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

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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 shown to reduce financial misstatements and increase investors' confidence on earnings information. We show that the benefits come with an unintended consequence of certain firms substituting for accruals management with real transactions management (e.g., reduce research and development [R&D] expenditures), especially firms with strong incentives to achieve short-term earnings targets, such as firms with high growth or high transient institutional ownership. As such, the total amount of earnings management does not decrease subsequent to clawback adoption. We further show that although real transactions management temporarily boosts those clawback adopters' short-term profitability and stock performance, this trend reverses after three years. In summary, clawbacks may have unexpected effects for a subset of firms whose managers are under greater pressure to meet earnings goals.

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I. INTRODUCTION

One of the most notable recent changes in executive compensation practices has been an increase in the use of compensation recovery policies or "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 that have adopted clawbacks increased from 19 to 444 over the 2005 to 2009 period. All listed firms will soon adopt clawback provisions, according to Section 954 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (U.S. House of Representatives 2010; hereafter, DFA 954). DFA 954 requires the Securities and Exchange Commission (SEC) to direct stock exchanges to prohibit the listing of companies that have not implemented compensation clawback policies.[1] However, as of early 2014, the SEC had not finalized the new rules to implement DFA 954.

While listed companies do not need to implement DFA 954's mandatory clawback policies until the rule is finalized by the SEC, the effectiveness of this requirement is reflected in the increase in voluntary adoption of clawback provisions between 2005 and 2009. This issue has attracted a great deal of attention from academics and the business press. 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 by reducing effort when auditing clients with such provisions (Chan, K. Chen, T. Chen, and Yu 2012; DeHaan, Hodge, and Shevlin 2013). Therefore, firm-initiated clawbacks appear to effectively deter financial misstatements.

A reduction in the occurrence of accounting restatements subsequent to clawback adoption, however, 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 examine whether clawbacks lead to a substitution between reduced accruals management and increased real transactions management. We predict that, on one hand, clawbacks deter managers from using accruals management because high accounting accruals tend to attract more scrutiny from the SEC and auditors. Hence, high accounting accruals are more likely to be associated with accounting restatements, which trigger clawbacks (Dechow, Ge, and Schrand 2010). On the other hand, real transactions management, such as cutting back on R&D or SG&A (selling, general, and administrative) expenses, is considered less risky than accruals management. The reason is that real transactions management represents a deviation from optimal business practices taken by managers to achieve certain earnings targets, but is unlikely to be deemed

[1] Regulatory clawbacks were first introduced by Section 304 of the Sarbanes-Oxley Act (SOX; U.S. House of Representatives 2002). Specifically, SOX 304 authorizes the 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, the SEC rarely enforces SOX 304, probably due to the SEC's limited resources and difficulty in proving managerial misconduct. In response, DFA 954 designates the board of directors rather than the SEC as the enforcer of clawbacks.

improper by auditors and regulators (Jiambalvo 1996; Roychowdhury 2006; Cohen, Mashruwala, and Zach 2010). The rational expectations equilibrium model constructed by Ewert and Wagenhofer (2005) also shows that a regulation intended to improve earnings quality, for example, by reducing discretionary accruals or improving ERCs, may actually induce managers to resort to other forms of earnings management, such as real transactions management. Consistent with this prediction, Cohen, Dey, and Lys (2008) find that while the Sarbanes-Oxley Act (SOX) reduces accruals-based earnings management, it causes managers to use real transactions to manage earnings. Thus, while clawbacks may constrain accruals management, they may also encourage real transactions management. This substitution would represent an unintended consequence of clawback provisions that has not been documented before.

Our study starts with a sample of nonfinancial 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, to test our empirical hypotheses, we use a double propensity score matching approach to identify 236 pairs of clawback adopters and non-adopters with the most closely matched firm characteristics. Using a difference-in-differences design, we find that the adoption of clawback provisions is associated with lower accruals management, consistent with Babenko, Bennett, Bizjak, and Coles (2012) and Chen, Greene, and Owers (2014), and greater real transactions management.

Following Cohen and Zarowin (2010) and Badertscher (2011), we also construct a measure of total earnings management by combining the amounts of accruals management and real transactions management, measured as the sum of abnormal cash flow and abnormal discretionary expenses. We find that total earnings management increases marginally rather than decreasing after clawbacks; that is, the decrease in accruals management appears to be offset by an increase in real transactions management. 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 driven mainly by clawback adopters with higher growth opportunities or with more transient institutional investors relative to non-adopting firms with similar growth characteristics or similar levels of transient institutional holdings. This result is consistent with Bushee's (1998) and Matsumoto's (2002) finding that managers of such firms have stronger incentives to manage reported earnings to achieve short-term earnings goals.

Finally, we find that clawback firms that increase real transactions management in the adoption year, relative to clawback adopters that do not increase real transactions management, experience a short-term increase in profitability as measured by return on assets, as well as stock returns. However, this trend reverses to the pre-managed levels after three years. This result is consistent with findings from previous studies, such as Bhojraj, Hribar, McInnis, and Picconi (2009) and Cohen and Zarowin (2010), indicating that while real transactions management may create a temporary spike in company performance, this short-term advantage disappears afterward.

Our study has important implications for the mandatory clawback provisions that the SEC is supposed to institute, as required by the DFA enacted in 2010. As of early 2014, the SEC had not yet finalized and implemented DFA 954, possibly due to certain concerns. For example, at least one commissioner (Paredes 2012) opined that it is unfair for executives to forfeit their compensation without having engaged in any misconduct. In addition, the enforcement of DFA 954 might compel firms to increase executive pay or grant discretionary bonuses that are not explicitly linked to specific financial targets (Babenko et al. 2012). Our study adds one more caveat in making clawback provisions mandatory. That is, while clawbacks may reduce accounting-based manipulation in the form of accruals management, they also encourage real transactions management. In particular, we find that clawback adopters that are under greater pressure to achieve earnings targets engage in more real transactions management to create a temporary spike

in profitability that reverses later. This substitution is consistent with Cohen et al.'s (2008) findings, which show that firms switch from accruals manipulation to real transactions management after the passage of SOX.[2] Thus, our study implies that a mechanism designed to improve financial reporting quality may have unintended consequences for certain types of firms.

Next, Section II develops our testable hypotheses. Section III discusses the sample. Section IV presents our research design and reports the results, and Section V concludes.

II. HYPOTHESIS DEVELOPMENT

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 financial media raise questions about the effectiveness of firm-initiated clawbacks (e.g., Dvorak and Ng 2006; Weiss 2008; Lublin 2010), Chan et al. (2012) and DeHaan et al. (2013) find that after clawback adoption, financial misstatements decrease and investors consider earnings to be more informative. 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.

We expect clawback adoption to lead to a reduction in 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, is less likely to be detected by regulators or auditors.[3] As Dechow et al. (2010, 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 misstatements (Chan et al. 2012). As Ashbaugh-Skaife et al. (2008) show, remediation of internal control deficiencies prevents managers from engaging in accruals manipulation, including misreporting warranty liabilities or the allowance for bad debt.

