatment (e.g. clawback adoption). Moreover, the non-parametric Kolmogorov-Smirnov test shows an insignificant difference in the distribution of all covariates (p-value > 0.147).

Panel B shows the distribution of the propensity-scores of the final sample suitable for matching and the matched pairs, and the difference in matched propensity-scores. The distributions are similar to prior research (e.g. Dehaan et al., 2013; Kyung et al., 2013), although the mean and median are somewhat lower. However, this is not a problem, since the propensity-score is only used for matching. The mean (standard deviation) difference is 0.009 (0.008), indicating a small difference between matched propensity-scores.

Taken together, the balanced, equally distributed covariates yield small differences between propensity-score with propensity-score distributions similar to prior research. Thus, the matching procedure yields matches of high quality, which allows assuming identical treatment and control firms before clawback adoption.

5.2 Difference-in-Differences

After matching, control firms are assigned pseudo-adoption years, before and after clawback adoption, conditional on the matched treatment observation. For example, if a treatment firm adopts a clawback in 2010, the control firm assumes to 'pseudo-adopt' a clawback in 2010, which is the counterfactual. To mitigate endogeneity issues, I adopt the following difference-in-differences (DiD)-design:

$$OUTCOME_{it} = \alpha_0 + \beta_1 CLAWBACK_{it} + \beta_2 AFTER_{it} + \boldsymbol{\beta_3 CLAWBACK_{it}} \times \boldsymbol{AFTER_{it}} + \Sigma\beta_k CONTROLS_{it} + \Sigma\beta_k IND10 + \Sigma\beta_k YEAR + \varepsilon_{it} \quad \text{(EQ2)}$$

OUTCOME is the consequence of the study under investigation, which is the *CEOs* compensation structure,[8] non-GAAP reporting frequency, or non-GAAP reporting quality of firm *i* in year *t*. The variable *AFTER* takes the value of one if a firm has a (pseudo-)clawback in place, and zero otherwise. The variable *CLAWBACK* takes the value of one for clawback adopters, and zero for non-adopters. Therefore, *CLAWBACK* distinguishes between control and treatment group. *CONTROLS* generally consists of the variables included in EQ1, unless

[8] The main results in section 6 follow based on the compensation structure of CEOs. Although CEOs do not fully represent other executives, I generalize the effect of clawback adoption on CEOs to executives in general.

stated otherwise. I include control variables, industry- and year-fixed effects consistent with prior research using propensity-score matching and a DiD. Since both time-varying effects are addressed using the difference between two periods, and an identical control group is created by using propensity-score matching to control for unobserved differences between clawback adopters and non-adopters, an inference can be made with regard to the effect of clawback adoption on *OUTCOME*. Therefore, the coefficient β_3 is the variable of interest, which captures both the periods before and after clawback adoption, and the effect of the clawback provision compared to non-adopters.

Table 4 presents the distribution of firm-years in the pre- and post-period for the clawback adopters and non-adopters. The total number of 274 firm-years is relatively low compared to other studies. However, this may not necessarily be a problem, since I focus on obtaining high-quality matches to infer the effect of clawback adoption, rather than trying to maximize the number of observations. I expect the first three years after clawback adoption measures the effect of the clawback. Therefore, only firm-years within three years before and after clawback adoption are included for the estimation of the DiD, which reduces the number of firm-years from 405 to 274.

Table 4. Number of firm-years included to estimate the results. The number of firm years correspond with 31 matched pairs. *AFTER*. The number of firm-years differ due to missing firm-years. I include firm-years only within 3 years before and after clawback adoption. The number of firm-years reporting non-GAAP earnings are included in parenthesis.

	AFTER = 0	*AFTER* = 1	*Total*
CLAWBACK = 1	73 (37)	72 (45)	145
CLAWBACK = 0	69 (34)	60 (24)	129
Total	142	132	274

5.2.1 Clawback Adoption on Executive Compensation Structure

To measure the CEOs compensation level for hypothesis 1a, I follow figure 2 to converge the data from ExecuComp. As announced, I do not investigate long-term incentive plans due to the lack of data. All compensation are the natural logarithm to account for outliers, and replaced by zero if missing. Table 1A provides the variable definitions. *TOTCOMP* is the proxy for total compensation level. *INC* is the proxy for incentive compensation, which consists of equity incentives (*EQINC*), and bonus and other incentive-based compensation (*NONEQINC*). In contrary to prior research, I proxy *EQINC* by the stock and options awarded

during the year, as detailed in FAS123R. The valuation is the cost recorded by the company on its income statement, or capitalized on the balance sheet. I also proxy for non-incentive compensation (*SALARY*), including base salary, other compensation and pension compensation. Finally, the CEOs compensation ratio for hypothesis 1b is the proportion of incentive-based compensation to total compensation (*INC/COMP*). Consistent with the hypothesis, I test the relation two-tailed, since I make no prediction regarding the sign of the coefficient.

5.2.2 Clawback Adoption on Non-GAAP Reporting Frequency

To measure the non-GAAP reporting frequency, I replace *OUTCOME* in EQ2 by *NG*, which takes the value of one for firms that report non-GAAP earnings in the financial statement. Consequently, EQ2 is slightly adjusted in that a probit-model is adopted, since the outcome variable *NG* is a binary variable. An increase in the variable of interest in EQ2 is in line with the hypothesis that the non-GAAP reporting frequency increases after clawback adoption. I test the relation one-tailed, since I expect an increase in non-GAAP reporting frequency.

5.2.3 Clawback Adoption on Non-GAAP Reporting Quality

EQ2 needs to be extended to measure non-GAAP reporting quality. Following Kyung et al. (2013) and Kolev et al. (2008), I model the non-GAAP reporting quality to the extent that non-GAAP exclusions (*NG_EXCL*) predict future operating income ($FOPI_{t+1}$) after clawback adoption. Therefore, the predictability of future earnings proxies for non-GAAP reporting quality. Since Reg. G requires reconciliation with the most directly comparable GAAP earnings number, a positive relation between the non-GAAP exclusions and $FOPI_{t+1}$ is expected if the non-GAAP earnings number is to be more informative. *NG_EXCL* proxies for non-GAAP exclusions, and is the sum of the quarterly differences between the reported diluted GAAP earnings and the diluted non-GAAP earnings reported by the executives, where a positive difference indicate that the diluted non-GAAP earnings is larger than the diluted GAAP earnings per share. The following model tests the exclusion quality of non-GAAP reporting:

$$FOPI_{i,t+1} = \alpha_0 + \beta_1 CLAWBACK_{it} + \beta_2 AFTER_{it} + \beta_3 NG\_EXCL_{it} + \beta_4 CLAWBACK_{it} \times NG\_EXCL_{it} + \beta_5 AFTER_{it} \times NG\_EXCL_{it} + \beta_6 AFTER_{it} \times CLAWBACK_{it} + \boldsymbol{\beta_7 CLAWBACK_{it} \times AFTER_{it} \times NG\_EXCL_{it}} + \Sigma\beta_k CONTROLS_{it} + \Sigma\beta_k IND10 + \Sigma\beta_k YEAR + \varepsilon_{it} \quad \text{(EQ3)}$$

Although the research design is relatively comparable to prior research (e.g. Kolev et al., 2008; Kyung et al., 2013; Doyle et al., 2003), the measurement of the variable is not. Specifically, prior research approximate non-GAAP earnings using I/B/E/S actual earnings, whereas this research measures non-GAAP earnings through the executive's diluted non-GAAP earnings, as reported in the financial statements. Therefore, *NG_EXCL* better captures the potential opportunism in non-GAAP reporting.

The interpretation of the sign is more complicated. Since I capture the predictability of future operating earnings by the exclusion of certain items from the GAAP earnings number, the sign is positive if non-GAAP reporting better predicts future operating income, and vice versa. Thus, the sign is negative if executives use the exclusions from GAAP earnings opportunistically. An insignificant result means that the excluded items are completely transitory. In other words, excluded items have no predictive value of future operating income. Considering the hypothesis, I would expect that after clawback adoption the sign of the coefficient would be significant and negative. Therefore, I test this hypothesis one-tailed.

5.2.4 Non-GAAP Reporting on Compensation Structure after Clawback Adoption

To investigate the fourth hypothesis, the following model examines whether CEOs use non-GAAP earnings opportunistically to increase their compensation after clawback adoption:

$$COMPENS_{it} = \alpha_0 + \beta_1 CLAWBACK_{it} + \beta_2 AFTER_{it} + \beta_3 NG\_EXCL_{i,t-1} + \beta_4 CLAWBACK_{it} \times NG\_EXCL_{it-1} + \beta_5 AFTER_{it} \times NG\_EXCL_{i,t-1} + \beta_6 AFTER_{it} \times CLAWBACK_{it} + \boldsymbol{\beta_7 CLAWBACK_{it} \times AFTER_{it} \times NG\_EXCL_{i,t-1}} + GAAP\_EPS_{i,t-1} + \Sigma\beta_k CONTROLS_{it} + \Sigma\beta_k IND10 + \Sigma\beta_k YEAR + \varepsilon_{it} \quad \text{(EQ4)}$$

COMPENS includes compensation variables, including *TOTCOMP*, *INC*, *NONEQINC*, *EQINC*, and *SALARY*. I include the performance indicators non-GAAP exclusions (*NG_EXCL*) and *GAAP_EPS* in the prior fiscal year (i.e. fiscal year 2012) to explain total

compensation changes in the current year (i.e. fiscal year 2013). Using the lagged performance indicator to explain current compensation level is intuitively correct, and consistent with prior research (e.g. Core, Holthausen & Larcker, 1999); incentive compensation is always reactive to performance, thus the performance and the awarded compensation have to take place subsequently. Consistent with Core et al. (1999) and other research on clawback adoption (e.g. Dehaan et al., 2013; Erkens et al., 2018; Chen et al., 2014), governance variables directly affects total compensation, as do the other firm-specific characteristics.[9] For example, riskiness, size, industry and growth opportunities are relatively stable over time. Consistent with the hypothesis, I expect a significant positive effect of $CLAWBACK \times AFTER \times NG\_EXCL_{t-1}$ on *COMPENS* after clawback adoption. Consistent with the hypothesis, I test the relation one-tailed, since I expect β_7 to be significant and positive.

Robustness Check: Testing the parallel trend assumption

The propensity-score matching procedure yields 31 matches to mitigate issues with the parallel trend assumption for the difference-in-differences research design. As a robustness test, I check whether the outcome variables, *TOTALCOMP* and *NG*, have similar, parallel trends between the treatment group (clawback adopters), and control group (non-adopters). The result of the parallel trend robustness check follow from figure 2A. The figures show the mean values of *TOTALCOMP* and *NG*. Concluding from the figures, the trend show a strong correlation for *TOTALCOMP*, and an insignificant difference in the trend of *NG* before clawback adoption. Concluding, the parallel trend assumption approximately holds for the matched clawback adopters and non-adopters before (pseudo) clawback adoption. Consistent with the findings, executive compensation level and non-GAAP reporting frequency is significantly higher for clawback adopters, compared to non-adopters.

[9] A small inconsistency exist between hypothesis 1 and hypothesis 4. The first hypothesis simply includes the covariates used in the ordered-logistic regression, which is consistent with prior research of clawback adoption on executive compensation structure. However, to include the sum of *NG_EXCL* and *GAAP_EPS*, prior year of *GAAP_EPS* is included for the examination of the fourth hypothesis. Untabulated results show that the regressions for hypothesis 1 and hypothesis 4 are unaffected when replacing *GAAP_EPS* with lagged *GAAP_EPS*, and vice versa.

6. Empirical analysis and results

The empirical analysis generally consists of a univariate test and a multivariate test, including a statistical and economical interpretation of the results. Moreover, I draw the implications and suggestions of the results, and conclude with the acceptance or rejection of the hypothesis.

6.1 Clawback Adoption on Executive Compensation Structure

Table 5A reports the univariate test statistics. Panel A shows that total compensation on average increases after clawback adoption, relative to non-adopters. This increase is mainly driven by a 17.8% increase in non-incentive compensation (*SALARY*) on average, relative to non-adopters. In contrary, incentive compensation, including equity-incentives and non-equity incentives (e.g. bonuses), do not differ significantly after clawback adoption, relative to non-adopters. The ratio of incentive compensation to total compensation also remains fairly the same.

These results, however, should be interpreted with caution. Except for *SALARY*, none of the difference-in-differences results (bolded) significantly differ at a two-tailed 10% significance level. Three potential reasons may account for the insignificant results. First, the relation is truly non-existent, and therefore insignificant. Second, the relatively small sample (31 matches and 274 firm-years included in the DiD-model) may increase the standard error and affect the significance of the results. Third, unobserved variables that are associated with the variable of interest and have an effect on the dependent variable may bias the results. Consequently, I control for omitted variable bias by including the set of covariates used in the ordered logistic regression (EQ1). This approach is consistent with prior research.

Table 5 shows the multivariate results, including control variables, year-fixed effects and industry-fixed effects. Table 6A provides the same table, including the coefficients of the control variables (*CONTROLS*). The results show that *TOTALCOMP* and *SALARY* significantly increase after clawback adoption. Specifically, after including *CONTROLS*, *YEAR* and *IND10*, total compensation increases on average with 21.7%, compared to non-adopters. This effect is mainly driven by *SALARY*, which increases on average by 22.2% in the multivariate regression after clawback adoption, relative to non-adopters. Thus, these results are both statistically and economically significant.

Moreover, there is no effect of clawback adoption on incentive compensation (both *INC*, *NONEQINC* and *EQINC*). Although *SALARY* significantly increases after clawback

adoption, I do not find an intuitively significant decrease in *INC/COMP*. An explanation is found in the univariate results reported in table 5A Panel A. The univariate results show that in general CEOs compensation level increases for both adopters and non-adopters. Therefore, incentive compensation have been rewarded to clawback-adopting CEOs, preventing the incentive to total compensation ratio to change significantly. These results only show that CEOs are not rewarded more incentive compensation after clawback adoption, relative to non-adopters.

Table 5. Multivariate results for the effect of clawback adoption on executive compensation structure, including *CONTROLS*, *IND10*, and *YEAR*. Table 6A panel A shows the complete results, including the coefficients of the control variables. The variable of interest is *CLAWBACK*×*AFTER*, and is significantly positive for the dependent variables *TOTALCOMP* and *SALARY*. The table includes robust standard errors in parenthesis to mitigate heteroscedasticity in the error term. * Indicates significance level at 10 percent, ** at 5 percent, *** at one percent, based on two-tailed t-test.

	TOTALCOMP	*INC*	*NONEQINC*	*EQINC*	*SALARY*	*INC/COMP*
CONSTANT	0.921	-34.465	6.490	-90.749***	3.382	-5.113*
	(6.615)	(22.420)	(29.364)	(24.560)	(6.701)	(2.653)
AFTER	-0.163	-0.250	0.133	0.089	-0.215*	0.002
	(0.106)	(0.216)	(0.377)	(0.320)	(0.113)	(0.032)
CLAWBACK	-0.002	0.110	-0.203	0.548	-0.020	0.041
	(0.096)	(0.263)	(0.401)	(0.361)	(0.072)	(0.032)
CLAWBACK* × *AFTER	**0.260****	**0.412**	**0.099**	**0.150**	**0.264****	**-0.012**
	(0.118)	**(0.285)**	**(0.455)**	**(0.406)**	**(0.111)**	**(0.039)**
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
IND10	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes
N	274	274	274	274	274	274
Adj. R^2	0.6573	0.424	0.326	0.480	0.325	0.474

The results are consistent with Dehaan et al. (2013), suggesting that CEOs are compensated for the increased risks associated with clawback adoption. Specifically, non-incentive compensation increases significantly after clawback adoption compared to non-adopters, consistent with the view that executives seek ways to increase their trigger-insensitive compensation. Moreover, the results suggest certain costs of clawback adoption; CEOs demand compensation for clawback adoption by increasing their base salary (*SALARY*).

Concluding, hypothesis 1a is partially accepted (i.e. the null-hypothesis is partially rejected), since CEOs total compensation and total non-incentive compensation differ from non-adopting CEOs after clawback adoption. Hypothesis 1b is rejected (i.e. the null-

hypothesis is not rejected), since the CEO compensation ratio does not differ significantly after clawback adoption, relative to non-adopters.

