

# Accepted Manuscript

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PII: S1544-6123(17)30596-2  
DOI: [10.1016/j.frl.2017.10.018](https://doi.org/10.1016/j.frl.2017.10.018)  
Reference: FRL 801

To appear in: *Finance Research Letters*

Received date: 25 September 2017  
Accepted date: 23 October 2017

Please cite this article as: Gady Jacoby , Yingqi Li , Tianze Li , Steven Xiaofan Zheng , Internal Control Weakness, Investment and Firm Valuation, *Finance Research Letters* (2017), doi: [10.1016/j.frl.2017.10.018](https://doi.org/10.1016/j.frl.2017.10.018)

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**Highlights**

- Firms with internal control weakness (ICW) reduce investment around ICW disclosure
- ICW firms reducing investment have worse stock performance before ICW disclosure
- The effects of ICW are less severe for ICW firms with credit rating
- The results are consistent with an ICW-investment hypothesis

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# Internal Control Weakness, Investment and Firm Valuation

Gady Jacoby<sup>a</sup>, Yingqi Li<sup>b</sup>, Tianze Li<sup>c</sup>, and Steven Xiaofan Zheng<sup>d</sup>

Current Draft: September 2017

## *Abstract*

We propose reduced investment as a potential explanation for why firms with internal control weakness (ICW) exhibit lower valuation relative to non-ICW firms. We show that ICW firms significantly reduce investment around ICW disclosure and also have poor stock performance. Additional evidence shows that many of the investment reductions have been announced during the year before ICW disclosure. A possible explanation for investment reductions is the higher costs of financial friction associated with ICW. Consistent with this explanation, we show that ICW firms with credit ratings do not reduce their investment as much and have much better stock performance than ICW firms without credit ratings.

**JEL:** G12; G14; G30

**Keywords:** Sarbanes-Oxley Act; Internal Control Weakness; Stock Performance;  $q$  theory of investments; Benchmark Adjusted Returns; Credit Ratings

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### Abstract

We propose reduced investment as a potential explanation for why firms with internal control weakness (ICW) exhibit lower valuation relative to non-ICW firms. We show that ICW firms significantly reduce investment around ICW disclosure and also have poor stock performance. Additional evidence shows that many of the investment reductions have been announced during the year before ICW disclosure. A possible explanation for investment reductions is the higher costs of financial friction associated with ICW. Consistent with this explanation, we show that ICW firms with credit ratings do not reduce their investment as much and have much better stock performance than ICW firms without credit ratings.

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# Internal Control Weakness, Investment and Firm Valuation

## 1. Introduction

Ashbaugh-Skaife et al. (2009) document that when firms report ICW<sup>1</sup> under SOX 404<sup>2</sup>, their costs of equity increase in the range of 50 to 150 basis points. Their costs of debt are also higher (Dhaliwal et al., 2011). These changes should cause sizeable shifts in firm value. However, the market reaction to ICW announcement is mostly insignificant (Ogneva et al., 2007; Beneish et al., 2008). A possible explanation is that stock prices have already incorporated much of the information related to ICW during pre-disclosure years (Beneish et al., 2008; Ghosh and Lee, 2013). Consistent with this argument, Li et al. (2016) find that firms reporting ICW under SOX 404 underperform non-ICW firms by about 13% during the year prior to ICW disclosure. However, this argument does not answer a critical question: what is the channel through which investors incorporate the negative ICW information? In this paper, we fill this gap by testing a possible explanation for the lower valuation of ICW firms: investment reductions around ICW disclosure.

The traditional  $q$ -theory of investment (Brainard and Tobin, 1968; Tobin, 1969) suggests that managers optimally adjust the supply of assets to changes in their market value. Thus Belo et al. (2013) propose that investors can infer a lower firm value if they observe that managers are investing less and vice versa. This argument can be applied to explain the lower valuation of ICW firms. Specifically, if managers realize that the disclosure of ICW at a later date is inevitable, they will expect the cost of capital to increase after the ICW disclosure. Such an

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<sup>1</sup> Internal Control Weakness

<sup>2</sup> Section 404 of Sarbanes-Oxley Act

increase will reduce the number of profitable real investment opportunities. Therefore, managers may decide to reduce corporate investments well before ICW disclosures are made. When investors learn about plans to reduce investments, they infer a lower firm value, causing the stock of ICW firms to underperform. We call this conjecture the ICW-investment hypothesis.

