Earnings Management and Corporate Investment Decisions

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ABSTRACT

We investigate the relationship between earnings management through intertemporal transfers of earnings and the efficiency of corporate investment decisions. Using discretionary accruals to measure intertemporal transfers of earnings, we show that earnings management exhibits a concave relationship with the investment sensitivity to investment opportunities as measured by Tobin's Q. We find that the association is concentrated among high Q firms. The effect is present among well governed firms, suggesting that better governed firms manage accruals strategically. The concave relationship suggests that the marginal impact of earnings management on investment efficiency decreases with the amount of earnings management. Using cases of misreporting that violate the GAAP guidelines, we document that a more severe form of earnings management does not improve investment efficiency. Taken together, these results support the view that a moderate amount of earnings management helps improve corporate investment decisions while an excessive amount undoes the potential benefit of earnings management.

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1. Introduction

This study empirically investigates how the use of intertemporal transfers of earnings affects a firm's investment policy. Managers' discretion over accruals, defined as the difference between earnings and cash flows, allows for such transfer without violating the guidelines of Generally Accepted Accounting Principles (GAAP). We argue that earnings management, though often associated with poor corporate governance or fraudulent behavior, can be used by managers to signal good earnings prospects to investors. In perfect capital markets, accruals management is irrelevant since all information is observable and verifiable. However, in a world with market frictions, accruals management can serve as a tool to help overcome information asymmetry between the firm and outsiders, improving access to external financing and internal asset allocation decisions. Managing accruals to obtain external financing, while sometimes viewed as opportunistic, can facilitate better investment decisions to the extent that these funds are used to finance value-enhancing projects. Discretion over accruals may allow internal funds to be allocated for valuable investment projects rather than for *real* earnings management: In the absence of managerial discretion over accruals, managers may resort to value-destructive real earnings management by delaying or foregoing investment, improving short-term profit at the expense of long-term firm value. According to Graham et al.'s (2005) survey of over 400 executives, managers candidly admit that they would take real economic actions such as delaying maintenance or advertising expenditure, and would even give up positive NPV projects, to meet short-term earnings benchmarks. In this study, we explore whether strategic earnings management can improve investment decisions. Specifically, we examine whether the ability to transfer earnings between periods allows managers to better align the firm's investment decisions with its investment opportunities.

The 2001-2002 accounting scandals and the subsequent regulatory response have highlighted the opportunistic aspect of accruals management, which are typically in violation of GAAP guidelines. A large body of literature has examined the causes and effects of fraudulent reporting[1]. In particular, some studies have stressed the association between aggressive earn-

[1]For example, see Benish, 1999; Burns and Kedia, 2006; Burns, Kedia, and Lipson, 2010; Efendi, Srivastava, and Swanson, 2007; Plumlee and Yohn, 2010; Wang, Winton, and Yu, 2010; Wilson, 2008.

ings management and financial policies including investment decisions. Kedia and Philippon (2009), for example, document that poorly performing firms overinvest and overstate their financial statements to mimic their better performing peers. McNichols and Stubben (2008) document that firms misreporting earnings overinvest during the misreporting period. However, the prior accounting literature also demonstrates that managerial discretion over accruals can enhance earnings' informativeness. Managers can use accruals to signal private information about the firm. Discretionary accruals, a discretionary portion of total accruals, help managers produce a reliable and more timely measure of firm performance than using nondiscretionary accruals alone (Dechow, 1994; Dechow, Kothari, and Watts, 1998; Subramanyam, 1996). The signal is quite credible despite managerial discretion over accruals because accruals management does not allow for permanent changes in earnings but only for a shift over time.

We test our prediction by examining the association between the absolute value of discretionary accruals and investment efficiency. Discretionary accruals, estimated using a cross-sectional version of the modified Jones model and expressed as percentage of lagged assets, have been used widely to proxy for accounting-based earnings management.[2] We evaluate investment efficiency as the sensitivity of investment expenditures to investment opportunities as measured by Tobin's Q. We augment the standard investment specification to allow for interactions between Q and the absolute value of discretionary accruals. For our analysis, we consider firms in the Compustat universe between 1989 and 2012 excluding financial and utility industries. Controlling for Tobin's Q and cash flows, we find that accruals management has a concave relationship with the sensitivity of investment to Tobin's Q. That is, the additional usage of accruals improves investment decisions to a certain point, beyond which the investment-Q sensitivity deteriorates. Furthermore, we document that this pattern is mainly driven by high-Q firms. Despite having more investment opportunities, high-Q firms in our sample manifest a lower investment-Q sensitivity than low-Q firms. The result highlights the importance of strategic accruals management by showing that the benefit of accruals management is greater for firms with more investment needs.

[2]For instance, see Bergstresser and Philippon, 2006; Healy and Wahlen, 1999; Teoh, Welch, and Wong, 1998a; Teoh, Welch, and Wong, 1998b; Yu, 2008.

The concave relationship documented above suggests effects on investment decisions vary with the amount of earnings management. A modest amount of earnings management is associated with better investment responses to changing investment opportunities. However, marginal benefit diminishes with earnings management, suggesting that excessive earnings management hurts investment efficiency. We further check a case of excessive earnings management by examining firms misreporting financial statements only to restate in later dates. Accruals management tends to be modest in nature. First, accruals are managed within the boundary of GAAP. Second, accruals management requires that the sum of a firm's income over all years equal the sum of its cash flows, meaning that managers must at some point in time reverse any excessive accruals made in the past. On the other hand, misreporting is often in violation of GAAP and sometimes results in SEC investigations or lawsuits, incurring large economic costs. Karpoff, Lee and Martin (2008) examine the firms targeted by SEC enforcement actions for financial misrepresentations and find that the size of lost sales and higher contracting and financing costs resulting from the earnings manipulation outweigh the amount inflated by manipulation. Firms that restate their accounting statements in later dates face tighter loan contract terms including higher spreads, shorter maturities, higher likelihood of being secured, and more covenant restrictions (Graham, Li, and Qiu, 2008). Given the relatively large expected costs, value-maximizing managers are not likely to rely on such aggressive earnings management. Consistent with this interpretation, we find misreporting that leads to restatement in future dates does not improve the investment-Q sensitivity. The results reinforce the concave relation documented earlier: The cost of earnings management starts outweighing its benefit beyond a certain level.

One concern in interpreting the results is that unobserved factors may drive accruals management and the investment-Q association simultaneously, generating a spurious correlation. We address this concern by employing a difference-in-differences (DID) methodology. This approach is well suited for attempting to disentangle causality in a quasi-experimental setting. We compare changes in investment efficiency for a sample of firms subject to an exogenous reduction in earnings management to changes in investment efficiency for those that were not affected by the event. Specifically, we examine the effects of earnings management by using the passage of the Sarbanes-Oxley Act (SOX). Undoubtedly, SOX affected the way firms manage their earnings. SOX was intended to curve earnings management and, indeed, various studies document significant declines in the accruals management practice in the post-SOX periods. We select control groups in two different ways. First, we use the pre-SOX years as the control period and examine within firm variation in investment efficiency around the enactment of SOX, where firms act as their own controls. Second, for our DID estimation, we select firms in the United Kingdom and Canada as our control group since SOX influences all firms in the U.S. (our treatment group). The UK and Canada are considered to have similar accounting guidelines and practices. In addition, investment expenditures for firms in these countries follow similar time series patterns as those of the US firms. Our DID regressions show a large reduction in investment efficiency for US firms around the passage of SOX. This provides support for the hypothesis that the decline in the use of earnings management after SOX reduced investment sensitivity to investment opportunities for US firms.

