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Yuanto KUSNADI

Yuanto KUSNADI

Singapore Management University, yuantok@smu.edu.sg

Jiwei WANG

Singapore Management University, jwwang@smu.edu.sg

Yujie WANG

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Insider Trading Restrictions and Real Activities Earnings Management: International Evidence*

Fang Hu
Griffith Business School, Griffith University, Australia
E-mail: f.hu@griffith.edu.au
Phone: +61-7-3735-7559

Yuanto Kusnadi*
School of Accountancy, Singapore Management University
E-mail: yuantok@smu.edu.sg
Phone: +65-6808-6550

Jiwei Wang
School of Accountancy, Singapore Management University
E-mail: jwwang@smu.edu.sg
Phone: +65-6828-0616

Yujie Wang
Department of Accounting, Central South University, China
E-mail: wangyujie113116@163.com

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* Contact author's address: School of Accountancy, Singapore Management University, Singapore 178900. Tel: +65-6808-5449; fax: +65-6828-0600. E-mail: yuantok@smu.edu.sg.

Insider Trading Restrictions and Real Activities Earnings Management: International Evidence

ABSTRACT

We examine the implications of insider trading restrictions on firms' real activities earnings management in an international setting. Using a sample of 28 countries over the period from 1992 to 2007, we find evidence that is supportive of the substitution hypothesis, in that managers have incentives to substitute accruals earnings management for real activities earnings management. This effect is found to be more pronounced for firms in countries with more restrictive insider trading regulation. Our result is robust to alternative measures of real activities earnings management and insider trading restrictions, alternative sub-samples, alternative regression specifications, and controlling for endogeneity. In addition, we find that the reinforcing role played by insider trading restrictions on the substitution effect is stronger for firms in common law countries than in civil law countries. Overall, our results are important in highlighting the role of insider trading restrictions in shaping corporate financial reporting policies. In particular, we find strong evidence to suggest that the extent of restriction of such laws influence managerial incentives to engage in earnings manipulation through real activities.

Keywords: Insider trading laws, Real earnings management, Substitution effect

JEL Classification: G18; G32; G34

Insider Trading Restrictions and Real Activities Earnings Management: International Evidence

1. Introduction

Recent studies in accounting and finance (such as Fernandes and Ferreira, 2009; Jayaraman, 2012; Chen et al., 2017) have documented evidences that enforcement of insider trading laws are relevant for informativeness of stock prices, earnings quality, and capital allocation decision. At the same time, the findings of a survey by Graham et al. (2005) reveal that top executives have more incentives to engage in real activities earnings management than in accruals earning management. These studies have ignited renewed interests in the strand of research on real activities earnings management.¹

This study aims to investigate the impact of insider trading laws enforcement on real activities earning management. Most of the studies on real activities earnings management have only focused on the U.S. market. Our international sample that comprises of more than 70,000 firm-year observations from 28 countries provides an excellent setting for us to explore whether variations in the insider trading restrictions, in addition to the existing institutional mechanisms, will impact managerial incentives to engage in real activities earnings management. This is an important and interesting research question, which has yet been empirically examined using an international cross-country sample.

Using the data from the survey on executives compiled in the Global Competitiveness Reports, we create an insider trading restrictions index (*ITR*) and examine whether the *ITR* index is

¹ See Roychowdury (2006), Cohen et al. (2008), Cohen and Zarowin (2010), Gunny (2010), Zang (2012), Doukakis (2014), Braam et al. (2015), Guo et al. (2015), Cheng et al. (2016), Cohen et al. (2016), Zhou et al. (20189), Garcia Osma et al. (2000), and Jiang et al. (2020) for discussions on how various firm-specific and country-level variables affect real activities earnings management.

associated with real activities earnings management.² The empirical finding demonstrates that our measures of real activities earnings management are positively related to the *ITR* index. This result is not only statistically significant but also economically significant. A one standard deviation increase in the *ITR* index results in an increase in the value of real activities earnings management by 0.034, which is about 56% relative to the value of standard deviation of the measure of real activities earnings management in our sample.

We continue to explore whether restrictions in insider trading laws influence the earnings management strategies - accruals earnings management versus real activities earnings management. We find that real activities earnings management is negatively associated with accruals earnings management, suggesting that our results are consistent with the substitution hypothesis that is proposed in prior studies. Moreover, the interaction coefficient between the *ITR* index and the measure of accruals earnings management is negatively significant. In particular, our results imply that the substitution effect is found to be more pronounced in firms in countries with more restrictive insider trading regulation. Our findings complement that in the prior literature which has documented that the switching effect is a response by managers to moves by regulators to tighten disclosure requirements (Cohen et al, 2008, Choi et al., 2018).