The effects of ICW disclosure may depend on whether a firm has credit rating. The monitoring of debt rating agencies reduces information risk, agency costs, and distortions in managers' real decisions. Firms with credit rating also face less constraint in capital supply (Faulkender and Petersen, 2006). So ICW may have less effect on costs of capital for firms with credit ratings (Dhaliwal et al., 2011). Therefore, we expect the effects predicted by the ICW-investment hypothesis to be more pronounced for non-rated ICW firms.

Consistent with the ICW-investment hypothesis, we find that ICW firms reduce investments significantly around the year of ICW disclosure year. We find evidence that the markets learn about the investment reductions before ICWs are disclosed. In addition, consistent with the argument that the underperformance of ICW stocks is caused by a reduction in corporate investment, the stocks of ICW firms perform much better in the year before disclosure if they do not subsequently experience investment reductions. The results are more pronounced for ICW firms without credit ratings.

The rest of the paper is organized as follows: We describe our sample and present the empirical evidence in Section 2. Section 3 concludes the paper with some observations about the ICW-investment hypothesis.

## **2. Empirical Tests**

## 2.1. Data and Sample

We collect the initial ICW and non-ICW samples from the Audit Analytics database for the period between 2004 and 2013. For the ICW sample we only keep firms that report initial ICW under SOX 404 without prior ICW 302 disclosures. The non-ICW sample includes only firms that never reported ICW under SOX 302 and SOX 404 prior to a given disclosure date. Following Cheng et al. (2013), each ICW firm is matched with a non-ICW firm based on the same filing year, the same industry (we use the 48 industries in Fama and French (1997)), the same rating group (rated or non-rated), and the closest propensity score estimated based on common determinants of ICW used in previous internal control studies (e.g., Ashbaugh-Skaife et al., 2007; Doyle et al., 2007)<sup>3</sup>. We retrieve each firm's financial information from the Compustat database and stock price and return from the Center for Research in Security Prices (CRSP) database. Financial firms are excluded. The final sample consists of 1,170 firms (585 ICW firms and 585 matched non-ICW firms) in which 74% are not rated.

## 2.2. Empirical Evidence on Investment

Similar to Biddle et al. (2009), we calculate total investment (INVT) as the sum of research and development expenses, capital expenditure and acquisition expenditure minus sales of property, plant, and equipment, scaled by lagged total assets. Following Richardson (2006), we decompose total investment into investment for maintenance (INVTM) and investment for new projects (INVTN). INVTM is measured as depreciation and amortization scaled by lagged total assets. INVTN is computed as the difference between INVT and INSTM.

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<sup>3</sup> Details are available upon request.

We first show the inter-temporal trend of mean investment levels for ICW firms around ICW disclosure year (year T) in Figure 1. Figure 1a depicts the change in average total investment for both ICW firms and non-ICW firms. It shows that ICW firms see a significant decline in their investment in years T and T+1 compared with non-ICW firms. Figure 1b shows the change in average investment for maintenance. We do not detect any obvious relation between ICW and investment for maintenance in Figure 1b. In contrast, Figure 1c, which reports the change in average investment for new projects, shows a very similar trend to that reported in Figure 1a. Thus, the relation between ICW and the decline in investment is mostly driven by investment in new projects. Univariate tests confirm that the decline in investment is significant only for total investments and investment for new projects.