Clawback provisions, however, are unlikely to eliminate all types of earnings manipulation, particularly when managers are under pressure to meet or beat earnings targets.[4] Previous research shows that, in addition to accruals management, real transactions management, such as 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 improper 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, Harvey, and Rajgopal (2005) find that a majority of financial executives are willing to cut

[2] 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, covering disclosure of internal control weakness, are both shown to improve accruals quality (Ashbaugh-Skaife, Collins, Kinney, and LaFond 2008). Further, Section 304 introduces the first mandatory clawbacks, which may also affect managers' choice of earnings management tools. Because our study focuses on firm-initiated clawbacks, we are better able to draw conclusions on the effects of such provisions.

[3] 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.

[4] Meeting certain earnings benchmarks is important, because doing so increases the firm's credibility with the capital market, supports the firm's stock price, and promotes the management team's reputation (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). In addition to capital market incentives, executive compensation is also tied to reported earnings, thereby providing incentives for managers to manipulate earnings. Beyer, Cohen, Lys, and Walther (2010) provide a detailed literature review.

discretionary expenditures, such as R&D or advertising, to maintain accounting appearances, even if such actions would sacrifice the firm's long-term performance.

Using a rational expectation 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 in the form of 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 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 increases, 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.

To summarize, we expect that clawback provisions cause managers to switch from accruals manipulation to real transactions management to achieve earnings targets. More formally:

H1: Subsequent to the adoption of clawback provisions, accruals-based earnings management decreases while real transactions management increases.

Clawback Adopters with High- versus Low-Growth Opportunities

H1 predicts that clawback provisions lead firms to substitute among different 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 compared to value firms, growth companies experience a sharper decline in share price after missing consensus forecasts. Further, extant literature on executive compensation shows that executives of firms with higher growth opportunities, such as firms with high market-to-book ratios, tend to receive more stock options or restricted stock than executives of firms with lower growth opportunities (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. Thus, we 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.

Clawback Adopters with High versus Low Transient Institutional Ownership

We also expect that the shift from accruals management to real transactions management subsequent to clawback adoption occurs primarily in firms with high transient institutional ownership. Bushee (1998) argues that due to high portfolio turnover, transient institutional investors tend to place significant focus on short-term earnings targets, which incentivizes managers to cut R&D investments to avoid negative earnings surprises. Supporting this argument, Matsumoto (2002) documents that firms with higher transient institutional ownership are positively associated with the likelihood of meeting/beating analysts' forecasts. These findings together suggest that relative to CEOs of clawback adopters with low transient institutional ownership, CEOs of clawback adopters with high transient institutional ownership have stronger incentives to resort to

real transactions management to avoid any earnings disappointment. They find that such disappointment would trigger large-scale stock selling by those transient investors and, in turn, lead to undervaluing the company stock price. More formally:

H3: Among clawback adopters, those with high transient institutional ownership 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. Because 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 the Treasury. After excluding financial firms and firms 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.

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, there were only 19 firms with such firm-initiated clawbacks in 2005, but clawbacks have since become increasingly popular. In Table 1, Panel B 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 distributed fairly evenly across industries.

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. These requirements reduce 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.

Table 1, Panel C compares salient firm characteristics across the 343 clawback adopters and 1,840 non-adopters. On average, clawback adopters have larger firm size, as measured by market value and sales revenue, lower sales growth, higher leverage ratio, more operating segments, better profitability, longer CEO tenure, higher CEO pay as a percentage of total pay of top five executives, and better corporate governance in terms of institutional ownership and board independence.

Table 1, Panel C indicates that clawback adopters differ from non-adopters along several dimensions, suggesting potential endogeneity associated with the decision to adopt clawbacks. Therefore, 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. (2013), we model clawback adoption as a function of firm size, as measured by market value and sales revenue, market-to-book ratio, sales growth, leverage, ROA, number of segments, restatement history, institutional ownership, board independence, CEO tenure, CEO pay, earnings-response coefficient, industry membership, and year fixed effects using a probit model.

Results of this analysis are reported in Table 1, Panel D. Employing a firm-level regression analysis by using year 2006 data, we find that clawback adoption is positively associated with firm size, number of segments, restatement history, and board independence, and negatively related to sales growth, earnings-response coefficients, and CEO tenure, consistent with Babenko et al. (2012) and DeHaan et al. (2013).

TABLE 1

Composition of Clawback Adopters and Descriptive Statistics of Adopting Firms Used in Analysis

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	3.60
Food products (20)	15	3.38
Paper and paper products (24–27)	17	3.83
Chemical products (28)	35	7.88
Manufacturing (30–34)	17	3.83
Computer equipment and services (35, 73)	49	11.04
Electronic equipment (36)	27	6.08
Transportation (37, 39, 40–42, 44, 45)	26	5.86
Scientific instruments (38)	23	5.18
Communications (48)	17	3.83
Electric, gas, and sanitary services (49)	19	4.28
Durable goods (50)	7	1.58
Retail (53, 54, 56, 57, 59)	22	4.95
Eating and drinking establishments (58)	9	2.03
Entertainment services (70, 78, 79)	1	0.23
Health (80)	8	1.80
All others	136	30.62
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**	**p-value**	**Clawback Firms**	**Non-Adopters**	**p-value**
LnMV	8.295	7.175	0.000	8.201	6.997	0.000
LnRev	7.991	6.690	0.000	8.046	6.711	0.000
M/B	3.037	2.975	0.697	2.505	2.375	0.230
SaleG	0.100	0.131	0.002	0.074	0.098	0.001

(continued on next page)

TABLE 1 (continued)

	Mean			Median		
	Clawback Firms	**Non-Adopters**	**p-value**	**Clawback Firms**	**Non-Adopters**	**p-value**
Leverage	0.207	0.185	0.040	0.187	0.156	0.001
ROA	0.037	0.012	0.000	0.043	0.035	0.007
Segment	1.780	1.480	0.000	1.963	1.384	0.000
Inst%	0.600	0.527	0.001	0.679	0.596	0.000
BDIndep	0.677	0.632	0.000	0.687	0.643	0.000
Tenure	1.307	1.128	0.006	1.387	1.099	0.004
CEOpay	32.849	23.969	0.000	38.072	28.530	0.000
ERC	19.822	18.142	0.435	7.603	5.956	0.254
n	343	1,840		343	1,840	

Panel D: Determinants of Adoption of Clawback Provisions for Propensity-Score Matching

	Clawback
LnMV	0.442
	(0.000)
LnRev	0.206
	(0.055)
M/B	0.012
	(0.589)
SaleG	−0.914
	(0.011)
Leverage	−0.258
	(0.529)
ROA	0.027
	(0.960)
Segment	0.258
	(0.003)
PriorRestate	0.339
	(0.044)
Inst%	0.042
	(0.646)
BDIndep	1.042
	(0.064)
Tenure	−0.361
	(0.000)
CEOpay	0.008
	(0.201)
ExecuComp_dum	0.515
	(0.136)
ERC	−0.002
	(0.070)
ERC_dum	−0.132
	(0.726)
Industry and year fixed effects	Yes
Pseudo R^2	0.21
n	2,183

