Substitution between Real and Accruals-Based Earnings Management after Voluntary Adoption of Compensation Clawback Provisions

ABSTRACT

To deter financial misstatements, many companies have recently adopted compensation recovery policies – commonly known as "clawbacks" – that authorize the board to recoup compensation paid to executives based on misstated financial reports. Clawbacks have been previously shown to reduce financial misstatements and increase investors' confidence about earnings information. We show that such benefits come at the cost of firms substituting earnings management tools. In particular, while clawback-adopting firms reduce accruals management, they increase real transactions management (e.g., reduce R&D expenditures). As such, the total amount of earnings management does not decrease subsequent to clawback adoption. We further show that the substitution effect is more pronounced in firms with high growth opportunities, as these firms' stock prices typically drop sharply after missing earnings benchmarks. Finally, we show that those clawback firms that engage in more real transaction management experience greater underperformance as measured by return on assets in the post-adoption period. In summary, clawbacks may have unintended consequences for firms whose managers feel pressure to maintain certain profitability levels.

I. INTRODUCTION

One of the most notable recent changes in executive compensation practices has been an increase in the use of compensation recovery policies – commonly known as "clawbacks" – among public companies. Clawbacks are provisions that authorize the board of directors to recoup compensation paid to managers based on misstated financial reports. Among industrial firms covered in the Russell 3000, the number of firms with clawbacks increased from 19 to 444 over the 2005 to 2009 period. This number is expected to increase further as Section 954 of the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act (hereafter, DFA 954) requires all U.S. listed companies to adopt and implement clawbacks as of July 2012.[1]

Given that clawback provisions have become a widely-used governance mechanism that is now mandatory for all U.S. listed firms, the effectiveness of clawbacks has attracted a great deal of attention from academics and the business press alike. Extant research suggests that clawbacks voluntarily adopted by firms lead to a reduction in financial misstatements, which investors welcome as indicated by higher earnings response coefficients (ERCs) for adopting firms. External auditors also respond to clawback initiation positively by reducing effort when auditing clients with such

[1]Regulatory clawbacks were first introduced by Section 304 of the Sarbanes-Oxley Act (SOX) in 2002. Specifically, SOX 304 authorizes the Securities and Exchange Commission (SEC) to recoup bonuses paid to CEOs and CFOs of public companies when the company restates its financial statements due to material noncompliance with any financial reporting requirement as a result of misconduct. However, as Chan et al. (2012) point out, SOX 304 has rarely been enforced by the SEC, likely due to the SEC's limited recourses and difficulty in proving managerial misconduct. In response, Section 954 of the Dodd-Frank Act designates the board of directors rather than the SEC as the enforcer of clawbacks. Note that because the Dodd-Frank Act only became effective in July 2012, the effectiveness of mandatory clawbacks cannot be examined at this time.

provisions (Chan et al. 2012; DeHaan et al. 2012).[2] Therefore, firm-initiated clawbacks appear to effectively deter financial misstatements.

However, a reduction in the occurrence of accounting restatements subsequent to clawback adoption does not necessarily suggest an improvement in earnings quality. As Denis (2012) argues, decreased financial misstatements after clawback initiation may be driven by managers' reluctance to disclose restatements to avoid triggering clawbacks or by auditors' reduced effort to uncover accounting irregularities. As such, whether earnings manipulation does indeed decrease after clawback adoption remains an open question.

In this study, we first examine whether clawbacks reduce accruals management. We predict that clawbacks deter managers from using accruals management as high accounting accruals tend to attract more scrutiny from the SEC and auditors, and hence are more likely to be associated with accounting restatements, which trigger clawbacks (Dechow et al. 2010).

Next, we investigate whether clawbacks cause managers to use greater real transactions management – that is, whether there is a substitution between accruals and real transactions management. Relative to accruals management, real transactions are considered less risky as they are unlikely to be deemed illegal by auditors and regulators. The rational expectations equilibrium model constructed by Ewert and Wagenhofer (2005) also shows that a regulation intended to improve earnings quality (e.g., reduce discretionary accruals or improve ERCs) may actually induce managers to resort to other forms of earnings management such as real transactions management. In particular, with

[2] Moreover, Iskandar-Datta and Jia (2013) find a significantly positive market reaction to announcements of clawback adoption and a reduction in bid-ask spreads following adoption, particularly in firms with previous restatements.

a higher ERC, any increase in earnings will lead to a higher valuation multiple, which in turn will increase the value of managers' stock-based compensation or stock holdings and thereby provide stronger incentives for managers to manipulate earnings.[3] Consistent with this prediction, Cohen et al. (2008) find that while the Sarbanes-Oxley Act reduces accruals-based earnings management, it causes managers to use real transactions to manage earnings. Roychowdhury (2006) and Zang (2012) also show that managers are likely to use real transactions management instead of accruals management when they are subject to tighter scrutiny. Thus, while clawbacks may constrain accruals management, they may also encourage real transactions management. This substitution represents an unintended consequence of clawback provisions that has not been documented before.

Our study starts with a sample of non-financial clawback adopters and non-adopters in the Russell 3000 index as covered by the Corporate Library dataset. To deal with the potential endogeneity associated with clawback adoption, we use a double propensity-score-matching approach to identify 239 pairs of clawback adopters and non-adopters with the closest firm characteristics (e.g., firm size, industry membership, growth opportunities) to test our empirical hypotheses. Using a difference-in-differences design, we find that the adoption of clawback provisions is associated with lower accruals management, which is consistent with two contemporaneous papers (Babenko et al. 2012; Chen et al. 2013). Importantly, we find the reduced accrual manipulation is accompanied by greater real transactions management. In particular, relative to pre-adoption periods and control firms, clawback adopters exhibit a reduction in positive discretionary accruals

[3] Real transactions management refers to actions taken by managers that deviate from optimal business practices to achieve certain earnings benchmarks (Jiambalvo 1996; Roychowhury 2006). Examples include discretionary reduction of R&D or SG&A expenses or overproduction to lower costs of goods sold.

(but not in negative discretionary accruals), and they also exhibit a reduction in discretionary expenses such as R&D, SG&A, and marketing. Moreover, we find that after implementing clawbacks, clawback adopters have abnormally low operating cash flow, which is another common measure of real transactions management. This could be driven by an intention to inflate sales revenue via aggressive price discounts or credit terms that are too lenient (Roychowdhury 2006). Taken together, the results imply that clawback provisions increase the cost of accounting-based manipulation and thus lead managers to resort to less detectable forms of earnings management. Our results are robust to using the Heckman model to address the endogeneity issues associated with earnings management or clawback adoption.

Following Badertscher (2011), we also construct a measure of total earnings management by cumulating the amounts of accruals management and real transactions management. This measure indicates that total earnings management does not decrease after clawbacks (rather, it increases marginally) – that is, the decrease in accruals management seems to be offset by an increase in real transactions management subsequent to clawback initiation. This result further confirms that clawbacks are associated with unintended consequences.

Next, we find that the substitution between accruals management and real transactions management is mainly driven by clawback adopters with higher growth opportunities (relative to non-adopting firms with similar growth characteristics). This result is consistent with Matsumoto's (2002) finding that managers of high growth firms have stronger incentives to manage reported earnings to avoid negative earnings surprises, as they suffer a larger drop in share price if they miss consensus forecasts as compared to value firms (Skinner and Sloan 2002).

Finally, we find that clawback firms that engage in a greater extent of real transactions management after adoption (relative to clawback adopters that do not increase real transactions management) experience a decline in future profitability as measured by return on assets in the post-adoption period, and the underperformance is persistent up to three years. This result is consistent with previous studies (e.g., Bhojraj et al. 2009; Cohen and Zarowin 2010) that show that real transactions management decreases long-term firm value as it represents a deviation from optimal operating decisions.

Our study has implications for the mandatory clawback provisions recently implemented under DFA 954. Complementing the finding in Chan et al. (2012) and DeHaan et al. (2012) that firm-initiated clawbacks reduce financial misstatements, we document that such provisions also lead to a reduction in accruals manipulation – a more prevalent form of earnings management. However, we show that the decrease in accruals manipulation is met with an increase in real transactions management. This substitution is consistent with Cohen et al. (2008), who show that firms switched from accruals manipulation to real transactions management after the passage of SOX.[4] Thus, our study implies that a mechanism designed to improve financial reporting quality may have unintended consequences. In particular, we provide evidence of clawbacks' costs: those clawback adopting firms that engage in more real transactions management perform worse in subsequent years. Moreover, we document that the substitution of accruals manipulation by real transactions management occurs mainly among clawback adopters

[4] Although Cohen et al. (2008) document a substitution between accruals management and real transactions management after the passage of SOX, it is not clear which section of SOX contributes to this effect. In particular, Sections 302 and 404 (disclosure of internal control weakness) are both shown to improve accruals quality (e.g., Ashbaugh-Skaife et al. 2008), and Section 304 introduces the first mandatory clawbacks (which may also affect managers' choice of earnings management tools). As our study focuses on firm-initiated clawbacks, we are better able to draw conclusions on the effects of such provisions.

with high growth opportunities, which suggests that the unintended consequences associated with clawback provisions may be more severe for certain types of firms. In particular, as long as managers have pressure to beat or meet earnings benchmarks, the uniform adoption of clawback provisions as required by DFA 954 may not necessarily improve overall financial reporting quality.