[Insert Figure 1 around here]

To formally test whether ICW firms significantly reduce their investment after ICW disclosure, we regress investments on ICW, POST, ICW\*POST, cash flow ratio, and Tobin's  $q$  ratio. ICW is a dummy variable which equals one for ICW firms and zero for non-ICW matching firms. POST is a dummy variable which equals one for years after ICW disclosure and zero otherwise. We run the regressions separately for total investment, investment for maintenance, and investment for new projects using observations from Year T-2 to Year T+1:

$Investment_{i,T-2 \text{ to } T+1}$

$$= \alpha_0 + \alpha_1 ICW_i + \alpha_2 POST_t + \alpha_3 ICW_i * POST_t + \alpha_4 Cash\ flow_i + \alpha_5 Tobin's\ q_i + \varepsilon_i \quad (1)$$



The regression results are reported in Table 1. Total investment (INVT) is the dependent variable in column (1). The coefficient of ICW\*POST is negative and significant at 1% level, suggesting that ICW firms substantially reduce total investment in the years after disclosure. The coefficients of ICW and POST are insignificant, suggesting that the total investment by ICW firm is similar to that of non-ICW firms before disclosure and non-ICW firms do not significantly reduce total investment after their ICW peers' disclosure. Column (2) reports regression results using investment for maintenance as the dependent variable. The coefficient of ICW\*POST is not significant, showing that ICW disclosure does not have significant effect on maintenance investments. In column (3) investment for new projects is the dependent variable. In this column the results are similar to those in column (1), suggesting that the decline in total investment is driven by decline in investment for new projects. These results are consistent with Figure 1 and support the ICW-investment hypothesis.

[Insert Table 1 around here]

The investment reduction above starts in year T and continues into year T+2. However, this does not mean that the decision to reduce investments is made in those years. Capital budgeting is a lengthy process in most corporations and the ICW-investment hypothesis assumes that the market learns about most of the investment reduction decisions before ICW disclosure. To test this assumption, we randomly select 50 ICW firms and search in the Proquest database for investment-related news about these companies and their non-ICW matching firms in the one-year window prior to the ICW disclosure date. For 23 of the 50 ICW companies, we find announcements about decisions to reduce investments. In contrast, only 7 of the 50 non-ICW matching firms announce plans to reduce investments. The much higher frequency of investment

reduction announcements for ICW firms is consistent with the assumption that most of the investment reductions decisions are announced before ICW disclosure.

### 2.3. Empirical Evidence on Stock Performance

The ICW-investment hypothesis suggests that ICW stocks underperform in reaction to investment reductions. To test this suggestion, we estimate the benchmark adjusted return for the window of (-252, -1) before the ICW disclosure date (date 0) for both the ICW and non-ICW firms and use it to measure stock performance. Our benchmark adjusted stock return is defined as the difference between the buy-and-hold return (BHR) of a stock and the corresponding return of its benchmark Fama and French 25 portfolio formed on firm size and book-to-market ratio. Univariate tests show that the ICW firms in our sample significantly underperform their non-ICW peers by more than 16% in the year before ICW disclosure. Then we divide the ICW firms into two groups: one with investment reduction between year T-1 and year T, the other without investment reduction. The mean benchmark-adjusted return for the ICW firms with investment reduction is -23.1%, which is 21.6 % lower than the return for those without investment reduction. If we also adjust for the performance of non-ICW matching firms, the ICW firms with investment reduction still underperform those without by more than 12%.

To formally test the relation between investment reduction and stock performance, we run regressions using the benchmark-adjusted return in the (-252, -1) window as the dependent variable. The regression model we estimate is as follows:

$$\begin{aligned}
 \text{Benchmark adjusted return}_i &= \alpha_0 + \alpha_1 \text{ICW}_i + \alpha_2 \text{INVTD}_i + \alpha_3 \text{ICW}_i * \text{INVTD}_i + \\
 &f(\text{variables associated with valuation})_{i,T-1} + \\
 &f(\text{variables associated with ICW determinants})_{i,T-1} + \varepsilon_i
 \end{aligned} \tag{2}$$

INVTD is a dummy that equals 1 if the investment ratio (INVT) in year T is less than that in year T-1. Otherwise, it equals zero. The ICW-investment hypothesis predicts that the coefficient of INVTD should be negative and significant. The variables associated with valuation and ICW determinants are listed in Table 2 and defined in Appendix A.