Finally, we examine how well-governed firms view accruals management that can potentially improve investment response to investment opportunities. A recent literature has focused on the opportunistic aspect of earnings management and has linked earnings management to poor corporate governance (e.g., Klein, 2002; Agrawal and Chadha, 2005; Cornett, Marcus, and Tehranian, 2008). However, the size of discretionary accruals alone does not address the strategic aspect of accruals management that can help secure internal or external funds necessary for valuable investment projects. A corporate governance mechanism should be designed to deter earnings management intended to manipulate earnings, but should not discourage accruals management that can improve resource allocation to finance valuable investment projects. We test this hypothesis by examining the association between accruals management and investment sensitivity to investment opportunities separately for well-governed and poorly-governed firms. We utilize G-index, E-index, and the presence of three individual provisions (poison pill, classified board, and golden parachutes provisions) to sort firms into two subgroups. We find that good governance and bad governance groups exhibit a previously documented concave relation between accrual management and investment-Q sensitivity. Better governed firms show a stronger association for some of the governance measures. This result suggests that well-governed firms do not discourage the strategic usage of accruals and effectively manage accruals in response to their investment opportunities.

Overall, our findings highlight the importance of managerial discretion to transfer earnings between periods as a better alternative to real earnings management that sacrifices valuable investment projects. Prior literature suggests the effect of accruals on investment decisions can work through both the internal resource allocation channel and external financing channel. First, accruals allows managers to allocate internal funds for valuable investment projects rather than for meeting earnings benchmarks, improving internal resource allocation. Many studies document that firms have been engaging in real earnings management in various ways including price discounts, overproduction, delaying R&D investment, reduction of discretionary expenditures, stock repurchase, and sale of profitable assets.[3] The real earnings management has direct real consequences. Ewert and Wagenhofer (2005) argue that firms engaging in real earnings management may deviate from normal business practices and thus experience a decline in their subsequent operating performances. Underperformance following seasoned equity offerings is more severe for firms engaging in real management than those managing accruals (Cohen and Zarowin, 2010). Firms seem to sacrifice employment, R&D, and other investment to finance EPS-increasing stock repurchases (Almeida et al., 2013).

Second, accruals management can influence investment decisions through the channel of external financing. Firms seem to manage discretionary accruals to obtain financing as suggested by abnormally high levels of positive accruals in the periods preceding stock issuances (Chen, Gu, and Tang, 2008; DuCharme, 2004; Friedlan, 1994; Shivakumar, 2000; Teoh, Welch, and Wong, 1998a,b). Bergstresser, Desai, and Rauh (2006) also document increased earnings managements measured by pensions assumptions prior to acquisition activities. However, this evidence alone does not speak to the role of accruals in the efficiency of investment decisions. Linck, Netter, and Shu (2013) take a step toward this direction by examining financially constrained firms with valuable investment projects. They find that these firms use discretionary accruals to credibly signal positive prospects to raise capital necessary for the investments.

[3] Dechow and Sloan, 1991; Baber et al., 1991; Bushee, 1998; Roychowdhury, 2006; Hribar et al., 2006; Cheng, 2004; Almeida et al., 2013; Herrmann et al. 2003; Bartov, 1993; Jackson and Wilcox, 2000; Gunny, 2010

We also contribute to the recent literature linking real investment decisions to earnings management. Zhang (2007), Wu, Zhang and Zhang (2010), Arif et. al (2016), among others, argue that accruals reflect real investment choices of firms. Wu, Zhang, and Zhang (2010) link the accrual anomaly, where firms with high accruals earn abnormally low returns on average, to real investment in a Q-theory framework. In their model, discount rates vary negatively with accruals and investment, therefore predicting lower future returns. Arif et. al (2016) show that like real investment, accruals decline significantly when economic uncertainty is high, consistent with the view that accounting accruals and investment are strongly linked.

Our investigation is especially relevant in light of the recent trend of adopting stricter disclosure rules: The 2001-2002 accounting scandals and the subsequent passage of SOX likely increased the expected cost of fraudulent financial reporting. SOX instituted a number of provisions including improving the composition and function of audit committees, CEO and CFO financial statement certification, restrictions on non audit-related work by the company's auditors, mandatory audit partner rotation, and an annual report on internal controls. Firms make choices between accruals management and real activities management (Cohen, Dey, and Lys, 2008; Cohen and Zarowin, 2010; Badertscher, 2011), and the choice depends on their relative costs (Zang 2012). Because accruals management is easier to detect in nature than real activity manipulation, the heightened scrutiny post SOX is likely to have increased the relative cost of accruals management, reducing accounting flexibility in GAAP. In fact, empirical evidence indicates that accruals management has decreased since the implementation of SOX. Lobo and Zhou (2010) document lower discretionary accruals post SOX. Koh, Matsumoto, and Rajgopal (2008) document that the propensity to engage in income-increasing earnings management to meet or beat earnings benchmarks has declined. Cohen et al. (2008) and Bartov and Cohen (2009) document that the level of accruals-based earnings management declined in the post-SOX period while the level of real activities manipulation increased, suggesting a shift from accruals management to real management. Our examination of the association between accruals management and investment decisions has implications for understanding the real benefits and costs of corporate disclosure policies.

2. Data and Methodology

2.1. Accruals

We utilize the absolute value of discretionary accruals as the measure of a moderate earnings management. We consider accruals management *moderate* for the following two reasons. First, since the sum of a firm's income over all years must equal the sum of its cash flows, managers must at some point in time reverse any ”excessive” accruals made in the past. Therefore, it is unlikely to observe an extreme accruals management that persists over time. Second, an accruals management is within the boundary of GAAP and therefore is unlikely to be extreme by definition. In general, an accruals management does not incur severe economic costs as do earnings managements violating the GAAP, which are often followed by restatements and, in some cases, SEC investigations or lawsuits.

Total accruals are defined as the difference between earnings and cash flows from operations and is constructed by subtracting Cash Flow from Operations (Compustat item OANCF) from Net Income (item NI), scaled by beginning-of-year total assets. We decompose total accruals to separate the component that are beyond the control of the managers. We estimate a modified version of Jones model of accruals (Dechow, Sloan, and Sweeney (1995)), which regresses total accruals on changes in revenue and gross property, plant and equipment (PPE) to control for changes in nondiscretionary accruals caused by changing conditions. Total accruals includes changes in working capital accounts, such as accounts receivable, inventory, and accounts payable that depend on changes in revenues to some degree. Thus revenues are used to control for the economic environment of the firm because they capture the firms' operations before managers' manipulations. Gross PPE is included to control for the portion of total accruals related to nondiscretionary depreciation expense. To summarize, we estimate the following model on our sample by each industry group and year[4]:

$$TA_{it} = \beta_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \Delta REV_{it} + \beta_3 PPE_{it} + \varepsilon_{it},$$

[4] We utilize Fama-French's definition of 48 industries

where TA is total accruals scaled by the beginning-of-year assets, ΔREV is the change in sales normalized by beginning assets and PPE is gross property plant and equipment scaled by beginning assets. We then feed these estimates to the following equation to obtain discretionary accrual (DA).

$$DA_{it} = TA_{it} - b_0 - b_1 \frac{1}{A_{it-1}} - b_2(\Delta REV_{it} - \Delta REC_{it}) - b_3 PPE_{it},$$

where b_j is the estimated value of β_j (j= 0, 1, 2, 3). DA is essentially the discretionary portion of total accruals expressed as a percentage of the lagged assets. Note that the change in accounts receivable (ΔREC) is subtracted from the change in revenues to allow for the manipulation of credit sales. The original Jones (1991) Model implicitly assumes that discretion is not exercised over revenues while the modified Jones model (Dechow, Sloan, and Sweeney (1995)) adjusts the change in revenues for the changes in receivables to control for potential revenues manipulation. Our results are qualitatively unchanged when we employ the original Jones model. Throughout the paper, we utilize *absolute value* of discretionary accruals since earnings manipulation involves both positive and negative values of accruals.