6.2 Clawback Adoption on Non-GAAP reporting

As indicated in paragraph 5.3, prior research estimates non-GAAP earnings using I/B/E/S actual earnings, whereas this thesis measures non-GAAP earnings through the executive's diluted non-GAAP earnings, as reported in the financial statements. Combining hypothesis 2 and 3 indicate whether executives start using non-GAAP opportunistically after clawback adoption. This section includes the results of clawback adoption on non-GAAP reporting frequency, non-GAAP reporting quality, and the combined consequence for non-GAAP reporting.

6.2.1 Clawback Adoption on Non-GAAP Reporting Frequency

Table 5A reports the univariate test statistics. Panel B shows that the non-GAAP reporting frequency (*NG*) on average increases by 21.1 percentage point after clawback adoption, relative to non-adopters. The univariate difference-in-differences result is significant at the one-tailed 5% significance level (p-value = 0.041). The increase of non-GAAP reporting frequency is explained by an increase in non-GAAP reporting after clawback adoption, and a decrease in non-GAAP reporting after the 'pseudo' clawback adoption.

Model 1 of table 6 presents the multivariate results for the second hypothesis. The variable of interest, *CLAWBACK* × *AFTER*, is significantly positive at the one-tailed one percent significance level (p-value = 0.009). Evaluated at the means, the marginal probability for the likelihood of non-GAAP reporting increases with 38.2% after clawback adoption, relative to non-adopters. Therefore, the effect of clawback adoption on non-GAAP reporting frequency is significantly positive, both economically and statistically, after controlling for *CONTROLS*, *IND10*, and *YEAR*. Concluding, the second (alternative) hypothesis is accepted (i.e. the null-hypothesis is rejected), since the non-GAAP reporting frequency significantly increases after clawback adoption. However, it is uncertain whether the increase of non-GAAP reporting is to better inform, or mislead stakeholders. Executives may perceive GAAP reporting as less informative, since they are not able to use sufficient discretion to reflect the underlying economic reality, or abuse the non-GAAP reporting discretion after clawback adoption for opportunistic reasons. Therefore, the combined effect of the second and third

hypothesis is important in determining whether executives use non-GAAP reporting more opportunistically after clawback adoption.

Table 6. Multivariate results for the effect of clawback adoption on non-GAAP reporting frequency and quality, including *CONTROLS*, *IND10*, and *YEAR*. Table 6A Panel B shows the complete results, including the coefficients of the control variables. The table includes heteroscedasticity-robust standard errors. Model 1 is a probit-regression, where *NG* is the (binary) dependent variable, taking the value of one if a firm engage in non-GAAP reporting, and zero otherwise. Model 2 is a linear regression, in which $FOPI_{t+1}$ is the dependent variable, which is defined as the annual GAAP diluted earnings per share from operations in the next year. Compared to table 5, the number of observations included is slightly less due to perfect collinearity in some industries. * Indicates significance level at 10 percent, ** at 5 percent, *** at one percent, based on one-tailed t-test.

	Model 1			**Model 2**		
	Non-GAAP Reporting Frequency			Non-GAAP Reporting Quality		
	Coef.		Robust Std. Error	Coef.		Robust Std. Error
CONSTANT	74.326	***	24.518	-1.241		25.606
AFTER	-0.741	**	0.356	-0.157		0.307
TREAT	-0.207		0.272	0.159		0.475
CLAWBACK* × *AFTER	**0.961**	*******	**0.404**	0.088		0.543
NG_EXCL	-		-	1.116		0.794
NG_EXCL × *AFTER*	-		-	0.849		0.576
NG_EXCL × *CLAWBACK*	-		-	-0.157		0.494
NG_EXCL* × *CLAWBACK* × *AFTER	**-**		**-**	**-1.939**	******	**0.880**
CONTROLS	Yes			Yes		
YEAR	Yes			Yes		
IND10	Yes			Yes		
N	270			266		
Pseudo R^2	0.434			-		
Adj. R^2	-			0.548		

6.2.2 Clawback Adoption on Non-GAAP Reporting Quality

I do not include univariate results as opposed to prior hypotheses, because the outcome variable is not of interest to determine the reporting quality. As explained in paragraph 5.3, I model the extent to which the non-GAAP exclusions (*NG_EXCL*), the difference between the GAAP and non-GAAP earnings number, predict future operating income ($FOPI_{t+1}$). Moreover, since I examine the *executive's* exclusion choices, the outcome of this test is a more accurate measure of the opportunistic use of non-GAAP reporting than prior research (e.g. Kyung et al., 2013; Kolev et al., 2008).

Model 2 of table 6 presents the multivariate results for the third hypothesis. The variable of interest, *NG_EXCL* × *CLAWBACK* × *AFTER*, is significantly negative at the one-tailed five percent significance level (p-value = 0.015). The significant negative sign contradicts the initial objective of non-GAAP reporting to exclude transitory items to better reflect the "core earnings". Concluding, the third (alternative) hypothesis is accepted (i.e. the null-hypothesis is rejected), indicating that firms tend to exclude certain items from the GAAP earnings number after clawback adoption that negatively predict future earnings, relative to non-adopters. Instead of reflecting "core earnings" by excluding transitory items that will not occur in the future, the opposite is true; the non-GAAP exclusions quality actually decreases after clawback adoption.

Collectively, considering the results of model 1 and model 2 in table 6, the increase in non-GAAP reporting frequency and the decrease in the predictability of the non-GAAP exclusions of GAAP future earnings after controlling for *CONTROLS*, *YEAR*, and *IND10*, suggest an opportunistic use of non-GAAP reporting after clawback adoption, relative to non-adopters. Executives perceive decreased discretion in GAAP reporting after clawback adoption, and the relatively unregulated and unaudited nature of non-GAAP earnings incentivizes executive to use non-GAAP reporting more opportunistically to maximize their utility. Although these findings provide evidence regarding the opportunistic use of non-GAAP reporting, they do not explain *why* executives misreport. Prior research finds opportunistic use of non-GAAP earnings to compensate for unfavorable GAAP earnings, to meet earnings targets, to beat analyst forecasts, or as a substitute for accruals management. Moreover, non-GAAP earnings may be inflated to increase stock prices or to increase executive compensation (Dichev et al., 2013).

6.3 Non-GAAP Reporting on Compensation Structure after Clawback Adoption

The fourth hypothesis examines whether non-GAAP earnings increases the CEOs compensation *level* after clawback adoption. Therefore, the investigation of executive compensation ratio is not relevant, nor interesting.[10] Table 7 presents the multivariate results for the fourth hypothesis. Panel C of table 6A provides the coefficients of the control variables. The variable of interest, NG_EXCL_{t-1} × *CLAWBACK* × *AFTER*, is significantly positive at the one-tailed one percent significance level (p-value = 0.001) for *TOTALCOMP*.

[10] For the completeness, the regression of *INC/COMP* is included in panel C of table 6A. The coefficient is slightly significant at the 5% one-tailed significance level. However, this finding does not have any meaningful interpretation, taking into account the findings of the first hypothesis.

Table 7: Multivariate results for the effect of non-GAAP earnings on executive compensation structure after clawback adoption, including *CONTROLS*, *IND10*, and *YEAR*. The variable of interest is *CLAWBACK* × *AFTER* × NG_EXCL_{t-1}, and is significantly positive for the dependent variables *TOTALCOMP* and *INC/COMP*. The table includes robust standard errors in parenthesis to mitigate heteroscedasticity in the error term. * Indicates significance level at 10%, ** at 5%, *** at 1%, based on two-tailed t-test.

	TOTALCOMP	*INC*	*NONEQINC*	*EQINC*	*SALARY*
CONSTANT	-2.120	-34.929*	-2.720	-93.210***	2.854
	(7.097)	(18.103)	(30.799)	(23.376)	(6.556)
CLAWBACK	0.036	0.061	-0.255	0.550	0.004
	(0.102)	(0.251)	(0.422)	(0.381)	(0.078)
AFTER	-0.102	-0.275	0.244	0.126	-0.176
	(0.116)	(0.253)	(0.402)	(0.376)	(0.121)
NG_EXCL_{t-1}	0.138*	-0.035	0.044	0.116	0.104
	(0.072)	(0.478)	(0.562)	(0.475)	(0.077)
$NG\_EXCL_{t-1} \times CLAWBACK$	-0.158**	0.100	0.242	-0.078	-0.098
	(0.080)	(0.429)	(0.598)	(0.440)	(0.085)
$NG\_EXCL_{t-1} \times AFTER$	-0.279***	-0.069	-0.288	-0.306	-0.210*
	(0.104)	(0.540)	(0.681)	(0.543)	(0.110)
$CLAWBACK \times AFTER$	0.132	0.297	-0.095	-0.006	0.247**
	(0.130)	(0.329)	(0.490)	(0.467)	(0.116)
$\mathbf{NG\_EXCL_{t-1} \times CLAWBACK \times AFTER}$	**0.467*** **	**0.353**	**0.663**	**0.546**	**0.083**
	(0.141)	**(0.519)**	**(0.813)**	**(0.551)**	**(0.137)**
$GAAP\_EPS_{t-1}$	0.045	0.111	-0.048	0.120	0.040**
	(0.028)	(0.107)	(0.119)	(0.107)	(0.017)
IND10	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes
Observations	274	274	274	274	274
Adj R2	0.660	0.424	0.323	0.477	0.339

These findings indicate that if last year's non-GAAP earnings number increases with one dollar, the total compensation of CEOs increases with approximately 42.4% after clawback adoption, relative to non-adopters, keeping all other variables equal. As discussed in paragraph 2.2.3, prior research finds a significant increase in financial reporting quality after clawback adoption. As a result, executives may perceive a decreased discretion in GAAP reporting. Consequently, they seek other ways with more discretion to increase their compensation and utility after clawback adoption, including the opportunistic usage of non-GAAP reporting. Concluding, the fourth (alternative) hypothesis regarding total CEOs compensation level is accepted (i.e. the null-hypothesis is rejected), indicating that CEOs use non-GAAP reporting opportunistically to increase their compensation after clawback

adoption, relative to non-adopters. However, it remains ambiguous what component contributes to the increase in total compensation, since *SALARY*, *INC*, *EQINC*, and *NONEQINC* are statistically insignificant.

6.4 Concluding Remarks

Testing hypothesis 1, I find a significant increase in *TOTALCOMP*, which is mainly driven by *SALARY*, after clawback adoption, relative to non-adopters. If executives do not use non-GAAP reporting (opportunistically), compensation becomes more based on *SALARY* after clawback adoption, which is by definition trigger-insensitive. Apparently, *if* a clawback-adopter reports non-GAAP earnings, executives opportunistically use their non-GAAP discretion, and are able to increase total compensation based on these numbers. This interpretation is consistent with the incentive to base executive compensation on trigger-insensitive financial measures. Nevertheless, it remains ambiguous what component contributes to the increase in total compensation. The objective of this thesis, however, is not to examine *how* executives use non-GAAP reporting to increase compensation, but merely to identify whether executives use non-GAAP reporting more opportunistically after clawback adoption, relative to non-adopters. Therefore, I leave this investigation for future research. Concluding, executives increase their trigger-insensitive compensation after clawback adoption, including non-incentive compensation, or compensation based on opportunistically used non-GAAP earnings after clawback adoption, relative to non-adopters. An important implication for this finding is that, if this trend keeps continuing, the compensation of executives becomes more insensitive to pre-defined trigger events, potentially leading to ineffectiveness of clawback provisions in the long-term.

7. Conclusion

The objective of clawback provisions is to impose *ex post* costs, the recoupment of erroneously awarded compensation, on executives if a pre-defined trigger event (e.g. restatement, misstatement, or misconduct) occurs, reducing the adverse incentives of executives to manipulate earnings *ex ante*. Prior research indeed finds a positive effect of clawback adoption on financial reporting quality, suggesting that clawbacks discourage the intentional misstatement of the financial statements. In the contrary, I empirically investigate the unintended consequences of clawback adoption. Therefore, the objective of this thesis is to identify how clawback adoption affects the executive compensation structure and the non-GAAP reporting.

Since both intentional and unintentional errors lead to recoupment of erroneously awarded compensation, it becomes more costly for executives to misstate earnings. From an agency theory perspective, clawbacks increase the costs in terms of utility imposed on executives. I find empirical evidence for a significant increase of executive total compensation resulting from clawback adoption, which is mainly explained by an increase of non-incentive compensation. These findings are consistent with executives requiring a risk premium to compensate for the increased costs arising from clawback provisions, and the necessity to increase effort to avoid unintended errors in the financial reporting process. Moreover, executives seek ways to increase their trigger-insensitive compensation after clawback adoption, explained by the increase in non-incentive compensation.

Another consequence of clawback is that executives may perceive a reduction of discretion over GAAP reporting, because of the higher costs to misstate earnings. Non-GAAP earnings are ordinarily informative for stakeholders, since their objective is to better reflect the "core earnings" of the firm by excluding one-time or transitory gains. However, the relative unregulated and unaudited nature of non-GAAP earnings may incentivize executives to use discretion in this type of reporting to achieve personal goals. I predict and find a more opportunistic use of non-GAAP reporting after clawback adoption to increase their compensation.

Concluding, the unintended consequences of clawback adoption are threefold. First, executives require a higher total compensation in the form of non-incentive compensation. Although I do not find a significant decrease in the proportion of incentive compensation to total compensation, the dependence of incentive compensation becomes less due to the higher non-incentive compensation. From an agency theory, this will have negative consequences for the level of effort of an executive, and subsequently the performance of the firm. Second,

the quality of the non-GAAP earnings number deteriorates, since executives use this earnings number more opportunistically after clawback adoption. As a result, the non-GAAP earnings number will be less reliable. Third, executives increase their trigger-insensitive compensation, including non-incentive compensation, or compensation based on opportunistically used non-GAAP earnings. More importantly, if this trend keeps continuing, the effect of clawback adoption may not be as effective as initially found by prior research in the long-term, because the compensation sensitive to trigger events decreases. Future research may further empirically investigate these potential unintended, negative consequences of clawback provisions.

This thesis contributes to the literature on the effect of clawback adoption on non-GAAP reporting and executive compensation structure. First, I add evidence to the existing, dispersed literature on the effect of clawback adoption on executive compensation structure. Second, Kyung et al. (2013) is the only study to examine the effect of clawback adoption on non-GAAP reporting. However, I examine *executives'* reported non-GAAP earnings, whereas Kyung et al. (2013) use the I/B/E/S *analysts'* reported non-GAAP earnings. Therefore, this study better reflects the executives' opportunism in non-GAAP reporting. Third, I provide first evidence that executives report non-GAAP earnings opportunistically to base their compensation on after clawback adoption. I therefore contribute to a better understanding of unintended consequences of clawback adoption. However, how executives use non-GAAP reporting to increase compensation I leave for future research.

This thesis has two limitations. First, prior research (e.g. Erkens et al., 2018; Beck, 2015) finds that the strength of the clawback provision matters. The available data did not allow controlling for the strength of a clawback provision. Although I assume a firm is not a 'hard' adopter if it only adopts a clawback in one year, this is not conclusive to state that including the strength of a clawback provision would not have had an impact on my results. Second, the findings sometimes contradict each other. For example, I find a significant increase in non-incentive compensation (*SALARY*), but no simultaneous decrease in the proportion of incentive compensation to total compensation (*INC/COMP*). This may be explained by the joint change of incentive and non-incentive compensation relative to the control group, and the required strong effect due to the small sample, which increases the standard error and affects the significance.

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Appendix A: Variable Definitions

Table 1A. Variable Definitions. The dependent variables for compensation are obtained from ExecuComp via Wharton Research Data Services (WRDS). Respectively, annual firm fundamentals, corporate governance variables, and audit information obtained from Compustat, ISS and Audit Analytics. I add data item numbers (#) to Compustat variables. The data item numbers are found on the website: https://intranet.johnson.cornell.edu/Portals/36/Departments/Research%20Computing/COMPUSTAT/NAM/FUNDA.pdf. Appendix D shows the exact STATA code used for computing the variables.