[Insert Table 2 around here]

We first run the regression without control variables associated with valuation and ICW determinants. The results are reported in column (1) of Table 2. The coefficient of ICW\*INVTD is negative and significant, implying that ICW firms with investment reduction underperform by 12.4% relative to ICW firms without investment reduction. In column (2) we report the results after including all control variables in regression equation (1). Consistent with the ICW-investment hypothesis, the coefficient of ICW\*INVTD continue to be negative and significant.

Because we have shown that the investment reduction of ICW firms concentrates in new investment, we re-estimate the regressions after replacing the INVTD dummy by the dummy of INVTND, which equals 1 if investment for new projects (INVTN) in year T is less than that in year T-1, and zero otherwise. We report the results with and without control variables in columns (3) and (4) of Table 2, respectively. Both columns show that the coefficients of ICW\*INVTND are negative and significant, suggesting that the ICW firms that reduce new investment have additional underperformance of between 11.6% and 12.4%. These results are consistent with the ICW-investment hypothesis.

#### **2.4. ICW and Rated Status**

We mentioned in the introduction that the effects predicted by the ICW-investment hypothesis should be more pronounced for non-rated ICW firms. So we add two explanatory variables, *Rated* (a dummy that equals 1 for firms with credit rating) and *POST\*Rated*, to the regressions in Table 1. Consistent with the ICW-investment hypothesis, the coefficient of *POST\*Rated* is positive and significant, suggesting that the ICW firms with credit ratings have less reduction in corporate investment. Then we examine the effect of credit rating on stock performance of firms in our sample. Regressions show that ICW firms with credit ratings have significantly better stock performance in the year before ICW disclosure, providing additional support to the ICW-investment hypothesis<sup>4</sup>.

## 2.5. Discussion

Our paper advances the existing literature on internal control over financial reporting in three ways. First, several studies have examined the ICW disclosure and investment decisions (e.g., see: Biddle et al, 2009; Cheng et al., 2013). However, these studies largely focus on whether better accounting quality reduces deviation from their optimal investment level. In contrast, our paper links the investment level with future ICW disclosure and find that ICW firms reduce investments more than non-ICW firms.

Second, we explore a possible channel through which ICW affects firm value. Previous research suggests that ICW affects firm value via a higher cost of capital (e.g., see: Ashbaugh-Skaife et al. 2009). This argument implies that the stocks of ICW firms should drop significantly after ICW disclosures are made, which is inconsistent with prior studies showing a muted market reaction to ICW announcements (e.g., see: Hammersley et al., 2008; Beneish et al., 2008). Instead, Li et al. (2016) show that the stock price drop/underperformance mostly occurs before

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<sup>4</sup> The results in this section are available upon request.

ICW disclosure. We provide a possible explanation about why the underperformance occurs early.

Third, our study adds value to the stream of research examining the relationship between ICW, cost of debt, and credit ratings (e.g., see: Dhaliwal et al., 2011; Elbannan, 2009). These studies largely conclude that ICW disclosure leads to a significant decline in credit quality and a surge in the cost of debt. However, these studies, in essence, have overlooked a very important subsample: non-rated firms (which account for more than 70% of the total ICW sample). Our findings imply that the negative effect of ICW disclosure on cost of capital may be driven by non-rated ICW firms.

### **3. Conclusions**

We assume that managers learn about the existence of ICW before other stakeholders do. They decide to cut corporate investments in response. The market observes the decision and infers a lower firm value. This causes the stock price to drop even before the ICW is disclosed. Consistent with this ICW-investment hypothesis, we find that on average ICW firms do reduce investments in the year of disclosure and after. Announcements for many of these reductions are found in the media in the year before disclosure. During this year, the stocks of the ICW firms that subsequently reduce investment underperform those that do not reduce investment. These results are less severe for ICW firms with credit rating.

**Acknowledgements**

Gady Jacoby acknowledges the financial support from Bryce Douglas Professorship in Finance and the Social Sciences and Humanities Research Council of Canada. Steven X. Zheng acknowledges the financial support from BMO Professorship in Finance at University of Manitoba. The authors thank helpful comments from Zhou Zhang.