2.2. Data

We consider all firms between 1989 and 2012 that are available in the merged Center for Research on Security Prices-Compustat Industrial Annual database. We exclude financial services firms, regulated utilities, and firms with book values smaller than \$10 million. We also drop observations with the missing total asset information. These steps result in a sample of 99,528 firm-year observations. The main variables are winsorized at the 1% and 99% level. Panel A of Table 1 summarizes various firm characteristics. Investment and cash flow are scaled by beginning-of-year capital measured by property, plant and equipment. The mean investment rate and mean lagged cash flow are 0.34 and 0.62, respectively. The mean discretionary accrual to total assets ratio (-0.005) is very close to zero as expected, reflecting the intertemporal nature of accruals management. However, its standard deviation is quite large with 0.349, highlighting managers's discretion over intertemporal shifts in the firm's earning.

The absolute value of discretionary accruals is larger with a mean value of 12.2% of total assets.

Next, corporate governance measures are drawn from Investor Responsibility Research Center (IRRC), which published detailed listings of corporate governance provisions. We examine the data between 1990 and 2007 because, after IRRC was acquired by Institutional Shareholder Services in 2005, a new data collection methodology was implemented in 2007, making the pre- and post-2007 data incomparable (see Karpoff, Schonlau, and Wehrly (2016) for additional detail about discontinuity between pre- and post-2007 data). The IRRC tracks 24 corporate provisions including corporate charters and bylaws. Almost all provisions gives management a tool to resist different types of shareholder activism, such as calling special meetings, changing the firm's charter or bylaws, suing the directors, or just replacing them all at once. They construct G-index by assigning one point for the existence (or absence) of each provision and summing the points across the 24 provisions. Well-governed firms tend to have less provisions and, thus, are assigned a lower number of the governance index. For our sample periods, this index has a mean of 9.05 and standard deviation of 2.75.

We also use E-index obtained from Lucian Bebchuk's website[5]. Table 1 shows E-index has a mean of 2.28 and standard deviation of 1.33. Finally, following Kedia and Philippon (2009), we select one provision from each of the three groups defined by Gompers et al. excluding the Voting and State groups.[6] Classified board is chosen from the Delay group, Golden parachutes from the Protection group, and Poison pill from the Other group. Table 1 shows that 53.4% of our firm-year observations have the Poison Pill provision, 58.6% Classified Board provision, and 61.3% Golden Parachutes provision.

Panel B reports investment rates for subsamples sorted on lagged Q and $\mid DA \mid$. The sample is first sorted into four quartiles based on lagged Q, and then each of the four subsamples is further sorted into four quartiles based on $\mid DA \mid$. Investment rates increase with investment opportunities proxied by lagged Q, consistent with the literature. Investment rates also increase

[5] http://www.law.harvard.edu/faculty/bebchuk/data.shtml

[6] Gompers, Ishii, and Metrick (2003) divides them into five groups: tactics for delaying hostile bidders (Delay); voting rights (Voting); director/officer protection (protection); other takeover defenses (Other); and state laws(State). We dropped Limit Ability to Amend Charter provision from the Voting group because very little fraction of our sample observations have the provision.

monotonically with $\mid DA \mid$, but the magnitude differs across lagged Q quartiles. Investment rises slowly for low Q quartiles but moves up rapidly for high Q quartiles. For the lowest Q quartile, for example, investment rates rise only by 0.054, from 0.182 in the lowest $\mid DA \mid$ quartile to 0.236 in the highest $\mid DA \mid$ quartile. By contrast, for the highest Q quartile, investment rates leap from 0.480 to 0.648, suggesting that accruals are utilized heavily in conjunction with investments for firms with strong growth potentials.

3. Test Results

3.1. Baseline Specification

In this section, we investigate our main hypothesis that the accruals management can be utilized to improve the investment-Q relationship. We augment the standard investment regression specification as follows:

$$I_{it} = \alpha_i + \beta_1 \cdot \mid DA_{it} \mid + \beta_2 \cdot \mid DA_{it} \mid \cdot Q_{it-1} + \beta_3 \cdot \mid DA_{it} \mid^2 \cdot Q_{it-1} + \beta_4 \cdot Q_{it-1} + \beta_5 \cdot CF_{it-1} + \gamma_t + \varepsilon_{it},$$

where i indexes a firm and t indexes time. The dependent variable is investment scaled by beginning-of-year capital. $\mid DA_{it} \mid$ is the absolute value of discretionary accruals. $\mid DA \mid \cdot Q$ and $\mid DA \mid^2 \cdot Q$ are of particular interest because they capture differences in investment-Q sensitivity across firms with a varying degree of accruals management. The quadratic term is introduced to account for the possibility that the effect of accruals management may not be linear. Time and firm fixed effects are included. We also replace firm fixed effects with industry fixed effects in some specifications. Our industry definition is drawn from Fama/French's classification of 48 industries.

Table 2 reports the estimation results. The first column presents the standard investment regression result as a benchmark. The second regression allows for the possibility of a linear relationship between $\mid DA \mid$ and the investment-Q sensitivity. The coefficient of $\mid DA \mid \cdot Q$ is positive and significant, indicating that investment is more sensitive to investment opportunities when accruals are actively managed. The third regression introduces a quadratic term,

$| DA |^2 \cdot Q$ to allow for the possibility that the marginal effect of $| DA |^2 \cdot Q$ may vary with the size of $| DA |$. Once the quadratic term is introduced, the coefficient of $| DA | \cdot Q$ nearly quadruples from 0.0153 to 0.0590 and the statistical significance also improves. The quadratic term is negative and statistically significant at the 1% level. The quadratic specification fits the data better than a linear specification, lending support for the view that moderate accruals management can improve the investment-Q sensitivity but an extreme usage of accruals can rather hurt the investment-Q sensitivity. The last column adds cash flow, but the results remain the same. Also note that the coefficients of Q vary little across the four regressions, suggesting that $| DA |$ adds additional explanatory power to the specification. Overall, the results support our hypothesis that accruals management helps managers respond to the investment opportunities more efficiently.