In our additional analyses, we find that the main results documented above are qualitatively and quantitatively unchanged to using alternative measures of insider trading restrictions and real activities earnings management, alternative samples, and regression specification. We also control for the possibility of endogeneity using the change in the *ITR* index and obtain similar results. Therefore, our main finding of a positive association between insider trading restrictions and real

² Several studies (Du and Wei, 2004; Kusnadi, 2015) have utilized the same *ITR* index in examining other important issues in an international setting. Du and Wei (2004) examine how the insider trading impacts market volatility. Kusnadi (2015) find that corporate risk taking activities are associated with insider trading restrictions.

activities earnings management is relatively robust. In addition, our finding of the reinforcing role played by insider trading restrictions on the switching effect from accruals based to real activities earnings management provides a new insight into how insider trading laws can shape managerial financial reporting choice.

We also find that the interaction term between the *ITR* index and the measure of accruals earnings management is negatively significant only for firms in common law countries. This finding corroborates those in prior studies in that the decision by managers of international firms to engage in real activities earnings management is also influenced by the strength of institutional infrastructure in each country.³

Overall, this study provides several important contributions to the extant literature. First, it is the first large-sample international study that examines the consequence of insider trading laws on firms' real activities earnings management. Different from the combined index of legal regime used by Choi et al. (2018) and Enomoto et al. (2015), we adopt the enforcement of insider trading laws as exogenous shock to the securities market. This shock has direct impact on the infrastructure of capital market. The findings provide insights on corporate managers' decisions to decide between accruals and real activities earnings management given this fundamental change in information environment. Second, it complements the growing literature on the effect of insider trading laws on corporate policies. This is important not only to academics but also to investors and regulators, especially as the recent debacles involving high-profile insider trading in some of the largest firms in the U.S. and around the world have renewed calls for more stringent enforcement of insider trading laws. Finally, the research findings further contribute to the

³ While we find that the reinforcing role played by the insider trading restrictions on the substitution effect between accruals and real activities earnings management is stronger in countries with strong institutional infrastructure, Jiang et al. (2020) find that the deterring effect played by short-sale constraint on real earnings management is stronger in countries with weak institutional infrastructure.

established literature on how country-level institutional infrastructure shapes firms' financial reporting incentives (Ball et al., 2000; Bushman and Piotroski, 2006).

The remainder of the paper is organized as follows. Section 2 reviews the related literatures on the implications of insider trading restrictions as well as on real activities earnings management; and develops the main hypotheses of the paper. Section 3 outlines the sample selection procedures and construction of the main variables. Section 4 describes the empirical regression models used in the analysis to explore the relation between insider trading restrictions and real activities earnings management. Section 5 provides the concluding remarks.

2. Literature Review and Hypothesis Development

2.1 Insider trading restrictions and implications

Regulation on insider trading is one of the most controversial and important securities regulations in the world (Newkirk and Robertson, 1998). The focus of the debate among scholars in law and economics has revolved around the economic efficiency of insider trading. Until now, there is still no clear consensus on whether allowing or restricting insider trading will be beneficial or detrimental for firms and more importantly for the interests of minority shareholders.

The empirical findings in the accounting and finance literature have suggested that while insider trading laws exist in most of the countries around the world, it has only been enforced in less than half of the countries (Bhattacharya and Daouk, 2002). In addition, the first-time enforcement of insider trading laws in these countries leads to reduction in the cost of equity as well as increases in analyst following (Bushman et. al., 2005), stock price informativeness (Fernandes and Ferreira, 2009), stock price synchronicity and liquidity (Beny, 2007), timely loss recognition (Jayaraman, 2012); and capital allocation efficiency (Chen et al., 2017).

There are also related papers which have examined how insider trading restrictions impact stock market volatility (Du and Wei, 2004), managerial compensation (Denis and Xu, 2013), and risk-taking incentives (Kusnadi, 2015). Interestingly, the effects are not uniform across all countries. More specifically, the increase in analyst following is found to be more prominent for firms in emerging markets; while the increase in stock price informativeness, stock price synchronicity and liquidity, capital allocation efficiency are stronger for firms in countries with strong institutional infrastructures such as developed markets and common-law countries. These findings highlight that there are important cross-sectional variations in the effects of insider trading restrictions on various issues in accounting and finance.