Dependent variables

Variable	**Description**	**Scale**	**Data Source**
TOTCOMP	The natural logarithm of the sum of compensation awarded during the fiscal year. The total compensation includes the base salary, other compensation, the bonus, stock and option awards, other non-equity incentive compensation and pension compensation.	Continuous	ExecuComp
SALARY	The natural logarithm of the sum of compensation unrelated to performance, which includes the base salary, other compensation and pension compensation.	Continuous	ExecuComp
NONEQINC	The natural logarithm of the sum of bonus compensation and other non-equity incentive compensation.	Continuous	ExecuComp
EQINC	The natural logarithm of the sum of stock and option awards.	Continuous	ExecuComp
INC	The natural logarithm of the sum of incentive compensation, which includes stock and option awards, bonus compensation and other non-equity incentive compensation.	Continuous	ExecuComp
INC/COMP	The proportion of incentive compensation (*INC*) to total compensation (*TOTCOMP*).	Continuous	ExecuComp
NG	Takes the value of one firms that report non-GAAP earnings in the annual financial statements, and zero otherwise.	Binary	Own Data
$FOPI_{t+1}$	Future operating income, defined as the annual GAAP diluted earnings per share from operations (#292) in the next year.	Continuous	Compustat

Independent Variables

Variable	**Description**	**Scale**	**Data Source**
AFTER	Takes the value of one for firm-years with a clawback provision in place, and zero otherwise.	Binary	Own Computation
CLAWBACK	Takes the value of one for firms that will adopt a clawback provision in any year, and zero otherwise.	Binary	Own Data
GAAP_EPS	Annual diluted earnings per share from operations, excluding extraordinary items and gains and losses from discontinued operations (#292) based on general accepted accounting principles (GAAP).	Continuous	Compustat
NG_EPS	Non-GAAP diluted earnings per share number, as reported by the executives in the financial statements.	Continuous	Own Data
NG_EXCL	The sum of the quarterly differences between GAAP_EPS and NG_EPS within one year.	Continuous	Own Data / Compustat
EXCL_HIGH	Takes the value of one if the reported non-GAAP exclusions number is higher than the median.	Binary	Own Data / Compustat
SI	Special items, computed as the impact of extraordinary items on the diluted GAAP earnings per share (item #292 - #291)	Continuous	Compustat
NG_OTHEREXCL	Other item exclusions in the non-GAAP number, computed as the difference between the total non-GAAP exclusions (NG_EXCL) minus special items (SI).	Continuous	Own Data / Compustat

Governance Variables

Variable	**Description**	**Scale**	**Data Source**
DIRECTORS	Total number of members, including the chair, in the board of directors.	Discrete	ISS
TOTFEM	Total number of female members, including the chair, in the board of directors.	Discrete	ISS
DIRFEM	Fraction of total female to total directors.	Continuous	ISS
INDEPENDENT	Number of independent board members, including the chair, in the board of directors.	Discrete	ISS
CGCOMM	Number of members, including chair if any, which is part of the corporate governance committee.	Discrete	ISS

COMPCOMM	Number of members, including chair if any, which is part of the corporate compensation committee.	Discrete	ISS
AUDCOMM	Number of members, including chair if any, which is part of the corporate audit committee.	Discrete	ISS
DIRAGE	Average age of the board of directors.	Continuous	ISS
INSIDER%	The natural logarithm of the sum of the shares owned by top management, divided by the total number of shares outstanding (#183).	Continuous	ISS / Compustat
CEOCHAIR	Equals one if the Chief Executive Officer (CEO) is also the chairperson of the board of directors.	Binary	ISS
CEOAGE	The age of the CEO.	Discrete	ExecuComp
TENURE	Takes the value of one if the CEO has been the CEO of the firm for at least two years.	Binary	ExecuComp

Firm-Specific Variables

Variable	**Description**	**Scale**	**Data Source**
LNASSETS	The natural logarithm of total assets, as reported in the annual financial statements.	Continuous	Compustat
LEVERAGE	The proportion of debt in current liabilities (#222) and long-term debt (#230) to total assets (#94).	Continuous	Compustat
GROWTH	The one-year growth in total net sales (#749)	Continuous	Compustat
RD	Takes the value of one for firms that report research and development expenses.	Binary	Compustat
INTANGIBLES	Total intangible assets (#401), as reported in the annual financial statements.	Continuous	Compustat
SOFTASSETS	Proportion of soft assets to total assets (#94), where soft assets is defined as total assets minus net property, plant and equipment (#648) and minus cash and short-term investments (#141)	Continuous	Compustat
ROA	Return on assets, computed as income before extraordinary items (#384), divided by the average total assets of the reporting year (#94).	Continuous	Compustat
ROASD	The natural logarithm of the 4-year standard deviation of the return on assets.	Continuous	Compustat

LOSS	Takes the value of one if a firm reports a loss. In that case, net income (#553) should be below zero.	Binary	Compustat
MTB	The closing stock price at the end of the fiscal year (#1003), divided by the book value of equity (#94 minus #527).	Continuous	Compustat
CASHRETURN	Earnings before interest, depreciation and amortization (EBITDA, #286), divided by lagged total assets (#94).	Continuous	Compustat
TOBIN'S Q	The sum of the book value of total long-term debt (#230), total debt in current liabilities (#222) and market capitalization at fiscal year-end (#1004 multiplied by #183), divided by total assets (#94).	Continuous	Compustat
dREC	The change in accounts receivable (#709), divided by the average total assets over the fiscal year (#94).	Continuous	Compustat
PRIORRESTATE	Takes the value of one if a firm suffers a restatement of its financial statements in the last two years.	Binary	Audit Analytics
RESTATE	Take the value of one if a firm's financial statements are restated for the fiscal year	Binary	Audit Analytics
LITIGATION	Based on the Standard Industrial Classification (SIC) code and similar to Lafond and Roychowdhurry (2008), litigious industries are defined by the following SIC codes: 2833-2836, 3570-3577, 3600-3674, 5200-5961 and 7370.	Binary	Audit Analytics
IND10	Industry fixed-effects are assigned to the ten major group industries, based on the Standard Industrial Classification (SIC) code. More information on these major group industries is found on: https://www.osha.gov/pls/imis/sic_manual.html.	Categorical	Audit Analytics
YEAR	Fiscal year-ending fixed-effects, based on line item #3.	Categorical	Compustat

Appendix B: Tables

Table 2A. Pearson correlation matrix of total compensation and covariates used in the logistic-regression model in table 3. Correlations higher than 0.700 are bolded.

	1	2	3	4	5	6	7	8	9	10	11	12
1 TOTCOMP	1											
2. NG_EXC	0,037	1										
3. NG	0,203***	0,442***	1									
4. DIRECTORS	0,284***	0,010	0,046	1								
5. DIRFEM	0,121*	0,056	0,104	0,082	1							
6 INDEPENDENT	0,432***	0,046	0,114*	**0,848*** **	0,179***	1						
7 CGCOMM	0,150**	-0,019	0,034	0,262***	0,132*	0,317***	1					
8 COMPCOMM	0,018	-0,010	-0,116*	0,266***	0,054	0,325***	0,406***	1				
9 AUDCOMM	0,133*	0,055	-0,034	0,332***	0,041	0,365***	0,365***	0,555***	1			
10 DIRAGE	-0,011	-0,104	-0,135*	0,290***	-0,177**	0,228***	-0,043	0,086	0,135*	1		
11 INSIDER%	-0,375***	-0,065	-0,106	-0,205***	-0,082	-0,291***	-0,170**	-0,115*	-0,078	0,124*	1	
12 CEOCHAIR	-0,061	0,009	-0,022	-0,050	0,183***	0,062	0,004	0,030	0,043	0,070	0,237***	1
13 CEOAGE	-0,067	-0,023	0,032	0,192***	-0,061	0,163**	-0,072	-0,038	0,082	0,518***	0,218***	0,095
14 INTANGIBLES	0,049	0,151**	0,347***	-0,111*	-0,133*	-0,059	-0,071	-0,027	-0,008	0,001	0,015	-0,150**
15 TENURE	0,088	-0,068	-0,067	0,020	0,071	0,054	0,105	0,027	-0,012	0,094	-0,028	0,086
16 LNASSETS	**0,745*** **	0,082	0,111*	0,391***	0,077	0,459***	0,232***	0,036	0,187***	0,119*	-0,438***	-0,049
17 LEVERAGE	0,318***	0,023	-0,056	0,160**	-0,160**	0,225***	-0,060	0,044	0,180***	0,277***	-0,046	0,009
18 GAAP_EPS	0,237***	-0,477***	-0,050	0,116*	-0,206***	0,075	0,080	0,064	0,005	0,144**	-0,112*	-0,188***
19 ROASD	0,091	0,221***	0,088	-0,006	0,232***	0,056	-0,054	-0,051	-0,026	-0,116*	-0,040	0,097
20 MTB	0,359***	-0,150**	0,087	0,112*	-0,063	0,172**	-0,049	-0,039	0,026	0,134*	-0,123*	-0,103
21 CASHRETURN	0,217***	-0,239***	-0,073	0,075	-0,088	0,060	-0,062	0,032	0,041	0,278***	-0,007	-0,034
22 TOBIN'S Q	0,318***	-0,181***	0,024	0,053	-0,026	0,115*	-0,086	-0,003	0,000	0,142**	-0,135*	-0,124*
23 LOSS	-0,023	0,507***	0,123*	-0,014	0,176**	0,003	-0,004	-0,042	-0,011	-0,201***	-0,033	0,050
24 PRIORRESTATE	-0,170**	-0,060	-0,058	-0,003	-0,056	-0,028	-0,023	-0,096	-0,054	0,001	0,192***	-0,022
25 LITIGATION	0,246***	0,052	0,182***	0,077	0,118*	0,076	-0,078	-0,096	-0,093	-0,026	-0,224***	-0.007

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Cont.	13	14	15	16	17	18	19	20	21	22	23	24	25
1 TOTCOMP													
2. NG_EXC													
3. NG													
4. DIRECTORS													
5. DIRFEM													
6 INDEPENDENT													
7 CGCOMM													
8 COMPCOMM													
9 AUDCOMM													
10 DIRAGE													
11 INSIDER%													
12 CEOCHAIR													
13 CEOAGE	1												
14 INTANGIBLES	0,079	1											
15 TENURE	0,097	-0,028	1										
16 LNASSETS	-0,086	-0,038	0,083	1									
17 LEVERAGE	0,168**	0,016	0,053	0,521***	1								
18 GAAP_EPS	0,041	0,077	0,163**	0,181***	0,078	1							
19 ROASD	-0,087	-0,138*	-0,145**	0,098	0,086	-0,381***	1						
20 MTB	-0,047	0,059	0,029	0,165**	0,009	0,465***	-0,064	1					
21 CASHRETURN	0,213***	0,004	0,020	0,037	-0,016	0,490***	-0,092	0,655***	1				
22 TOBIN'S Q	-0,039	0,075	-0,012	0,071	-0,096	0,378***	-0,027	**0,916*** **	0,709***	1			
23 LOSS	-0,120*	-0,012	-0,160**	0,084	0,057	-0,580***	0,408***	-0,282***	-0,428***	-0,303***	1		
24 PRIORRESTATE	0,002	0,027	-0,131*	-0,149**	-0,037	-0,053	0,083	-0,036	-0,109*	-0,100	0,057	1	
25 LITIGATION	0.062	-0.090	0.045	0.192***	0.059	0.064	-0.031	0.179***	0.357***	0.233***	-0.050	-0.080	1

* p < 0.05, ** p < 0.01, *** p < 0.001.

Table 3A. Descriptive statistics for (non-) clawback adopters and the total sample available for propensity-score matching.

Descriptive statistics of accounting variables. The t-statistic is a two-sided t-test in the means of the variables between the non-adopters and clawback adopters. * Indicates significance level at 5%, ** at 1%, *** at 0.1%, based on two-tailed t-test.

	Non-Adopters (N = 354)					**Clawback Adopters (N = 485)**							**Total sample (N = 839)**		
	Mean	*Median*	*Std. Dev.*	*Min.*	*Max.*	*Mean*	*Median*	*Std. Dev.*	*Min.*	*Max.*	*t-statistic*	*P-value*	*Mean*	*Median*	*Std. Dev.*
NG	0.492	0	0.501	0	1	0.649	1	0.478	0	1	-4.60	0.000***	0.583	1	0.493
NG_EXC	0.332	0	0.839	-0.62	5.31	0.577	0.15	1.135	-0.62	5.31	-3.61	0.000***	0.474	0.07	
DIRECTORS	8.260	8	1.807	4	14	9	9	1.880	4	15	-5.76	0.000***	8.688	9	1.884
DIRFEM	11	0.111	0.103	0	0.5	0.133	0.125	0.104	0	0.467	-3.22	0.001***	0.124	0.125	0.104
INDEPENDENT	6.551	7	1.742	3	11	6.953	7	1.696	2	12	-3.34	0.001***	6.783	7	1.726
CGCOMM	3.319	3	1.399	0	7	3.598	4	1.270	0	7	-2.96	0.003**	3.480	3	1.332
COMPCOMM	3.418	3	0.949	0	6	3.652	3	1.008	1	7	-3.42	0.001***	3.553	3	0.990
AUDCOMM	3.582	3	0.891	2	6	3.658	4	0.887	1	7	-1.22	0.223	3.626	3	0.889
DIRAGE	61.996	61.764	4.463	51.5	75.2	61.797	61.667	3.672	53.111	72.100	0.69	0.493	61.881	61.700	4.023
INSIDER%	2.945	3.024	1.181	-1.203	6.351	2.685	2.674n	1.366	-4.064	5.923	2.94	0.003**	2.795	2.784	1.297
CEOCHAIR	0.418	0	0.494	0	1	0.487	0	0.500	0	1	-1.97	0.049*	0.458	0	0.499
CEOAGE	55.531	55.500	8.188	40	90	55.619	56	6.607	37	80	-0.16	0.869	55.582	56	7.312
INTANGIBLES	0.196	0.114	0.216	0	0.798	0.236	0.190	0.195	0	0.870	-2.78	0.006**	0.219	0.172	0.205
TENURE	0.619	1	0.486	0	1	0.610	1	0.488	0	1	0.24	0.807	0.614	1	0.487
LNASSETS	7.035	6.725	1.233	4.888	10.369	7.773	7.828	1.227	5.105	10.856	-8.57	0.000***	7.462	7.339	1.282
LEVERAGE	16.319	14.523	14.152	0	49.575	18.674	17.984	14.412	0	49.575	-2.36	0.018**	17.680	16.606	14.342
GAAP_EPS	1.219	1.095	2.295	-12.430	11.170	1.742	1.770	3.091	-21.900	17.960	-2.81	0.005**	1.521	1.500	2.793
CASHRETURN	0.157	0.129	0.117	-0.044	0.543	0.167	0.153	0.104	-0.044	0.543	-1.25	0.213	0.163	0.144	0.110
ROASD	1.135	1.224	1.118	-1.786	3.618	0.979	0.936	1.119	-2.883	3.551	1.99	0.046*	1.045	1.059	1.120
LOSS	0.181	0	0.385	0	1	0.146	0	0.354	0	1	1.32	0.187	0.161	0	0.368
MTB	2.625	1.974	2.103	0.462	11.154	3.023	2.394	2.225	0.462	11.154	-2.64	0.009**	2.855	2.216	2.182
TOBIN'S Q	1.679	1.322	1.190	0.464	6.419	1.822	1.455	1.243	0.464	6.419	-1.69	0.092	1.762	1.388	1.223
LITIGATION	0.288	0	0.454	0	1	0.309	0	0.463	0	1	-0.66	0.509	0.300	0	0.459
PRIORRESTATE	0.234	0	0.424	0	1	0.179	0	0.384	0	1	1.932	0.054	0.203	0	0.402

Table 4A. Propensity-score matching results.

Panel A. Covariate balance between the matched pairs of 31 clawback adopters and 31 non-adopters. The p-value of the paired sample t-test is the two-sided parametric p-value comparing the means of clawback adopters and non-adopters. The p-value of the non-parametric two-sample Kolmogorov-Smirnov (KS)-test is the exact p-value to test the (in)equality of the distribution of observation between the clawback adopters and non-adopters. * Indicates significance level at 10%, ** at 5%, *** at 1%, based on two-tailed t-test.