The rest of the paper is organized as follows. Section II develops our testable hypotheses. Section III discusses the sample. Section IV presents our research design and reports the results. Section V concludes.

II. HYPOTHESIS DEVELOPMENT

Accruals Management

Firm-initiated clawbacks have become popular among public companies since 2005. For instance, 194 firms on the S&P 500 index had adopted clawbacks as of early 2011 (Addy and Yoder 2011). While the financial media have raised questions about the effectiveness of firm-initiated clawbacks (e.g., Dvorak and Ng 2006; Weiss 2009; Lublin 2010), Chan et al. (2012) and DeHaan et al. (2012) find that financial misstatements decrease, and investors consider earnings to be more informative, after clawback adoption. Moreover, Chan et al. (2012) find that audit fees are lower after clawback provisions are adopted. Iskandar-Datta and Jia (2013) further find a significantly positive market reaction to clawback adoption announcements. Although the above findings are subject to alternative interpretations (Denis 2012), firm-initiated clawbacks appear to deter financial misstatements and improve the integrity of financial reporting.[5]

[5] Denis (2012) argues that the decrease in financial misstatements after clawback initiation may be driven by managers' reluctance to disclose restatements to avoid triggering clawbacks or by auditors' reduced

We expect clawback adoption to lead to a reduction in accounting-based manipulation, i.e., accounting accruals manipulation. First, to avoid accounting restatements, managers of clawback adopters are expected to engage in earnings manipulation that is less likely to exceed the boundaries of GAAP and hence less likely to be detected by regulators or auditors.[6] As Dechow et al. (2010, page 349) argue, financial reports with high accruals tend to attract more scrutiny from the SEC and are more likely to trigger accounting restatements. Second, managers subject to clawback provisions enhance internal control systems to prevent potential misstatement (Chan et al. 2012). As Ashbaugh-Skaife et al. (2008) show, remediation of internal control deficiencies prevents managers from accruals manipulation (e.g., misreporting warranty liabilities or the allowance for bad debt). Accordingly, we predict that accruals management decreases following the adoption of clawbacks. More formally:

H1a: Accruals-based earnings management decreases subsequent to the adoption of clawback provisions.

Real Transactions Management

However, it is unlikely that clawback provisions eliminate all types of earnings manipulation, particularly when managers have pressure to meet or beat earnings targets.[7] Previous research shows that, in addition to accruals management, real

effort to discover accounting irregularities. That is, overall financial reporting quality may not necessarily improve subsequent to clawback adoption.

[6] As indicated in Collins and McInnis (2011), an earnings management tool is considered more costly if it has a higher probability of attracting regulatory scrutiny or shareholders' attention.

[7] Meeting certain earnings benchmarks is important as doing so increases the firm's credibility with the capital market, supports the firm's stock price, and promotes the reputation of the management team (Burgstahler and Dichev 1997; Graham et al. 2005). Missing an earnings benchmark, in contrast, creates uncertainty about the company's future and can lead executives to suffer personal financial penalties (Matsunaga and Park 2001). Other than capital market incentives, executive compensation is also tied to

transactions management (e.g., cutting back on R&D or SG&A expenditures) is another means to manage earnings. The use of real transactions represents a deviation from optimal operating decisions, but is not likely to be deemed illegal by regulators or auditors (Roychowdhury 2006). Thus, managers often resort to real transactions before turning to accruals to meet or beat earnings targets (Zang 2012). In their survey of CFOs, Graham et al. (2005) find that a majority of financial executives are willing to cut discretionary expenditures such as R&D or advertising to maintain accounting appearances even if such actions sacrifice the firm's long-term performance.

Using a rational expectations model, Ewert and Wagenhofer (2005) demonstrate that a regulation intended to improve earnings quality may actually lead managers to use other manipulation tools such as real transactions. The reason is that better earnings quality leads to higher value relevance (i.e., a stronger association between reported earnings and stock price). In addition, better earnings quality can encourage compensation committees to put more weight on reported earnings in determining executive compensation. Thus, managers benefit more by increasing earnings using lawful real transactions management. Consistent with this prediction, Cohen et al. (2008) show that after the passage of SOX, accruals management decreases while real transactions management increases. That is, when regulatory scrutiny or shareholder monitoring increase, managers tend to shift from accruals management to real transactions management. Accordingly, we predict that managers of clawback adopters increase the use of real transactions management subsequent to the adoption of clawbacks. More formally:

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reported earnings, thereby providing incentives for managers to manipulate earnings. Please see Beyer et al. (2010) for a detailed literature review.

H1b: Real transactions management increases subsequent to the adoption of clawback provisions.

Clawback Adopters with High vs. Low Growth Opportunities

Hypotheses H1a and H1b predict that clawback provisions lead firms to substitute earnings management tools. We next predict that this phenomenon is more pronounced among clawback firms with high growth opportunities. Skinner and Sloan (2002) show that growth companies experience a sharper decline in share price after missing consensus forecasts as compared to value firms. Further, extant literature on executive compensation shows that executives of firms with higher growth opportunities (e.g., firms with high market-to-book) tend to receive more stock options or restricted stock than executives of firms with lower growth opportunities (e.g., Murphy 2003). Taken together, this evidence suggests that relative to CEOs of value firms, managers of growth companies experience a larger financial loss if their firms fail to meet or beat earnings benchmarks and hence have stronger incentives to achieve earnings targets. We thus predict that among clawback adopters, those with greater growth opportunities are more likely to turn to real transactions management to meet or beat earnings targets. More formally:

H2: Among clawback adopters, those with high growth opportunities are more likely to shift from accruals management to real transactions management subsequent to the adoption of clawback provisions.

III. SAMPLE

We obtain data on clawback provisions from Corporate Library. Corporate Library identifies 638 firms in the Russell 3000 index as clawback adopters as of early 2010. Since we are interested in the effect of firms' *voluntary* initiation of clawback provisions on managers' choice of earnings management tools, we exclude financial firms from the analysis because financial institutions that received federal bailout funds during the financial crisis in 2008 and 2009 are subject to *mandatory* clawbacks enforced by the Department of Treasury. After excluding financial firms and those whose clawback provisions are solely related to "non-compete" restrictions, we have 444 firms with clawback provisions in place by fiscal year-end 2009, and 1,918 firms without such provisions.[8] For the 444 clawback firms, we manually identify the year in which they initiated their clawback policy by searching company websites, news announcements, and firms' proxy statements. As shown in the first column of Table 1, Panel A, firm-initiated clawbacks were rare in 2005 (there were only 19 firms with such provisions), but became increasingly popular since 2006. In Panel B of Table 1, we present the industry distribution for the 444 clawback adopters in the Corporate Library database. Based on two-digit SIC codes, we find that clawback adopters are fairly evenly distributed over industries.

[8] Non-compete clawback provisions are restrictive covenants that apply to executives who violate non-compete clauses. For example, the non-compete clawback provision of Texas Instruments Inc. states that "Options may be cancelled if the grantee competes with TI during the two years after employment termination or discloses TI trade secrets. In addition, for options received while the grantee was an executive officer, the company may reclaim (or 'claw back') profits earned under grants if the officer engages in such conduct. These provisions are intended to strengthen retention and provide a reasonable remedy to TI in case of competition or disclosure of our confidential information." Because non-compete clawback provisions are not related to accounting restatements or misconduct, we exclude them from our analysis. However, some companies have both non-compete clawback provisions as well as clawback provisions that deal with misconduct leading to accounting fraud or restatements of financial statements (e.g., Chubb Corporation). We include such firms in our clawback sample.

To test our empirical hypotheses, we require clawback adopters and non-adopters to have the necessary data in Compustat, CRSP, Corporate Library, Risk Metrics, and Audit Analytics. This merging process reduces our primary sample to 343 firms with clawback provisions in place as of 2009 and 1,840 firms that do not have such provisions in place at any point during our sample period.

[INSERT TABLE 1 HERE]

Panel C compares salient firm characteristics across the 343 clawback adopters and 1,840 non-adopters. We find that, on average, clawback adopters have larger firm size, lower sales growth, more operating segments, better profitability, and better corporate governance in terms of institutional ownership and board independence. The information in Panel C indicates that clawback adopters are different from non-adopters along several dimensions, suggesting potential endogeneity associated with the decision to adopt clawbacks. As such, we employ propensity score matching (PSM) to control for observable differences between clawback adopters and non-adopters. Specifically, following Chan et al. (2012) and DeHaan et al. (2012), we model clawback adoption as a function of firm size, market-to-book ratio, sales growth, leverage, ROA, number of segments, restatement history, institutional ownership, board independence, industry membership, and year fixed effects using a Probit model. Results of this analysis are reported in Table A1 in the Appendix. We find that clawbacks are positively associated with firm size and number of segments and negatively related to sales growth. Consistent with Babenko et al. (2012), we also find that clawback adoption is marginally positive associated with a firm's restatement history and board independence. Next, for each clawback adopter, we choose the non-adopter with the closest propensity score as the

control firm. Specifically, we use a one-to-one firm matching with a caliper of 0.1, and a common support range of [0.1 to 0.9] (Caliendo and Kopeinig 2008). This procedure yields 254 pairs of clawback adopters and control firms. One concern with a single round of PSM is that it may not control fully for observable differences across clawback adopters and non-adopters. Thus, as suggested in Peel and Makepeace (2009), we perform a *double* PSM – that is, we perform the same procedure as described earlier (i.e., the clawback selection model) on the 254 matched pairs again. This second round of PSM further reduces the sample size to 239 pairs of clawback adopters and control firms, which we use as the primary sample for our empirical tests.