We next investigate whether the association between accruals management and the investments-Q sensitivity changes with investment opportunities. Panel B of Table 1 shows that investment increases with $| DA |$ but the size of the increase differs considerably across different Q quartiles. We further examine this dynamics by sorting the sample into two subgroups based on Q and estimating the baseline specification separately for the two subsamples. Table 3 reports the estimation results. The first two columns report the benchmark cases without $| DA |$. The investment-Q sensitivity seems much higher for the low Q firms. The coefficient for the high Q subgroup is only 0.0639 while the coefficient for the low Q subgroup is 0.1488, suggesting that high Q firms may have more room for improvement in their investment response to investment opportunities. The last two regressions present the results of our baseline specification. The effect of discretionary accruals is pronounced in the high-Q subgroups as shown by the linear and quadratic terms of $| DA |$. These estimates are similar to those in full sample results (Table 2). As before, marginal increases in $| DA |$ improves the investment-Q sensitivity as long as the size of accruals are moderate. The estimates for the low Q subsample are quite different. The quadratic term remains negative and significant, but the linear term, $| DA | \cdot Q$, is no longer statistically significant. Overall, the documented association seems to be mainly driven by high Q firms. This highlights the importance of strategic accruals management because accruals have bigger effects where they are needed the most. That is, the effects are more pronounced in the subsample with relatively lower investment-Q sensitivity in the benchmark cases (first two regressions). Furthermore, these firms are the ones with strong growth potentials, for which investment decisions are especially critical.

3.2. Restatements

The concave relationship documented in the previous section suggests that the marginal improvement in the investment-Q sensitivity diminishes with the size of discretionary accruals. To corroborate this result, we consider a more extreme form of earnings management, financial misreporting that requires restatements in later dates. The degree of misreporting varies considerably among restating firms from a minor misapplication of accounting principles to an outright fraud. While accruals management is a legitimate tool that allows managers to exert discretion over reported earnings across time, misreporting is a clear violation of GAAP, resulting in SEC investigations or lawsuits in some cases. Because misreporting is more likely to be driven by opportunistic earnings management, we do not expect such earnings management to be associated with improvement in the investment-Q sensibility.

We start with the restatement announcement data provided by the United States General Accoutring Office (GAO). The data contain announcements made between January 1997 and June 2006. We then identify the misreporting periods corresponding to the restatement announcement by reading news articles in FACTIVA. Our final sample covers 2284 restating firm-year observations between 1996 and 2004. The distribution of misreporting over the sample period is reported in panel A of Table 4. On average, 6.6% of sample firms misreport each year to restate their accounting statement in later dates. However, there is a strong time-series trend in the frequency of misreporting. An incidence of misreporting is relatively rare in early years with 46 incidences in 1996 and 98 in 1997. However, it gradually increases over time to reach 421 incidences in 2004.

We modify the baseline investment specification by replacing $|DA|$ with a restate dummy variable as follows:

$$I_{it} = \alpha_i + \beta_1 \cdot Restate_{it} + \beta_2 \cdot Restate_{it} \cdot Q_{it-1} + \beta_3 \cdot Q_{it-1} + \beta_4 \cdot CF_{it-1} + \gamma_t + \varepsilon_{it},$$

where *Restate* is set to one if misreporting that subsequently results in restatements occurs in the given firm-year. Note that a quadratic association cannot be tested in this setting because *Restate* is an indicator variable. $Restate \cdot Q$ captures differences in the investment-Q sensitivity between misreporting firms and non-restating firms. Panel B of Table 4 report the estimation results. The first column presents a univariate analysis of investment for restating firms and non-restating firms with year and firm fixed effects. The restate dummy is positive, but only marginally significant (10%). The next two regressions show that the restate dummy becomes negative and significant once $Restate \cdot Q$, Q, and cash flow are controlled for. The main variable of interest, $Restate \cdot Q$, remains insignificant, suggesting that misreporting does not facilitate a better alignment between investment and investment opportunities. It appears that accruals are utilized strategically to improve investment decisions, but that fraudulent accounting seems to be motivated by rather opportunistic behavior.

3.3. Quasi-Natural Experiment: The Sarbanes-Oxley Act and Earnings Management

An important concern in the above results showing a strong, concave relationship between earnings management and investment efficiency is the possible endogeneity coming from the two choice variables. There could be an omitted variable that drives both investment and earnings management. An ideal empirical setup would provide exogenous shocks to earnings management for one group of firms and not for another. A comparison of changes in investment around the shock for the two groups of firms would yield a better estimate of the effect of earnings management on investment. In this section, we employ an empirical approach to address the concerns about possible endogeneity by employing a natural experiment in the form of the Sarbanes-Oxley Act of 2002.

We examine the effects of earnings management on investment by using the passage of SOX. SOX instituted a number of provisions including improving the composition and function of audit committees, CEO and CFO financial statement certification, restrictions on nonaudit-related work by the companys auditors, mandatory audit partner rotation, and an annual report on internal controls. Empirical evidence shows that accruals management decreased quickly and significantly after SOX. Lobo and Zhou (2010) document lower discretionary accruals post SOX. Koh, Matsumoto, and Rajgopal (2008) document that the propensity to engage in income-increasing earnings management to meet or beat earnings benchmarks has declined. Cohen et al. (2008) and Bartov and Cohen (2009) document that the level of accruals-based earnings management declined in the post-SOX period while the level of real activities manipulation increased, suggesting a shift from accruals management to real management. In our sample, the average amount of discretionary accruals (in absolute value) was 19.1% of total assets. After the enactment of SOX, the average value of discretionary accruals fell to 13.2% of assets, representing a 31% decline in the use of discretionary accruals. We use this shock to the use of discretionary accruals to examine the impact of earnings management on investment efficiency.

An important challenge is that the SOX Act was at the national level and hence affected most firms in the US, complicating the formation of a good control group of firms. To deal with this complication, we estimate changes in investment efficiency around SOX in two ways. First, we estimate investment regressions with firm fixed effects and include a post-SOX dummy variable. In this estimation, the firms in the sample are also the control group, where the pre-SOX time years represents the control period and the post-SOX years the treatment period. Specifically, we estimate the regression

$$\frac{I_{it}}{K_{i,t-1}} = \alpha_i + \gamma_t + \beta_1 \cdot 1_{(SOX)} + \beta_2 \cdot Q_{i,t-1} + \beta_3 Q_{i,t-1} \cdot 1_{(SOX)} + \beta_4 \cdot CF_{i,t-1} + \varepsilon_{it},$$

where α_i and γ_t are firm and year fixed effects, $1_{(SOX)}$ is a dummy variable taking a value of one in the years following the implementation of SOX. The coefficient β_1 captures level changes in investment rates around SOX and β_3, the main coefficient of interest, captures changes in investment sensitivity to Tobin's Q in the post-SOX period.

The first column of Table 5 reports the estimation results for the post-SOX analysis of investment efficiency. The coefficient on the interaction between Tobin's Q and the post-SOX dummy variable is negative and statistically significant, representing a decline in investment efficiency following SOX. The value of the coefficient, -0.0227, represents a decline of about

27% in investment efficiency following the negative shock to the use of discretionary accruals after the Sarbanes-Oxley Act.

An alternative approach to comparing investment investment efficiency before and after SOX within the US is to compare changes in investment for firms affected by SOX to firms that were not affected around the same time period. To this, we employ a difference-in-differences (DID) estimator. The DID methodology we employ compares the effect of SOX on groups affected by the regulation (treatment group) to those that are unaffected (control group). The inferences are made by calculating the changes in investment levels and efficiency of treatment firms around the event to the changes around the event for the control firms. We choose to construct a set of control firms using data from Canada and the United Kingdom, as firms in these countries tend to be affected by similar economic shocks as firms in the US but were not subject to the changes brought on by SOX. Assuming that the control firms' investment policies are being driven by similar dynamics over time, it will allow us to control for common economic shocks and also to alleviate potential bias due to other changes in law around SOX that could have affected the treatment group.