2.2 Real activities and accruals earnings management

Meanwhile, studies on the determinants and consequences of earnings management are voluminous and the majority of these studies tend to focus on accruals-based earnings management. Recently, several studies have examined the importance of real activities earnings management. Real activities manipulation is defined as “departures from normal operational practices, motivated by managers’ desire to mislead at least some stakeholders into believing certain financial goals have been met in the normal course of operation.” (Roychowduri, 2006). Typically, managers engage in real activities manipulation to meet certain earnings threshold. Thus, these activities may be regarded as detrimental to shareholders’ values.

The findings from several subsequent studies further imply that manager trades off the relative costs of accruals-based versus real activities earnings management. In particular, managers adjust the level of accruals-based earnings management according to the level of real activities manipulation realized (Zang, 2012). Accruals manipulation raises higher political costs than real

activities earnings managements since they are more likely to draw auditors' or regulators' scrutiny. By this reasoning, prior studies find that firms switch from accruals-based to real activities manipulation surrounding events such as the introduction of the Sarbanes-Oxley Act (Cohen et al., 2008) and seasoned equity offerings (Cohen and Zarowin, 2010). On the other hand, real activities manipulation is found to have negative implications on future firms' performance (Gunny, 2010; Cohen and Zarowin, 2010). Kim and Sohn (2013) also discover that real activities earnings management is positively associated with cost of equity capital. This implies that real activities manipulation increases the risk premium demanded by investors. A recent paper by Cheng et al. (2016) also explores the role of internal governance in influencing managers' incentives for real activities earnings management.

A related paper by Garcia Osma et al. (2020) examines the effect of insider trading laws on earnings management. However, their study focuses on the voluntary restrictions of insider trading laws for firms in the US. They document that voluntary adoption of insider trading laws is negatively associated with the tendencies to engage in accruals earnings management. Moreover, they do not find that there exists a substitution effect between accruals and real activities earnings management. Overall, their findings suggest that an increase in the restrictions of insider trading laws helps to lessen the incidence of accruals earnings management and has the effect of increasing the quality of reported earnings.

Meanwhile, several recent papers using an international sample like ours examine the role of mandatory adoption of IFRS (Doukakis, 2014), political connections (Braam et al., 2015), legal regime (Choi et al., 2018), investor protection (Enomoto et al., 2015) and short-selling threat (Jiang et al., 2020) on the choice of international firms to engage in accruals and real activities earnings management. Using a difference-in-difference research design, Doukakis (2014) documents that

mandatory adoption of IFRS does not affect firms' choices between accruals and real activities earnings management. In particular, he emphasizes that his finding is suggestive of the importance that managers place on firm-level reporting incentives rather than mandatory accounting standards such as IFRS in influencing their choice of earnings manipulation to influence reporting earnings.

The findings by Braam et al. (2015) further confirm the important role of firm-level political connections in shaping managerial incentives to engage in accruals vs real activities earnings management. Specifically, they report that politically-connected firms have greater tendencies to switch from accruals-based to real activities earnings management, which is supportive of the substitution hypothesis. One strong compelling reason for the incentives to engage in real activities earnings management is due to the fact that these strategies are more difficult to uncover, as compared to accruals-based earnings management. Moreover, employing real activities earnings management helps to mask potential rent-seeking motives that politicians usually seek from firms from being disclosed to the public.

Choi et al. (2018) examine whether and how a firm's real activities earnings management is influenced by the strength of a country's legal regime and the presence of a Big 4 auditor. They measure the the strength of the legal regime using two combined index pertaining to the liability standards of the auditors. Enomoto et al. (2015) examine the differences in accrual-based and real activities earnings management across countries from the perspective of investor protection. Their variables of investor protection are also based on the combined index including the anti-director right index, legal enforcement and analyst following. The index used in those two prior studies can be endogeneously determined by the corporate information disclosure in the capital markets.

Meanwhile, Jiang et al. (2000) contend that short-selling threat acts as an additional monitoring and disciplining mechanism on managerial decisions, and serves to deter managers

from engaging in real activities earnings management. Moreover, this finding is found to be more pronounced for firms in countries with strong investor protection as well as as those in countries where short-selling is viable.

2.3 Hypothesis development

An increase in litigation risks creates higher demand for higher quality financial reporting, which subsequently results in auditors' and regulators' intensive scrutiny on accruals manipulations. Managers would switch to real activities earnings management, which are relatively more difficult to be detected than accruals earnings management (Cohen et al., 2008; Cohen and Zarowin, 2010; Zang, 2012). In this respect, more restrictive insider trading regulations are likely to result in higher prevalence of real activities earnings management.