(continued on next page)

TABLE 1 (continued)

Panel E: Descriptive Statistics of 236 Pairs of Clawback Adopters and Non-Adopters Identified by Propensity-Score Matching

	Mean			Median		
	Clawback Firms	**Non-Adopters**	**p-value**	**Clawback Firms**	**Non-Adopters**	**p-value**
LnMV	7.937	7.923	0.928	7.733	7.914	0.771
LnRev	7.605	7.611	0.976	7.611	7.760	0.920
M/B	2.862	2.978	0.535	2.267	2.275	0.928
SaleG	0.107	0.124	0.298	0.075	0.080	0.704
Leverage	0.212	0.224	0.653	0.191	0.204	0.960
ROA	0.030	0.032	0.872	0.047	0.047	0.548
Segment	1.779	1.627	0.406	1.865	1.622	0.639
Inst%	0.573	0.601	0.177	0.685	0.702	0.441
BDIndep	0.661	0.658	0.429	0.689	0.667	0.327
Tenure	1.319	1.334	0.880	1.386	1.386	0.841
CEOpay	32.444	30.154	0.215	36.943	35.257	0.246
ERC	19.835	21.121	0.638	8.242	7.975	0.802
n	236	236		236	236	

p-values are reported in parentheses.
Panel A provides the yearly distribution of the number of industrial firms with clawback provisions in the Corporate Library dataset, and Panel B presents the distribution of clawback adopters based on industry membership (two-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 for year 2006. Panel D provides the results of logit regression, which uses data in year 2006 to perform the propensity score matching. Panel E provides the same set of descriptive statistics as in Panel C for 236 pairs of clawback adopters and non-adopters, matched based on propensity score matching using year 2006 data. See Appendix A for variable definitions.

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 252 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 repeat the clawback selection model procedure described earlier on the 252 matched pairs. This second round of PSM further reduces the sample size to 236 pairs of clawback adopters and control firms, which we use as the primary sample for our empirical tests.

The two rounds of PSM apparently alleviate observable differences across clawback adopters and control firms, as shown in Table 1, Panel E. Considering the same set of firm characteristics as in Panel C, clawback adopters, on average, are statistically indistinguishable from their matched control firms, indicating that our matching procedure achieves a *covariate balance*.

IV. EMPIRICAL RESULTS

Following prior studies on firm-initiated clawbacks (Chan et al. 2012; DeHaan et al. 2013), we use the difference-in-differences approach to test our hypotheses. Specifically, we employ the following research design:

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

where *Y* is the dependent variable of interest, the value of discretionary accruals or measures of real transactions management. *PostClawback* is an indicator variable that equals 1 if the company is a clawback adopter in those years in which the clawback provision is implemented, and 0 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 prior literature, we use performance-adjusted discretionary accruals to proxy for accruals management (Kothari, Leone, and Wasley 2005; Ashbaugh-Skaife et al. 2008). Specifically, we first estimate the following modified Jones (1991) model cross-sectionally for industry-years with at least 20 observations, using the entire Compustat universe:

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

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. Following Kothari et al. (2005), we subtract the change in accounts receivable from the change in sales revenue ($\Delta Sales$) prior to estimating Equation (2).[5] The estimated residuals from Equation (2) are unadjusted discretionary accruals. While we include an intercept in Equation (2) following Kothari et al. (2005), we find that our results remain qualitatively similar if we exclude the intercept—that is, the sign and statistical significance levels of *PostClawback* are similar to those reported in Table 2, Panel B.[6]

Finally, we follow Ashbaugh-Skaife et al. (2008) to performance-adjust the discretionary accruals obtained from Equation (2). Specifically, we use the entire Compustat universe and rank firms within each industry into ten deciles based on the prior year's ROA, and compute the performance-adjusted discretionary accruals as the difference between the sample firm's discretionary accruals and the median discretionary accruals for firms in the same industry ROA decile, where the median ROA value excludes the particular sample firm. More importantly, given that we have identified 236 pairs of clawback adopters and control firms using the PSM procedure, we ensure that each individual firm within the 236 pairs of clawback adopters and non-adopters does not serve as each other's performance-adjustment for discretionary accruals.[7]

[5] 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.

[6] For example, if we exclude the intercept from Equation (2), then the coefficient on *PostClawback* is −0.023 ($p = 0.015$) when the dependent variable is positive discretionary accruals ($AM > 0$). Throughout the paper, we consider the results from robustness tests to be "qualitatively similar" when the sign and economic significance levels of key variable, *PostClawback,* are close to the reported main results.

[7] For example, when we compute clawback adopter Allegheny Energy's performance-adjusted discretionary accruals, we do not include Vectren Corporation, which is Allegheny Energy's matched control firm, and Allegheny Energy itself in the industry ROA decile (two-digit SIC code: 33). Similarly, when we compute Vectren Corporation's performance-adjusted discretionary accruals, we again exclude Vectren Corporation and Allegheny Energy in the industry ROA decile. Finally, our results remain qualitatively similar if we directly use discretionary accruals from the modified Jones (1991) model as the dependent variable.

TABLE 2

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

Panel A: Descriptive Statistics of Key Variables

	Mean					
	Clawback Firms			Non-Adopters		
	Pre	Post	p-value	Pre	Post	p-value
AM	−0.005	−0.004	0.818	−0.008	−0.012	0.503
AM > 0	0.074	0.055	0.003	0.076	0.074	0.696
AM < 0	−0.071	−0.061	0.080	−0.082	−0.080	0.841
|*AM*|	0.072	0.054	0.001	0.079	0.078	0.880
ABExp	0.028	−0.009	0.007	0.052	0.045	0.674
ABCash	0.097	0.061	0.000	0.112	0.098	0.072
ABProd	−0.041	−0.039	0.810	−0.040	−0.032	0.337
n		236			236	

Panel B: The Impacts of Clawbacks on Accruals and Real Transactions Management

	AM (Accruals Management)			*RTM* (Real Transactions Management)					*AM* + *RTM1* (Total Management)
	AM (1)	*AM* > 0 (2)	*AM* < 0 (3)	*ABExp* (4)	*ABCash* (5)	*ABProd* (6)	*RTM1* (7)	*RTM2* (8)	*EM* (9)
PostClawback	−0.002	−0.020	0.007	−0.024	−0.014	0.001	0.038	0.025	0.026
	(0.757)	(0.019)	(0.332)	(0.023)	(0.025)	(0.841)	(0.001)	(0.009)	(0.064)
Size	−0.036	−0.020	−0.026	−0.057	0.007	0.009	0.050	0.056	0.025
	(0.000)	(0.004)	(0.006)	(0.000)	(0.226)	(0.103)	(0.000)	(0.000)	(0.035)
M/B	−0.001	−0.001	−0.002	−0.005	0.002	−0.002	0.003	0.003	0.002
	(0.031)	(0.153)	(0.015)	(0.000)	(0.009)	(0.006)	(0.001)	(0.000)	(0.165)
SaleG	−0.011	0.021	−0.053	0.150	0.022	0.033	−0.173	−0.117	−0.193
	(0.142)	(0.010)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.441	0.114	0.325	−0.244	0.336	−0.194	−0.091	0.050	0.462
	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.051)	(0.201)	(0.000)