To investigate the effect of SOX on investment efficiency in a DID framework, we estimate the following regression:

$$\frac{I_{it}}{K_{i,t-1}} = \alpha_i + \gamma_t + \delta \cdot 1_{(SOX)} + \nu \cdot 1_{(SOX)} \cdot 1_{(i=T)} + \eta \cdot 1_{(SOX)} \cdot 1_{(i=T)} \cdot Q_{i,t-1} + \beta_1 \cdot Q_{i,t-1} + \beta_2 \cdot CF_{i,t-1} + \varepsilon_{it},$$

where α_i and γ_t are firm and year fixed effects, $1_{(SOX)}$ is a dummy variable taking a value of one in the years following the implementation of SOX and zero otherwise, and $1_{(i=T)}$ is a dummy variable set equal to one for firms that belong to the treatment group and zero for firms in the control group. The coefficient η on the interaction between the two indicator variables and Tobin's Q captures the difference-in-differences effect on investment and is the main estimate of interest in the regression. The coefficient ν picks up the difference-in-differences effect on investment levels.

A challenge with employing the DID methodology around the passage of SOX is that there are other factors, both observable and unobservable, that may influence investment in the United States and other countries around the enactment of SOX. The DID regression is helpful in that it allows for the control of omitted variables that affect the treatment and control group similarly. However, identification of the causal effect of SOX on investment requires controlling for other shocks to the treatment group that may be correlated with the timing of SOX. For example, the decline in investment efficiency around the passage of SOX may have been more significant for US firms due to different sensitivities to the global business cycle. We address this and related concerns in a variety of ways. First, we include firm level controls, particularly Tobin's Q and cash flow, to control for changing investment opportunities over time. Second, in robustness checks[7], we include industry by year fixed effects to control for industry/time variation and find similar results.

Before reporting the results, we examine whether the use of Canadian and UK firms are appropriate to use as controls. An important assumption in the way we construct treatment and control groups is that the outcome in both groups would follow the same time trend in the absence of the treatment. While this assumption is very difficult to verify, we can look at pre-treatment trends to see if investment followed a similar pattern prior to the enactment of SOX. Figure 1 shows mean investment rates for the two treatment and control groups around the passage of SOX. The figure shows that investment rates for both treatment and control firms moved roughly in parallel before the policy change. After the enactment of SOX, the treatment firms show a slower rate of increase in investment rates compared to firms in Canada and the UK. Figure 1 supports the assumption that trends in investment rates were similar prior to the passage of SOX. We also examine changes in the full distribution of investment for both treatment and control firms. In Figure 2 we plot the kernel densities of investment rates for both treatment and control firms before and after the policy change. The distribution of investment rates shifts to the left for the treatment firms but not significantly for the control firms, suggesting the presence of an effect of SOX on corporate investment. The shift in the density for the treatment group is statistically significant as the Kolmogorov-Smirnov test for

[7]Results available upon request.

the equality of the distributions is rejected at the 1% level. The figures show that there appears to be a change in investment for treatment groups compared to control groups.

Columns (2) through (4) of Table 5 report the results of the DID regression. The second column compares changes in investment efficiency for US firms compared to both UK and Canadian firms. The coefficient on the interaction term between the treatment effect and Tobin's Q is negative and statistically significant with a magnitude of -0.0339, suggesting a reduction in investment efficiency for US firms around the passage of SOX relative to firms in Canada and the UK. Columns 3 and 4 repeat the difference-in-difference methodology separately for Canadian and UK firms as control groups and find similar results. We also note that the interaction between treatment/control and the SOX dummy is significant and negative. The negative coefficient of -0.0327 suggests that investment rates were also affected negatively by the passage of SOX. The magnitudes of changes in investment efficiency relative to Canadian and UK firms are similar to the magnitude measured in the US only sample reported in column 1. While the identifying assumptions differ across our approaches, the results are consistent and lend support to the hypothesis that the decline in the use of earnings management after SOX reduced investment efficiency for US firms.

3.4. Corporate governance and accruals management

The recent literature has focused on the opportunistic aspect of earnings management and has linked earnings management to poor corporate governance. Klein (2002) and Agrawal and Chadha (2005) document that independence of audit committee and corporate board is negatively associated with earnings management and restatement. Kedia and Philippon (2009) examine restating firms and report that firms with poor governance are more likely to misreport accounting statements to restate in later dates. Cornett, Marcus, and Tehranian (2008) document that the usage of discretionary accruals is reduced by better governance measured by institutional ownership of shares, institutional investor representation on the board of directors, and the presence of independent outside directors on the board. Cheng (2008) reports that a larger board is associated with a smaller variation in accruals. However, these studies focus on the size of discretionary accruals and do not consider their interaction with investment decisions. The size of discretionary accruals alone does not indicate whether they were used for fraudulent accounting or to help align investment opportunities with internal or external resources. While a corporate governance mechanism should be designed to deter accounting fraud, it should not discourage strategic management of accruals to the extent that it is within the GAAP boundary and improves investment efficiency. If the strategic usage of discretionary accruals can improve investment decisions, we expect to observe the documented concave relation in well governed firms as well. We test this hypothesis by examining the association between accruals management and investment sensitivity to investment opportunities separately for well-governed and poorly-governed firms.

We sort the firms into two subgroups based on the degree of corporate governance. Five measures of governance are employed including the G-index by Gompers, Ishii, and Metrick (2003), E-index by Bebchuk, Cohen, and Ferrell (2009), and the presence of three individual provisions (poison pill, classified board, and golden parachutes provisions). The absence of each of the individual provisions is considered good governance, as the presence of those provisions weakens the power of the shareholders in favor of managers. Similarly, a firm is classified as having good governance if the value of G-index is lower than the median of its distribution. As in Masulis, Wang, and Xie(2007) and Schmidt (2015), low E-index is defined as those with an E-index smaller than three.

Table 6 summarizes the usage of accruals and other firm characteristics for the two subgroups. The first column shows that the differences in total accruals between the two subgroups are very small and statistically insignificant across all measures. The second column reports that the absolute values of discretionary accruals are somewhat different across the two subgroups. To the extent that these measures capture the quality of governance, better governed firms tend to have higher absolute values of discretionary accruals. If the usage of discretionary accruals were motivated exclusively by opportunistic reasons, we would expect the usage of discretionary accruals to be higher for poorly governed firms. However, it appears that better governed firms do not discourage the usage of discretionary accruals. These firms also seem to differ in other dimensions. Well governed firms invest more, have more investment opportunities proxied by Q, and have more cash flows. The result is consistent with the previous studies documenting a negative correlation between governance measures and Tobin's Q (Gompers, Ishii, and Metrick, 2003; Bebchuk, Cohen, and Ferrell, 2009).

We next conduct a multivariate analysis by estimating the baseline specification for the two subgroups separately. The first four columns of Table 7 report the regression results for subgroups formed based on the G-index and E-index. In both cases, both well governed and poorly governed subgroups show a concave relation between accruals managements and investment-Q sensitivity. The next three columns sort the firms based on the presence of each of the individual provisions. The results are similar regardless of which of the three governance measures is used. A small exception is that when a golden parachute provision is utilized, the quadratic term is not statistically significant for well governed firms. Overall, the concave relationship is present for both well-governed and poorly-governed firms. The evidence is consistent with our view that accruals management can be utilized to enhance the corporate investment response to investment opportunities.