	Mean difference of matches			Median difference & distribution		
	Non-adopter	Clawback adopter	p-value of paired sample t-test	Non-adopter	Clawback adopter	p-value of two-sample KS-test exact
NG	0.516	0.484	0.803	1.000	0.000	1.000
DIRECTORS	8.710	8.097	0.170	8.000	8.000	0.823
DIRFEM	0.107	0.076	0.168	0.111	0.000	0.256
INDEPENDENT	6.677	6.226	0.253	7.000	6.000	0.414
CGCOMM	3.419	3.387	0.932	3.000	3.000	1.000
COMPCOMM	3.613	3.355	0.308	3.000	3.000	0.823
AUDCOMM	3.742	3.484	0.259	4.000	3.000	0.823
DIRAGE	62.186	61.235	0.357	62.000	60.250	0.615
INSIDER%	2.962	2.947	0.968	3.047	3.007	0.615
CEOCHAIR	0.516	0.419	0.453	1.000	0.000	0.999
CEOAGE	56.677	54.387	0.219	56.000	56.000	0.963
INTANGIBLES	0.191	0.198	0.887	0.117	0.170	0.414
TENURE	0.613	0.613	1.000	1.000	1.000	1.000
LNASSETS	6.993	6.974	0.944	6.758	6.680	0.256
LEVERAGE	14.856	14.003	0.827	11.676	4.095	0.414
GAAP_EPS	1.326	1.573	0.689	0.960	1.340	0.414
CASHRETURN	0.159	0.178	0.532	0.134	0.151	0.256
ROASD	1.167	1.044	0.642	1.130	0.966	0.963
LOSS	0.194	0.161	0.745	0.000	0.000	1.000
MTB	2.308	3.095	0.137	2.133	2.439	0.147
TOBIN'S Q	1.630	1.889	0.388	1.416	1.496	0.414
LITIGATION	0.290	0.355	0.594	0.000	0.000	1.000
PRIORRESTATE	0.258	0.226	0.771	0.000	0.000	1.000

Panel B. Distribution of fitted conditional probabilities and the absolute differences in matched propensity-scores. The distribution of the propensity-scores of the final sample is the sample suitable for the ordered logistic-regression model, whereas the distribution of the matched sample is the distribution of the propensity-score of the 31 matched pairs.

	N	*1%*	*Median*	*75%*	*99%*	*Mean*	*Std. Dev.*	*Min.*	*Max.*
Distribution – Final Sample	388	0.002	0.099	0.256	0.859	0.180	0.203	0.001	0.959
Distribution – Matched Sample	62	0.027	0.172	0.283	0.400	0.185	0.110	0.027	0.400
Differences	31	0.000	0.007	0.015	0.028	0.009	0.008	0.000	0.028

Table 5A. Univariate results for the effect of clawback adoption on the outcome variable.

Panel A: Univariate results for the effect of clawback adoption on executive compensation structure (see paragraph 6.1). In general, the univariate results show no statistically significant results, mainly due to the large standard error resulting from the relatively low number of observations. Of these results, only the univariate effect of clawback adoption on *SALARY* is significant at the two-tailed 10% significance level.

		AFTER			*AFTER*		
		0	1	Δ (After - Before)	0	1	Δ (After - Before)
		TOTALCOMP			*INC*		
	N	*142*	*132*	274	*142*	*132*	274
CLAWBACK = 1	145	7.84	8.18	0.34	7.31	7.85	0.54
CLAWBACK = 0	129	7.83	8.02	0.18	7.08	7.42	0.34
Δ (Adopter – non-adopter)	274	0.01	0.16	**0.16**	0.23	0.43	**0.20**
		EQINC			*NONEQINC*		
CLAWBACK = 1	145	6.90	7.52	0.62	5.15	5.85	0.70
CLAWBACK = 0	129	6.12	6.80	0.68	5.12	5.93	0.81
Δ (Adopter – non-adopter)	274	0.78	0.72	-0.06	0.03	-0.08	**-0.11**
		SALARY			*INC/COMP*		
CLAWBACK = 1	145	6.57	6.71	0.14	0.69	0.74	0.05
CLAWBACK = 0	129	6.71	6.64	-0,07	0.60	0.68	0.08
Δ (Adopter – non-adopter)	274	-0.15	0.07	**0.22**	0.09	0.06	**-0.03**

Panel B: Univariate results for the effect of clawback adoption on non-GAAP reporting quality (see paragraph 6.2.1). The univariate results show a statistically significant result regarding the effect of clawback adoption, relative to non-adopters at the 5% one-tailed significance level (p-value = 0.041).

		AFTER = 0	*AFTER* = 1	Δ (After - Before)
	N	*142*	*132*	274
CLAWBACK = 1	145	50.68	62.50	11.82
CLAWBACK = 0	129	49.28	40.00	-9.28
Δ (Adopter – non-adopter)	274	1.40	22.50	**21.10**

Table 6A. Multivariate results for the effect of clawback adoption on the outcome variable.

Panel A: Multivariate results for the effect of clawback adoption on executive compensation structure, including *CONTROLS*, *IND10*, and *YEAR*. The variable of interest is *CLAWBACK* × *AFTER*, and is significantly positive for the dependent variables *TOTALCOMP* and *SALARY*. The table includes robust standard errors in parenthesis to mitigate heteroscedasticity in the error term. * Indicates significance level at 10%, ** at 5%, *** at 1%, based on two-tailed t-test.

	TOTALCOMP	*INC*	*NONEQINC*	*EQINC*	*SALARY*	*INC/COMP*
CONSTANT	0.921	-34.465	6.490	-90.749***	3.382	-5.113*
	(6.615)	(22.420)	(29.364)	(24.560)	(6.701)	(2.653)
AFTER	-0.163	-0.250	0.133	0.089	-0.215*	0.002
	(0.106)	(0.216)	(0.377)	(0.320)	(0.113)	(0.032)
CLAWBACK	-0.002	0.110	-0.203	0.548	-0.020	0.041
	(0.096)	(0.263)	(0.401)	(0.361)	(0.072)	(0.032)
CLAWBACK* × *AFTER	**0.260****	**0.412**	**0.099**	**0.150**	**0.264****	**-0.012**
	(0.118)	**(0.285)**	**(0.455)**	**(0.406)**	**(0.111)**	**(0.039)**
NG	0.100	-0.043	-0.364	0.355	0.038	0.012
	(0.074)	(0.199)	(0.328)	(0.267)	(0.067)	(0.027)
DIRECTORS	-0.100**	-0.232**	-0.077	-0.419***	-0.032	-0.032**
	(0.047)	(0.092)	(0.150)	(0.136)	(0.034)	(0.013)
DIRFEM	-0.292	-0.832	-0.452	1.066	-0.624*	0.101
	(0.447)	(1.108)	(1.656)	(1.393)	(0.359)	(0.144)
INDEPENDENT	0.150***	0.357***	0.518***	0.443**	0.087**	0.041**
	(0.054)	(0.123)	(0.188)	(0.180)	(0.038)	(0.018)
CGCOMM	0.045**	0.081*	0.056	0.181**	0.022	0.007
	(0.022)	(0.046)	(0.109)	(0.073)	(0.022)	(0.008)
COMPCOMM	-0.021	-0.094	-0.049	-0.060	-0.013	-0.001
	(0.036)	(0.101)	(0.159)	(0.132)	(0.032)	(0.013)
AUDCOMM	0.022	0.111	0.004	-0.071	0.078**	-0.011
	(0.045)	(0.127)	(0.195)	(0.146)	(0.039)	(0.016)
DIRAGE	0.095	1.210*	-0.030	2.970***	0.006	0.178**
	(0.204)	(0.686)	(0.896)	(0.757)	(0.210)	(0.082)
DIRAGE2	-0.001	-0.010*	-0.000	-0.024***	0.000	-0.002**
	(0.002)	(0.005)	(0.007)	(0.006)	(0.002)	(0.001)
INSIDERPERC	0.004	-0.007	-0.036	-0.031	0.003	0.003
	(0.027)	(0.075)	(0.114)	(0.099)	(0.021)	(0.010)
CEOCHAIR	0.017	-0.269*	-0.509	-0.243	0.131**	-0.062***
	(0.064)	(0.147)	(0.316)	(0.210)	(0.057)	(0.020)
CEOAGE	0.000	-0.025	-0.030	-0.018	0.004	-0.003
	(0.005)	(0.018)	(0.023)	(0.019)	(0.005)	(0.002)
INTANGIBLES	-0.102	0.251	0.791	0.415	-0.419**	0.175**
	(0.212)	(0.514)	(0.856)	(0.697)	(0.194)	(0.072)
TENURE	0.038	0.176	-0.656**	0.405*	-0.004	0.006
	(0.077)	(0.195)	(0.331)	(0.235)	(0.062)	(0.024)
LNASSETS	0.537***	0.666***	0.322	0.866***	0.228***	0.091***
	(0.051)	(0.093)	(0.214)	(0.134)	(0.042)	(0.013)
LEVERAGE	-0.004*	-0.006	-0.014	-0.010	0.003	-0.002**
	(0.002)	(0.006)	(0.012)	(0.008)	(0.002)	(0.001)
	TOTALCOMP	*INC*	*NONEQINC*	*EQINC*	*SALARY*	*INC/COMP*

GAAP_EPS	0.041**	0.084	0.086	0.083	0.032	0.004
	(0.021)	(0.056)	(0.091)	(0.062)	(0.020)	(0.008)
ROASD	0.098***	0.207***	-0.129	0.236**	0.002	0.027**
	(0.034)	(0.079)	(0.132)	(0.115)	(0.029)	(0.011)
MTB	-0.130***	-0.192*	0.103	-0.259**	-0.111***	-0.003
	(0.042)	(0.103)	(0.129)	(0.107)	(0.034)	(0.014)
CASHRETURN	0.307	0.880	3.875	-0.882	0.092	0.139
	(0.504)	(1.117)	(2.430)	(1.594)	(0.505)	(0.166)
TOBIN'S Q	0.405***	0.547***	0.039	0.852***	0.202***	0.041*
	(0.076)	(0.179)	(0.241)	(0.193)	(0.062)	(0.023)
LOSS	-0.051	0.072	-1.016	0.255	0.066	-0.022
	(0.123)	(0.269)	(0.631)	(0.339)	(0.096)	(0.038)
PRIORRESTATE	0.029	0.168	-0.155	0.362	0.035	-0.006
	(0.076)	(0.154)	(0.372)	(0.250)	(0.068)	(0.023)
LITIGATION	-0.125	-0.021	-0.380	0.061	-0.320***	0.038
	(0.108)	(0.252)	(0.482)	(0.290)	(0.082)	(0.032)
IND10	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes
Observations	274	274	274	274	274	274
Adj. R^2	0.6573	0.424	0.326	0.480	0.325	0.474

Panel B: Multivariate results for the effect of clawback adoption on non-GAAP reporting frequency and quality, including *CONTROLS*, *IND10*, and *YEAR*. The table includes heteroscedasticity-robust standard errors. Model 1 is a probit-regression, where *NG* is the (binary) dependent variable, taking the value of one if a firm engage in non-GAAP reporting, and zero otherwise. Model 2 is a linear regression, where $FOPI_{t+1}$ is the dependent variable, which is defined as the annual GAAP diluted earnings per share from operations in the next year. The table includes robust standard errors to mitigate heteroscedasticity in the error term. * Indicates significance level at 10%, ** at 5%, *** at 1%, based on one-tailed t-test for the variables of interest, and two-tailed t-test for the control variables.

	Model 1			**Model 2**		
	Non-GAAP Reporting Frequency			Non-GAAP Reporting Quality		
	Coef.		Robust Std. Error	Coef.		Robust Std. Error
CONSTANT	74.326	***	24.518	-1.241		25.606
AFTER	-0.741	**	0.356	-0.157		0.307
TREAT	-0.207		0.272	0.159		0.475
CLAWBACK × AFTER	0.961	**	0.404	0.088		0.543
NG_EXCL	-		-	1.116		0.794
$NG\_EXCL \times AFTER$	-		-	0.849		0.576
$NG\_EXCL \times CLAWBACK$	-		-	-0.157		0.494
NG_EXCL × CLAWBACK × AFTER	-		-	**-1.939**	****	**0.880**
NG	-		-	-0.731	**	0.354
DIRECTORS	-0.199		0.138	0.271		0.185
DIRFEM	1.080		1.472	2.851		1744
INDEPENDENT	0.506	***	0.153	-0.232		0.193
CGCOMM	0.041		0.095	-0.138	*	0.083
COMPCOMM	-0.309	*	0.158	-0.031		0.181
AUDCOMM	0.063		0.162	0.049		0.193
DIRAGE	-2.298	***	0.766	-0.013		0.782

			Robust Std.			
	Coef.		Error	Coef.		Robust Std. Error
DIRAGE2	0.018	***	0.006	-0.000		0.006
INSIDERPERC	-0.048		0.082	-0.083		0.119
CEOCHAIR	0.155		0.229	-0.227		0.293
CEOAGE	0.008		0.020	0.018		0.019
INTANGIBLES	4.502	***	0.984	0.167		1.080
TENURE	-0.663	***	0.249	0.063		0.401
LNASSETS	-0.107		0.175	-0.160		0.210
LEVERAGE	-0.004		0.009	0.001		0.013
GAAP_EPS	-0.123	*	0.072	0.593	***	0.147
ROASD	0.240	*	0.128	-0.301	**	0.122
MTB	0.547	***	0.133	0.836	***	0.231
CASHRETURN	-4.810	**	1.974	-0.022		2075
TOBIN'S Q	-0.712	***	0.237	-0.706	*	0.392
LOSS	0.214		0.437	0.131		0.507
PRIORRESTATE	-0.873	***	0.289	0.065		0.307
LITIGATION	1.028	***	0.314	-0.168		0.332
YEAR			Yes			Yes
IND10			Yes			Yes
N			270			266
Pseudo R^2			0.434			-
Adj. R^2			-			0.554

Panel C: Multivariate results for the effect of non-GAAP earnings on executive compensation structure after clawback adoption, including *CONTROLS*, *IND10*, and *YEAR*. The variable of interest is *CLAWBACK* × *AFTER* × NG_EXCL_{t-1}, and is significantly positive for the dependent variables *TOTALCOMP* and *INC/COMP*. The table includes robust standard errors in parenthesis to mitigate heteroscedasticity in the error term. * Indicates significance level at 10%, ** at 5%, *** at 1%, based on two-tailed t-test.