On the other hand, Huang et al. (2020) employ an exogenous shock in the form of an unanticipated court ruling that reduced litigation risk for firms headquartered in the Ninth Circuit to test how such change impacts real activities earnings management. They find that litigation risks are negatively associated with real activities earnings management. In the same vein, as insider trading law becomes more restrictive, the enforcement of such law increases the litigation risks that managers will likely face. This may restrict managers' incentives to engage in real activities earnings management due to the higher costs that could be incurred in the litigation process.

From the above argument, the effect of more restrictive insider trading regulation on real activities earnings management becomes an open empirical question. Hence we state the first hypothesis in the null form as follows:

H1. Insider trading restrictions are not associated with real activities earnings management.

As a consequence of Hypothesis 1 above, whether insider trading restrictions will incentivize managers to trade off between accruals earnings management and real activities earnings management is also an open empirical question. One possibility is that insider trading restrictions constrain both accruals earnings management and real activities earnings management as both are perceived as detrimental to the financial reporting quality (*simultaneous hypothesis*). Another possibility is managers switch from accruals earnings management to real activities earnings management since the latter is harder to detect (*substitution hypothesis*). Hence we state our second hypothesis in the null form as follows:

H2. Insider trading restrictions are not associated with the tendencies to substitute accruals earnings management with real activities earnings management.

Finally, we also examine whether the effect of insider trading restrictions on real activities earnings management will be influenced by cross-country differences in institutional infrastructures which have been found in prior international studies (La Porta et al., 1998; La Porta et al., 2006; Djankov et al., 2008) to be important determinants of financial reporting quality.

In this study, we use a dummy variable that equals one for common law countries, and 0 for civil law countries. Common law countries are often denoted to offer stronger legal protection to minority shareholders, as compared to civil law countries. As we express our first and second hypothesis in null form, this leads to our third hypothesis in the null form as follows:

H3. The effect of insider trading restrictions on real activities earnings management is not different between firms in common law countries and in civil law countries.

3. Sample Data and Variables

In this section, we describe the sample selection procedure and the design of our dependent and independent variables. The sample selection procedure is outlined in Panel A of Table 1. We provide the detailed definition of each variable in Appendix A.

3.1 Sample data

We collect the firm-specific financial data of international firms from the Compustat Global database and then merge the data with the insider trading restrictions (*ITR*) variable (to be described in the next sub-section). The sample period is from 1992 to 2007.⁴ For each firm-year observation, we obtain the firm-level financial variables and employ regression analysis to estimate proxies for real activities earnings management as well as accruals earnings management. To be consistent with prior studies, we require our sample to have non-missing firm-year observations on the measures of accruals and real activities earnings management that will be explained in more details in the next sub-section. We also exclude firms in countries with no *ITR* data, firms operating in the financial industries (SIC 6000 to 6999), and firms with book values of total assets of less than US\$10 million and those with missing control variables. The industry classification follows Fama and French (1997). Before performing any empirical tests, we winsorize all the control variables at the 1 and 99 percent levels to ensure that the results are not attributed to outliers in the data.

After the sample selection procedure, which is outlined in Panel A of Table 1, our international sample comprises of 72,411 firm-year observations for 16,527 firms from 28 countries. Countries that dominate our sample are UK (8,176 observations), Japan (18,910 observations), and US

⁴ We choose this sample period because the financial data in Compustat Global is available since 1992, and until 2007 the sample has not been impacted by global financial crisis (GFC).

(24,162 observations). In one of the robustness tests, we examine whether the results are influenced by these three countries.

[Intert Table 1]

3.2 Insider trading restrictions variable

Consistent with prior study (Dennis and Xu, 2013), we construct the main independent variable – the insider trading restrictions (*ITR*) index from the Global Competitiveness Report (GCR) for 1996, 1998, and 1999. The reports are based on the survey results of executives carried out by the World Economic Forum annually and capture the insight provided by business leaders on countries around the world with regards to various topics.⁵ Specifically, with regards to insider trading regulation, the survey responses to the following question form the basis of the *ITR* index, which is the main insider trading restriction variable that is used in this study:

Insider trading is not common in the domestic market (1 = strongly disagree, 7 – strongly agree)

For each country, we measure the *ITR* index as the mean score of all the survey responses done by the executives in that country. Since our sample period is from 1992 to 2007 and the responses to the survey questions were only provided for 3 years (1996, 1998, and 1999), for each country, we use the index value for 1996 as the corresponding value for 1992 to 1997. Similarly, the index value for 1998 is used as the corresponding value for 1998. Finally, the index value for 1999 is used as the corresponding value for 1999 to the end of the sample period (2007). Countries with higher values of the *ITR* index are regarded to be countries with more restrictive in terms of their insider trading regulations, since insider trading is deemed to be not prevalent by the executives in those countries.