4. Conclusion

We empirically investigate the relationship between intertemporal transfer of earnings and the efficiency of corporate investment decisions. Using the absolute value of discretionary accruals as a measure of such earnings management, we document that earnings management exhibits a concave relationship with the investment sensitivity to investment opportunities as measured by Tobin's Q. We find that the relationship between earnings management and investment efficieny is concentrated among firms with relatively high investment opportunities. The effect is present among firms with good corporate governance measures, suggesting that better governed firms manage accruals strategically. The concave relationship suggests that the marginal impact of earnings management on investment efficiency decreases with the amount of earnings management. Using misreporting that leads to restatement in future dates, we document that a more severe form of earnings management does not improve investment efficiency. We implement a difference-in-differences (DID) methodology to disentangle causality in a quasi-experimental setting around the passage of the Sarbanes-Oxley Act. We find a large reduction in investment efficiency for US firms (treatment group) relative to those in UK and Canada (control group) around the passage of SOX. Taken together, these results support the view that a moderate amount of earnings management helps improve corporate investment decisions while an excessive amount undoes the potential benefit of earnings management.

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Table 1
Summary Statistics

Panel A summarizes firm characteristics for our sample between 1989 and 2012. Investment and cash flow are scaled by beginning-of-year capital measured by property, plant and equipment. Discretionary accrual (DA) is a discretionary portion of total accruals, which is defined as net income minus cash flow from operations. DA is estimated by a cross-sectional version of the modified Jones model, expressed as percentage of lagged assets. Corporate governance data cover the period between 1990 and 2007. Panel B reports investment rates for subsamples sorted on lagged Q and $|DA|$. The sample is first sorted into four quartiles based on lagged Q, and then each of the four subsamples is further sorted into four quartiles based on $|DA|$. See the appendix for variable descriptions.

Panel A: Firm Characteristics

Variable	N	Mean	Q1	Median	Q3	Std. Dev.
Firm Characteristics						
Investment	99,647	0.34	0.11	0.21	0.39	0.42
Lagged Q	99,647	1.92	1.05	1.40	2.14	1.56
Lagged Cash Flow	99,647	0.62	0.08	0.27	0.65	1.61
Leverage	99,647	0.25	0.04	0.20	0.37	0.46
Discretionary Accruals						
DA	99,647	-0.005	-0.078	-0.005	0.066	0.349
$\|DA\|$	99,647	0.122	0.022	0.055	0.125	0.204
Corporate Governance						
G-Index	17,491	9.05	7.00	9.00	11.00	2.75
E-Index	17,491	2.28	1	2	3	1.33
Number (%) of firm-year observations with the provisions						
Poison Pill	14,084	53.4%				
Classified Board	15,473	58.6%				
Golden Parachutes	16,185	61.3%				

Panel B: Mean Investment Rates by Lagged Q $-$ $|DA|$ Quartiles

	Lagged Q			
$\|DA\|$	1st quartile	2nd quartile	3rd quartile	4th quartile
1st quartile	0.182	0.238	0.304	0.480
2nd quartile	0.189	0.246	0.315	0.492
3rd quartile	0.201	0.259	0.341	0.535
4th quartile	0.236	0.309	0.407	0.648

Table 2
Accruals Management and Investment

This table presents estimation results of the baseline specification:

$$I_{it} = \alpha_i + \beta_1 \cdot \mid DA_{it} \mid + \beta_2 \cdot \mid DA_{it} \mid \cdot Q_{it-1} + \beta_3 \cdot \mid DA_{it} \mid^2 \cdot Q_{it-1} + \beta_4 \cdot Q_{it-1} + \beta_5 \cdot CF_{it-1} + \gamma_t + \varepsilon_{it},$$

where the dependent variable is investment scaled by beginning-of-year capital. Firm and year fixed effects are included. Standard errors are clustered at the firm level and reported in parenthesis.

	(1)	(2)	(3)	(4)
Q_{it-1}	0.0751***	0.0811***	0.0775***	0.0664***
	(0.002)	(0.003)	(0.003)	(0.003)
CF_{it-1}	0.0775***			0.0778***
	(0.002)			(0.002)
$\mid DA_{it} \mid$		0.0877***	0.0837***	0.0731***
		(0.015)	(0.014)	(0.014)
$Q_{it-1} \cdot \mid DA_{it} \mid$		0.0153**	0.0590***	0.0635***
		(0.007)	(0.014)	(0.013)
$Q_{it-1} \cdot \mid DA_{it} \mid^2$			-0.0427***	-0.0445***
			(0.012)	(0.012)
Constant	0.2337***	0.2230***	0.2254***	0.2055***
	(0.007)	(0.008)	(0.008)	(0.008)
Observations	99,647	99,647	99,647	99,647
R^2	0.475	0.439	0.439	0.478

*** indicates 1% significance and ** indicates 5% significance.

Table 3
Subsample Analysis: High Q vs. Low Q

This table estimates the following baseline specification for two subsamples sorted on Q.

$$I_{it} = \alpha_i + \beta_1 \cdot \mid DA_{it} \mid + \beta_2 \cdot \mid DA_{it} \mid \cdot Q_{it-1} + \beta_3 \cdot \mid DA_{it} \mid^2 \cdot Q_{it-1} + \beta_4 \cdot Q_{it-1} + \beta_5 \cdot CF_{it-1} + \gamma_t + \varepsilon_{it},$$

where the dependent variable is investment scaled by beginning-of-year capital. Firm and year fixed effects are included. Standard errors are clustered at the firm level and reported in parenthesis.

	(1) High Q	(2) Low Q	(3) High Q	(4) Low Q
Q_{it-1}	0.0639***	0.1488***	0.0563***	0.1469***
	(0.003)	(0.010)	(0.003)	(0.011)
CF_{it-1}	0.0787***	0.0754***	0.0790***	0.0756***
	(0.003)	(0.004)	(0.003)	(0.005)
$\mid DA_{it} \mid$			0.1051***	0.069
			(0.028)	(0.050)
$Q_{it-1} \cdot \mid DA_{it} \mid$			0.0513***	0.061
			(0.016)	(0.052)
$Q_{it-1} \cdot \mid DA_{it} \mid^2$			-0.0399***	-0.0719***
			(0.013)	(0.024)
Constant	0.3329***	0.1023***	0.2955***	0.0764***
	(0.016)	(0.012)	(0.017)	(0.013)
Observations	51,410	51,409	50,412	49,235
R^2	0.528	0.478	0.529	0.473

*** indicates 1% significance and ** indicates 5% significance.

Table 4
Accounting Restatements

Panel A describes the distribution of misreporting of accounting statements between 1996 and 2004. We identity the misreported periods for each firm that makes a restatement announcement in the period of January 1997 through June 2006. Panel B reports estimation results of baseline specification:

$$I_{it} = \alpha_i + \beta_1 \cdot Restate_{it} + \beta_2 \cdot Restate_{it} \cdot Q_{it-1} + \beta_3 \cdot Q_{it-1} + \beta_4 \cdot CF_{it-1} + \gamma_t + \varepsilon_{it},$$

where *Restate* is set to one if a firm misreports in the given firm-year, and zero otherwise. Note that $\mid DA_{it} \mid$ is replaced by the restate dummy variable. Firm and year fixed effects are included. Standard errors are clustered at the firm level and reported in parenthesis.