(continued on next page)

TABLE 2 (continued)

	AM (Accruals Management)			*RTM* (Real Transactions Management)					*AM + RTM1* (Total Management)
	AM (1)	*AM > 0* (2)	*AM < 0* (3)	*ABExp* (4)	*ABCash* (5)	*ABProd* (6)	*RTM1* (7)	*RTM2* (8)	*EM* (9)
ZScore	0.008	0.001	0.009	−0.015	0.007	−0.010	0.008	0.005	0.008
	(0.000)	(0.441)	(0.000)	(0.004)	(0.000)	(0.000)	(0.012)	(0.084)	(0.034)
MktShare	0.418	0.104	0.637	−0.928	−0.430	−0.089	1.213	0.965	2.153
	(0.103)	(0.704)	(0.051)	(0.011)	(0.110)	(0.826)	(0.001)	(0.009)	(0.000)
MTax	−0.036	−0.014	−0.043	0.075	0.009	−0.013	−0.084	−0.088	−0.146
	(0.034)	(0.490)	(0.019)	(0.003)	(0.549)	(0.424)	(0.002)	(0.000)	(0.000)
Inst%	0.003	0.004	−0.000	0.011	0.009	0.001	−0.020	−0.010	−0.016
	(0.589)	(0.549)	(0.944)	(0.177)	(0.063)	(0.803)	(0.022)	(0.194)	(0.134)
BigFour	−0.07	−0.016	0.008	−0.006	−0.003	0.007	0.010	0.013	−0.010
	(0.529)	(0.165)	(0.490)	(0.667)	(0.711)	(0.465)	(0.542)	(0.327)	(0.589)
AuditTenure	−0.001	−0.001	−0.000	0.001	0.000	0.001	−0.001	−0.000	−0.004
	(0.624)	(0.412)	(0.992)	(0.497)	(0.841)	(0.418)	(0.465)	(0.857)	(0.032)
Cycle	0.000	0.000	−0.000	0.000	0.000	0.000	−0.000	−0.000	−0.000
	(0.008)	(0.101)	(0.795)	(0.177)	(0.174)	(0.052)	(0.043)	(0.472)	(0.204)
NOA	0.003	−0.010	0.014	−0.007	0.014	0.009	−0.007	0.016	0.015
	(0.610)	(0.144)	(0.019)	(0.395)	(0.006)	(0.112)	(0.441)	(0.042)	(0.168)
M&A	−0.007	−0.007	−0.000	−0.005	−0.002	0.004	−0.003	−0.001	0.002
	(0.147)	(0.242)	(0.992)	(0.484)	(0.610)	(0.327)	(0.719)	(0.928)	(0.857)
Restructure	0.006	0.000	0.005	0.026	−0.014	0.016	−0.012	−0.010	−0.007
	(0.230)	(0.984)	(0.332)	(0.001)	(0.003)	(0.001)	(0.150)	(0.147)	(0.509)
Writeoff	−0.003	0.009	−0.007	−0.008	0.008	−0.005	0.000	0.003	−0.003
	(0.516)	(0.110)	(0.204)	(0.250)	(0.074)	(0.267)	(0.960)	(0.631)	(0.757)
RTM1	0.046	0.001	0.029						
	(0.000)	(0.936)	(0.029)						
AM				0.008	0.152	−0.084	−0.103	−0.061	
				(0.904)	(0.000)	(0.002)	(0.000)	(0.011)	
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.12	0.07	0.14	0.11	0.13	0.10	0.10	0.11	0.08
n	3,556	1,683	1,873	3,556	3,556	3,556	3,556	3,556	3,556

(continued on next page)

TABLE 2 (continued)

Panel C: The Impacts of Clawbacks on Accruals and Real Transactions Management with the Control of Executive Compensation

	AM (Accruals Management)			*RTM* (Real Transactions Management)					*AM + RTM1* (Total Management)
	AM (1)	*AM > 0* (2)	*AM < 0* (3)	*ABExp* (4)	*ABCash* (5)	*ABProd* (6)	*RTM1* (7)	*RTM2* (8)	*EM* (9)
PostClawback	−0.004	−0.019	0.009	−0.030	−0.013	0.002	0.041	0.028	0.022
	(0.610)	(0.025)	(0.226)	(0.004)	(0.055)	(0.757)	(0.001)	(0.007)	(0.117)
Bonus	−0.033	−0.008	−0.019	0.046	0.027	−0.006	−0.062	−0.047	−0.116
	(0.097)	(0.638)	(0.204)	(0.037)	(0.103)	(0.704)	(0.015)	(0.030)	(0.000)
Option_Grant	0.027	0.030	−0.007	0.004	−0.014	−0.002	0.018	0.002	0.044
	(0.012)	(0.012)	(0.529)	(0.772)	(0.019)	(0.741)	(0.075)	(0.818)	(0.040)
Option_Ex	0.007	−0.012	0.004	−0.007	−0.003	−0.000	0.011	0.007	0.010
	(0.803)	(0.168)	(0.246)	(0.142)	(0.313)	(0.912)	(0.059)	(0.156)	(0.093)
Option_Un	0.004	0.009	−0.004	0.019	0.010	0.000	−0.029	−0.019	−0.034
	(0.294)	(0.054)	(0.497)	(0.064)	(0.129)	(0.984)	(0.016)	(0.062)	(0.011)
Owner	0.001	0.004	0.000	0.000	0.001	0.000	−0.002	−0.000	−0.000
	(0.093)	(0.000)	(0.960)	(0.697)	(0.174)	(0.624)	(0.250)	(0.944)	(0.912)
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^2	0.07	0.05	0.05	0.12	0.14	0.10	0.08	0.09	0.07
n	2,790	1,285	1,505	2,790	2,790	2,790	2,790	2,790	2,790

p-values are reported in parentheses.
See Appendix A for variable definitions.