The two rounds of PSM seem to successfully alleviate observable differences across clawback adopters and control firms as shown in Panel D of Table 1. That is, considering the same set of firm characteristics as in Panel C, clawback adopters are on average statistically indistinguishable from their matched control firms, indicating that our matching procedure achieves a *covariate balance*.[9]

IV. EMPIRICAL RESULTS

Following extant studies on firm-initiated clawbacks (Chan et al. 2012; DeHaan et al. 2012), we use the difference-in-differences approach to test our hypotheses. Specifically, we employ the following research design:

$$Y = \alpha + \beta_1 PostClawback + \beta X + u + d + \varepsilon, \quad (1)$$

[9] We notice that after the first round of matching, the 254 clawback adopters on average still have larger firm size and better ROA than the control firms, with the difference marginally significant at the 10% level. To fully achieve covariate balance, we perform the second-round matching.

where *Y* is the dependent variable of interest (i.e., the absolute value of discretionary accruals or measures of real transactions management). *PostClawback* is an indicator variable that equals one if the company is a clawback adopter in those years in which the clawback provision is implemented, and zero otherwise. The coefficient on *PostClawback* measures the change in the dependent variable of interest across pre- and post-adoption periods for a clawback firm compared to the change over the same interval for a control firm. *X* is a vector of control variables. *u* and *d* denote firm- and year-specific fixed effects. The inclusion of firm fixed effects helps control for time-invariant differences across clawback adopters and control firms that may not be alleviated by PSM. Finally, standard errors are adjusted based on the Huber-White sandwich estimate of variances and are clustered by firm.

Accruals-Based Earnings Management

Following existing literature, we use performance-adjusted discretionary accruals to proxy for accruals management (see Kothari et al. 2005). Specifically, we first estimate the following modified Jones model (1991) cross-sectionally for industry-years with at least 20 observations:

$$TA_{it}/Asset_{i,t-1} = \alpha + \beta_1(1/Asset_{i,t-1}) + \beta_2(\Delta Sales_{it}/Asset_{i,t-1}) + \beta_3(PPE_{it}/Asset_{i,t-1}) + \varepsilon_{it}, \quad (2)$$

where *TA* is earnings before extraordinary items and discontinued operations minus the operating cash flow reported in the statement of cash flows in year *t* (Collins and Hribar 2002). *Asset* denotes total assets, and *PPE* is gross property, plant, and equipment. Finally, following Kothari et al. (2005), we subtract the change in accounts receivable

from the change in sales revenue (*ΔSales*) prior to estimating equation (2).[10] The estimated residuals from equation (2) are discretionary accruals and are used to proxy for accruals manipulation.

Real Transactions Management

Following Roychowdhury (2006), we proxy for real transactions management using three measures, *ABCash*, *ABExp*, and *ABProd*, which represent abnormal levels of cash flow from operating activities, discretionary expenses (the sum of R&D, advertising, and SG&A expenses), and production costs, respectively. *ABCash*, *ABExp*, and *ABProd*, are residuals obtained from the following three regressions:

$$Expense = \alpha + \beta_1(1/Asset_{t-1}) + \beta_1(Sales_{t-1}/Asset_{t-1}) + \varepsilon_t \quad (3)$$

$$Production = \alpha + \beta_1(1/Asset_{t-1}) + \beta_1(Sales_t/Asset_{t-1}) + \beta_2(\Delta Sales_t/Asset_{t-1}) + \beta_3(\Delta Sales_{t-1}/Asset_{t-1}) + \varepsilon_t. \quad (4)$$

$$CFO = \alpha + \beta_1(1/Asset_{t-1}) + \beta_1(Sales_t/Asset_{t-1}) + \beta_2(\Delta Sales_t/Asset_{t-1}) + \varepsilon_t \quad (5)$$

We estimate equations (3) to (5) by year and two-digit SIC codes for all firms in Compustat during our sample period (2000-2009).[11] The estimated coefficients from the corresponding industry-year are used to compute firm-specific *ABExp*, *ABProd*, and *ABCash*. Roychowdhury (2006) posit that managers often cut discretionary expenses such as advertising or R&D expenses to boost short-term earnings, suggesting a negative *ABExp*. Moreover, a positive *ABProd* suggests that managers overproduce inventory

[10] Kothari et al. (2005) indicate that subtracting the change in accounts receivable from the change in sales in the first stage helps to avoid overestimating discretionary accruals for firms with extreme growth. Also, following Kothari et al. (2005), we include an intercept in equation (2); our results remain qualitatively similar if we exclude the intercept.

[11] As in footnote 10, we again include an intercept in equations (3) to (5) following Roychowdhury (2006) and Gunny (2010); our results remain qualitatively similar if we exclude the intercept.

items to reduce costs of goods sold per unit for a higher reported operating income. Finally, to inflate sales revenue, managers are likely to offer price discounts or lenient credit terms, though these practices may lead to lower operating cash flow (a negative *ABCash*). We also create an overall measure of real transactions management by summing *ABCash*, *ABExp*, and *ABProd* (Badertscher 2011). Specifically, we multiply *ABExp* and *ABCash* by -1 so that the three variables represent real transactions management in a consistent fashion (because companies with greater real transactions management are expected to have a positive *ABProd* but a negative *ABExp* and *ABCash*).

The Impact of Clawbacks on Accruals Management

To examine whether firms that adopt clawback provisions decrease accruals management (H1a) and increase real transactions manipulation (H1b), we estimate the following regression models, which follow Ashbaugh-Skaife et al. (2008), Cohen and Zarowin (2010), and Zang (2012):

$$\begin{aligned} AM_{it} \text{ (or } RTM_{it}) = {} & \alpha + \beta_1 PostClawback_{it} + \beta_2 Size_{it} + \beta_3 M/B_{it} + \beta_4 ROA_t + \beta_5 ZScore_{it} \\ & + \beta_6 MktShare_{it} + \beta_7 MTR_{it} + \beta_8 Inst\%_{it} + \beta_9 BigFour_{it} + \beta_{10} AuditTenure_{it} \\ & + \beta_{11} Cycle_{it} + \beta_{12} NOA_{it} + \beta_{13} RTM_{it} \text{ (or } AM_{it}) + u_i + d_t + \varepsilon_{it.} \end{aligned} \quad (6)$$

AM is the value of performance-adjusted accruals as described earlier. *RTM* is one of three measures, *ABCash*, *ABExp*, and *ABProd*, as defined above. *PostClawback* is defined as in equation (1). *Size* is the natural log of total assets. *M/B* is the market-to-book ratio. *ROA* is income before extraordinary items divided by lagged total assets. Following Zang (2012), we include *ZScore*, *MktShare*, *MTR*, and *Inst%* to control for the costs associated with real transactions management: *ZScore* is the decile of Altman's z-

score, *MktShare* is the Herfindahl index using 2-digit SIC-codes, *MTR* is the marginal tax rate, and *Inst%* is the percentage of institutional ownership. Zang (2012) shows that firms with better financial health (higher *ZScore*) and larger market share (*MktShare*) are more likely to engage in real transactions management. On the other hand, higher marginal tax rates (*MTR*) and institutional ownership (*Inst%*) constrain the use of real transactions management. Next, we include *BigFour*, *AuditTenure*, *NOA*, and *Cycle* to proxy for the costs related to accruals manipulation. *BigFour* is a dummy variable equal to one if the company is audited by one of the Big-4 CPA firms, and zero otherwise. *AuditTenure* is a dummy variable equal to one if the number of years the auditor has audited the client is above the sample median, and zero otherwise. *NOA* is a dummy variable equal to one if net operating assets (i.e., shareholders' equity less cash and marketable securities plus total debt) at the beginning of the year divided by lagged sales is above the median of the corresponding industry-year, and zero otherwise. *Cycle* is days receivable plus days inventory less days payable. We expect that managers are less likely to use accruals manipulation when they face stronger scrutiny by external auditors, suggesting that Big-4 auditors (*BigFour*) and auditor tenure (*AuditTenure*) are negatively related to accruals management. The use of accruals management in the current year is expected to be constrained by prior years' accruals manipulation, suggesting a negative association between *NOA* and the amount of accruals management (Barton and Simko 2002). Firms with a longer operating cycle are expected to have more flexibility in using accruals management, suggesting a positive relation between *Cycle* and *AM*. Finally, following prior studies that document a substitution between real transactions management and accruals manipulation (e.g., Cohen et al. 2008), we include *AM* (*RTM*) as a control

variable when the dependent variable is *RTM* (*AM*). u_i and d_t are, respectively, firm and year fixed effects. This regression is based on 3,582 firm-year observations for 239 pairs of clawback adopters and non-adopters over the 2000 to 2009 period. The coefficient on *PostClawback* measures the change in the levels of discretionary accruals and real transactions management for a firm before and after clawback adoption and compares this change with that for a control firm over the same period.