Panel A: Distribution of misreporting by restatement data

Fiscal Year	Misreporting firms	
	Number of observations	Fraction (%)
1996	46	1.1%
1997	98	2.2%
1998	133	3.0%
1999	200	4.6%
2000	256	6.2%
2001	320	8.2%
2002	396	10.8%
2003	414	11.6%
2004	421	11.7%
Mean	254	6.6%

Panel B: Investment Regressions

	(1)	(2)	(3)
$Restate_{it} \cdot Q_{it-1}$		0.0134	0.0164
		(0.011)	(0.011)
$Restate_{it}$	0.0216*	-0.0542***	-0.0582***
	(0.012)	(0.019)	(0.019)
Q_{it-1}		0.1064***	0.0930***
		(0.004)	(0.004)
CF_{it-1}			0.0937***
			(0.006)
Intercept	0.4696***	0.1411***	0.1146***
	(0.007)	(0.008)	(0.008)
Observations	36,246	36,246	36,246
R^2	0.502	0.531	0.567

Table 5
Investment Efficiency around the Sarbanes-Oxley Act of 2002

This table examine the effects of accruals management on investment by estimating changes in investment efficiency around the implementation of SOX. Column (1) reports estimates from the following regression:

$$\frac{I_{it}}{K_{i,t-1}} = \alpha_i + \gamma_t + \beta_1 \cdot 1_{(SOX)} + \beta_2 \cdot Q_{i,t-1} + \beta_3 Q_{i,t-1} \cdot 1_{(SOX)} + \beta_4 \cdot CF_{i,t-1} + \varepsilon_{it},$$

. Columns (2) through (4) report estimates from the following difference-in-differences (DID) regression:

$$\frac{I_{it}}{K_{i,t-1}} = \alpha_i + \gamma_t + \delta \cdot 1_{(SOX)} + \nu \cdot 1_{(SOX)} \cdot 1_{(i=T)} + \eta \cdot 1_{(SOX)} \cdot 1_{(i=T)} \cdot Q_{i,t-1} + \beta_1 \cdot Q_{i,t-1} + \beta_2 \cdot CF_{i,t-1} + \varepsilon_{it},$$

where α_i and γ_t are firm and year fixed effects, $1_{(SOX)}$ is a dummy variable (Post-SOX) taking a value of one in the years following the implementation of SOX and zero otherwise, and $1_{(i=T)}$ is a dummy variable set equal to one for firms that belong to the treatment group and zero for firms in the control group. The treatment group is U.S. firms and the control group consists of firms located in the United Kingdom and Canada. Standard errors are clustered at the firm level and reported in parenthesis.

	Control Sample			
	(1)	(2)	(3)	(4)
	US Pre-SOX	UK/Canada	Canada	United Kingdom
Post-SOX	-0.0281**	0.0860	0.0832	0.0876
	(0.011)	(0.077)	(0.078)	(0.077)
Post-SOX×Q	-0.0227***			
	(0.004)			
Post-SOX×Treatment		-0.0327**	-0.0649***	-0.0428**
		(0.015)	(0.022)	(0.017)
Post-SOX×Treatment×Q		-0.0339***	-0.0316***	-0.0357***
		(0.005)	(0.004)	(0.005)
Q_{it-1}	0.0816***	0.0461***	0.0754***	0.0440***
	(0.002)	(0.004)	(0.003)	(0.004)
CF_{it-1}	0.0777***	0.0178***	0.0786***	0.0173***
	(0.002)	(0.002)	(0.003)	(0.002)
Fixed Effects	Firm, Year	Firm, Year	Firm, Year	Firm, Year
Observations	99,657	113,951	90,617	105,919
R-squared	0.476	0.385	0.477	0.379

*** indicates 1% significance, ** 5% significance, and * 10% significance.

Table 6
Firm Characteristics by Corporate Governance Subgroups

This table sorts firm-year observations into two subgroups based on corporate governance measures and report the mean firm characteristics by the subgroups. Four governance measures are employed including G-index, E-index, and the presence of three individual provisions. Also reported are the differences in firm characteristics between the two subgroups. The corresponding *t*-statistics are reported in parentheses. See appendix for variable descriptions.

	Accruals		Other Firm Characteristics		
	TA	| *DA* |	Investment	lag Q	lag CF
G-Index					
Low	0.0016	0.0818	0.2871	2.0558	0.6416
High	0.0019	0.0765	0.2395	1.8342	0.4924
Difference (Low-High)	-0.0003	0.0053	0.0476	0.2216	0.1492
t-statistic	(-0.49)	(2.52)	(13.97)	(11.28)	(9.34)
E-Index					
Low	0.0011	0.1417	0.3092	2.1417	0.6371
High	0.0018	0.1320	0.2509	1.7991	0.5202
Difference (Low-High)	-0.0007	0.0096	0.0583	0.3426	0.1169
t-statistic	(-0.42)	(2.33)	(14.40)	(15.96)	(6.90)
Poison Pill					
No	0.0020	0.0767	0.2730	2.0310	0.6320
Yes	0.0017	0.0805	0.2498	1.8498	0.4972
Difference (No-Yes)	0.0003	-0.0038	0.0232	0.1812	0.1348
t-statistic	(0.53)	(-1.80)	(6.79)	(9.24)	(8.46)
Classified Board					
No	0.0021	0.0820	0.2764	2.0243	0.5865
Yes	0.0016	0.0765	0.2483	1.8621	0.5357
Difference (No-Yes)	0.0005	0.0055	0.0281	0.1622	0.0508
t-statistic	(0.75)	(2.59)	(8.16)	(8.21)	(3.16)
Golden Parachutes					
No	0.0018	0.0810	0.2807	2.0831	0.5861
Yes	0.0018	0.0774	0.2463	1.8273	0.5375
Difference (No-Yes)	-0.0001	0.0036	0.0344	0.2558	0.0486
t-statistic	(-0.13)	(1.68)	(9.93)	(12.90)	(3.01)

Table 7
Corporate Governance and Earnings Management

This table reports estimation results of baseline regressions for subsamples sorted by corporate governance measures. Five governance measures are employed including G-index, E-index, and the presence of three individual provisions. The dependent variable is investment rate. Time and firm fixed effects are included. Robust standard errors are clustered at the firm level and reported in parenthesis. See the appendix for variable descriptions.