Real Transactions Management

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

$$Expense = \alpha + \beta_1(1/Asset_{t-1}) + \beta_2(Sales_{t-1}/Asset_{t-1}) + \varepsilon_t. \tag{3}$$

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

$$CFO = \alpha + \beta_1(1/Asset_{t-1}) + \beta_2(Sales_t/Asset_{t-1}) + \beta_3(\Delta Sales_t/Asset_{t-1}) + \varepsilon_t. \tag{5}$$

We estimate Equations (3) to (5) by year and two-digit SIC code for all firms in Compustat during our sample period (2000–2009).[8] The estimated coefficients from the corresponding industry-years are used to compute firm-specific *ABExp, ABProd,* and *ABCash*. Roychowdhury (2006) posits 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 items to reduce costs of goods sold per unit in order to achieve a higher reported operating income. Finally, to inflate sales revenue, managers are likely to offer price discounts or lenient credit terms, although these practices may lead to lower operating cash flow, a negative *ABCash*. Following Cohen and Zarowin (2010), we also create two overall measures of real transactions management by summing *ABCash* and *ABExp* (*RTM1*), and *ABProd* and *ABExp* (*RTM2*), respectively. Specifically, we multiply *ABExp* and *ABCash* by −1 so that they can represent real transactions management in a consistent fashion as *ABProd;* i.e., 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 and increase real transactions manipulation (H1), we estimate the following regression models, which follow Ashbaugh-Skaife et al. (2008), Cohen and Zarowin (2010), and Zang (2012):

$$\begin{aligned} AM_{it}(\text{or } RTM_{it}) = {} & \alpha + \beta_1 PostClawback_{it} + \beta_2 Size_{it} + \beta_3 M/B_{it} + \beta_4 SaleG_{it} + \beta_5 ROA_{it} \\ & + \beta_6 ZScore_{it} + \beta_7 MktShare_{it} + \beta_8 MTax_{it} + \beta_9 Inst\%_{it} + \beta_{10} BigFour_{it} \\ & + \beta_{11} AuditTenure_{it} + \beta_{12} Cycle_{it} + \beta_{13} NOA_{it} + \beta_{14} M\&A_{it} \\ & + \beta_{15} Restructure_{it} + \beta_{16} Writeoff_{it} + \beta_{17} RTM_{it}(\text{or } AM_{it}) + u_i + d_t + \varepsilon_{it}. \end{aligned} \tag{6}$$

AM is the value of performance-adjusted accruals, as described earlier. *RTM* is one of three measures, *ABExp, ABCash,* 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, and *SaleG* is one-year sales growth. *ROA* is income before extraordinary items divided by lagged total assets. Following

[8] As before, we include an intercept in Equations (3) to (5), following Roychowdhury (2006) and Gunny (2010); our results remain qualitatively similar if we exclude the intercept. For example, if we exclude the intercept from Equation (3), then the coefficient on *PostClawback* is −0.027 (p = 0.016) when the dependent variable is abnormal discretionary expenses (*ABExp*).

Zang (2012), we include *ZScore, MktShare, MTax,* 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 two-digit SIC-codes, *MTax* 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. In contrast, higher marginal tax rates (*MTax*) 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 1 if the company is audited by one of the Big 4 CPA firms, and 0 otherwise. *AuditTenure* is a dummy variable equal to 1 if the number of years the auditor has audited the client is above the sample median, and 0 otherwise. *Cycle* is days receivable plus days inventory less days payable. *NOA* is a dummy variable equal to 1 if net operating assets, measured as 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 0 otherwise. 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*. *M&A* is a dummy variable equal to 1 if the company is pursuing a merger or acquisition, and 0 otherwise. *Restructure* is a dummy variable equal to 1 if the company has undergone restructuring activities, and 0 otherwise. *Writeoff* is equal to 1 if the company reports any asset write-down in the year, and 0 otherwise.

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 firm and year fixed effects, respectively. This regression is based on 3,556 firm-year observations for 236 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.

The results of Equation (6) are presented in Table 2. Panel A presents descriptive statistics for key variables used to test Equation (6). We find that relative to pre-adoption periods, clawback adopters have a similar amount of signed discretionary accruals (*AM*), but they have a lower amount of positive discretionary accruals ($AM > 0$), as well as negative discretionary accruals ($AM < 0$) subsequent to having clawbacks. As such, the absolute amount of discretionary accruals ($|AM|$) is significantly lower during post-adoption periods for clawback adopters. In contrast, control firms do not exhibit any significant change in discretionary accruals during the same periods. For real transactions management, we find that relative to pre-adoption periods, clawback adopters, on average, have lower discretionary expenses and lower cash flow operating activities during post-adoption periods, suggesting that they have greater real transactions management subsequent to having clawbacks. In contrast, we do not observe any significant change in *RTM* proxies for control firms except for *ABCash*.

Next, turning to the regression results in Table 2, Panel B, we find that in the first column, where the dependent variable is signed accruals, the coefficient on *PostClawback* is statistically insignificant (-0.002, $p = 0.757$). We next estimate Equation (6) separately for firms with positive and negative accruals; that is, we partition the 3,556 firm-year observations into two groups based

on the sign of discretionary accruals. The results of this analysis are provided in the second and third columns. The coefficient on *PostClawback* is negatively significant in the second column (−0.020, p = 0.019), whereas it is positive but insignificant in the third column (0.007, p = 0.332).[9] The results indicate that clawback provisions constrain income-increasing accruals, but not downward accruals manipulation.

Next, we present the results of real transactions management in columns (4) to (8). In column (4), where *ABExp* is the dependent variable, we find that the coefficient on *PostClawback* is significantly negative (−0.024, p = 0.023), suggesting that adopting firms reduce discretionary expenses after clawback adoption. In column (5), where the dependent variable is *ABCash,* we find that the coefficient on *PostClawback* is significantly negative (−0.014, p = 0.025), indicating that clawback adopters are associated with abnormally low operating cash flow. 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. We also consider the two overall measures of *RTM: RTM1,* the sum of *ABCash* and *ABExp,* and *RTM2,* the sum of *ABProd* and *ABExp,* as the dependent variable. As stated earlier, we multiply *ABExp* and *ABCash* by −1 to ensure that the three variables represent real management in a consistent fashion (the more positive the number is, the higher the real manipulation). The results in columns (7) and (8) confirm that clawback adopters engage in more real transactions manipulation in the post-adoption period, as the coefficient on *PostClawback* is significantly positive in both columns. The control variables, whenever significant, take the predicted signs.

To summarize, the results in Table 2, Panel B indicate that the passage of clawback provisions leads to reduced accruals manipulation, but greater real transactions management. Given the two opposite effects, we next analyze how clawbacks affect the overall level of earnings management. To do so, we sum the signed accruals (*AM*) and the aggregate real transactions management (*RTM1* or *RTM2*) to construct *EM,* the overall level of earnings management. Because we obtain very similar results using either *RTM1* or *RTM2,* we present only the result based on *RTM1* to save space (column (9)). We find that the coefficient on *PostClawback* is significantly positive (0.026, p = 0.064), 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.