	TOTALCOMP	*INC*	*NONEQINC*	*EQINC*	*SALARY*	*INC/COMP*
CONSTANT	-2.120	-34.929*	-2.720	-93.210***	2.854	-5.826**
	(7.097)	(18.103)	(30.799)	(23.376)	(6.556)	(2.495)
CLAWBACK	0.036	0.061	-0.255	0.550	0.004	0.048
	(0.102)	(0.251)	(0.422)	(0.381)	(0.078)	(0.032)
AFTER	-0.102	-0.275	0.244	0.126	-0.176	0.013
	(0.116)	(0.253)	(0.402)	(0.376)	(0.121)	(0.036)
NG_EXCL_{t-1}	0.138*	-0.035	0.044	0.116	0.104	0.016
	(0.072)	(0.478)	(0.562)	(0.475)	(0.077)	(0.052)
$NG\_EXCL_{t-1} \times CLAWBACK$	-0.158**	0.100	0.242	-0.078	-0.098	-0.026
	(0.080)	(0.429)	(0.598)	(0.440)	(0.085)	(0.048)
$NG\_EXCL_{t-1} \times AFTER$	-0.279***	-0.069	-0.288	-0.306	-0.210*	-0.042
	(0.104)	(0.540)	(0.681)	(0.543)	(0.110)	(0.060)
$CLAWBACK \times AFTER$	0.132	0.297	-0.095	-0.006	0.247**	-0.043
	(0.130)	(0.329)	(0.490)	(0.467)	(0.116)	(0.043)

	TOTALCOMP	*INC*	*NONEQINC*	*EQINC*	*SALARY*	*INC/COMP*
$\boldsymbol{NG\_EXCL_{t-1}}$ $\boldsymbol{\times CLAWBACK}$ $\boldsymbol{\times AFTER}$	**0.467*** **	**0.353**	**0.663**	**0.546**	**0.083**	**0.112***
	(0.141)	**(0.519)**	**(0.813)**	**(0.551)**	**(0.137)**	**(0.061)**
$GAAP\_EPS_{t-1}$	0.045	0.111	-0.048	0.120	0.040**	0.002
	(0.028)	(0.107)	(0.119)	(0.107)	(0.017)	(0.012)
NG	0.086	-0.073	-0.438	0.326	0.035	0.010
	(0.078)	(0.233)	(0.352)	(0.288)	(0.069)	(0.030)
DIRECTORS	-0.092**	-0.230**	-0.047	-0.412***	-0.025	-0.031**
	(0.045)	(0.090)	(0.152)	(0.140)	(0.033)	(0.013)
DIRFEM	-0.166	-0.327	-0.573	1.511	-0.548	0.110
	(0.466)	(1.061)	(1.760)	(1.355)	(0.349)	(0.145)
INDEPENDENT	0.138***	0.342***	0.472**	0.426**	0.079**	0.039**
	(0.053)	(0.121)	(0.191)	(0.182)	(0.038)	(0.017)
CGCOMM	0.054**	0.094*	0.066	0.195**	0.018	0.009
	(0.023)	(0.049)	(0.113)	(0.078)	(0.022)	(0.008)
COMPCOMM	-0.040	-0.124	-0.045	-0.095	-0.018	-0.005
	(0.039)	(0.110)	(0.162)	(0.142)	(0.032)	(0.015)
AUDCOMM	0.023	0.101	0.031	-0.081	0.070*	-0.009
	(0.045)	(0.122)	(0.199)	(0.144)	(0.039)	(0.016)
DIRAGE	0.216	1.261**	0.279	3.094***	0.028	0.206***
	(0.220)	(0.553)	(0.950)	(0.725)	(0.209)	(0.078)
DIRAGE2	-0.002	-0.010**	-0.003	-0.025***	-0.000	-0.002***
	(0.002)	(0.004)	(0.008)	(0.006)	(0.002)	(0.001)
INSIDERPERC	-0.001	-0.029	-0.017	-0.053	-0.009	0.004
	(0.028)	(0.071)	(0.117)	(0.098)	(0.022)	(0.009)
CEOCHAIR	0.029	-0.238	-0.510	-0.209	0.135**	-0.060***
	(0.066)	(0.153)	(0.327)	(0.216)	(0.057)	(0.020)
CEOAGE	-0.000	-0.023	-0.033	-0.017	0.004	-0.003
	(0.005)	(0.018)	(0.023)	(0.020)	(0.005)	(0.002)
INTANGIBLES	-0.058	0.422	1.043	0.549	-0.373**	0.178**
	(0.211)	(0.470)	(0.939)	(0.685)	(0.186)	(0.070)
TENURE	0.019	0.116	-0.647*	0.352	-0.003	0.003
	(0.079)	(0.185)	(0.329)	(0.235)	(0.063)	(0.024)
LNASSETS	0.516***	0.630***	0.323	0.823***	0.226***	0.087***
	(0.055)	(0.118)	(0.231)	(0.155)	(0.044)	(0.016)
LEVERAGE	-0.004*	-0.008	-0.011	-0.012	0.003	-0.002**
	(0.003)	(0.006)	(0.012)	(0.008)	(0.002)	(0.001)
ROASD	0.100***	0.213**	-0.213	0.249**	0.008	0.026**
	(0.035)	(0.087)	(0.136)	(0.120)	(0.028)	(0.012)
MTB	-0.122***	-0.176*	0.152	-0.246**	-0.099***	-0.004
	(0.040)	(0.095)	(0.131)	(0.102)	(0.034)	(0.013)
CASHRETURN	0.762	1.695	4.824**	-0.055	0.318	0.203
	(0.519)	(1.044)	(2.312)	(1.485)	(0.469)	(0.148)
TOBIN'S Q	0.385***	0.481***	-0.024	0.796***	0.176***	0.042**
	(0.075)	(0.155)	(0.245)	(0.175)	(0.058)	(0.021)
LOSS	-0.108	-0.038	-1.263**	0.166	0.047	-0.032
	(0.113)	(0.259)	(0.614)	(0.335)	(0.091)	(0.035)

	TOTALCOMP	*INC*	*NONEQINC*	*EQINC*	*SALARY*	*INC/COMP*
PRIORRESTATE	0.036	0.128	-0.114	0.341	0.050	-0.006
	(0.077)	(0.142)	(0.374)	(0.259)	(0.067)	(0.023)
LITIGATION	-0.137	-0.038	-0.424	0.045	-0.345***	0.039
	(0.108)	(0.259)	(0.480)	(0.297)	(0.081)	(0.033)
IND10	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes
Observations	274	274	274	274	274	274
Adj R2	0.660	0.424	0.323	0.477	0.339	0.473

Appendix C: Figures

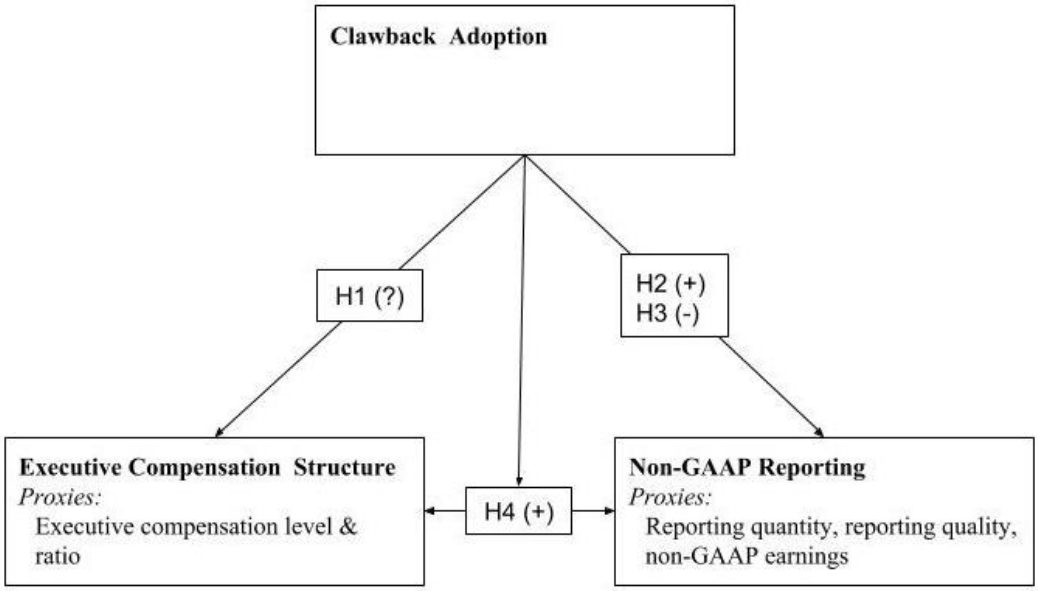


Figure 1A. This figure summarizes the hypothesized relations between the constructs and its operationalization. Figure 2 specifies the executive compensation structure.

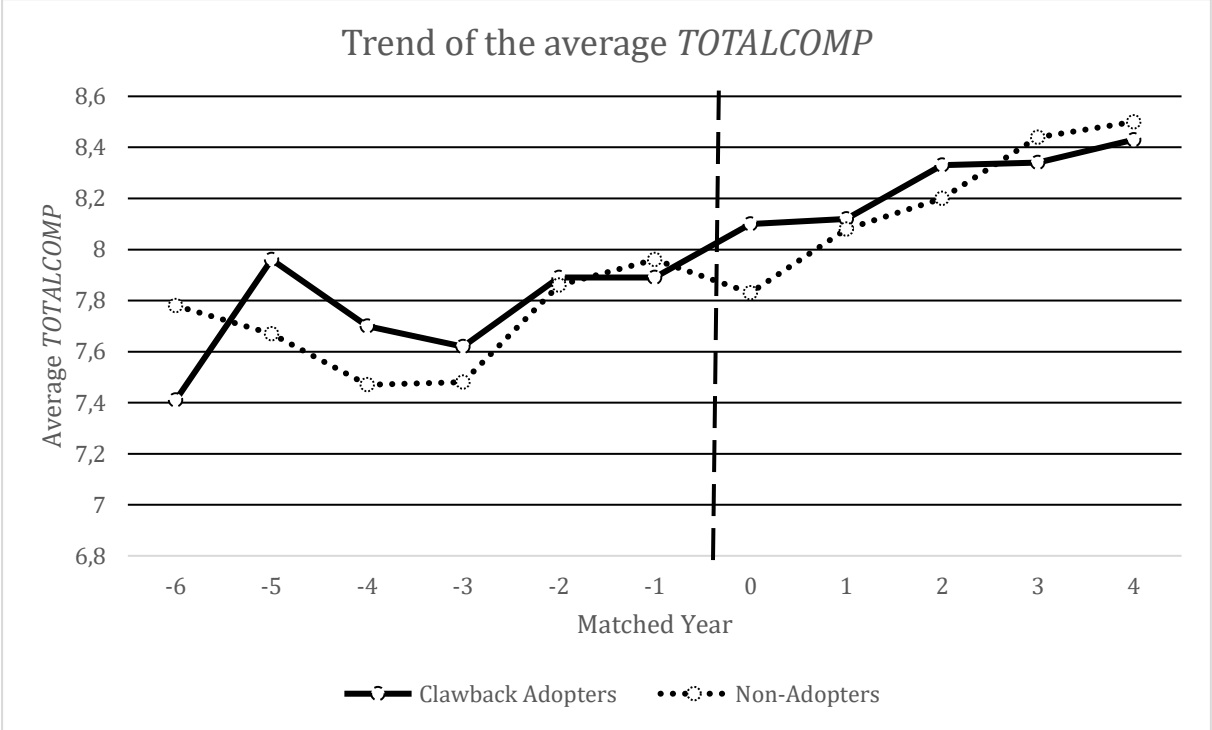
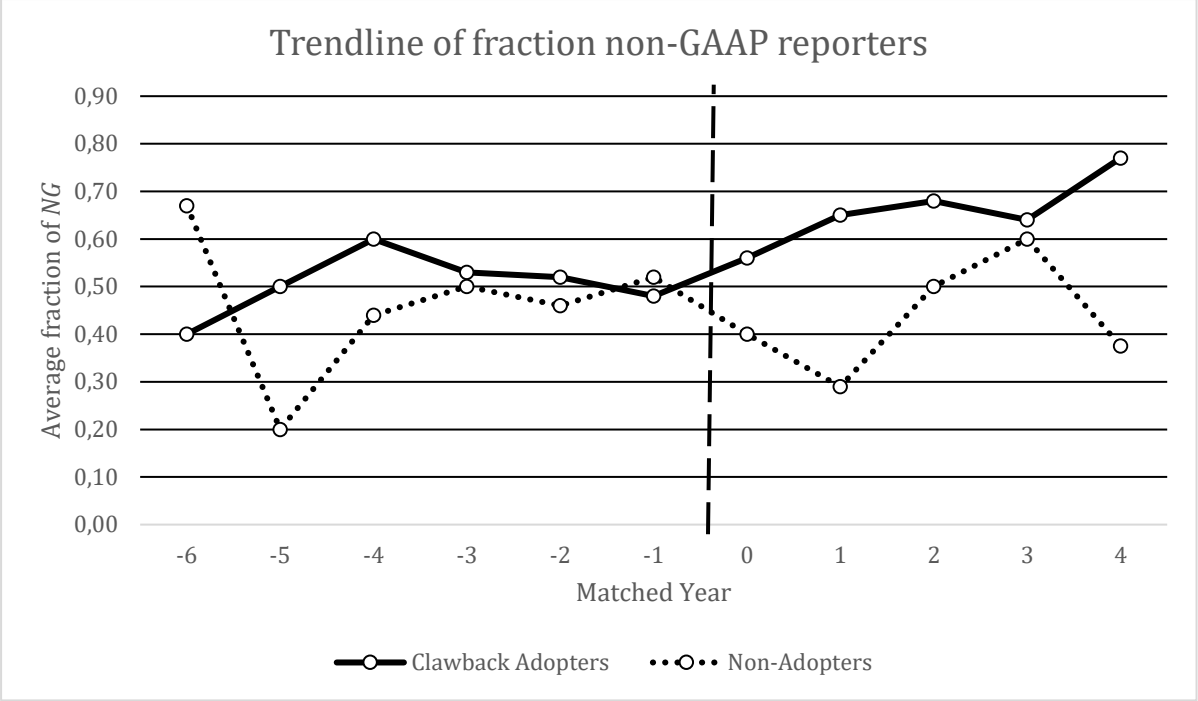


Figure 2A. This figure shows the average logarithm of total compensation level before and after clawback adoption, where a firm adopts a clawback in matched year 0. As expected, before clawback adoption, the trendlines of clawback adopters and non-adopters move together. The correlation coefficient equals respectively 0.31 and 0.98 for the periods [-6; -1] and [-3;-1]. For analysis purposes, the period [-3; 2] is investigated, and bolded in the table.



This figure shows the average fraction of non-GAAP reporting to total firms before and after clawback adoption, where a firm adopts a clawback in matched year 0. As expected, before clawback adoption, the trendlines of clawback adopters and non-adopters move together. The correlation coefficient equals respectively -0.46 and -0.62 for the periods [-6; -1] and [-3;-1]. However, this is not a problem per se, because a small number of firms included for the period explains the difference between the two groups [-6; -4]. Moreover, although the correlation is negative, the groups do not differ significantly for the period [-3; -1]. For analysis purposes, the period [-3; 2] is investigated, and bolded in the table.

	Average *TOTALCOMP*				**Fraction of non-GAAP Reporting**			
Matched Year	**Clawback adopter**		**Non-Adopter**		**Clawback adopter**		**Non-Adopter**	
	Mean	*N*	*Mean*	*N*	*Mean*	*N*	*Mean*	*N*
-6	7,41	5	7,78	3	0,40	5	0,67	3
-5	7,96	8	7,67	5	0,50	8	0,20	5
-4	7,7	15	7,47	9	0,60	15	0,44	9
-3	7,62	15	7	14	0,53	15	0,50	14
-2	7,89	27	7,86	24	0,52	27	0,46	24
-1	7,89	31	7,96	31	0,48	31	0,52	31
0	8,1	27	7,83	25	0,56	27	0,40	25
1	8,12	23	8,08	17	0,65	23	0,29	17
2	8,33	22	8,2	18	0,68	22	0,50	18
3	8,34	14	8,44	15	0,64	14	0,60	15
4	8,43	13	8,5	8	0,77	13	0,38	8