	G-Index		E-Index		Poison Pill		Classified Board		Golden Parachute	
	Low	High	Low	High	No	Yes	No	Yes	No	Yes
Q_{it-1}	0.0389***	0.0365***	0.0400***	0.0586***	0.0418***	0.0380***	0.0472***	0.0352***	0.0449***	.0369***
	(0.007)	(0.005)	(0.006)	(0.009)	(0.007)	(0.007)	(0.008)	(0.006)	(0.008)	(0.005)
CF_{it-1}	0.0881***	0.0693***	0.0960***	0.0872***	0.0826***	0.0686***	0.0847***	0.0663***	0.0825***	0.0716***
	(0.013)	(0.011)	(0.013)	(0.014)	(0.015)	(0.011)	(0.013)	(0.011)	(0.016)	(0.009)
$\mid DA_{it} \mid$	0.0089	-0.0001	0.0056	0.0052	-0.0221	-0.0013	0.027	-0.0343	-0.0147	-0.0124
	(0.031)	(0.024)	(0.013)	(0.016)	(0.030)	(0.036)	(0.029)	(0.027)	(0.043)	(0.023)
$Q_{it-1} \cdot \mid DA_{it} \mid$	0.0882***	0.0849***	0.0859***	0.0718***	0.0976***	0.0470*	0.0854**	0.0808***	0.0799***	0.0606**
	(0.034)	(0.026)	(0.023)	(0.021)	(0.032)	(0.033)	(0.036)	(0.027)	(0.024)	(0.027)
$Q_{it-1} \cdot \mid DA_{it} \mid^2$	-0.0789***	-0.0740***	-0.0534**	-0.0434**	-0.0647**	-0.0836***	-0.0857***	-0.0644***	-0.0606	-0.0638***
	(0.030)	(0.020)	(0.026)	(0.020)	(0.027)	(0.026)	(0.030)	(0.019)	(0.041)	(0.020)
Observations	7,463	9,776	9,392	7,675	7,595	9,644	7,250	9,989	6,874	10,365
R^2	0.608	0.483	0.615	0.568	0.628	0.560	0.582	0.580	0.614	0.605

*** indicates 1% significance, ** 5% significance, and * 10% significance.

Figure 1. Investment Rates around SOX: Treatment and Control Firms

This figure plots average investment rates (I/K) for US firms ("treatment") and Canadian/UK firms ("control").

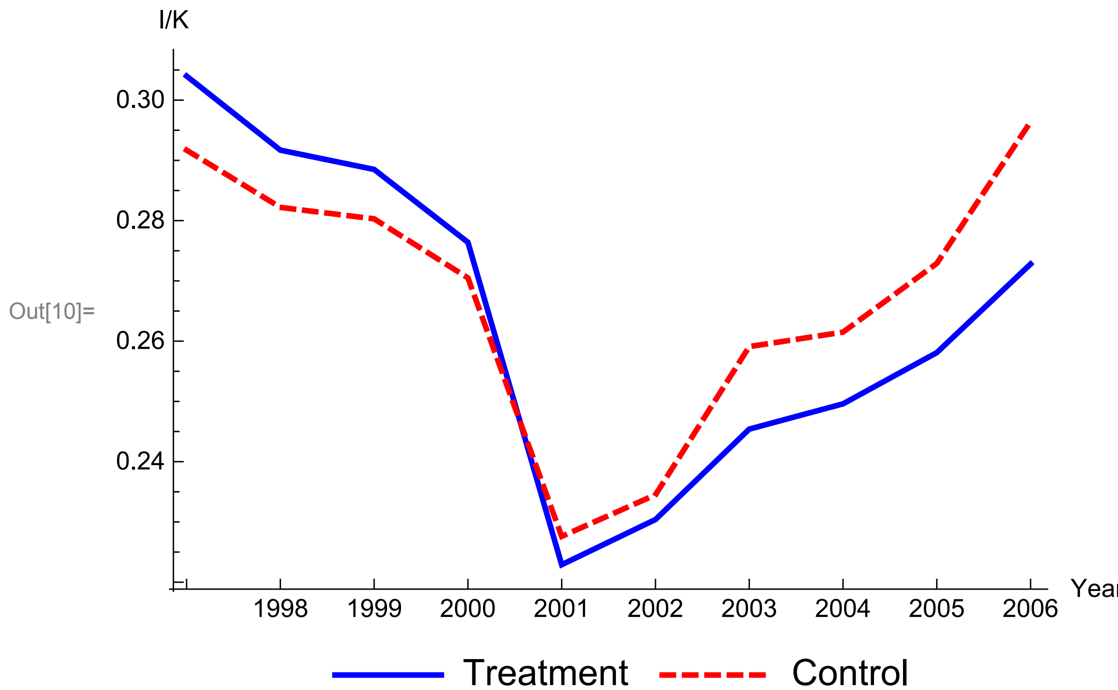
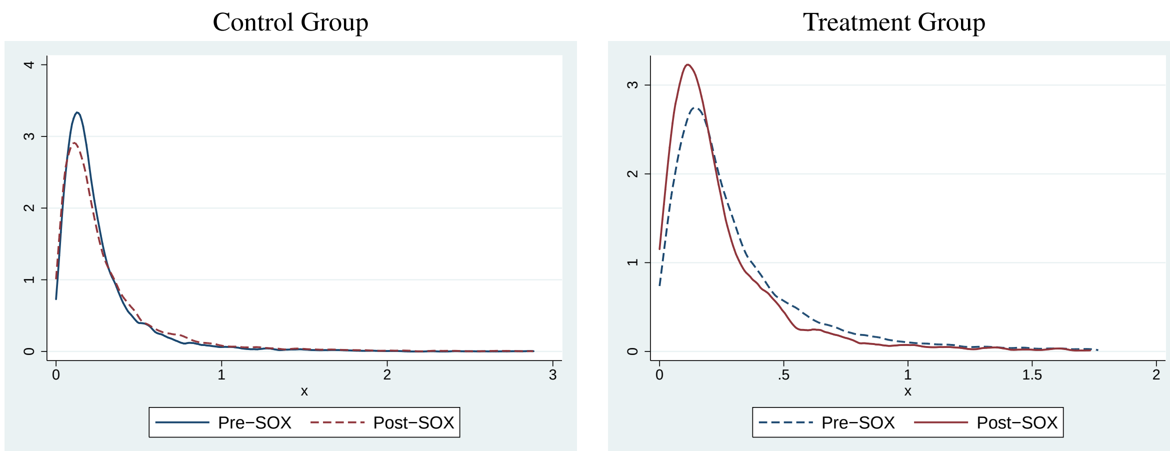


Figure 2. Kernel Density Estimation: Investment Rates

This figure plots the Epanechnikov kernal density investment rates for both US firms ("treatment") and Canadian/UK firms ("control") for the period before and after the passing of the Sarbanes-Oxley Act. A Kolmogorov-Smirnov test for the equality of distributions is rejected at the 1% level for the treatment group.



Appendix: Variable Descriptions

Variable	Description
Investment	Capital Expenditures divided by beginning-of-year capital measured by property, plant, and equipment.
Q	Book value of total assets minus the book value of equity plus the market value of equity scaled by the beginning-of-year total assets.
Cash Flow	EBIT plus depreciation and amortization minus interest expense, taxes and dividends scaled by beginning-of-year capital.
Leverage	Total debt (long-term and short-term) scaled by total assets
G-Index	Gompers, Ishii, and Metrick (2003)'s governance index constructed by assigning one point for the existence (or absence) of each corporate governance provision and summing the points across all 24 provisions.
E-index	Governance index constructed by Bebchuk, Cohen and Ferrell (2009). The index assigns one point for the existence (or absence) of each of the following six corporate governance provisions: a staggered board, limits to amend the charter, limits to amend bylaws, supermajority voting requirements, golden parachutes for executives, and the ability to adopt a poison pill.
Post-SOX	An indicator variable set to one for years following 2003 implementation of SOX and zero otherwise.
Restate	An indicator variable set to one if misreporting that subsequently results in restatements occurs in the given firm-year and zero otherwise.