⁵ Interestingly, Du and Wei (2004) observe that most of the respondents were executives from multinational corporations and not those from financial firms and that these executives were regarded as experts in financial issues.

Panel B of Table 1 presents the sample distribution by countries. There exists significant variation in the extent of insider trading restrictions in our cross-country sample, with the minimum value of 2.49 in India (1996) to the maximum value of 5.85 in the UK (1999). Moreover, we further observe that the *ITR* index has increased over the years in most countries, with the exception of Chile, Greece, Hong Kong, Malaysia, Thailand, South Africa, and Switzerland. Overall, there is a marked increase in the mean value (standard deviation) of the *ITR* index from 1996 to 1999, from 3.98 (0.75) to 4.49 (0.91). This finding is consistent with the notion that insider trading regulations have become more restrictive over the years.

In addition, we use the insider trading law (*ITL*) index obtained from Beny (2005) in the robustness test. The *ITL* index is created by taking the sum of three dummy variables: *Tippee*, *Tipping*, and *Criminal*; each of which represents the main elements involved in insider trading laws. Specifically, *Tippee* equals one if a corporate insider is prohibited from engaging in insider trading transaction (such as divulging price sensitive or private information), and zero otherwise. *Tipping* equals one if a corporate insider is found to be guilty of engaging in insider trading transaction which influences an outsider to trade on those information, and zero otherwise. *Criminal* equals one if engaging in insider trading is regarded as a criminal activity in a particular country, and zero otherwise.

Similarly, higher value of the *ITL* index is reflective of more restrictive insider trading regulation. Panel B of Table 1 shows that the *ITL* index is available for 25 out of the 28 countries in our sample, with the value ranging from 1 (1 country, Norway) to 3 (14 countries).⁶ The mean value of the *ITL* index is 2.52 and the corresponding standard deviation is 0.59.

⁶ Three countries: Chile, Turkey, and Taiwan have no *ITL* index.

Moreover, we also obtain the first year of enforcement of insider trading laws (*IT_ENF*) from Bhattacharya and Daouk (2002). From Panel B of Table 1, 26 out of the 28 countries in our sample have enforced insider trading laws, only Philippines and South Africa have not. The country with the earliest year of enforcement is the US (1961) and 14 countries have their first year of enforcement within the sample period. In our robustness test, we create a dummy variable (*ENF*) that equals one to represent countries which have enforced insider trading regulation by 1999, and zero otherwise.

In Panel B of Table 1, we also present the legal origin of each country based on La Porta et al. (1998) and La Porta et al. (2006). *LO* is defined as one for a country with common law tradition and zero for a country with civil law tradition. The last column of Panel B shows that 11 countries such as Australia, Canada, UK, US are common law countries while the others such as Brazil, Germany, Japan are civil law countries.

3.3 Measures of real activities earnings management

Our measures of real activities earnings management closely follow that of Dechow et al. (1998), Roychowdhury (2006) and Zang (2012). In particular, we focus on manipulation through real operational activities that are manifested through three channels: (i) ***Sales manipulation***: sales manipulation can be done through providing sales discount and/or more liberal credit terms to customers in order to accelerate the recognition of sales. These strategies result in a temporary increase in sales volume, which is not sustainable in the long run once the price and credit terms revert back to normal in the near future. The real implications of engaging in these sales manipulation is that while sales revenue may be higher, the firm will realize lower cash flows from operations in the current year, as the margin from these discounted sales will be lower.

Consequently, the production costs from manipulating sales are also likely to be higher; (ii) **Engaging in overproduction**: engaging in overproduction is one way for a firm to allocate the fixed overhead costs to more units. As a result, the fixed costs and also the total costs per unit produced will be lower. The cost of goods sold will also decline and the firm can report higher earnings. However, there are additional inventory holding costs due to the additional units produced which are likely to lead to lower cash flows from operations (relative to normal production and sales level); and (iii) **Reducing discretionary expenditures**: discretionary expenditures refer to expenditures on *R&D*, advertising, maintenance, as well as selling and general administrative (*SG&A*).⁷ The operating costs are expensed immediately in the same year that they are incurred. Therefore, by spending less on these discretionary expenditures, a firm can manage current year earnings upwards, which may be at the expense of future earnings.⁸ The resulting effect is that the current year's cash flows from operations will be higher.