[INSERT TABLE 2 HERE]

The results of equation (6) are presented in Table 2. Before moving to the regression results, in Panel A we provide descriptive statistics for key variables used to test equation (6). We find that relative to the control firms, clawback adopters have a lower absolute amount of discretionary accruals (|*AM*|), while they have a similar amount of signed discretionary accruals (*AM*). For real transactions management, we find that clawback adopters on average have lower discretionary expenses and lower cash flow operating activities, suggesting that they have greater real transactions management.

Next, turning to the regression results in Panel B, we find that in the first column, where the dependent variable is the absolute value of discretionary accruals (|*AM*|), the coefficient on *PostClawback* is significantly negative (-0.013, t = -2.35), indicating that the amount of unsigned discretionary accruals is lower subsequent to the adoption of clawback provisions.[12] In the second column, where the dependent variable is signed

[12] To confirm the robustness of our results, we also use an accruals measure following Dechow and Dichev (2002). Specifically, we run the following regression for each industry based on 2-digit SIC codes: $\Delta WC = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon$, where CFO is operating cash flow scaled by total assets, and WC is computed as {[ΔCurrent Assets - ΔCash and Short-term Investments]-[ΔLiabilities - ΔDebt in Current Liabilities - ΔTaxes Payable]} scaled by total assets. After performing the regression, we calculate the mean absolute value of the residual (ε) for each industry, and we then subtract the industry-mean residual from the absolute value of each firm's residual. We find that our conclusions are unaffected

accruals, the coefficient on *PostClawback* becomes statistically insignificant (-0.009, t = --1.02). The inconsistent results between the first two columns may be caused by clawback provisions' different impacts on positive and negative accruals. To further investigate this issue, we next estimate equation (6) separately for firms with positive and negative accruals – that is, we partition the 3,582 firm-year observations into two groups based on the sign of discretionary accruals. The results of this analysis are provided in the third and fourth columns. The coefficient on *PostClawback* is negatively significant in the third column (-0.024, t = -3.00), whereas it is positive but insignificant in the fourth column (0.004, t = 0.46). The results indicate that the reduction in discretionary accruals subsequent to clawback adoption is driven primarily by positive discretionary accruals. Thus, clawback provisions seem to constrain income-increasing accruals, but not downward accruals manipulation.

Next, we present the results of real transactions management in columns (5) to (8). In column (5), where *ABExp* is the dependent variable, we find that the coefficient on *PostClawback* is significantly negative (-0.022, t = -2.19), suggesting that adopting firms reduce discretionary expenses after clawback adoption. Turning to the sixth column, which presents results using *ABProd* as the dependent variable, we find that the coefficient on *PostClawback* is insignificant, which indicates that clawback adopters do not engage in abnormal production after adopting clawbacks. In column (7), where the dependent variable is *ABCash*, we find that the coefficient on *PostClawback* is significantly negative (-0.017, t = -2.02), indicating that clawback adopters are associated with abnormally low operating cash flow. We also consider the overall measure of *RTM*,

by using this method to calculate accruals. Untabulated results indicate that the coefficient on *PostClawback* is -0.020 (t = -2.58), suggesting that clawback adoption improves accruals quality.

which is the sum of *ABCash*, *ABExp*, and *ABProd*, as the dependent variable. As stated earlier, we multiply *ABExp* and *ABCash* by -1 to ensure the three variables represent real management in a consistent fashion (the more positive the number is, the higher the real manipulation). The results in column (8) confirm that clawback adopters engage in more real transactions manipulation in the post-adoption period as the coefficient on *PostClawback* is significantly positive (0.032, t = 2.78). The control variables, whenever significant, take the predicted signs. To summarize, the results in Panel B of Table 2 indicate that the passage of clawback provisions leads to reduced accruals manipulation but greater real transactions management. Given the two opposite effects, a natural question to ask is how clawbacks affect the overall level of earnings management. To do so, we sum the unsigned accruals (*AM*) and the aggregate real transactions management (*RTM*) to construct *EM*, the overall level of earnings management. The result of this analysis is presented in column (9). We find that the coefficient on *PostClawback* is significantly positive (0.024, t = 1.69), indicating that the increase in real transactions management dominates the reduction in accruals manipulation, thereby leading to a marginal increase in the total amount of earnings management subsequent to clawback initiation.[13]

As Cheng and Warfield (2005), Bergstresser and Philippon (2006), and Efendi et al. (2007) find, earnings manipulation activities are affected by incentives stemming from option grants or managers' stock holdings. To check the robustness of our findings, we

[13] As suggested in Roberts and Whited (2013), we also repeat the analyses in Table 2 without any covariates. That is, we include only *PostClawback* and firm and year-fixed effects without any control variables and re-estimate equation (6). Roberts and Whited (2013) indicate that if the assignment of treatment and control firms is random, the inclusion of covariates (control variables) should have a negligible effect on the coefficient of *PostClawback*. The analysis (untabulated) suggests that the coefficient on *PostClawback* is quite comparable to those reported in Table 2. This provides further support that the double PSM procedure has achieved random assignment of treatment (clawback adopters) and control firms (non-adopters).

next add control variables related to executive compensation and re-estimate equation (6). Specifically, following Cheng and Warfield (2005) and Cohen et al. (2008), we include the variables *Bonus*, *Option_Grant*, *Option_Ex*, *Option_Un*, and *Owner*. *Bonus* is CEO annual bonus compensation as a proportion of total compensation. *Option_Grant* is the number of options granted to the CEO during the year divided by the firm's total common shares outstanding. *Option_Ex* is the number of exercisable options held by the CEO at year-end divided by the firm's total common shares outstanding. *Option_Un* is the number of unexercisable options (excluding annual option grants) held by the CEO at year-end divided by the firm's total common shares outstanding. *Owner* is shares owned by the CEO divided by the firm's total common shares outstanding.

The results of this analysis are presented in Panel C, Table 2. In short, the results are similar to those reported in Panel B. In particular, clawback initiation leads to a reduction in the use of discretionary accruals (i.e., positive discretionary accruals), while it increases reliance on real transactions management. Turning to the control variables, consistent with Cohen et al. (2008), we find that the number of unexercisable options held by the CEO, annual option grants to the CEO, and CEO stock ownership are positively related to the use of accruals management.[14] In contrast, we find that bonus as a proportion of total pay and unexercisable options deter managers from engaging in real transactions management.

To summarize, the results in Table 2 support Hypotheses H1a and H1b, which posit that clawback adoption leads to less accruals management but greater real transactions

[14] Another reason to control for compensation variables in the analysis of earnings management is that the initiation of clawback provisions may be accompanied by changes in executive compensation practices. Indeed, prior studies find that regulations that affect financial reporting practices tend to also change executive compensation practices. For example, Carter et al. (2009) and Cohen et al. (2012) find that the passage of SOX reduces accruals manipulation, and the reduced earnings manipulation allows firms to put more weight on accounting earnings in the determination of the CEO's annual bonus.

management.

Robustness Test – Using the Heckman Model to Address the Endogeneity Associated with Clawback Adoption

As indicated in Tucker (2010), PSM is useful in alleviating observed differences across treatment and control firms, but it cannot control for their unobserved differences. Although unobservable differences across clawback adopters and non-adopters can be mitigated to a certain extent by the inclusion of firm fixed effects, we nonetheless perform the Heckman test to check the robustness of our findings. Specifically, we again estimate the clawback adoption model described in Section III (page 11, which is the model used in the PSM). However, to satisfy the "excluding restriction" as indicated in Lennox et al. (2012), we add two instrumental variables, *Enforceability* and *PeerAdopt*, to the model. *Enforceability* is a state-level enforcement index of non-competition clauses included in the employment contracts, which is obtained from Garmaise (2011). Garmaise (2011) posits that a legal clause is more likely to be included in the employment contract if it is more enforceable in the state. As such, this index is expected to be positively related to clawback adoption – that is, clawback adoption should be more likely if such provisions are more enforceable in the specific state. *PeerAdopt* is defined as the percentage of peer firms in the same industry (2-digit SIC codes) that also have clawback provisions in place. We expect that this variable is positively related to clawback adoption. That is, we argue that a company is more likely to initiate clawbacks when more of its peer firms do so. Importantly, the two instruments *Enforceability* and

PeerAdopt are not expected to be *directly* associated with the second-stage dependent variables *AM* or *RTM*.