Appendix D: Stata Code

```
use "Clawbacks.dta", clear
egen firm_id = group(cusip8) // a unique firm
bys firm_id: egen TREAT = max(clawback)
unique firm_id if TREAT==1 // 413
unique firm_id if TREAT==0 // 253
tab fyear // 2007-2016
count if clawback==1 // 1937

use "Compustat.dta", clear
 // Compustat
set more off
sort cusip fyear
order cusip fyear
tab fyear
gen cusip8 = substr(cusip,-8,.)
order cusip cusip8 fyear

// datadate 31/1/2003 - 30/6/2017 (annually, fiscal year ending)
// Identifiers: gvkey cusip datadate fyear
duplicates report cusip8 fyear
duplicates drop cusip8 fyear, force // 345 obs deleted

// Variables
gen ID = gvkey
destring ID, replace
sort ID fyear
xtset ID fyear, yearly

gen Assets = at
gen lnAssets = ln(at)
gen Leverage = ((dlc+dltt)/Assets)*100 // (current+LT-debt)/total assets
replace Leverage = 0 if Assets != . & Leverage==.
gen Growth = (sale-l.sale)/l.sale
// RD as percentage of total sales
gen RD = xrd/sale
replace RD = 0 if RD==.
gen dReceivable = (rect-l.rect)/(Assets+l.Assets/2)*100
replace dReceivable = 0 if missing(dReceivable)
gen Intangibles = intan/Assets
replace Intangibles = 0 if Intangibles == .
gen SoftAssets = (Assets-(ppent+che))/Assets
replace SoftAssets = 0 if SoftAssets == .
gen CashReturn = ebitda/l.Assets
gen ROA = ib/((Assets+l.Assets)/2)*100
gen ROAMEAN = (ROA+l.ROA+l2.ROA+l3.ROA)/4
gen ROAVAR = ((ROA-ROAMEAN)^2+(l.ROA-ROAMEAN)^2+(l2.ROA-ROAMEAN)^2+(l3.ROA-
ROAMEAN)^2)/3
gen ROASD = ROAVAR^(.5)
gen lnROASD = ln(ROASD)
replace lnROASD=0 if lnROASD==.
gen Loss = 0
replace Loss = 1 if ni < 0
gen MTB = mkvalt /(at - lt)
gen TobinsQ = (csho*prcc_f+dltt+dlc)/Assets
gen return = dvpsx_f + (prcc_f-l.prcc_f)
gen lROA = l.ROA
gen lreturn = l.return
gen lEPS = l.epsfx
gen lROASD = l.ROASD
drop ID
egen firm_id = group(cusip8) // a unique firm

 // Merging clawbacks
merge 1:1 cusip8 fyear using "Clawbacks.dta"
bys firm_id: egen TREAT = max(clawback)
```

```
order cusip8 cusip fyear _merge conm companyname
sort cusip8 _merge
drop if _merge==2
drop _merge

 // Other changes
drop if TREAT==.
sort firm_id fyear
xtset firm_id fyear

// Assume clawback=0 if future years also do not have a clawback
replace clawback=0 if TREAT==1 & clawback==. & f.clawback==0
replace clawback=0 if TREAT==1 & clawback==. & f.clawback==0 & f2.clawback==0
replace clawback=0 if TREAT==1 & clawback==. & f.clawback==0 & f2.clawback==0
& f3.clawback==0
replace clawback=0 if TREAT==1 & clawback==. & f.clawback==0 & f2.clawback==0
& f3.clawback==0 & f4.clawback==0
replace clawback=0 if TREAT==1 & clawback==. & f.clawback==0 & f2.clawback==0
& f3.clawback==0 & f4.clawback==0 & f5.clawback==0
replace clawback=0 if TREAT==1 & clawback==. & f.clawback==0 & f2.clawback==0
& f3.clawback==0 & f4.clawback==0 & f5.clawback==0 & f6.clawback==0
replace clawback=0 if TREAT==1 & clawback==. & f.clawback==0 & f2.clawback==0
& f3.clawback==0 & f4.clawback==0 & f5.clawback==0
gen lclaw = l.clawback

// Identify firms that are no 'hard' adopters (less than two years)
bys firm_id: egen CONTROL = sum(clawback)
bys firm_id: replace clawback=. if clawback==1 & CONTROL==1 & TREAT==1
drop CONTROL
bys firm_id: egen CONTROL = sum(clawback)
replace TREAT=0 if CONTROL==0 & TREAT==1

// Control firms stay control firms
replace clawback=0 if TREAT==0 & clawback==.

*MATCH firm years
bys firm_id: gen MATCH = 0 if (clawback-l.clawback)==1
order firm_id fyear clawback TREAT MATCH CONTROL
format fyear %9.0g

 // replace all . in MATCH if treatment firm
bys firm_id: replace MATCH = -1 if f.MATCH==0
bys firm_id: replace MATCH = -2 if f2.MATCH==0
bys firm_id: replace MATCH = -3 if f3.MATCH==0
bys firm_id: replace MATCH = -4 if f4.MATCH==0
bys firm_id: replace MATCH = -5 if f5.MATCH==0
bys firm_id: replace MATCH = -6 if f6.MATCH==0
bys firm_id: replace MATCH = -7 if f7.MATCH==0
bys firm_id: replace MATCH = -8 if f8.MATCH==0
bys firm_id: replace MATCH = -9 if f9.MATCH==0
bys firm_id: replace MATCH = -10 if f10.MATCH==0
bys firm_id: replace MATCH = 1 if l.MATCH==0
bys firm_id: replace MATCH = 2 if l2.MATCH==0
bys firm_id: replace MATCH = 3 if l3.MATCH==0
bys firm_id: replace MATCH = 4 if l4.MATCH==0
bys firm_id: replace MATCH = 5 if l5.MATCH==0
bys firm_id: replace MATCH = 6 if l6.MATCH==0
bys firm_id: replace MATCH = 7 if l7.MATCH==0
bys firm_id: replace MATCH = 8 if l8.MATCH==0
bys firm_id: replace MATCH = 9 if l9.MATCH==0
bys firm_id: replace MATCH = 10 if l10.MATCH==0

count // 7578
unique firm_id if TREAT!=. // 565
unique firm_id if TREAT==1 // 321
unique firm_id if TREAT==0 // 244
tab fyear // 2003 - 2017
count if clawback==1 // 1712
```

```
117.  // Merge Non-GAAP
118. sort gvkey datadate
119. merge 1:1 gvkey datadate using "IdentifiersQ.dta"
120. order gvkey datadate fyearq fyear epsfxq epsfx
121. sort gvkey datadate fyearq
122. drop _merge

123. merge 1:1 gvkey datadate using "Non-GAAP.dta"

124. sort gvkey datadate
125. gen EPS_Q = epsfxq
126. gen NG_EXC_Q = NG_diluted_EPS - EPS_Q

127. egen firmyear = group(gvkey fyearq)
128. bys firmyear: egen NG_EXC_Y = sum(NG_EXC_Q)
129. bys firmyear: egen NG_EPS_Y = sum(NG_diluted_EPS)
130. gen SI = epsfx - epsfi
131. gen OtherExc = NG_EXC_Y - SI
132. order gvkey datadate fyearq fyear EPS_Q epsfx NG_diluted_EPS NG_EPS_Y NG_EXC_Q
     NG_EXC_Y NG _merge

133. drop firm_id
134. egen firm_id = group(gvkey) // a unique firm

135. xtset firm_id fyear
136. gen FOPI = f.epsfx
137. gen lEXC = l.NG_EXC_Y
138. gen lnlEXC = ln(lEXC)
139. gen lnEXC = ln(NG_EXC_Y)
140. order gvkey datadate fyearq fyear EPS_Q epsfx NG_diluted_EPS NG_EPS_Y NG_EXC_Q
     NG_EXC_Y NG _merge FOPI
141. sort gvkey datadate

142. drop if _merge==1 | _merge==2
143. drop _merge

144. drop if fyear==.
145. drop NG_EXC_Q EPS_Q epsfxq

146. count // 4135
147. unique firm_id // 504
148. unique firm_id if TREAT==1 // 292
149. unique firm_id if TREAT==0 // 212
150. tab fyear // 2003 - 2015
151. count if clawback==1 // 985
152. count if NG==1 // 1875
153. drop if missing(cik)
154. save "CompustatMerge.dta", replace

155. use "AuditAnalytics2.dta", clear
156.  // Audit Analytics
157. set more off
158. rename company_fkey cik
159. rename fiscal_year fyear
160. tab fyear // 2005 - 2016 * 1/1/2006 - 31/12/2016 (fiscal year ended)

161. order cik fyear
162. sort cik fyear

163. *Variable
164. gen BIG4 = 0
165. replace BIG4 = 1 if auditor_fkey == 1| auditor_fkey == 2| auditor_fkey == 3|
     auditor_fkey == 4

166. // Identifiers: company_fkey (cik) fiscal_year (fyear)
167. duplicates drop cik fyear if restatement!=1, force
168. duplicates report fyear cik
```

```
169. duplicates drop fyear cik, force //

170. gen ID = cik
171. destring ID, replace
172. destring fyear, replace
173. sort ID fyear
174. xtset ID fyear, yearly

175. gen PriorRest = 0
176. replace PriorRest = 1 if l.restatement == 1 | l2.restatement == 1
177. gen Restate = 0
178. replace Restate = 1 if restatement==1
179. drop ID

180. merge 1:1 fyear cik using "CompustatMerge.dta"
181. order cik fyear _merge
182. sort cik fyear _merge
183. drop if _merge==1 | _merge==2
184. drop _merge
185. gen cusipEx = substr(cusip, 1, 8)
186. order cusip cusip8 cusipEx

187. count // 3300
188. unique firm_id // 492
189. unique firm_id if TREAT==1 // 288
190. unique firm_id if TREAT==0 // 204
191. tab fyear // 2005 - 2015
192. count if clawback==1 // 982
193. count if NG==1 // 1628
194. save "ComAud.dta", replace

195.  // Merge Execucomp
196. use "Execucomp.dta", clear

197. set more off
198. tab year
199. // year 2005 - 2016 (annually, fiscal years)
200. // Identifiers: gvkey cusip, year
201. // gvkey
202. rename year fyear
203. order gvkey fyear cfoann ceoann
204. sort gvkey fyear cfoann ceoann

205. // Variables
206. gen CEOAge = age if ceoann=="CEO"
207. gen BaseSalary = salary
208. replace BaseSalary = 0 if BaseSalary ==.
209. gen OthComp = othcomp
210. replace OthComp = 0 if OthComp ==.
211. gen Bonus = bonus
212. replace Bonus = 0 if Bonus ==.
213. gen StockAwards = stock_awards
214. replace StockAwards = 0 if StockAwards ==.
215. gen OptionAwards = option_awards
216. replace OptionAwards = 0 if OptionAwards ==.
217. gen OtherNEI = noneq_incent
218. replace OtherNEI = 0 if OtherNEI ==.
219. gen PensionComp = pension_chg
220. replace PensionComp = 0 if PensionComp ==.
221. gen EqInc = StockAwards+OptionAwards
222. gen NonEqInc = Bonus+OtherNEI
223. gen NonInc = BaseSalary+OthComp+PensionComp
224. gen Inc = EqInc + NonEqInc
225. gen TotalComp = (BaseSalary + OthComp + StockAwards + OptionAwards + Bonus +
     OtherNEI + PensionComp)
226. gen IncentiveComp = (StockAwards + OptionAwards + Bonus + OtherNEI)/TotalComp
227. count if TotalComp == .
228. replace IncentiveComp = 0 if IncentiveComp ==.
```

```
sort gvkey fyear
egen group = group(gvkey fyear)
bys group: gen x = 1 if ceoann=="CEO"
bys group: egen TotalCEO = sum(x)
tab TotalCEO
sort TotalCEO gvkey fyear
order gvkey fyear TotalCEO ceoann
replace TotalCEO=. if TotalCEO==1
replace ceoann="CEO" if pceo!="" & TotalCEO == 0
replace ceoann="CEO" if becameceo!=. & TotalCEO == 0

// Variable
bys group: egen InsiderTot = sum(shrown_tot)
bys group: egen InsiderPerc1 = sum(shrown_tot_pct)
drop group
keep if ceoann=="CEO" // 107.899 observations deleted

// InsiderPerc = fraction of total shares owned by the CEO and CFO
duplicates report cusip fyear
duplicates drop cusip fyear, force
sort fyear cusip
rename cusip cusipEx // no difference
merge 1:1 fyear cusipEx using "ComAud.dta", force
// cusip cusipEx cusip8 and tic does not matter
order gvkey fyear _merge
sort gvkey fyear _merge
drop if _merge==1 | _merge==2
drop _merge // dropped 22.747 observations

// Variables
gen InsiderPerc = InsiderTot / csho
*hist InsiderPerc
gen lnInsider = ln(InsiderPerc)
replace lnInsider = 0 if lnInsider==.
*hist lnInsider, normal // OK

order firm_id fyear
sort firm_id fyear
xtset firm_id fyear, yearly
destring execid, replace
gen ExecID= l2.execid
bys firm_id: gen Tenure = 1 if (execid-ExecID)==0
replace Tenure=0 if Tenure==.

gen lnBaseSalary = ln(BaseSalary)
replace lnBaseSalary = 0 if lnBaseSalary==.
gen flnBaseSalary = f.lnBaseSalary

gen lnOthComp = ln(OthComp)
replace lnOthComp = 0 if lnOthComp==.
gen flnOthComp = f.lnOthComp

gen lnBonus = ln(Bonus)
replace lnBonus = 0 if lnBonus==.
gen flnBonus = f.lnBonus

gen lnOtherNEI = ln(OtherNEI)
replace lnOtherNEI = 0 if lnOtherNEI==.
gen flnOtherNEI = f.lnOtherNEI

gen lnStockAwards = ln(StockAwards)
replace lnStockAwards = 0 if lnStockAwards==.
gen flnStockAwards = f.lnStockAwards

gen lnOptionAwards = ln(OptionAwards)
replace lnOptionAwards = 0 if lnOptionAwards==.
gen flnOptionAwards = f.lnOptionAwards
```

```
gen lnPensionComp = ln(PensionComp)
replace lnPensionComp = 0 if lnPensionComp==.
gen flnPensionComp = f.lnPensionComp

gen lnTotalComp = ln(TotalComp)
replace lnTotalComp = 0 if lnTotalComp==.
gen flnTotalComp = f.lnTotalComp

gen lnNonEqInc = ln(NonEqInc)
replace lnNonEqInc = 0 if lnNonEqInc==.
gen flnNonEqInc = f.lnNonEqInc

gen lnEqInc = ln(EqInc)
replace lnEqInc = 0 if lnEqInc==.
gen flnEqInc = f.lnEqInc

gen lnInc = ln(Inc)
replace lnInc = 0 if lnInc==.
gen flnInc = f.lnInc

gen lnNonInc = ln(NonInc)
replace lnNonInc = 0 if lnNonInc==.
gen flnNonInc = f.lnNonInc

count // 2233
unique firm_id // 330
unique firm_id if TREAT==1 // 228
unique firm_id if TREAT==0 // 102
tab fyear // 2005 - 2015
count if clawback==1 // 846
count if NG==1 // 1259

// NOTE: CFO can also be examined !!!! Repeat this step for other file

save "ComAudExe.dta", replace

*Open ISS
use "ISS.dta", clear

rename year fyear
gen cusip8 = substr(cusip,-8,.)
order cusip8 fyear
sort cusip8 fyear
drop if missing(cusip8)

// Variables
keep cusip cusip8 fyear classification meetingdate pcnt_ctrl_votingpower
female cg_membership comp_membership audit_membership financial_expert age
employment_ceo employment_chairman ticker

// Numbers of directors (assuming all people are active members in the board
of directors)
gen x = 1
egen group = group(cusip8 fyear)
bysort group: egen TotalDirectors = sum(x)

// Percentage of females
gen Female = 0
replace Female = 1 if female =="Yes"
bysort group: egen TotalFemale = sum(Female)
gen DirFemPerc = TotalFemale/TotalDirectors

// CEODuality
gen CEODuality = 0
replace CEODuality = 1 if employment_ceo == "Yes" & employment_chairman ==
"Yes"
bys group: egen CEOChair = max(CEODuality)
```

```
336. // Percentage of independent board members
337. gen Independent = 0
338. replace Independent = 1 if classification=="I"
339. bysort group: egen TotalIndependent = sum(Independent)
340. gen PercIndependent = TotalIndependent/TotalDirectors

341. // Total members in Corporate Governance Committee
342. gen CGComm = 0
343. replace CGComm = 1 if cg_membership == "Chair" | cg_membership == "chair" |
     cg_membership == "Member" | cg_membership == "member"
344. bysort group: egen TotalCGComm = sum(CGComm)

345. // Total members in compensation committee
346. gen CompComm = 0
347. replace CompComm = 1 if comp_membership == "Chair" | comp_membership ==
     "chair" | comp_membership == "Member" | comp_membership == "member"
348. bysort group: egen TotalCompComm = sum(CompComm)

349. // Total members in audit committee
350. gen AudComm = 0
351. replace AudComm = 1 if audit_membership == "Chair" | audit_membership ==
     "chair" | audit_membership == "Member" | audit_membership == "member"
352. bysort group: egen TotalAudComm = sum(AudComm)

353. // Total financial expertise within all committees
354. gen Expert = 0