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## Appendix. Variable Definition

Variable Names	Variable Definitions	Source
<i>ICW</i>	An indicator variable sets to one for ICW firms and zero for non-ICW firms	Audit Analytics
<i>% Loss</i>	% of years reporting negative net income over the past three years	Compustat
<i>B/M equity ratio</i>	Book value of equity divided by market value of equity	Compustat
<i>Big 4</i>	An indicator variable for firms hiring a prestigious audit firm	Compustat
<i>Capex ratio</i>	Capital expenditures to total assets	Compustat
<i>Cash flow ratio</i>	Cash flow to total assets	Compustat
<i>Cash holdings</i>	The ratio of cash and short-term investments to net assets	Compustat
<i>Decile of Altman Z-score</i>	The decile of Altman Z-score value in Compustat for a given year	Compustat
<i>Decile of sales growth</i>	Decile rank of average growth rate in sales in past three years	Compustat
<i>Dividend payer</i>	An indicator which is set as unity if the firm pays dividends during the fiscal year, and zero otherwise	Compustat
<i>Firm age</i>	Log of one plus the total number of years' data available in Compustat	Compustat
<i>INVT</i>	Total investment, calculated as the sum of research and development expenses, capital expenditure, and acquisition expenditure minus sale of property, plant, and equipment (Compustat item: XRD+CAPX+AQC-SPPE) multiplied by 100 and scaled by lagged total assets	Compustat
<i>INVTD</i>	An indicator which is set as unity if the investment ratio (INVT) at year T (disclosure year) is smaller than that at year T-1, and zero otherwise	Compustat
<i>INVTM</i>	Investment for maintenance, calculated as depreciation and amortization (Compustat mnemonic: DPC) multiplied by 100 and scaled by lagged total assets	Compustat
<i>INVTN</i>	Investment for new projects, calculated as INVT minus INVTM	Compustat
<i>INVTND</i>	An indicator which is set at unity if the investment for new projects (INVTN) at year T (disclosure) is smaller than that at year T-1	Compustat
<i>Leverage</i>	All debt to total assets	Compustat
<i>Litigation industry</i>	An indicator variable equal to 1 if a firm operates in a high litigation industry (SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, 7370–7374, 8731–8734), and zero otherwise	Compustat
<i>POST</i>	An indicator variable set to one for year t and t+1 and zero for year t-1 and t-2 relative to ICW disclosure date	Compustat
<i>R&amp;D dummy</i>	An indicator variable takes the value of one if R&D is a non-missing value, and zero otherwise.	Compustat
<i>R&amp;D intensity</i>	Research and development expense to sales	Compustat
<i>Rated</i>	An indicator which is set at unity if the firm has a credit rating in the nearest fiscal year end prior to the ICW disclosure date, and zero otherwise. The credit rating used is Standard & Poor's Long-Term Domestic Issuer Credit Rating (Compustat mnemonic: SPLTICRM).	Compustat
<i>Restructure</i>	An indicator variable takes the value of one if Compustat item "rcp," "rca," "rceps," or "rcd" taking a non-missing value over the past three years, and zero otherwise	Compustat
<i>Sales growth rate</i>	Sales minus lagged sales, then scaled by lagged sales	Compustat
<i>Segments</i>	Log of one plus total number of geographic segments and business segments	Compustat
<i>Size</i>	The log of total assets	Compustat

<i>Stdev of Cash flow ratio</i>	Standard deviation of cash flows from operations divided by total assets, where the standard deviation is calculated using the current and the prior four fiscal years, requiring a minimum of three years of data	Compustat
<i>Benchmark adjusted returns</i>	The difference between the buy and hold return of a stock and the corresponding return of size and B/M benchmark portfolio adjusted returns	CRSP
<i>Tobin's q ratio</i>	The ratio of book value of assets minus the book value of common equity and deferred taxes plus the market value of common equity over the book value of assets	CRSP and Compustat