Results of this analysis are provided in Table A2 in the Appendix. In Panel A, we find that clawback adoption is positively associated with *PeerAdopt*, while it is not significantly related to *Enforceability*. Next, we compute the inverse Mills ratio (*IMR_Clawback*) and include it in the estimate of equation (6). The abbreviated results are provided in Panel B of Table A2. Generally, our main findings remain unchanged: clawback adoption is related to less accruals manipulation but greater real transactions management. We find that the variance inflation factor (VIF) associated with the inverse Mills ratio (*IMR_Clawback*) and *PostClawback* is 1.89, suggesting that multicollinearity is very low in this specification. According to Lennox et al. (2012), a low VIF suggests that *Enforceability* and *PeerAdopt* satisfy the "excluding restriction" and thus are valid instruments.[15]

To summarize, we find supporting evidence for Hypotheses H1a and H1b by using the Heckman model to control for unobservable differences across clawback adopters and non-adopters.

A Two-Stage Model to Account for the Endogenous Decision to Manage Earnings

The results in Table 2 indicate that clawback adoption leads to a trade-off between accruals manipulation and real transactions management. However, the decision for firms to engage in earnings manipulation is not exogenous. Moreover, as argued in Watts and Zimmerman (1986), except when used for opportunistic purposes, earnings management

[15] Our results in Panel B of Table A2 remain qualitatively similar if we include *Bonus*, *Option_Grant*, *Option_Ex*, *Option_Un*, and *Owner* as control variables.

may also be efficient. For example, managers may use discretionary accruals to convey information about company prospects (Subramanyam 1996). As such, to verify whether the substitution between accruals manipulation and real transactions management subsequent to clawbacks does indeed represent opportunistic behavior, we use the Heckman model to address the self-selection associated with earnings manipulation decisions. Specifically, following Cohen and Zarowin (2010) and Zang (2012), we first model a company's decision to manage reported earnings as the following probit model:

$$Suspect\_EM_{it} = \alpha + \beta_1 Clawback_{it} + \beta_2 Size_{it} + \beta_3 M/B_{it} + \beta_4 Leverage_{it} + \beta_5 HabitBeater + \beta_6 Shares + \beta_7 ROA_{it} + \beta_8 NAnalyst_{it} + d_t + \varepsilon_{it}, \quad (7)$$

where *Clawback* is a dummy variable equal to one if the company is a clawback adopter, and zero otherwise. *Suspect_EM* is a dummy variable equal to one if either *AM* or *RTM* is above the industry-year median, and zero otherwise (Cohen and Zarowin 2010). Based on this definition, 2,244 firm-years among the full sample can be classified as suspect firm-years. *Leverage* is long-term liabilities divided by total assets. *Size, M/B,* and *ROA* are as previously defined. We include these variables to control for the effects of capital structure, profitability, firm size, and growth opportunities on earnings management (see Dechow et al. 2010 for a review of the earnings management literature). *HabitBeater* is the number of times analysts' forecast consensus was met or beat over the past four quarters. *Shares* is the log number of shares outstanding. As posited by Cohen and Zarowin (2010), *HabitBeater* and *Shares* capture capital market incentives for managers to engage in more earnings management to meet earnings targets, suggesting a positive sign on the two variables. *NAnalyst* is the number of analysts following the firm at the beginning of the year. There are two alternative predictions on the sign of *NAnalyst*. On

the one hand, being followed by more analysts could provide stronger incentives for managers to manage earnings. On the other hand, financial analysts with sophisticated financial and industry knowledge could constrain managers' earnings management activities. In short, there is no predicted sign on *NAnalyst*.

[INSERT TABLE 3 HERE]

The results of equation (7) are presented in Panel A, Table 3. We find that the coefficient on *Clawback* is statistically insignificant, suggesting that clawback adopters do not differ from control firms in their propensity to meet or just beat earnings benchmarks. Consistent with Cohen and Zarowin (2010) and Zang (2012), we find that the likelihood of engaging in earnings manipulation to achieve earnings targets is positively related to firm size, leverage, a prior history of meeting or beating earnings benchmarks, and the number of shares outstanding and is negatively related to number of analysts following.

After estimating equation (7), we compute the inverse Mills ratio (*IMR*) and include it to re-estimate equation (6) using the 2,244 suspect firm-years. The results are presented in Panel B, Table 3. To save space, we only present coefficients on *PostClawback* and *IMR*. In general, the results are qualitatively similar to those reported in Table 2. In particular, using a sample of firms-years suspected of earnings manipulation, we find that clawback adopters reduce accruals manipulation while increasing real transactions management subsequent to clawback initiation.[16]

[16] Alternatively, following Zang (2012), we classify a firm-year as associated with earnings management if one of the following situations holds: (1) earnings before extraordinary items divided by total assets falls between 0 and 0.005; (2) the change in basic EPS excluding extraordinary items between year *t* and year *t*-1 falls between zero and $0.02; or (3) actual EPS minus the latest analyst consensus forecast (or management forecast) before the fiscal year-end falls between zero and $0.01. Based on this definition, 806 firm-years among the full sample can be classified as suspect firm years, with the remaining 2,776

Subgroup Analysis - Clawback Adopters with High vs. Low Growth Opportunities

Hypothesis H2 predicts that clawback firms with high growth opportunities are more likely to resort to real activities management to meet or beat earnings targets relative to clawback adopters with low growth opportunities. To test this conjecture, we partition the 239 pairs of clawback adopters and non-adopters into two groups based on the median market-to-book ratio. That is, a company is considered as having high growth opportunities if its average market-to-book ratio over the entire sample period is above the sample median; otherwise we classify it as a firm with low growth opportunities. We then estimate equation (6) separately for clawback adopters and non-adopters with high growth opportunities and those with low growth opportunities. In doing so we compare treatment firms (clawback adopters) and control firms (non-adopters) on the same grounds. The results of this analysis are provided in Table 4. Again, to save space, we only present results for variables of interest.

[INSERT TABLE 4 HERE]

We find that our results are mainly driven by clawback adopters with high growth opportunities. Specifically, we find that the coefficient on *PostClawback* is significant in columns (1), (5), (9), and (11), suggesting that clawback adopters with high growth opportunities engage in less accruals management (in particular, positive discretionary accruals), while they switch to real activities management to a greater extent after initiating clawbacks. As such, the total amount of earnings management actually increases after clawback adoption for adopters with high growth opportunities. In contrast,

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firm-years classified as non-suspect years. We then estimate equation (6) separately for suspect- and non-suspect firm-years. We find that our main findings mainly occur in suspect firm-years. This test again confirms that the substitution among earnings management tools subsequent to clawback adoption is driven by opportunistic purposes.

we do not observe the same phenomenon for clawback firms with low growth opportunities. Further tests reveal that these differences between the two groups are on average statistically significant.

The Impact of Clawbacks on Firm Performance

The results in Tables 2 to 4 suggest that clawback adoption causes a shift from accruals manipulation to real transactions management. It is thus natural to ask whether this shift indeed represents an unintended consequence – that is, whether it is associated with any costs for those adopting firms. It is possible that the increase in real transactions management actually represents an efficient outcome. For example, shareholders expect managers to make such a shift when clawback provision is instituted or to convey information about company future prospects (Gunny 2010). If this argument holds, then we should not observe any negative consequence subsequent to clawback initiation.

Alternatively, the increase in real transactions management may create adverse consequences for clawback adopters. This is because real transactions management represents a deviation from optimal operating decisions (e.g., overproduction or underinvestment) and has direct adverse effects on cash flows, whereas accruals manipulation involves the adjustment of revenue or expense accruals and has no direct impact on cash flows. Supporting this argument, Cohen and Zarowin (2010) show that firms with seasoned equity offerings (SEO) engage in both accruals manipulation and real transactions management, and that the post-SEO underperformance documented in the literature is mainly due to real transactions management rather than accruals

manipulation. Similarly, Bhojraj et al. (2009) and Gupta et al. (2010) find that firms experience stock underperformance after engaging in real transactions management.

Based on the above discussion, we investigate whether clawback adopters, which engage in greater real transactions management, experience underperformance subsequent to clawback adoption. To do so, we estimate the following model, which is similar as the one used in Cohen and Zarowin (2010):

$$\Delta ROA_{(t,\,t+i)} = \alpha + \beta_1 Clawback\_IRTM_{\,t} + \beta_2 Clawback\_DRTM_{\,t} + \beta_3 \Delta Size_{(t,\,t+i)} + \beta_4 \Delta M/B_{(t,\,t+i)} + \beta_5 \Delta Leverage_{(t,\,t+i)} + d_t + \varepsilon_{it}, \quad (8)$$

where $\Delta ROA_{(t,\,t+i)}$ is the industry-adjusted change in *ROA* from year *t* to *t*+*i*, *i* = 1, 2, and 3. Year *t* is the year during which the clawback provision is initiated. *ΔSize* is the change in *Size*. *ΔM/B* is the change in *M/B*. *ΔLeverage* is the change in *Leverage*. *Size*, *M/B*, and *ROA* are as previously defined. d_t is year-specific fixed effects. *Clawback_IRTM* (*Clawback_DRTM*) equals one if the clawback adopter increases (decreases) its amount of real transactions management during the adoption year relative to pre-adoption years, and zero otherwise. That is, a clawback adopter is considered as increasing its use of real transactions management only if its amount of real transactions management in year *t* is larger than in the pre-adoption period, otherwise we consider the clawback adopter as decreasing its use of real transactions management. This definition is quite stringent in that a clawback adopter will not be classified as engaging in more real transactions management unless it immediately increases real transactions management in the adopting year. Using this definition enables us to investigate how increased real transactions management affects future performance in one to three years. The results are reported in Table 5.