Before moving to the next test, following Armstrong, Jagolinzer, and Larcker (2010), we examine whether our findings in Table 2, Panel B are robust to hidden bias associated with clawback adoption. Specifically, we conduct the boundary test, as outlined by Rosenbaum (2002), to ensure that our inference is not sensitive to hidden bias that may not be eliminated by PSM. To do so, we first compute the percentage of clawback adopters and control firms with a shift from accruals management to real transactions management. We find that 58 percent of the 236 clawback adopters experience a substitution between accruals and real transactions management, whereas only 30 percent of control firms exhibit such a phenomenon, and the difference is statistically significant (p = 0.008). Next, we estimate the boundary Γ value, which represents the amount of hidden bias necessary to invalidate the above inference. According to Rosenbaum (2002), a larger Γ

[9] We also consider the absolute value of discretionary accruals (|*AM*|) and add volatility of operating cash flow and volatility of sales revenue to Equation (6) when doing so, as suggested by Hribar and Nichols (2007). We find that the coefficient on *PostClawback* is significantly negative (−0.015, p = 0.017), indicating that the amount of unsigned discretionary accruals is lower subsequent to the adoption of clawback provisions. Moreover, we also verify our findings using another accrual measure following Dechow and Dichev (2002). We find that our conclusions are unaffected by using this method to calculate accruals. Untabulated results indicate that the coefficient on *PostClawback* is −0.018 (p = 0.015), suggesting that clawback adoption improves accruals quality.

value provides greater confidence that the results are not sensitive to hidden bias. The Γ value is 4.64 for our sample, which provides strong support for our finding that clawback provisions cause managers to substitute accruals management with real transactions management.[10]

Next, we add control variables related to executive compensation and reestimate Equation (6) because earnings manipulation activities are affected by incentives stemming from option grants or managers' stock holdings (Cheng and Warfield 2005; Bergstresser and Philippon 2006; Efendi, Srivastava, and Swanson 2007). 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 Table 2, Panel C. In short, the results are similar to those reported in Panel B. In particular, clawback initiation leads to a reduction in the use of 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 annual option grants to the CEO, the number of unexercisable options held by the CEO, and CEO stock ownership are positively related to the use of accruals management.[11] In contrast, we find that bonus as a proportion of total pay and unexercisable options are related to a lower level of real transactions management.

To summarize, the results in Table 2 support H1, which posits that clawback adoption leads to less accruals management, but greater real transactions management.

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. Firms' decision to engage in earnings manipulation, however, is not exogenous. Moreover, as argued in Watts and Zimmerman (1986), except when used for opportunistic purposes, earnings management may also be efficient.

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[10] We also perform the Heckman test to check the robustness of our findings, as suggested by Tucker (2010). Specifically, we again estimate the clawback adoption model described in Section III using a firm-year-level regression analysis. To satisfy the "excluding restriction" as indicated in Lennox, Francis, and Wang (2012), however, we add two instrumental variables, *Enforceability* and *PeerAdopt,* to the model. *Enforceability* is a state-level enforcement index of non-competition clauses included in employment contracts, which is obtained from Garmaise (2011). *PeerAdopt* is defined as the percentage of peer firms in the same industry (two-digit SIC codes) that also have clawback provisions in place. The two instruments, *Enforceability* and *PeerAdopt,* are not expected to be *directly* associated with the second-stage dependent variables *AM* and *RTM*. Untabulated results indicate that our main findings remain generally unchanged. Specifically, we find that clawback adoption is related to less accruals manipulation, but greater real transactions management. Importantly, the sign and statistical significances on *PostClawback* are similar to those reported in Table 2, Panel B. For example, the coefficient on *PostClawback* is −0.026 ($p = 0.000$) when the dependent variable is positive discretionary accruals ($AM > 0$). We find that the variance inflation factor (VIF) associated with the inverse Mills ratio (*IMR*) and *PostClawback* is 1.95, suggesting that multicollinearity is very low in this specification.

[11] 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. Carter, Lynch, and Zechman (2009) and Cohen, Dey, and Lys (2013), for example, 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.

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:

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

where *Clawback* is a dummy variable equal to 1 if the company is a clawback adopter, and 0 otherwise. *Suspect_EM* is a dummy variable equal to 1 if either *AM* or *RTM* is above the industry-year median, and 0 otherwise (Cohen and Zarowin 2010). Based on this definition, 2,227 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 (Dechow et al. 2010). *HabitBeater* is the number of times analysts' forecast consensus had been met or beaten over the past four quarters. *Shares* is the log of the 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,* the number of analysts following the firm at the beginning of the year, involves two offsetting effects. Being followed by more analysts could provide stronger incentives for managers to manage earnings, but financial analysts with sophisticated financial and industry knowledge could also constrain managers' earnings management activities. In short, there is no predicted sign on *NAnalyst*.

The results of Equation (7) are presented in Table 3, Panel A. 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 it is negatively related to number of analysts following the firm.

After estimating Equation (7), we compute the inverse Mills ratio (*IMR*) and include it to reestimate Equation (6) using the 2,227 suspect firm-years. The results are presented in Table 3, Panel B. To save space, we present only the coefficients on *PostClawback* and *IMR*. In general, the results are qualitatively similar to those reported in Table 2. In particular, using a sample of firm-years suspected of earnings manipulation, we find that clawback adopters reduce accruals manipulation while increasing real transactions management subsequent to clawback initiation.

Subgroup Analysis

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 236 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

TABLE 3

The Effects of Clawback Provisions on Accruals and Real Transactions Management Using the Heckman Model to Deal with Endogeneity Associated with Earnings Management

Panel A: The First-Stage Model—Determinants of Earnings Management

	Suspect_EM
Clawback	0.043
	(0.250)
Size	0.076
	(0.045)
M/B	−0.009
	(0.171)
Leverage	0.601
	(0.000)
HabitBeater	0.068
	(0.002)
Shares	0.105
	(0.030)
ROA	−0.280
	(0.276)
NAnalyst	−0.010
	(0.059)
Year fixed effects	Yes
Pseudo R^2	0.06
n	3,556

Panel B: The Second-Stage Model—Effects of Clawbacks on Earnings Management

	AM **(1)**	***AM* > 0** **(2)**	***AM* < 0** **(3)**	***RTM1*** **(4)**	***RTM2*** **(5)**	***EM*** **(6)**
PostClawback	−0.006	−0.023	0.025	0.029	0.026	0.022
	(0.490)	(0.012)	(0.119)	(0.063)	(0.077)	(0.194)
IMR	−0.137	−0.148	0.101	−0.154	−0.117	−0.196
	(0.005)	(0.003)	(0.234)	(0.046)	(0.070)	(0.029)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.05	0.04	0.03	0.08	0.10	0.07
n	2,227	1,536	691	2,227	2,227	2,227

p-values are reported in parentheses.
See Appendix A for variable definitions.

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, Panel A, again presenting results only for the variables of interest.