To measure the earnings manipulation from the three channels described above, we construct three measures of real activities earnings management. We first obtain the normal level of cash flow from operations (*CFO*), by estimating the following cross-sectional regression for each country, industry, and year:

$$\frac{CFO_{i,t}}{TA_{i,t-1}} = a_0 + a_1 \left(\frac{1}{TA_{i,t-1}} \right) + a_2 \left(\frac{SALES_{i,t}}{TA_{i,t-1}} \right) + a_3 \left(\frac{\Delta SALES_{i,t}}{TA_{i,t-1}} \right) + \epsilon_{i,t} \quad (1)$$

where *TA* is total assets; *SALES* is total sales; $\Delta SALES$ is the change in sales over the past one year.

⁷ Roychowdurry (2006) argues that *SG&A* should be included as part of the discretionary expenses as it includes relevant expenses such as maintenance costs, training and development costs, and others.

⁸ This is especially true for *R&D* and advertising expenses. Reducing these discretionary expenses may have detrimental effect on future sales and earnings.

Meanwhile, production cost (*PROD*) is defined as the sum of cost of goods sold (*COGS*) and the change in inventory (ΔINV) over the past one year; and discretionary expenses (*DISCEXP*) is defined as selling, general, administrative (*SGA*) expenses. Both *COGS* and ΔINV are modelled by the following specifications:

$$\frac{COGS_{i,t}}{TA_{i,t-1}} = a_0 + a_1 \left(\frac{1}{TA_{i,t-1}} \right) + a_2 \left(\frac{SALES_{i,t}}{TA_{i,t-1}} \right) + \epsilon_{i,t} \quad (2)$$

$$\frac{\Delta INV_{i,t}}{TA_{i,t-1}} = a_0 + a_1 \left(\frac{1}{TA_{i,t-1}} \right) + a_2 \left(\frac{SALES_{i,t}}{TA_{i,t-1}} \right) + a_3 \left(\frac{\Delta SALES_{i,t}}{TA_{i,t-1}} \right) + \epsilon_{i,t} \quad (3)$$

Using (2) and (3), we estimate the normal level of production cost (*PROD*) by the sum of *COGS* and (ΔINV), using the following specification:

$$\frac{PROD_{i,t}}{TA_{i,t-1}} = a_0 + a_1 \left(\frac{1}{TA_{i,t-1}} \right) + a_2 \left(\frac{SALES_{i,t}}{TA_{i,t-1}} \right) + a_3 \left(\frac{\Delta SALES_{i,t}}{TA_{i,t-1}} \right) + \epsilon_{i,t} \quad (4)$$

Similarly, the normal level of discretionary expenses (*DISCEXP*) is estimated as follows⁹:

$$\frac{DISCEXP_{i,t}}{TA_{i,t-1}} = a_0 + a_1 \left(\frac{1}{TA_{i,t-1}} \right) + a_2 \left(\frac{SALES_{i,t-1}}{TA_{i,t-1}} \right) + \epsilon_{i,t} \quad (5)$$

The abnormal levels of *CFO*, *PROD*, *DISCEXP* are computed as the residuals of equation (1), (4), and (5) respectively. We denote the residuals of equation (4) as *RM_PROD*. Higher values on *RM_PROD* imply higher abnormal value of production costs due to overproduction. This results in higher reported earnings in the current year through reduction in cost of goods sold.

⁹ Both Roychowdurry (2006) and Zang (2012) use lagged sales ($SALES_{i,t-1}$) as the numerator in the asset turnover ratio in equation (5) to mitigate the problem of having unusually low residuals in equation (5), even in the case when there is no decline in the discretionary expense in a particular year.

Meanwhile, following Zang (2012) and Doukakis (2014), we multiply the residuals of equations (1) and (5) by -1 and denote them as RM_CFO and $RM_DISCEXP$ respectively. Higher values on these two variables suggest more prevalent use of sales discounts and/or more lenient credit terms to manipulate sales level; as well as greater reduction of discretionary expenditures.

Overall, we employ these three variables (RM_CFO , RM_PROD and RM_DISEXP) to represent (i) - (iii) measures respectively for real activities earnings management. To be consistent with prior studies, we also construct an aggregate measure of real activities earnings management, $REAL_EM$, by taking the sum of the three measures. Similarly, higher values of $REAL_EM$ indicate that managers are more likely to engage in real activities manipulation.

3.4 Measures of accruals-based earnings management

Although the focus on our paper is on real activities earnings management, we also examine whether there is a shift from accruals to real activities earnings management as insider trading laws become more restrictive. In this respect, we follow the existing literature in constructing measure of accruals earnings management.