[INSERT TABLE 5 HERE]

The coefficient on *Clawback_IRTM* is significantly negative in all three columns, suggesting that clawback adopters that increase real transactions management experience a reduction in ROA. In contrast, the coefficient on *Clawback_DRTM* is insignificant in all columns, suggesting that clawback adopters that decrease real transactions management do not experience changes in firm performance after adopting clawbacks. Indeed, when we consider all clawback adopters as one group, we find that clawback adoption is not related to future underperformance, as the coefficient on *Clawback* is insignificant in columns ((2), (4), and (6). Further tests reveal that the differences in changes in ROA between the two coefficients (*Clawback_IRTM* versus *Clawback_DRTM*) are statistically significant up to year *t+2*.

To summarize, the results in Table 5 are consistent with the notion that clawback adoption causes managers to engage in suboptimal operating activities to meet or beat earnings targets, suggesting a cost incurred by such provisions.

V. CONCLUSIONS

In this study we examine whether firm-initiated clawback provisions, policies that aim to reduce financial misstatements by allowing firms to recoup compensation from managers in the event of accounting restatements, influence managers' choice between within-GAAP accruals management and real transactions management to meet or beat earnings targets. Using Russell 3000 non-financial firms to form a matched sample of clawback adopters and non-adopters, we first show that clawback adoption leads to less accruals management but greater real transactions management. Specifically, we find that

relative to pre-adoption periods and firms without clawbacks, clawback adopters are associated with lower positive discretionary accruals (but not downward accruals), but are more likely to cut back on discretionary expenses such as R&D or SG&A or manipulate sales revenue (as reflected in abnormally low cash flow from operating activities). This suggests that managers subject to clawbacks move away from accruals manipulation to less detectable real activities management to achieve earnings targets, and that this phenomenon occurs mainly among clawback adopters with greater growth opportunities. Finally, we find that clawback adopters that engage in greater real activities management experience a reduction in operating performance subsequent to clawback adoption, consistent with the notion that real activities management sacrifices long-term firm value.

Taken together, our results indicate that although clawbacks deter managers from engaging in financial misreporting, they do not fully eliminate earnings management. In particular, clawbacks appear to cause managers to reduce expenses that may create long-term benefits, with this phenomenon more pronounced for firms with greater growth opportunities. Clawback provisions may therefore have unintended consequences for certain types of firms. Mandatory clawback adoption pursuant to the Dodd-Frank Act may lead to the same unintended consequences.

Our study has a few limitations. First, we examine the effect of firm-initiated clawbacks on managers' reporting behavior. Because clawbacks as required by the Dodd-Frank Act are mandatory, our results may not generalize due to the fundamental difference between firm-initiated and mandatory clawbacks. Further study is thus needed to investigate the consequences of mandatory clawbacks. Second, as firm-initiated

clawbacks became popular after 2006, the short time horizon prevents us from performing certain tests to examine the subsequent underperformance of clawback adopters. Future research could revisit this issue by examining whether managers' risk-taking or investment behavior is affected by clawback initiation. Such evidence would help us better understand the consequences of clawback provisions.

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TABLE 1
Descriptive statistics

Panel A: Number of Industrial Firms with Firm-initiated Clawbacks in the Corporate Library Dataset by Year

Year	Number of Clawback Adopters	Number of New Adopters
2005	19	19
2006	92	73
2007	200	108
2008	336	136
2009	444	108

Panel B: Number and Percentage of Clawback Adopters by Two-digit SIC code

	Clawback adopters in Corporate Library	
Industry (SIC) distribution	**Frequency**	**%**
Oil and gas (13, 29)	16	3.58
Food products (20)	15	3.36
Paper and paper products (24-27)	19	4.25
Chemical products (28)	35	7.83
Manufacturing (30-34)	16	3.58
Computer equipment and services (35, 73)	49	10.96
Electronic equipment (36)	26	5.82
Transportation (37, 39,40-42,44,45)	28	6.26
Scientific instruments (38)	23	5.15
Communications (48)	17	3.8
Electric, gas, and sanitary services (49)	19	4.25
Durable goods (50)	7	1.57
Retail (53, 54,56,57,59)	22	4.92
Eating and drinking establishments (58)	9	2.01
Entertainment services (70, 78,79)	1	0.22
Health (80)	8	1.79
All others	137	30.65
Total	444	100

Panel C: Descriptive Statistics of 343 Clawback Adopters and 1,840 Non-adopters with Available Data in Compustat and Corporate Library

	Mean			Median		
	Clawback firms	**Non-adopters**	**Diff. *t*-stat.**	**Clawback firms**	**Non-adopters**	**Diff. *z*-stat.**
Size	7.958	6.755	13.20***	7.898	6.586	11.48***
M/B	3.037	2.975	0.39	2.505	2.375	1.20
SaleG	0.100	0.131	-3.05***	0.074	0.098	-3.45***
Leverage	0.207	0.185	2.06**	0.187	0.156	3.35***
ROA	0.037	0.012	3.55***	0.043	0.035	2.68***
Segment	1.780	1.480	6.73***	1.963	1.384	6.61***
Inst%	0.600	0.527	3.40***	0.679	0.596	4.78***
BDIndep	0.677	0.632	5.45***	0.687	0.643	5.27***
n	343	1,840		343	1,840	
Panel D: Descriptive Statistics of 239 Pairs of Clawback Adopters and Non-adopters Identified by the Propensity Score Matching						
Size	7.700	7.781	-0.59	7.594	7.838	-0.93
M/B	2.505	2.844	-1.07	2.039	2.185	-0.62
SaleG	0.077	0.089	-1.01	0.079	0.085	-0.55
Leverage	0.219	0.226	-0.37	0.187	0.199	-0.03
ROA	0.028	0.030	-0.14	0.051	0.044	0.81
Segment	1.503	1.425	0.90	1.791	1.386	0.90
Inst%	0.585	0.605	-1.32	0.706	0.743	-0.92
BDIndep	0.648	0.637	0.95	0.647	0.647	0.56
n	239	239		239	239	

Tests for differences in mean (median) are based on *t*- (*z*-) statistics. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level, respectively.

Panel A provides the yearly distribution of number of industrial firms with clawback provisions in the Corporate Library dataset, and Panel B presents distribution of clawback adopters based on industry membership (2-digit SIC code). Panel C provides descriptive statistics of 343 clawback adopters and 1,840 non-adopters with available data in Compustat and Corporate Library. Panel D provides the same set of descriptive statistics of 239 pairs of clawback adopters and non-adopters matched based on the propensity-score-matching.

Size = the natural log of total assets.
M/B = the market to book ratio.
SaleG = a one-year sales growth.
Leverage = long-term liabilities divided by total assets.
ROA = income before extraordinary items divided by lagged total assets.
Segment = the natural log of the number of business segments.
Inst% = the percentage of shares owned by institutional investors.
BDIndep = the number of independent directors divided by the total number of directors on the board.

TABLE 2

The Effects of Clawback Provisions on Accrual Management and Real Transactions Management

Panel A: Descriptive Statistics of Key Variables

	Mean			Median		
	Clawback firms	**Non-adopters**	**Diff. *t*-stat.**	**Clawback firms**	**Non-adopters**	**Diff. *z*-stat.**
|AM|	0.064	0.073	-3.26***	0.043	0.047	-1.71*
AM	-0.006	-0.012	1.40	-0.004	-0.006	1.60
ABExp	0.012	0.051	-3.60***	-0.028	-0.001	-2.44**
ABProd	-0.045	-0.039	-0.92	-0.034	-0.038	0.13
ABCash	0.087	0.113	-5.05***	0.070	0.093	-4.24***
n	1,762	1,820		1,762	1,820	

Tests for differences in mean (median) are based on *t*- (*z*-) statistics. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level, respectively.