TABLE 4

The Effects of Clawback Provision on Accruals and Real Transactions Management

Panel A: High- versus Low-Growth Firms

	AM		*AM* > 0		*AM* < 0		*RTM1*		*EM*	
	High Growth (1)	**Low Growth (2)**	**High Growth (3)**	**Low Growth (4)**	**High Growth (5)**	**Low Growth (6)**	**High Growth (7)**	**Low Growth (8)**	**High Growth (9)**	**Low Growth (10)**
PostClawback	−0.006	−0.001	−0.027	−0.006	0.010	0.004	0.039	0.013	0.030	0.007
	(0.757)	(0.780)	(0.021)	(0.516)	(0.689)	(0.272)	(0.001)	(0.653)	(0.054)	(0.780)
t-test for high- vs. low-growth firms	(0.834)		(0.052)		(0.944)		(0.043)		(0.075)	
Control variables	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
R^2	0.08	0.08	0.05	0.07	0.10	0.12	0.08	0.05	0.06	0.04
n	1,778	1,778	776	908	1,002	870	1,778	1,778	1,778	1,778

Panel B: High versus Low Transient Institutional Shareholders' Firms

	AM		*AM* > 0		*AM* < 0		*RTM1*		*EM*	
	High Transient (1)	**Low Transient (2)**	**High Transient (3)**	**Low Transient (4)**	**High Transient (5)**	**Low Transient (6)**	**High Transient (7)**	**Low Transient (8)**	**High Transient (9)**	**Low Transient (10)**
PostClawback	−0.008	−0.003	−0.034	−0.004	0.009	0.001	0.047	0.012	0.033	0.006
	(0.780)	(0.857)	(0.049)	(0.596)	(0.596)	(0.818)	(0.000)	(0.490)	(0.046)	(0.889)
t-test for high- vs. low-growth firms	(0.873)		(0.069)		(0.460)		(0.029)		(0.058)	
Control variables	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
R^2	0.07	0.08	0.05	0.05	0.09	0.10	0.08	0.04	0.06	0.03
n	1,304	1,272	591	580	713	692	1,304	1,272	1,304	1,272

p-values are reported in parentheses.
See Appendix A for variable definitions.

We find that our results are driven mainly by clawback adopters with high-growth opportunities. Specifically, we find that the coefficient on *PostClawback* is significant in columns (3), (7), and (9), suggesting that clawback adopters with high-growth opportunities engage in less positive accruals management, 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, 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 statistically significant, on average.

H3 predicts that clawback firms with high transient institutional ownership are more likely to switch to real activities management to meet or beat earnings targets relative to clawback adopters with low transient institutional ownership. We again partition the 236 pairs of clawback adopters and non-adopters into two groups based on the median level of transient institutional ownership. We then estimate Equation (6) separately for clawback adopters and non-adopters with high transient institutional ownership and those with low transient institutional ownership. The results of this analysis are provided in Table 4, Panel B.

We find that our results are driven mainly by clawback adopters with high transient institutional ownership. Specifically, we find that the coefficient on *PostClawback* is significant in columns (3), (7), and (9), suggesting that clawback adopters with high transient institutional ownership engage in less positive accruals management, 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 transient institutional ownership. In contrast, we do not observe the same phenomenon for clawback firms with low transient institutional ownership, and the differences between the two groups are 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. We next analyze whether this shift represents an unintended consequence in terms of increased 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 a clawback provision is instituted or to convey information about the company's 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, while temporarily boosting short-term performance (Gupta, Pevzner, and Seethamraju 2010; Cohen and Zarowin 2010). In particular, Bhojraj et al. (2009) find that although using discretionary accruals or real transactions management to achieve short-term earnings targets may lead to positive short-term stock returns, this trend reverses over a three-year horizon.

Based on the above discussion, we investigate whether clawback adopters that engage in greater real transactions management have better performance in the year of increasing *RTM* and then experience underperformance subsequent to clawback adoption. We estimate the following model, following Cohen and Zarowin (2010):

$$\begin{aligned}\Delta ROA_{(t-1,\ t);(t,\ t+i)} = {} & \alpha + \beta_1 Clawback\_JRTM_t + \beta_2 Clawback\_DRTM_t + \beta_3 \Delta Size_{(t-1,\ t);(t,\ t+i)} \\ & + \beta_4 \Delta M/B_{(t-1,\ t);(t,\ t+i)} + \beta_5 \Delta Leverage_{(t-1,\ t);(t,\ t+i)} + d_t + \varepsilon_{it},\end{aligned} \tag{8}$$

where $\Delta ROA_{(t-1,\ t);\ (t,\ t+i)}$ is (1) the industry-adjusted change in *ROA* from year $t-1$ to t, and (2) 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. $\Delta Size$ is the change in *Size*, $\Delta M/B$ is the change in *M/B*, and $\Delta Leverage$ is the change in *Leverage*. *Size*, *M/B*, *Leverage*, and *ROA* are as previously defined. d_t is year-specific fixed effects.

Clawback_IRTM (*Clawback_DRTM*) equals 1 if the clawback adopter increases (decreases) its amount of real transactions management during the adoption year relative to pre-adoption years, and 0 otherwise. That is, a clawback adopter is considered as increasing its use of real transactions management (as measured by *RTM1*, which is the sum of *ABCash* and *ABExp*, or *RTM2*, which is the sum of *ABProd* and *ABExp*) 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. Using this definition enables us to investigate how increased real transactions management affects current performance and future performance in one to three years. The results are reported in Table 5. (As our results are very similar using either *RTM1* or *RTM2* to define *Clawback_IRTM* and *Clawback_DRTM*, we present only the results based on *RTM1* to save space.)

The coefficient on *Clawback_IRTM* is significantly positive in the first column of Table 5, suggesting that clawback adopters engaging in more *RTM* experience a larger increase in accounting performance in the year, relative to control firms and adopters without increasing *RTM*. However, we also find that the coefficient on *Clawback_IRTM* is significantly negative in columns (3) and (4), suggesting that clawback adopters that increase real transactions management experience a larger decrease in *ROA* in years $t+2$ and $t+3$. Interestingly, we notice that the absolute magnitude of the coefficient on *Clawback_IRTM* in columns (2) to (4) is similar to that in column (1). This suggests that clawback adopters that engage in more *RTM* are able to temporarily boost their accounting profitability in year *t*, but this spike does not sustain in later years.

In contrast, the coefficient on *Clawback_DRTM* is insignificant in all columns, suggesting that relative to control firms and adopters with increased *RTM*, clawback adopters that decrease real transactions management do not experience significant changes in firm performance after adopting clawbacks. Further tests reveal that the differences in changes in *ROA* between the two coefficients (*Clawback_IRTM* versus *Clawback_DRTM*) are statistically significant in all years except for year $t+1$.