We employ the modified cross-sectional Jones model (Dechow et al., 1995) that controls for industry and time effects (DeFond and Jiambalvo, 1994) to estimate total accruals ($TACC$). Specifically, we use the following cross-section regression for every country, industry, and year:

$$\frac{TACC_{i,t}}{TA_{i,t-1}} = a_0 + a_1 \left(\frac{1}{TA_{i,t-1}} \right) + a_2 \left(\frac{\Delta SALES_{i,t}}{TA_{i,t-1}} \right) + a_3 \left(\frac{PPE_{i,t}}{TA_{i,t-1}} \right) + \epsilon_{i,t} \quad (6)$$

where $TACC$ is defined as earnings before extraordinary items and discontinued operations minus CFO (operating cash flows); PPE is the gross property, plant, and equipment. Discretionary

accruals (*DA*) are computed as the residuals of the regression equation (6). Higher absolute values of *DA* are indicative of greater tendencies to engage in accruals-based earnings management.

3.5 Descriptive statistics and univariate analysis

The descriptive statistics of the firm-specific financial variables that are used in this study are presented in Table 2. Apart from the measures of the real activities and accruals earnings management that are described in the previous sub-sections, we also obtain other firm-specific financial variables that are used as control variables in the empirical tests, such as: firm size (*SIZE*), market-to-book ratio (*MTB*), leverage ratio (*LEV*), and return on assets (*ROA*). We also construct a dummy variable that equals one if the sample firm is audited by a Big-4 auditor (*BIG4*), and 0 otherwise.

The mean (standard deviation) of the main measure of real activities earnings management, *REAL_EM*, is 0.006 (0.061), with an interquartile range value of 0.048. As for the other measures of the real activities earnings management, the mean (standard deviation) of *RM_CFO*, *RM_PROD*, and *RM_DISCEXP* are -0.02 (0.131), 0.009 (0.191), and 0.026 (0.18), respectively. Meanwhile, the mean (standard deviation) of the accruals earnings management measure, $|DA|$ is 0.085 (0.115), with an interquartile range value of 0.081.

[Intert Table 2]

In an unreported univariate test (available upon request), we find that the value of *REAL_EM* is higher in the sample of firms in countries with above median *ITR* (0.013) than for those in countries with below median *ITR* (-0.001).¹⁰ This finding is indicative of a preliminary evidence of a positive association between *ITR* and *REAL_EM*, which we will formally test in the subsequent empirical regression.

¹⁰ The difference is statistically significant at the 1% level.

The correlation analysis between firm-specific financial variables and the main independent variable of concern (*ITR*) is presented in Table 3. We observe that insider trading restrictions (*ITR*) is positively and significantly associated with accruals earnings management (*/DA/*) as well as the aggregate measure of real activities earnings management (*REAL_EM*). Meanwhile, although the correlation between */DA/* and *REAL_EM* is negative, the magnitude is small and the value is not statistically significant. In addition, we also find that *REAL_EM* is negatively and significantly correlated to the other firm-specific control variables, with the exception of *Big4*.

[Intert Table 3]

4. Regression Models and Empirical Tests

In this section, we construct regression models and perform empirical tests to test the three main hypotheses we have developed in Section 2.

4.1 Insider trading restrictions and real activities earnings management

Our first empirical test is to examine the effect of insider trading regulation on international firms' real activities earnings management. Specifically, we estimate the following multivariate panel data regression specification:

$$REM_{i,t} = a_0 + a_1 ITR_{i,t} + a_2 SIZE_{i,t} + a_3 MTB_{i,t} + a_4 LEV_{i,t} + a_5 ROA_{i,t} + a_6 BIG4_{i,t} + \sum Country + \sum Industry + \sum Year + \epsilon_{i,t} \quad (7)$$

where for each firm (*i*)-year (*t*) observation, *REM* is one of the measures of real activities earnings management; *ITR* is the insider trading restrictions index; *SIZE* is the firm size, *MTB* is the market-to-book-ratio; *LEV* is the leverage ratio; *ROA* is the profitability ratio; and *BIG4* is the Big 4 auditor dummy variable.

We estimate equation (7) using ordinary least squares (OLS) regression model with additional country, industry, as well as year fixed effects. This is because our sample is an international sample spread across many industries and over a relatively long sample period of 16 years. As a result, it will be prudent to control for potential country-level, industry-level or time-invariant omitted variables. Moreover, we use the industry classification from Fama and French (1997) and the standard error for each coefficient is estimated using the White's heteroscedasticity corrected standard errors, clustered by firm and year. This is done to mitigate the problem of multicollinearity and heteroskedasticity that may influence our findings.