Panel B

	***AM* (Accrual Management)**				***RTM* (Real Transaction Management)**				***AM+RTM* (Total Management)**
	| AM |	***AM***	***AM>0***	***AM<0***	***ABExp***	***ABProd***	***ABCash***	***RTM***	***EM***
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PostClawback	-0.013**	-0.009	-0.024***	0.004	-0.022**	0.002	-0.017**	0.032***	0.024*
	(-2.35)	(-1.02)	(-3.00)	(0.46)	(-2.19)	(0.27)	(-2.02)	(2.78)	(1.69)
Size	-0.001	-0.034***	-0.023***	-0.016***	-0.071***	0.001	0.016*	0.055***	0.032**
	(-0.26)	(-5.75)	(-3.63)	(-2.67)	(-4.68)	(0.19)	(1.89)	(4.69)	(2.49)
M/B	0.001**	-0.001*	-0.000	-0.002***	-0.005***	-0.002***	0.002**	0.000	-0.002
	(2.17)	(-1.87)	(-0.54)	(-3.22)	(-3.99)	(-3.22)	(2.18)	(0.31)	(-1.31)
ROA	-0.175***	0.443***	0.079**	0.313***	-0.257***	-0.213***	0.237***	-0.159***	0.302***
	(-9.01)	(16.12)	(2.16)	(12.45)	(-3.60)	(-6.66)	(5.76)	(-2.72)	(4.92)
ZScore	-0.005***	0.011***	0.002	0.012***	-0.010**	-0.008***	0.009***	-0.004	-0.005

	(-3.28)	(4.69)	(1.02)	(5.63)	(-2.23)	(-3.91)	(3.36)	(-1.12)	(-1.26)
MktShare	-0. 232	0.345	0.094	0.551*	-0 .857**	-0.019	-0.478**	1.316***	1.792***
	(-1.19)	(1.38)	(0.35)	(1.78)	(-2.31)	(-0.08)	(-2.00)	(3.19)	(3.51)
MTR	0.014	-0.026	0.004	-0.019	0.043*	-0.015	0.014	-0.084***	-0.121***
	(1.17)	(-1.58)	(0.23)	(-1.16)	(1.69)	(-0.88)	(0.72)	(-2.74)	(-3.53)
Inst%	0.006*	0.004	0.006	-0.002	0.021*	0.005	0.003	-0.017	-0.006
	(1.69)	(0.84)	(1.10)	(-0.33)	(1.71)	(0.96)	(0.50)	(-1.26)	(-0.59)
BigFour	0.003	-0.005	0.009	0.014	0.003	-0.009	0.018	-0.010	-0.007
	(0.48)	(-0.51)	(0.90)	(1.31)	(0.19)	(-0.82)	(1.46)	(-0.48)	(-0.32)
AuditTenure	-0.001*	-0.000	-0.000	0.000	0.002	0.001	0.001	-0.001	-0.002
	(-1.94)	(-0.03)	(-0.48)	(0.15)	(1.32)	(1.28)	(0.97)	(-0.75)	(-1.16)
Cycle	0.000**	0.000***	0.000**	-0.000	0.000	0.000**	0.000	-0.000	-0.000
	(2.05)	(2.96)	(2.22)	(-0.10)	(1.50)	(2.47)	(1.06)	(-0.99)	(-0.15)
NOA	-0.012***	0.006	-0.007	0.013**	-0.016	0.006	0.023***	-0.005	0.010
	(-3.15)	(1.17)	(-1.18)	(2.46)	(-1.44)	(0.98)	(3.37)	(-0.38)	(0.86)
RTM	-0.045***	0.084***	-0.001	0.081***	-	-	-	-	-
	(-5.60)	(7.72)	(-0.06)	(7.32)	-	-	-	-	-
AM	-	-	-	-	0.002	-0.091***	0.163***	-0.278***	-
	-	-	-	-	(0.03)	(-3.22)	(3.88)	(-3.83)	-
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.08	0.12	0.07	0.14	0.11	0.10	0.13	0.09	0.06
n	3,582	3,582	1,696	1,886	3,582	3,582	3,582	3,582	3,582

Panel C

	AM (Accrual Management)				**RTM (Real Transaction Management)**				***AM+RTM (Total Management)***
	| AM |	***AM***	***AM>0***	***AM<0***	***ABExp***	***ABProd***	***ABCash***	***RTM***	***EM***
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PostClawback	-0.013**	-0.008	-0.021***	0.007	-0.024**	-0.002	-0.009	0.031**	0.021
	(-2.40)	(-1.03)	(-2.68)	(0.93)	(-2.38)	(-0.26)	(-1.52)	(2.53)	(1.43)
Bonus	0.019	-0.031	-0.006	-0.014	0.065***	-0.0101	0.039**	-0.115***	-0.154***
	(1.62)	(-1.57)	(-0.38)	(-0.85)	(2.82)	(-0.67)	(2.42)	(-4.06)	(-4.55)
Option_Grant	0.015*	0.022**	0.020*	-0.009	0.004	-0.002	-0.037***	0.031	0.070***
	(1.89)	(2.21)	(1.76)	(-0.81)	(0.23)	(-0.16)	(-3.35)	(1.60)	(3.06)
Option_Ex	-0.008	0.008	-0.014	0.004	-0.005	0.001	-0.002	0.008	0.016**
	(-1.16)	(0.27)	(-1.40)	(1.19)	(-1.05)	(0.26)	(-0.58)	(1.33)	(2.14)
Option_Un	0.007*	0.007	0.012**	-0.002	0.021*	-0.000	0.015**	-0.036***	-0.044***
	(1.80)	(1.52)	(2.42)	(-0.30)	(1.92)	(-0.04)	(1.97)	(-2.72)	(-2.75)
Owner	0.002**	0.002*	0.003***	-0.000	0.000	0.000	0.001	-0.001	0.001
	(2.41)	(1.95)	(3.23)	(-0.04)	(0.33)	(0.40)	(0.81)	(-0.53)	(0.54)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.06	0.07	0.05	0.04	0.11	0.09	0.14	0.08	0.06
n	2,811	2,811	1,295	1,516	2,811	2,811	2,811	2,811	2,811

The *t*-statistics based on robust standard errors clustered by firm are reported in parentheses. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level, respectively.

| AM | = the absolute value of performance-adjusted abnormal accruals, which is computed following Kothari et al. (2005).
AM = performance-adjusted abnormal accruals, which is computed following Kothari et al. (2005).

ABExp = abnormal discretionary expenses, measured as the deviations from the predicted values of the corresponding industry-year regression, as defined by Roychowdhury (2006).

ABProd = abnormal production cost, measured as the deviations from the predicted values of the corresponding industry-year regression, as defined by Roychowdhury (2006).

ABCash = abnormal cash flow from operations, measured as the deviations from the predicted values of the corresponding industry-year regression, as defined by Roychowdhury (2006).

RTM = total amount of real transaction management, computed as the sum of *ABProd*, *ABExp*, and *ABCash.*

EM = total earnings management, which is the sum of *AM* and *RTM.*

PostClawback = 1 if the company is a clawback adopter in those years in which the clawback provision is implemented, and 0 otherwise .

Size = the natural log of total assets.

M/B = the market to book ratio.

ROA = income before extraordinary items divided by lagged total assets.

ZScore = decile of Altman's z-score.

MktShare = Herfindahl index using 2-digit SIC-codes.

MTR = the marginal tax rate.

Inst% = the percentage of shares owned by institutional investors.

BigFour = 1 if the company is audited by Big-4 CPA firms, and 0 otherwise.

AuditTenure = 1 if the number of years the auditor has audited the client is above the sample median, and 0 otherwise.

Cycle = the days receivable plus the days inventory less the days payable.

NOA = 1 if the net operating assets (i.e., shareholders' equity less cash and marketable securities and plus total debt) at the beginning of the year divided by lagged sales is above the median of the corresponding industry-year, and 0 otherwise.

Bonus = CEO's annual bonus compensation as a proportion of total compensation.

Option_Grant = number of option granted to the CEO during the year divided by the firm's total common shares outstanding

Option_Ex = number of exercisable options held by the CEO at year-end divided by the firm's total common shares outstanding

Option_Un = number of unexercisable options (excluding annual option grants) held by the CEO at year-end divided by the firm's total common shares outstanding

Owner = shares owned by the CEO divided by the firm's total common shares outstanding

TABLE 3
The Effects of Clawback Provisions on Accrual and Real Transaction Management
– Using the Heckman Model to Deal with the Endogeneity Associated with Earnings Management

Panel A : The First Stage Model - Determinants of Earning Management

	Suspect_EM
Clawback	0.025
	(0.38)
Size	0.107***
	(2.61)
M/B	-0.008
	(-0.96)
Leverage	0.645***
	(3.58)
HabitBeater	0.071***
	(3.11)
Shares	0.117**
	(2.25)
ROA	-0.141
	(-0.49)
NAnalyst	-0.012*
	(-1.95)
Year fixed effects	Yes
Pseudo R-squared	0.05
n	3,582

Panel B: The Second Stage Model -The Effects of Clawback Provisions

	|AM|	***AM***	***AM>0***	***AM<0***	***RTM***	***EM***
	(1)	(2)	(3)	(4)	(5)	(6)
PostClawback	-0.027***	-0.011	-0.029***	0.019	0.033**	0.020
	(-3.59)	(-1.16)	(-3.22)	(1.12)	(2.08)	(1.14)
IMR	-0.065	-0.118**	-0.116**	0.113	-0.179**	-0.285***
	(-1.60)	(-2.43)	(-2.41)	(1.22)	(-2.15)	(-3.14)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.05	0.05	0.04	0.02	0.09	0.07
n	2,244	2,244	1,548	696	2,244	2,244

The *z*-statistics (*t*-statistics) based on robust standard errors clustered by firm are reported in parentheses. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level, respectively.

Suspect_EM = 1 if either *AM* or *RTM* is above the industry-year median, and 0 otherwise.

Clawback = 1 if the company is a clawback adopter, and 0 otherwise.

Size = the natural log of total assets.

M/B = the market to book ratio.