Except for *ROA*, we also estimate Equation (8) using annual abnormal stock returns (*ARET*) as the dependent variable, and we again compute *ARET* for the five-year period from year $t-1$ to $t+3$. The results of this analysis are provided in columns (5) to (8). We find that the coefficient on *Clawback_IRTM* is significantly positive in the fifth column, suggesting that relative to control firms and adopters without increasing *RTM*, clawback adopters that increase *RTM* in the adoption year have better stock returns in year *t*. The coefficient on *Clawback_IRTM* is not statistically significant in columns (6) and (7) and is significantly negative in the eighth column. This again suggests that clawback adopters that increase *RTM* experience a short-term spike in stock returns in year *t*, but this reverses after three years. To summarize, the results in Table 5 are consistent with the notion that clawback adoption causes managers to engage in suboptimal operating activities to boost short-term performance at the expense of long-term value.

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 accruals management and real transactions management to meet or beat earnings targets. Using Russell 3000 nonfinancial 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.

TABLE 5

The Impacts of Clawback Adopters' Increased Use of Real Transactions Management on Future Performance

	$\Delta ROA_{(t-1,\ t)}$ (1)	$\Delta ROA_{(t,\ t+1)}$ (2)	$\Delta ROA_{(t,\ t+2)}$ (3)	$\Delta ROA_{(t,\ t+3)}$ (4)	$ARET_{(t-1,\ t)}$ (5)	$ARET_{(t,\ t+1)}$ (6)	$ARET_{(t,\ t+2)}$ (7)	$ARET_{(t,\ t+3)}$ (8)
$Clawback\_IRTM_t$	0.019	−0.017	−0.022	−0.018	0.045	−0.007	−0.072	−0.095
	(0.040)	(0.188)	(0.037)	(0.068)	(0.026)	(0.905)	(0.396)	(0.054)
$Clawback\_DRTM_t$	−0.002	0.002	−0.006	0.008	0.006	0.039	−0.071	0.039
	(0.928)	(0.727)	(0.589)	(0.454)	(0.810)	(0.569)	(0.466)	(0.056)
$\Delta Size_{(t-1,\ t);(t,\ t+i)}$	−0.045	−0.066	−0.073	−0.075	0.415	0.222	−0.224	−0.113
	(0.039)	(0.018)	(0.010)	(0.000)	(0.000)	(0.003)	(0.084)	(0.454)
$\Delta M/B_{(t-1,\ t);(t,\ t+i)}$	−0.000	−0.001	0.000	−0.000	0.002	0.017	0.002	−0.002
	(0.787)	(0.576)	(0.857)	(0.742)	(0.865)	(0.031)	(0.742)	(0.757)
$\Delta Leverage_{(t-1,\ t);(t,\ t+i)}$	0.086	0.119	0.109	0.096	−0.239	−0.448	0.354	−0.039
	(0.052)	(0.000)	(0.216)	(0.083)	(0.040)	(0.069)	(0.086)	(0.936)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.10	0.13	0.11	0.12	0.05	0.05	0.06	0.04
n	456	446	440	363	456	446	440	363
t-test for:								
$Clawback\_IRTM = Clawback\_DRTM$	(0.049)	(0.124)	(0.076)	(0.053)	(0.027)	(0.290)	(1.000)	(0.004)

p-values are reported in parentheses.
See Appendix A for variable definitions.

Specifically, we find that relative to pre-adoption periods and to firms without clawbacks, clawback adopters are associated with lower positive discretionary accruals (but not downward accruals) and 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. Moreover, this phenomenon occurs mainly among clawback adopters with greater growth opportunities or higher levels of transient institutional ownership. Finally, we find that clawback adopters that engage in greater real transactions management exhibit better stock and operating performance in the concurrent year, and this trend reverses after three years. This finding is consistent with the notion that real activities management boosts short-term profits, but 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. Clawback provisions, therefore, may have unintended consequences for certain types of firms. Thus, mandatory clawback adoption pursuant to the Dodd-Frank Act may lead to the same unintended consequences for those firms.

One limitation of our analysis is that firm-initiated clawbacks became popular after 2006, and this 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 long-term consequences of clawback provisions.

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APPENDIX A

Variable Definitions

Variable		Description
Clawback	=	1 if the company is a clawback adopter, and 0 otherwise.
PostClawback	=	1 if the company is a clawback adopter in those years in which the clawback provision is implemented, and 0 otherwise.
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).
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).
ABProd	=	abnormal production cost, measured as the deviations from the predicted values of the corresponding industry-year regression, as defined by Roychowdhury (2006).
RTM1	=	the first measure of the total amount of real transactions management, computed as the sum of *ABExp* and *ABCash*.
RTM2	=	the second measure of the total amount of real transactions management, computed as the sum of *ABExp* and *ABProd*.
EM	=	total earnings management, which is the sum of *AM* and *RTM1*.
LnMV	=	the natural log of market value.
LnRev	=	the natural log of sales revenue.
M/B	=	the market-to-book ratio.
SaleG	=	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.
Tenure	=	the natural log of CEO tenure. Set equal to 0 if missing.
CEOpay	=	the percentage of CEO's total pay to the aggregate total pay of the firm's top five executives, computed by ExecuComp variable: TDC1. Set equal to 0 if missing.
ERC	=	the earnings-response coefficient for the most recent two years using quarterly data.
PriorRestate	=	1 if firm has any earnings restatement during prior three years, and 0 otherwise.
ExecuComp_dum	=	1 if a firm is non-missing in ExecuComp, and 0 otherwise.
ERC_dum	=	1 if ERC is non-missing, and 0 otherwise.
Size	=	the natural log of total assets.
ZScore	=	decile of Altman's Z-score.
MktShare	=	Herfindahl index using two-digit SIC-codes.
MTax	=	the marginal tax rate.
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.

(continued on next page)

APPENDIX A (continued)

Variable		Description
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.
M&A	=	1 if firm is involved in a merger or acquisition, and 0 otherwise.
Restructure	=	1 if firm takes a restructuring charge, and 0 otherwise.
Writeoff	=	1 if the firm reported a write-down in the fiscal year, and 0 otherwise.
Bonus	=	CEO's annual bonus compensation as a proportion of total compensation.
Option_Grant	=	number of options 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.
Suspect_EM	=	1 if either *AM* or *RTM* is above the industry-year median, and 0 otherwise.
HabitBeater	=	the number of times analysts' forecast consensus was met or beat over the past four quarters.
Shares	=	the log of the number of shares outstanding.
NAnalyst	=	the number of analysts following at the beginning of the year.
IMR	=	the inverse Mills ratio estimated from the first-stage model (Table 3, Panel A) of the Heckman model.
$\Delta ROA_{(t-1,\ t)}$	=	the industry-adjusted change in *ROA* from year $t-1$ to t. Year t is the year during which the clawback provision is initiated.
$ARET_{(t-1,\ t)}$	=	the industry-adjusted stock return from year $t-1$ to t. Year t is the year during which the clawback provision is initiated.
$\Delta ROA_{(t,\ t+i)}$	=	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.
$ARET_{(t,\ t+i)}$	=	the industry-adjusted stock return from year t to $t+i$; $i = 1$, 2, and 3. Year t is the year during which the clawback provision is initiated.
Clawback_IRTM	=	1 if the clawback adopter increases its amount of real transactions 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 transactions 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.