355. replace Expert = 1 if financial_expert =="Yes"
356. bysort group: egen TotalExperts = sum(Expert)
357. gen DirExpertPerc = TotalExperts/TotalDirectors

358. // Average age of directors
359. bysort group: egen DirectorAge = mean(age)
360. summ age, detail // median = 63
361. replace age = r(p50) if age>100 | age==. | age==0 | age==1

362. sort cusip fyear
363. duplicates report cusip fyear
364. duplicates drop cusip fyear, force
365. drop group
366. merge 1:1 cusip8 fyear using "ComAudExe.dta", force
367. // Merged with cusip8: 12635 remaining // cusip: 12.635 remaining
368. order cusip8 fyear _merge
369. sort cusip8 fyear _merge
370. drop if _merge==1 | _merge==2
371. drop _merge // dropped 10.359 observations

372. count // 1525
373. unique firm_id // 231
374. unique firm_id if TREAT==1 // 150
375. unique firm_id if TREAT==0 // 81
376. tab fyear // 2005 - 2015
377. count if clawback==1 // 718
378. count if NG==1 // 881
379. order firm_id fyear clawback TREAT

380.  // Saving + Year / Industry-fixed effects retrieved from:
     https://www.osha.gov/pls/imis/sic_manual.html
381. gen Y07 = 0
382. gen Y08 = 0
383. gen Y09 = 0
384. gen Y10 = 0
385. gen Y11 = 0
386. gen Y12 = 0
387. gen Y13 = 0
388. gen Y14 = 0
389. gen Y15 = 0
390. gen Y16 = 0
```

```
replace Y07 = 1 if fyear==2007
replace Y08 = 1 if fyear==2008
replace Y09 = 1 if fyear==2009
replace Y10 = 1 if fyear==2010
replace Y11 = 1 if fyear==2011
replace Y12 = 1 if fyear==2012
replace Y13 = 1 if fyear==2013
replace Y14 = 1 if fyear==2014
replace Y15 = 1 if fyear==2015
replace Y16 = 1 if fyear==2016

gen SIC = string(sic)
gen SIC2 = substr(SIC,1,2)
order SIC SIC2
destring SIC SIC2, replace
*Similar to Lafond and Roychowdhury (2008), the litigious industries are
defined by the following SIC codes: 2833-2836, 3570-3577, 3600-3674, 5200-5961
and 7370.
gen Litigation = 0
replace Litigation = 1 if SIC > 2832 & SIC < 2837
replace Litigation = 1 if SIC > 3569 & SIC < 3578
replace Litigation = 1 if SIC > 3599 & SIC < 3675
replace Litigation = 1 if SIC > 5199 & SIC < 5962
replace Litigation = 1 if SIC == 7370

gen Agriculture = 0
replace Agriculture = 1 if SIC2>0 & SIC2 < 10
gen Mining = 0
replace Mining = 1 if SIC2>9 & SIC2<15
gen Construction = 0
replace Construction = 1 if SIC2>14 & SIC2<18
gen Manufacturing = 0
replace Manufacturing = 1 if SIC2>19 & SIC2<40
gen Transportation = 0
replace Transportation = 1 if SIC2>39 & SIC2<50
gen Wholesale = 0
replace Wholesale = 1 if SIC2>49 & SIC2<52
gen Retail = 0
replace Retail = 1 if SIC2>51 & SIC2<60
gen Financials = 0
replace Financials = 1 if SIC2>59 & SIC2<68
gen Services = 0
replace Services = 1 if SIC2>69 & SIC2<90
gen Administration = 0
replace Administration = 1 if SIC2>90 & SIC2<98
gen Nonclassifiable = 0
replace Nonclassifiable = 1 if SIC2>98
save "ComAudExeISS.dta", replace

use "ComAudExeISS.dta", clear
// Drop treatment firms without matching years
// Less: Drop treatment firms without pre-adoption year
gen M1 = 1 if MATCH==-1
bys firm_id: egen USE = max(M1)
drop if USE!=1 & TREAT==1
drop USE

count // 1022
unique firm_id // 175
unique firm_id if TREAT==1 // 94
unique firm_id if TREAT==0 // 81
tab fyear // 2005 - 2015
count if clawback==1 // 321
count if NG==1 // 581

// Drop if no clawback is adopted after an adoption year
sort firm_id fyear
xtset firm_id fyear
```

```
drop if TREAT==1 & clawback==0 & l.clawback==1 // 22
drop if TREAT==1 & clawback==0 & l2.clawback==1 // 8
drop if TREAT==1 & clawback==0 & l3.clawback==1 // 5
drop if TREAT==1 & clawback==0 & l4.clawback==1 // 6
drop if TREAT==1 & clawback==0 & l5.clawback==1 // 2
count // 992
unique firm_id // 175
unique firm_id if TREAT==1 // 94
unique firm_id if TREAT==0 // 81
tab fyear // 2005 - 2015
count if clawback==1 // 321
count if NG==1 // 563
order firm_id fyear clawback TREAT MATCH

// Less: Firms with less than two firm-years before or after clawback adoption
gen AFT = 1 if MATCH >= 0
gen BEF = 1 if MATCH < 0
bys firm_id: egen AUSE = sum(AFT)
bys firm_id: egen BUSE = sum(BEF)
gen UNUSE = 1 if AUSE < 1 | BUSE < 1
drop if UNUSE == 1 & TREAT==1
unique firm_id // 175
unique firm_id if TREAT==1 // 88
unique firm_id if TREAT==0 // 81
tab fyear // 2005 - 2015
count if clawback==1 // 306
count if NG==1 // 558

drop CONTROL AUSE BUSE UNUSE

// Drop Financials
drop if Financials==1
unique firm_id // 149
unique firm_id if TREAT==1 // 75
unique firm_id if TREAT==0 // 74
tab fyear // 2007 - 2015
count if clawback==1 // 321
count if NG==1 // 558

 // Governance Variables
// drop missing variables & winsorize data
// Governance
drop if missing(TotalDirectors)
*hist TotalDirectors, normal width(1) // OK
drop if missing(TotalFemale)
*hist TotalFemale, normal width(1) // OK
drop if missing(DirFemPerc)
*hist DirFemPerc, normal width(.1) // OK
drop if missing(PercIndependent)
*hist PercIndependent, kdensity normal width(.1) // OK
drop if missing(TotalCGComm)
*hist TotalCGComm, normal width(1) // OK
drop if missing(TotalCompComm)
*hist TotalCompComm, kdensity normal width(1) // OK
drop if missing(TotalAudComm)
*hist TotalAudComm, normal width(1) // OK
drop if missing(TotalExperts)
*hist TotalExperts, normal width(1) // OK
drop if missing(DirExpertPerc)
*hist DirExpertPerc, normal width(.05) // OK
drop if missing(DirectorAge)
*hist DirectorAge, kdensity normal // OK
drop if missing(CEOChair)
drop if missing(CEOAge)
*hist Tenure, normal // OK
drop if Tenure==. // 6 observations
*hist lnInsider, normal // OK
```

```
515.  // Compensation. Assuming ln(x) = 0, if x=0, since earning 1 or 0 dollars is
      economically insignificant.
516. winsor2 BaseSalary OthComp OtherNEI Bonus StockAwards OptionAwards PensionComp
      TotalComp NonEqInc EqInc NonInc IncentiveComp lnBaseSalary lnTotalComp
      NonEqInc lnNonInc, replace cuts(2 98)

517. drop if missing(BaseSalary)
518. *hist BaseSalary, normal // OK
519. *hist lnBaseSalary, normal // OK

520. drop if missing(OthComp)
521. *hist OthComp, normal // winsor right
522. *hist lnOthComp, normal // OK

523. drop if missing(Bonus)
524. *hist Bonus, normal // winsor right
525. *hist lnBonus, normal // NAH

526. drop if missing(OtherNEI)
527. *hist OtherNEI, normal // winsor right
528. *hist lnOtherNEI, normal

529. drop if missing(StockAwards)
530. *hist StockAwards, normal // winsor right
531. *hist lnStockAwards, normal // Nah

532. drop if missing(OptionAwards)
533. *hist OptionAwards, normal // winsor right
534. *hist lnOptionAwards, normal // NAH

535. drop if missing(PensionComp)
536. *hist PensionComp, normal // winsor right
537. *hist lnPensionComp, normal

538. drop if missing(TotalComp)
539. *hist TotalComp, normal // winsor right
540. *hist lnTotalComp, normal // OK!

541. *hist NonEqInc, normal
542. *hist lnNonEqInc, normal // A lot of executives do not receives non-equity
      incentives

543. *hist EqInc, normal
544. *hist lnEqInc, normal // OK!

545. *hist Inc, normal
546. *hist lnInc, normal // OK

547. *hist NonInc, normal
548. *hist lnNonInc, normal // OK
549. drop if missing(IncentiveComp)
550. *hist IncentiveComp, kdensity normal width(.05) // OK

551. winsor2 NG_EXC_Y SI OtherExc, replace cuts(2 98)
552. *hist NG_EXC_Y, normal
553. *hist SI, normal
554. *hist OtherExc, normal
555. *hist FOPI, normal

556.  // Firm-specific characteristics
557. winsor2 Leverage Growth CashReturn ROA MTB TobinsQ dReceivable RD return lROA
      lreturn lEXC, replace cuts(2 98)

558. drop if missing(Assets)
559. *hist Assets, normal
560. drop if missing(lnAssets)
561. *hist lnAssets, normal // OK
562. drop if missing(Leverage)
```

```
*hist Leverage, kdensity normal // OK
drop if missing(Growth)
*hist Growth, kdensity normal // winsor right
drop if missing(dReceivable)
*hist dReceivable, normal
drop if missing(RD)
*hist RD, kdensity normal // winsor right
replace RD=1 if RD>0
tab RD // rd obs = 3218
drop if missing(Intangibles)
*hist Intangibles, kdensity normal // OK

drop if missing(SoftAssets)
*hist SoftAssets, kdensity normal // winsor right
drop if missing(CashReturn) // dropping 15 obs
*hist CashReturn, kdensity normal // winsor left/right

drop if missing(ROA)
*hist ROA, kdensity normal // OK
*hist ROAVAR, kdensity normal // OK
*hist lnROASD, normal // OK

count if missing(return)
*hist return // OK
drop if missing(Loss)
drop if missing(MTB)
*hist MTB, kdensity normal // OK
drop if missing(TobinsQ)
*hist TobinsQ, kdensity normal // OK
drop if missing(clawback)
drop if missing(BIG4)
*hist BIG4, kdensity normal

unique firm_id // 149
unique firm_id if TREAT==1 // 75
unique firm_id if TREAT==0 // 74
tab fyear // 2007 - 2015
count if clawback==1 // 248
count if NG==1 // 489

save Merges.dta, replace

use Merges.dta, clear
set more off


global vars firm_id cusip8 fyear mkvalt clawback TREAT MATCH sic NG
     NG_diluted_EPS NG_EPS_Y NG_EXC_Y lnlEXC lnEXC SI OtherExc FOPI TotalDirectors
     TotalFemale DirFemPerc TotalIndependent PercIndependent TotalCGComm
     TotalCompComm TotalAudComm TotalExperts DirExpertPerc DirectorAge lnInsider
     CEOChair CEOAge Tenure BaseSalary OthComp Bonus StockAwards OptionAwards
     OtherNEI PensionComp EqInc NonEqInc NonInc TotalComp IncentiveComp
     lnBaseSalary lnOthComp lnBonus lnStockAwards lnOptionAwards lnOtherNEI
     lnTotalComp lnNonEqInc lnEqInc Inc lnInc lnNonInc lnAssets Leverage Growth RD
     Intangibles SoftAssets CashReturn ROA ROAVAR ROASD lnROASD Loss MTB TobinsQ
     dReceivable Litigation PriorRest Restate BIG4 epsfx Y07 Y08 Y09 Y10 Y11 Y12
     Y13 Y14 Y15 Y16 Agriculture Mining Construction Manufacturing Transportation
     Wholesale Retail Financials Services Administration Nonclassifiable return
     lROA lreturn lEPS lROASD lEXC lclaw
order $vars
keep $vars
sort firm_id fyear

gen DirectorAge2 = DirectorAge^2
global xlist NG TotalDirectors DirFemPerc TotalIndependent TotalCGComm
     TotalCompComm TotalAudComm DirectorAge DirectorAge2 lnInsider CEOChair CEOAge
     Intangibles Tenure lnAssets Leverage epsfx lnROASD MTB CashReturn TobinsQ Loss
```

```
    PriorRest Litigation /* ROA IncentiveComp TotalFemale lnTotalComp dReceivable
    Growth BIG4 SoftAssets Restate TotalExpert*/
607. global xlist1 TotalDirectors DirFemPerc TotalIndependent TotalCGComm
    TotalCompComm TotalAudComm DirectorAge DirectorAge2 lnInsider CEOChair CEOAge
    Intangibles Tenure lnAssets Leverage epsfx lnROASD MTB CashReturn TobinsQ Loss
    PriorRest Litigation // Without NG
608. global xlist2 TotalDirectors DirFemPerc TotalIndependent TotalCGComm
    TotalCompComm TotalAudComm DirectorAge DirectorAge2 lnInsider CEOChair CEOAge
    Intangibles Tenure lnAssets Leverage lnROASD MTB CashReturn TobinsQ Loss
    PriorRest Litigation // Without NG & epsfx
609. global xlist3 NG TotalDirectors DirFemPerc TotalIndependent TotalCGComm
    TotalCompComm TotalAudComm DirectorAge DirectorAge2 lnInsider CEOChair CEOAge
    Intangibles Tenure lnAssets Leverage lEPS lnROASD MTB CashReturn TobinsQ Loss
    PriorRest Litigation // lEPS included
610. global IND Agriculture Mining Construction Manufacturing Transportation
    Wholesale Retail Services Administration Nonclassifiable
611. global YEAR Y07 Y08 Y09 Y10 Y11 Y12 Y13 Y14 Y15 Y16

612.  // LABELS
613. label variable NG "NG"
614. label variable TotalDirectors "DIRECTORS"
615. label variable DirFemPerc "DIRFEM"
616. label variable TotalIndependent "INDEPENDENT"
617. label variable TotalCGComm "CGCOMM"
618. label variable TotalCompComm "COMPCOMM"
619. label variable TotalAudComm "AUDCOMM"
620. label variable DirectorAge "DIRAGE"
621. label variable DirectorAge2 "DIRAGE2"
622. label variable lnInsider "INSIDERPERC"
623. label variable CEOChair "CEOCHAIR"
624. label variable CEOAge "CEOAGE"
625. label variable Intangibles "INTANGIBLES"
626. label variable Tenure "TENURE"
627. label variable lnAssets "LNASSETS"
628. label variable Leverage "LEVERAGE"
629. label variable epsfx "GAAP_EPS"
630. label variable lnROASD "ROASD"
631. label variable MTB "MTB"
632. label variable CashReturn "CASHRETURN"
633. label variable TobinsQ "TOBIN'S Q"
634. label variable Loss "LOSS"
635. label variable PriorRest "PRIORRESTATE"
636. label variable Litigation "LITIGATION"

637. save Before.dta, replace
638.  // Correlation table and descriptives - full sample
639. estpost correlate lnTotalComp NG_EXC_Y SI OtherExc $xlist, matrix listwise
640. est store c1
641. esttab * using Correlationtable.xls, unstack not noobs compress replace

642. // Descriptive Statistics - full sample
643. bys TREAT: outreg2 using descriptivesperclaw.xls, sum(detail) eqkeep(mean N
    p50 sd min max) excel replace keep($xlist) dec(3)
644. outreg2 using descriptivesfull.xls, sum(detail) eqkeep(mean N p50 sd min max)
    excel replace keep($xlist) dec(3)

645. ttest NG, by(TREAT) unequal
646. ttest TotalDirectors, by(TREAT) unequal
647. ttest DirFemPerc, by(TREAT) unequal
648. ttest TotalIndependent, by(TREAT) unequal
649. ttest TotalCGComm, by(TREAT) unequal
650. ttest TotalCompComm, by(TREAT) unequal
651. ttest TotalAudComm, by(TREAT) unequal
652. ttest DirectorAge, by(TREAT) unequal
653. ttest lnInsider, by(TREAT) unequal
654. ttest CEOChair, by(TREAT) unequal
655. ttest CEOAge, by(TREAT) unequal
656. ttest Intangibles, by(TREAT) unequal
```

```
ttest Tenure, by(TREAT) unequal
ttest lnAssets, by(TREAT) unequal
ttest Leverage, by(TREAT) unequal
ttest epsfx, by(TREAT) unequal
ttest lnROASD, by(TREAT) unequal
ttest MTB, by(TREAT) unequal
ttest CashReturn, by(TREAT) unequal