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## References

- Ashbaugh-Skaife, H., Collins, D.W., Kinney W.R., 2007. The Discovery and Reporting of Internal Control Deficiencies prior to SOX-Mandated Audits. *J. Account. Econ.* 44, 166–192.
- Ashbaugh-Skaife, H., Collins, D.W., Kinney, W.R., Lafond, R., 2009. The Effect of SOX Internal Control Deficiencies on Firm Risk and Cost of Equity. *J. Account. Res.* 47, 1–43.
- Belo, F., Xue, C., Zhang, L., 2013. A Supply Approach to Valuation. *Rev. Financ. Stud.* 26, 3029–3067.
- Beneish, M.D., Billings, M., Hodder, L., 2008. Internal control weaknesses and information uncertainty. *Account. Rev.* 83, 665–703.
- Biddle, G.C., Hilary, G., Verdi, R.S., 2009. How Does Financial Reporting Quality Relate to Investment Efficiency? *J. Account. Econ.* 48, 112–131.
- Brainard, W.C, Tobin, J., 1968. Pitfalls in Financial Model. *Am. Econ. Rev.* 58, 99–122.
- Cheng, M., Dhaliwal, D., Zhang, Y., 2013. Does Investment Efficiency Improve after the Disclosure of Material Weaknesses in Internal Control over Financial Reporting? *J. Account. Econ.* 56, 1–18.
- Dhaliwal, D., Hogan, C., Trezevant, R., Wilkins, M., 2011. Internal Control Disclosures, Monitoring, and the Cost of Debt. *Account. Rev.* 86, 1131–1156.
- Doyle, J., Ge, W., McVay S., 2007. Determinants of Weaknesses in Internal Control over Financial Reporting. *J. Account. Econ.* 44, 193–223.
- Elbannan, M. A., 2009. Quality of Internal Control over Financial Reporting, Corporate Governance and Credit Ratings. *Int. J. Discl. Gov.* 6, 127–49.
- El-Gazzar, S.M., Chung, K.H., Jacob R.A., 2011. Reporting of Internal Control Weaknesses and Debt Rating Changes. *Int. Adv. Econ. Res.* 17, 421–435.
- Fama, E.F., French, K.R., 1997. Industry costs of equity. *J. Financ. Econ.* 43, 153–193.
- Faulkender, M., Petersen, M.A., 2006. Does the Source of Capital Affect Capital Structure? *Rev. Financ. Stud.* 19, 45–79.
- Ghosh, A.A., Lee, Y.G., 2013. Financial Reporting Quality, Structural Problems and the Informativeness of Mandated Disclosures on Internal Controls. *J. Bus Financ. Account.* 40, 318–349.
- Hammersley, J. S., Myers, L.A., Shakespeare, C., 2008. Market Reactions to the Disclosure of Internal Control Weaknesses and to the Characteristics of Those Weaknesses under Section 302 of the Sarbanes Oxley Act of 2002. *Rev. Account. Stud.* 13, 141–65.
- Li, Y., Yu, J., Zhang, Z., Zheng, S.X., 2016. The Effect of Internal Control Weakness on Firm Valuation: Evidence from SOX Section 404 Disclosures. *Financ. Res. Lett.* 17, 17–24.
- Ogneva, M., Subramanyam, K.R., Raghunandan, K., 2007. Internal Control Weakness and Cost

of Equity: Evidence from SOX Section 404 Disclosures. *Account. Rev.* 82, 1255–1297.

Richardson, S., 2006. Over-Investment of Free Cash Flow. *Rev. Account. Stud.* 11, 159–189.

Tobin, J. 1969. A General Equilibrium Approach To Monetary Theory. *J. Money Credit Bank.* 1, 15-29.