Leverage = long-term liabilities divided by total assets.

Labor = 1 minus capital intensity, where capital intensity equals gross PP&E divided by total sales.

HabitBeater = the number of times analysts' forecast consensus was met or beat over the past four quarters.

Shares = the log number of shares outstanding.

ROA = income before extraordinary items divided by lagged total assets.

Nanalyst = the number of analyst following at the beginning of the year.

| *AM* |= the absolute value of performance-adjusted abnormal accruals, which is computed following Kothari et al. (2005).

AM = performance-adjusted abnormal accruals, which is computed following Kothari et al. (2005)

RTM = total amount of real transaction management, computed as the sum of *ABProd*, *ABExp*, and *ABCash.*

EM = total earnings management, which is the sum of *AM* and *RTM*.

PostClawback = 1 if the company is a clawback adopter in those years in which the clawback provision is implemented, and 0 otherwise.

IMR = the inverse Mills Ratio estimated from the first-stage model (Panel A) of the Heckman model.

TABLE 4

The Effects of Clawback Provision on Accrual and Real Transaction Management – High vs. Low Growth Firms

	|AM|		***AM***		***AM>0***		***AM<0***		***RTM***		***EM***	
	High growth	**Low growth**	**High growth**	**Low growth**	**High growth**	**Low growth**	**High growth**	**Low growth**	**High growth**	**Low growth**	**High growth**	**Low growth**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
PostClawback	-0.021**	-0.004	-0. 008	-0.004	-0.023***	-0.007	0.007	-0.002	0.047***	0.018	0.032*	0.006
	(-2.67)	(-0.99)	(-0.09)	(-0.03)	(-2.75)	(-0.42)	(0.64)	(-0.17)	(3.46)	(0.65)	(1.95)	(0.40)
t-test for high versus low growth firms	2.02**		0.25		1.93*		0.48		2.04**		1.85*	
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.07	0.06	0.07	0.08	0.05	0.08	0.10	0.12	0.07	0.05	0.05	0.04
n	1,791	1,791	1,791	1,791	782	915	1,009	876	1,791	1,791	1,791	1,791

The *t*-statistics based on robust standard errors clustered by firm are reported in parentheses. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level, respectively.

AM = performance-adjusted abnormal accruals, which is computed following Kothari et al. (2005)

RTM = total amount of real transaction management, computed as the sum of *ABProd, ABExp,* and *ABCash.*

EM = total earnings management, which is the sum of *AM* and *RTM.*

PostClawback = 1 if the company is a clawback adopter in those years in which the clawback provision is implemented, and 0 otherwise.

TABLE 5

The Impacts of Clawback Adopter's Increased Use of Real Transaction Management on Future Performance

	$\Delta ROA_{(t, t+1)}$	$\Delta ROA_{(t, t+1)}$	$\Delta ROA_{(t, t+2)}$	$\Delta ROA_{(t, t+2)}$	$\Delta ROA_{(t, t+3)}$	$\Delta ROA_{(t, t+3)}$
	(1)	(2)	(3)	(4)	(5)	(6)
$Clawback\_IRTM_{(t-1, t)}$	-0.021**	-	-0.028**	-	-0.014*	-
	(-2.26)	-	(-2.44)	-	(-1.81)	-
$Clawback\_DRTM_{(t-1, t)}$	0.006	-	-0.002	-	-0.004	-
	(0.66)	-	(-0.12)	-	(-0.58)	-
Clawback	-	-0.009	-	-0.015	-	-0.009
	-	(-1.13)	-	(-1.55)	-	(-1.39)
$\Delta Size_{(t-1, t)}$	-0.055***	-0.059***	-0.070**	-0.074***	-0.078***	-0.080***
	(-2.84)	(-3.01)	(-2.47)	(-2.60)	(-4.36)	(-4.46)
$\Delta M/B_{(t-1, t)}$	-0.001	-0.001	0.000	0.000	-0.000	-0.000
	(-0.82)	(-0.76)	(0.11)	(0.20)	(-0.65)	(-0.61)
$\Delta Leverage_{(t-1, t)}$	0.152***	0.146***	0.115	0.123	0.107**	0.105**
	(5.10)	(4.89)	(1.39)	(1.49)	(2.21)	(2.19)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.12	0.11	0.11	0.10	0.12	0.11
n	449	449	442	442	364	364
t- test for Clawback_IRTM = Clawback_DRTM	2.36**		1.99**		1.09	

The *t*-statistics based on robust standard errors clustered by firm are reported in parentheses. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level, respectively.

$\Delta ROA_{(t, t+i)}$ = the industry-adjusted change in *ROA* from year *t* to *t+i*; *i* = 1, 2, and 3. Year *t* is the year during which the clawback provision is initiated.

Clawback = 1 if the company is a clawback adopter, and 0 otherwise.

Clawback_IRTM = 1 if the clawback adopter increases its amount of real transaction management during the adoption year relative to pre-adoption years, and 0 otherwise.

Clawback_DRTM = 1 if the clawback adopter decreases its amount of real transaction management during the adoption year relative to pre-adoption years, and 0 otherwise.

$\Delta Size$ = change in firm size (as measured by total assets) .

$\Delta M/B$ = change in the firm's market-to-book ratio.

$\Delta Leverage$ = change in the firm's leverage ratio.

Appendix

TABLE A1
Determinants of Adoption of Clawback Provisions for Propensity Score Matching

	Clawback
Size	0.548***
	(9.89)
M/B	0.009
	(0.55)
SaleG	-0.715**
	(-2.41)
Leverage	-0.174
	(-0.45)
ROA	0.059
	(0.11)
Segment	0.224***
	(2.70)
PriorRestate	0.263*
	(1.79)
Inst%	0.033
	(0.31)
BDIndep	0.827*
	(1.78)
Industry and year fixed effects	Yes
Pseudo R-squared	0.127
n	8,868

The *z*-statistics based on robust standard errors clustered by firm are reported in parentheses. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level, respectively.

Size = the natural log of total assets.
M/B = the market to book ratio.
SaleG = a one-year sales growth.
Leverage = long-term liabilities divided by total assets.
ROA = income before extraordinary items divided by lagged total assets.
Segment = the natural log of the number of business segments.
PriorRestate = 1 if firm has any earnings restatement during prior three years, and 0 otherwise.
Inst% = the percentage of shares owned by institutional investors.
BDIndep = the number of independent directors divided by the total number of directors on the board.

TABLE A2

The Effects of Clawback Provisions on Accrual Management and Real Transactions Management – Using the Heckman Model to Deal with the Endogeneity Associated with Clawback Adoption

Panel A: The First Stage regression - Determinants of Clawback Adoption

	Clawback
Size	0.268***
	(9.30)
M/B	0.012
	(0.67)
SaleG	-0.350**
	(-2.24)
Leverage	-0.256
	(-1.22)
ROA	0.029
	(0.11)
Segment	0.142***
	(2.61)
Inst%	0.039
	(0.66)
BDIndep	0.446*
	(1.90)
Enforceability	-0.006
	(-0.36)
PeerAdopt	0.569***
	(4.24)
Industry and year fixed effects	Yes
Pseudo R-squared	0.143
n	13,010

Panel B: The Second Stage Regression - The Effects of Clawback Provisions

	|AM|	***AM***	***AM>0***	***AM<0***	***RTM***	***EM***
	(1)	(2)	(3)	(4)	(5)	(6)
PostClawback	-0.015**	-0.005	-0.024***	0.005	0.045***	0.036**
	(-2.57)	(-0.80)	(-3.51)	(0.53)	(3.60)	(2.54)
IMR_Clawback	0.003**	0.060***	0.033***	0.013***	0.071***	0.126***
	(2.25)	(41.36)	(12.51)	(5.37)	(17.33)	(27.14)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.12	0.14	0.11	0.15	0.08	0.08
n	13,010	13,010	6,040	6,970	13,010	13,010

The *t*-statistics based on robust standard errors clustered by firm are reported in parentheses. ***, **, * indicates significance at the 0.01, 0.05, and 0.10 level, respectively.

Size =	the natural log of total assets.
M/B =	the market to book ratio.
SaleG =	a one-year sales growth.
Leverage =	long-term liabilities divided by total assets.
ROA =	income before extraordinary items divided by lagged total assets.
Segment =	the natural log of the number of business segments.
Inst% =	the percentage of shares owned by institutional investors.
BDIndep =	the number of independent directors divided by the total number of directors on the board.
Enforceability =	a state level enforceability index of non-competition clause developed in Garmaise (2011).
PeerAdopt =	the percentage of peer firms in the same industry (2-digit SIC codes) that also have clawback provisions in place.
AM =	performance-adjusted abnormal accruals, which is computed following Kothari et al. (2005)
RTM =	total amount of real transaction management, computed as the sum of *ABProd*, *ABExp*, and *ABCash.*
EM =	total earnings management, which is the sum of *AM* and *RTM*.
PostClawback =	1 if the company is a clawback adopter in those years in which the clawback provision is implemented, and 0 otherwise.
IMR_Clawback =	the inverse Mills ratio estimated from the first-stage model (Panel A) of the Heckman model.