ttest TobinsQ, by(TREAT) unequal
ttest Loss, by(TREAT) unequal
ttest PriorRest, by(TREAT) unequal
ttest Litigation, by(TREAT) unequal

rename TREAT treat
logit treat $xlist $YEAR $IND if (MATCH ==-1 | MATCH==.), robust
test TotalCGComm TotalCompComm TotalAudComm

*regress treat NG TotalComp SI NG_EXC_Y OtherExc TotalDirectors DirFemPerc
TotalIndependent TotalCGComm TotalCompComm TotalAudComm DirectorAge lnInsider
CEOChair CEOAge Intangibles Tenure lnAssets Leverage epsfx lnROASD MTB
CashReturn TobinsQ Loss PriorRest Litigation if (MATCH ==-1 | MATCH==.)
*estat vif // Mean VIF is 2.18
*outreg2 using logit.xls, excel replace label dec(3) seeout

 // MATCHING
gen USED = (treat == 1 | treat == 0)
order firm_id fyear clawback treat MATCH USED
gen treatment=.
gen pdif=.
count if MATCH==-1 // 70
gen pscore2 = .
tab fyear if MATCH==-1 // 2007 - 2014
gen help_year = .

foreach num in 2007 2008 2009 2010 2011 2012 2013 2014
qui logit treat $xlist $YEAR $IND if (MATCH ==-1 | MATCH==.), robust
gen sample = e(sample)
predict double score if sample == 1
set seed 12345
tempvar sortorder
gen `sortorder' = runiform()
sort `sortorder'

psmatch2 treat, pscore(score) noreplacement descending caliper(0.03) common,
if fyear==`num' &(MATCH == -1 | MATCH == .) & USED == 1
gen help = 1 if treat == 1 & score != . & _n1 != .
replace help = 0 if treat == 0 & score != . & _weight != .
order firm_id fyear score help treat _weight
bysort firm_id: egen help_ = min(help)
replace USED = 0 if help_ !=.
replace pdif = _pdif if help == 1
replace pscore2 = score
replace help_year = 1 if help == 0
replace MATCH = -_weight if treat==0 & MATCH==.
drop _weight _n1 _treated help help_ _pscore _support _id _nn _pdif
drop score sample

*outreg2 using pscore.xls, sum(detail) eqkeep(mean N p1 p50 p75 p99 sd min
max) excel replace keep(pscore2 pdif) dec(3)
*outreg2 using pscoreMATCH.xls, sum(detail) eqkeep(mean N p1 p50 p75 p99 sd
min max) excel replace keep(pscore2) dec(3): summ pscore2 if MATCH==-1

 // replace all . in MATCH for control firms
bys firm_id: replace MATCH = -2 if f.MATCH==-1 & MATCH==.
bys firm_id: replace MATCH = -3 if f2.MATCH==-1 & MATCH==.
bys firm_id: replace MATCH = -4 if f3.MATCH==-1 & MATCH==.
bys firm_id: replace MATCH = -5 if f4.MATCH==-1 & MATCH==.
bys firm_id: replace MATCH = -6 if f5.MATCH==-1 & MATCH==.
bys firm_id: replace MATCH = -7 if f6.MATCH==-1 & MATCH==.
```

```
712. bys firm_id: replace MATCH = -8 if f7.MATCH==-1 & MATCH==.

713. bys firm_id: replace MATCH = 0 if l.MATCH==-1 & MATCH==.
714. bys firm_id: replace MATCH = 1 if l2.MATCH==-1 & MATCH==.
715. bys firm_id: replace MATCH = 2 if l3.MATCH==-1 & MATCH==.
716. bys firm_id: replace MATCH = 3 if l4.MATCH==-1 & MATCH==.
717. bys firm_id: replace MATCH = 4 if l5.MATCH==-1 & MATCH==.
718. bys firm_id: replace MATCH = 5 if l6.MATCH==-1 & MATCH==.
719. bys firm_id: replace MATCH = 6 if l7.MATCH==-1 & MATCH==.
720. bys firm_id: replace MATCH = 7 if l8.MATCH==-1 & MATCH==.
721. bys firm_id: replace MATCH = 8 if l9.MATCH==-1 & MATCH==.

722. drop if USED==1
723. bys treat: tab MATCH
724. count if USED == 0 & treat==0
725. count if USED == 0 & treat==1
726. keep if MATCH<3 & MATCH>-4
727. count if MATCH==-1 & USED==0 & treat==0 // 31
728. count if MATCH==-1 & USED==0 & treat==1 // 31
729. drop USED

730. Inequality ttests and KS-test
731. keep if MATCH==-1
732. bys treat: outreg2 using Sample2.xls, sum(detail) eqkeep(mean N p50) excel
     replace keep($xlist) dec(3)
733. ttest NG, by(treat) unequal
734. ksmirnov NG, by(treat) exact
735. ttest TotalDirectors, by(treat) unequal
736. ksmirnov TotalDirectors, by(treat) exact
737. ttest DirFemPerc, by(treat) unequal
738. ksmirnov DirFemPerc, by(treat) exact
739. ttest TotalIndependent, by(treat) unequal
740. ksmirnov TotalIndependent, by(treat) exact
741. ttest TotalCGComm, by(treat) unequal
742. ksmirnov TotalCGComm, by(treat) exact
743. ttest TotalCompComm, by(treat) unequal
744. ksmirnov TotalCompComm, by(treat) exact
745. ttest TotalAudComm, by(treat) unequal
746. ksmirnov TotalAudComm, by(treat) exact
747. ttest DirectorAge, by(treat) unequal
748. ksmirnov DirectorAge, by(treat) exact
749. ttest lnInsider, by(treat) unequal
750. ksmirnov lnInsider, by(treat) exact
751. ttest CEOChair, by(treat) unequal
752. ksmirnov CEOChair, by(treat) exact
753. ttest CEOAge, by(treat) unequal
754. ksmirnov CEOAge, by(treat) exact
755. ttest Intangibles, by(treat) unequal
756. ksmirnov Intangibles, by(treat) exact
757. ttest Tenure, by(treat) unequal
758. ksmirnov Tenure, by(treat) exact
759. ttest lnAssets, by(treat) unequal
760. ksmirnov lnAssets, by(treat) exact
761. ttest Leverage, by(treat) unequal
762. ksmirnov Leverage, by(treat) exact
763. ttest epsfx, by(treat) unequal
764. ksmirnov epsfx, by(treat) exact
765. ttest lnROASD, by(treat) unequal
766. ksmirnov lnROASD, by(treat) exact
767. ttest MTB, by(treat) unequal
768. ksmirnov MTB, by(treat) exact
769. ttest CashReturn, by(treat) unequal
770. ksmirnov CashReturn, by(treat) exact
771. ttest TobinsQ, by(treat) unequal
772. ksmirnov TobinsQ, by(treat) exact
773. ttest Loss, by(treat) unequal
774. ksmirnov Loss, by(treat) exact
775. ttest PriorRest, by(treat) unequal
```

```
776. ksmirnov PriorRest, by(treat) exact
777. ttest Litigation, by(treat) unequal
778. ksmirnov Litigation, by(treat) exact

779. gen after = 0
780. replace after = 1 if MATCH >= 0
781. gen byte aftertreat = treat*after
782. sort firm_id fyear
783. order firm_id fyear treat clawback after MATCH
784. tab after treat
785. save Results.dta, replace

786. // Results
787. use Results.dta, clear nol
788. drop __000000 __000001 __000002 __000003 __000004 __000005 __000006 __000007

789. *OK: BaseSalary lnBaseSalary lnOthComp lnTotalComp lnNonInc lnInc
     IncentiveComp NG
790. *Conditional OK (if have): lnOtherNEI lnStockAwards lnOptionAwards lnNonEqInc
     lnEqInc
791. *Other: NG NG_diluted_EPS

792.  // Label dependent variables
793. label variable lnTotalComp "TOTALCOMP"
794. label variable lnInc "INC"
795. label variable lnNonEqInc "NONEQINC"
796. label variable lnEqInc "EQINC"
797. label variable lnNonInc "SALARY"
798. label variable IncentiveComp "INC/COMP"
799.
800.  // H1: Compensation
801. ttest lnTotalComp if after==0 , by(treat) unequal
802. ttest lnTotalComp if after==1 , by(treat) unequal
803. ttest lnTotalComp if treat==0 , by(after) unequal
804. ttest lnTotalComp if treat==1 , by(after) unequal
805. regress lnTotalComp after treat aftertreat, robust
806. diff lnTotalComp, t(treat) p(after)
807. regress lnTotalComp after treat aftertreat $xlist $YEAR $IND, robust // +++
808. ereturn list r2_a
809. *outreg2 using TotComp.xls, excel replace label dec(3)

810. regress lnInc after treat aftertreat, robust
811. ttest lnInc if after==0 , by(treat) unequal
812. ttest lnInc if after==1 , by(treat) unequal
813. ttest lnInc if treat==0 , by(after) unequal
814. ttest lnInc if treat==1 , by(after) unequal
815. regress lnInc after treat aftertreat, robust
816. regress lnInc after treat aftertreat $xlist $YEAR $IND, robust // 000
817. ereturn list r2_a
818. *outreg2 using lnInc.xls, excel replace label dec(3)

819. regress lnNonEqInc after treat aftertreat, robust
820. ttest lnNonEqInc if after==0 , by(treat) unequal
821. ttest lnNonEqInc if after==1 , by(treat) unequal
822. ttest lnNonEqInc if treat==0 , by(after) unequal
823. ttest lnNonEqInc if treat==1 , by(after) unequal
824. regress lnNonEqInc after treat aftertreat, robust
825. regress lnNonEqInc after treat aftertreat $xlist $YEAR $IND, robust // 000
826. ereturn list r2_a
827. *outreg2 using lnNonEqInc.xls, excel replace label dec(3)

828. regress lnEqInc after treat aftertreat, robust
829. ttest lnEqInc if after==0 , by(treat) unequal
830. ttest lnEqInc if after==1 , by(treat) unequal
831. ttest lnEqInc if treat==0 , by(after) unequal
832. ttest lnEqInc if treat==1 , by(after) unequal
833. regress lnEqInc after treat aftertreat, robust
834. regress lnEqInc after treat aftertreat $xlist $YEAR $IND, robust // 000
```

```
ereturn list r2_a
*outreg2 using lnEqInc.xls, excel replace label dec(3)

regress lnNonInc after treat aftertreat, robust
ttest lnNonInc if after==0 , by(treat) unequal
ttest lnNonInc if after==1 , by(treat) unequal
ttest lnNonInc if treat==0 , by(after) unequal
ttest lnNonInc if treat==1 , by(after) unequal
regress lnNonInc after treat aftertreat, robust
regress lnNonInc after treat aftertreat $xlist $YEAR $IND, robust // +++
ereturn list r2_a
*outreg2 using lnNonInc.xls, excel replace label dec(3)

regress IncentiveComp after treat aftertreat, robust
ttest IncentiveComp if after==0 , by(treat) unequal
ttest IncentiveComp if after==1 , by(treat) unequal
ttest IncentiveComp if treat==0 , by(after) unequal
ttest IncentiveComp if treat==1 , by(after) unequal
regress IncentiveComp after treat aftertreat $xlist $YEAR $IND, robust // 000
ereturn list r2_a
*outreg2 using IncentiveComp.xls, excel replace label dec(3)

 // H2: NG frequency, xlist1
probit NG after treat aftertreat, robust
ttest NG if after==0 , by(treat) unequal
ttest NG if after==1 , by(treat) unequal
ttest NG if treat==0 , by(after) unequal
ttest NG if treat==1 , by(after) unequal
regress NG after treat aftertreat, robust
probit NG after treat aftertreat $xlist1 $YEAR $IND, robust // +++
*outreg2 using NG.xls, excel replace label dec(3)
margins, dydx(after treat aftertreat) atmeans

order firm_id fyear epsfx NG_EPS_Y NG_EXC_Y NG FOPI
format fyear %9.0g

 // H3: NG quality, xlist1
gen treatEXC = treat*NG_EXC_Y
gen afterEXC = after*NG_EXC_Y
gen aftertreatEXC = after*treat*NG_EXC_Y
regress FOPI treat after NG_EXC_Y treatEXC afterEXC aftertreat aftertreatEXC
$xlist $IND $YEAR, robust // --
ereturn list r2_a
*outreg2 using FOPI.xls, excel replace label dec(3)

 // H4: Compensation with lagged exclusion number & xlist
drop treatEXC afterEXC aftertreatEXC
gen treatEXC = treat*lEXC
gen afterEXC = after*lEXC
gen aftertreatEXC = after*treat*lEXC

// lEPS
regress lnTotalComp treat after lEXC treatEXC afterEXC aftertreat
aftertreatEXC lEPS NG $xlist2 $IND $YEAR, robust // +++
test lEPS lEXC
outreg2 using lEXC1.xls, excel replace label dec(3)
ereturn list r2_a

regress lnInc treat after lEXC treatEXC afterEXC aftertreat aftertreatEXC lEPS
NG $xlist2 $IND $YEAR, robust // 000
outreg2 using lEXC2.xls, excel replace label dec(3)
ereturn list r2_a

regress lnNonEqInc treat after lEXC treatEXC afterEXC aftertreat aftertreatEXC
lEPS NG $xlist2 $IND $YEAR, robust // 000
outreg2 using lEXC3.xls, excel replace label dec(3)
ereturn list r2_a
```

```
892. regress lnEqInc treat after lEXC treatEXC afterEXC aftertreat aftertreatEXC
     lEPS NG $xlist2 $IND $YEAR, robust // 000
893. outreg2 using lEXC4.xls, excel replace label dec(3)
894. ereturn list r2_a

895. regress lnNonInc treat after lEXC treatEXC afterEXC aftertreat aftertreatEXC
     lEPS NG $xlist2 $IND $YEAR, robust // 000
896. outreg2 using lEXC5.xls, excel replace label dec(3)
897. ereturn list r2_a

898. regress IncentiveComp treat after lEXC treatEXC afterEXC aftertreat
     aftertreatEXC lEPS NG $xlist2 $IND $YEAR, robust // +
899. outreg2 using lEXC6.xls, excel replace label dec(3)
900. ereturn list r2_a

901.  // H4: Compensation with lagged exclusion MEDIAN & xlist
902. drop treatEXC afterEXC aftertreatEXC
903. summ lEXC, detail
904. gen lEXCm = 0
905. replace lEXCm = 1 if lEXC>0
906. gen treatEXC = treat*lEXCm
907. gen afterEXC = after*lEXCm
908. gen aftertreatEXC = after*treat*lEXCm

909. // lEPS
910. regress lnTotalComp treat after lEXC treatEXC afterEXC aftertreat
     aftertreatEXC lEPS NG $xlist2 $IND $YEAR, robust // +
911. test lEPS lEXC
912. outreg2 using lEXC1.xls, excel replace label dec(3)
913. ereturn list r2_a

914. regress lnInc treat after lEXC treatEXC afterEXC aftertreat aftertreatEXC lEPS
     NG $xlist2 $IND $YEAR, robust // 000
915. outreg2 using lEXC2.xls, excel replace label dec(3)
916. ereturn list r2_a

917. regress lnNonEqInc treat after lEXC treatEXC afterEXC aftertreat aftertreatEXC
     lEPS NG $xlist2 $IND $YEAR, robust // 000
918. outreg2 using lEXC3.xls, excel replace label dec(3)
919. ereturn list r2_a

920. regress lnEqInc treat after lEXC treatEXC afterEXC aftertreat aftertreatEXC
     lEPS NG $xlist2 $IND $YEAR, robust // 000
921. outreg2 using lEXC4.xls, excel replace label dec(3)
922. ereturn list r2_a

923. regress lnNonInc treat after lEXC treatEXC afterEXC aftertreat aftertreatEXC
     lEPS NG $xlist2 $IND $YEAR, robust // 000
924. outreg2 using lEXC5.xls, excel replace label dec(3)
925. ereturn list r2_a

926. regress IncentiveComp treat after lEXC treatEXC afterEXC aftertreat
     aftertreatEXC lEPS NG $xlist2 $IND $YEAR, robust // +
927. outreg2 using lEXC6.xls, excel replace label dec(3)
928. ereturn list r2_a

929. // Test H1 using lEPS - No changes
930. regress lnTotalComp after treat aftertreat $xlist3 $YEAR $IND, robust // +++
931. regress lnInc after treat aftertreat $xlist3 $YEAR $IND, robust // 000
932. regress lnNonEqInc after treat aftertreat $xlist3 $YEAR $IND, robust // 000
933. regress lnEqInc after treat aftertreat $xlist3 $YEAR $IND, robust // 000
934. regress lnNonInc after treat aftertreat $xlist3 $YEAR $IND, robust // +++
935. regress IncentiveComp after treat aftertreat $xlist3 $YEAR $IND, robust // 000
936. // Robustness test pre-parallel trend assumption
937. tab MATCH
938. bys treat: tab MATCH
939. bys treat MATCH: summ lnTotalComp
940. bys treat MATCH: summ NG
```