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**Table 1. Corporate Investment around ICW: Regression Analysis**

Table 1 reports the regression results using investment level as the dependent variable. The dependent variables are INVT (total investment) in column (1), INVTM (investment for maintenance) in column (2), and INVTN (investment for new projects) in column (3). ICW is a dummy variable that takes the value of one for ICW companies and the value of zero for non-ICW companies. POST is an indicator variable set to one for year T and year T+1 and zero for year T-1 and T-2 relative to ICW disclosure year (year T). The remaining variables are defined in Appendix A. The observations are from year T-2 (2 years before ICW disclosure) to T+1 (2 years after ICW disclosure). All tests use White heteroskedasticity robust standard errors. *t*-statistics are reported in the parentheses under the estimated coefficients. \*, \*\*, and \*\*\* represent the significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
	INVT	INVTM	INVTN
ICW	0.517 (0.611)	0.515** (2.439)	-0.061 (-0.075)
POST	0.099 (0.161)	-0.196** (-2.053)	0.212 (0.354)
ICW*POST	-2.872*** (-3.398)	-0.129 (-0.924)	-2.685*** (-3.246)
Cash flow ratio	-13.352*** (-3.746)	4.092*** (5.365)	-17.361*** (-5.030)
Tobin's Q	3.152*** (9.215)	0.135** (2.145)	2.957*** (9.054)
Constant	9.542*** (10.579)	4.357*** (20.793)	5.325*** (6.107)
Observations	4,420	4,420	4,420
Adjusted R-squared	0.087	0.032	0.097

**Table 2. Corporate Investment and Stock Returns**

Table 2 reports the regression results for the association between investment level and stock returns. The dependent variable is benchmark-adjusted returns, which is calculated as the difference between the BHR return of a stock and the corresponding return of size and B/M benchmark portfolio adjusted returns during the window of (-252, -1). ICW is a dummy variable that takes the value of one for ICW companies and the value of zero for non-ICW companies. INVTD is an indicator which is set as unity if the investment ratio (INVT) at year T (disclosure year) is smaller than that at year T-1, zero otherwise. INVTND is an indicator which is set as unity if the investment for new projects (INVTN) at year T (disclosure year) is smaller than that at year T-1, zero otherwise. The remaining control variables are defined in Appendix A. All tests use White heteroskedasticity robust standard errors. *t*-statistics are reported in the parentheses under the estimated coefficients. \*, \*\*, and \*\*\* represent the significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
ICW	-0.088** (-2.052)	-0.051 (-1.229)	-0.086** (-1.964)	-0.037 (-0.868)
INVTD	-0.092** (-2.384)	-0.075** (-2.005)		
ICW*INVTD	-0.124** (-2.259)	-0.095* (-1.819)		
INVTND			-0.091** (-2.343)	-0.066* (-1.756)
ICW*INVTND			-0.124** (-2.255)	-0.116** (-2.222)
Size		0.030*** (2.865)		0.030*** (2.885)
B/M equity ratio		-0.308*** (-9.097)		-0.310*** (-9.200)
Leverage		-0.007 (-0.077)		-0.003 (-0.030)
Cash holdings		0.019 (1.437)		0.018 (1.414)
Capex ratio		-0.170 (-0.687)		-0.186 (-0.756)
Cash flow ratio		0.753*** (5.510)		0.758*** (5.559)
Restructure		-0.037 (-1.275)		-0.037 (-1.294)
Decile of sales growth		-0.003 (-0.559)		-0.003 (-0.561)
% Loss		0.090** (2.078)		0.088** (2.037)
R&D dummy		-0.061** (-2.050)		-0.061** (-2.055)
Decile of Altman Z-score		0.006 (0.693)		0.006 (0.693)
Litigation industry		-0.055* (-1.863)		-0.055* (-1.845)
Stdev of Cash flow ratio		-0.016***		-0.016***

		(-7.131)		(-7.217)
Segments		0.018		0.017
		(1.268)		(1.159)
Firm age		0.024		0.023
		(1.071)		(1.029)
Big 4		-0.015		-0.010
		(-0.447)		(-0.303)
Constant	0.073**	-0.098	0.073**	-0.101
	(2.510)	(-0.795)	(2.498)	(-0.820)
Observations	1,170	1,170	1,170	1,170
Adjusted R-squared	0.058	0.181	0.058	0.182

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### Figure 1. Investment Level for ICW Firms around ICW Disclosure Year

Figure 1 plots the mean values of total investment (INVT), investment for maintenance (INVTM), and investment for new projects (INVTN) for ICW firms and their matching peers from Year T-4 through Year T+2. Year T is ICW disclosure year. Variables are defined in Appendix A.