We are interested in the sign and statistical significance of a_1 , the coefficient on *ITR*, which is the main insider trading restrictions variable of interest. Table 4 presents the regression estimates of equation (7) using different measures of real activities earnings management as the dependent variable. Column (1) displays the results for the aggregate measure of real activities earnings management (*REAL_EM*). We find that coefficient a_1 is *positive* (coefficient value = 0.043) and statistically significant at the 1 percent level (standard error = 0.013).¹¹

To measure the economic significance of the result, holding other variables constant, we multiply the coefficient estimate of a_1 (0.043) by the standard deviation increase in the *ITR* index (0.789) and obtain an increase in the value of *REAL_EM* of 0.034. This represents about 56% of the standard deviation of *REAL_EM* (which is 0.061, as observed from Table 2). Hence, not only is the result statistically significant, it is also material economically.

Columns (2) to (4) of Table 4 display the results when the dependent variable is replaced by various channels through which real activities earnings management is realized (sales manipulation, overproduction, and reducing discretionary expenses). The sign of coefficient a_1

¹¹ The positive value of coefficient a_1 is consistent with the positive correlation between *ITR* and *REAL_EM* that we find in Table 2 and the positive difference in the mean value of *REAL_EM* in countries with high vs low *ITR*.

remains positive and it is statistically significant (at least at the 5% percent level) for two components of real activities earnings management (*RM_PROD* and *RM_DISCEXP*). However, we find that the coefficient a_1 is negative but not associated with *ITR* in Column (2), when we use *RM_CFO* as the dependent variable. In general, we find strong evidence to suggest that there exists a positive relation between insider trading restrictions and incentives of managers to engage in overproduction and reducing discretionary expenses. On the other hand, we find that insider trading restrictions is not related to real activities earnings management through sales manipulation.

In terms of the other control variables, *MTB*, *LEV*, and *ROA* are negatively associated with *REAL_EM*, implying that growth firms, highly levered firms, and profitable firms are less likely to engage in real activities earnings management. As expected, we find that *Big4* is positively associated with *REAL_EM*. This result is also found by Chi et al. (2010). Because accruals earnings management is more likely to be detected by high quality auditor (Big 4), firms which are audited by the Big 4 auditors may shift to more real activities earnings manipulation, which are presumably harder to detect.

Overall, the results in Table 4 show that firms in countries with more restrictive insider trading regulation are more likely to engage in real activities earnings management, than their counterparts in countries with less restrictive insider trading regulation.

[Intert Table 4]

4.2 Insider trading restrictions and substitution effect from accruals to real activities earnings management

Next, we are interested in testing whether firms switch from accruals to real activities earnings management.¹² To achieve this, we modify equation (7) by including an additional control variable, which is our measure of accruals earnings management. Then, we re-estimate the following regression specification using the OLS model that controls for country, industry and year fixed effects:

$$REM_{i,t} = a_0 + a_1 ITR_{i,t} + a_2 |DA|_{i,t} + a_3 SIZE_{i,t} + a_4 MTB_{i,t} + a_5 LEV_{i,t} + a_6 ROA_{i,t} + a_7 BIG4_{i,t} + \sum Country + \sum Industry + \sum Year + \epsilon_{i,t} \quad (8)$$

where $|DA|$ is the absolute value of discretionary accruals and all other variables are as defined earlier.

Panel A of Table 5 presents the regression estimates of equation (8) using different measures of real activities earnings management as the dependent variable. Similar to Table 4, Column (1) displays the results for the aggregate measure of real activities earnings management (*REAL_EM*). Even after controlling for the measure of accruals-based earnings management, the value of coefficient a_1 continues to be positive (coefficient value = 0.044) and statistically significant at the 1 percent level (standard error = 0.013). More interestingly, we now find that coefficient a_2 is **negative** (-0.027) and statistically significant at the 1% level. This result shows that even after controlling for the presence of insider trading laws, there exists a switching effect from accruals to real activities earnings management and corroborates the findings that have been documented in the prior literature as well (Cohen et al, 2008; Cohen and Zarowin, 2010; Zang, 2012; Braam et al, 2015; Jiang et al., 2020).

¹² In another unreported test (available upon request), we regress $|DA|$ on *REM* and other control variables. We find that the coefficient estimate of *REM* is negative (value = -0.084) and statistically significant at the 1% level, which confirms that the substitution effect exists in general.

Moreover, the results in Columns (2) to (4) further support the earlier findings in Table 4 that the substitution effect only takes place for real activities earnings management that are achieved through overproduction (*RM_PROD*) and reducing discretionary expenses (*RM_DISCEXP*). In contrast, we do not find evidence of a substitution effect between discretionary accruals and sales manipulation. In fact, we document that coefficient a_7 turns out to be positive (value = 0.017) and statistically significant at the 5% level in Column (2), when *RM_CFO* is the dependent variable. In other words, we do find evidence of a complementary effect (rather than substitution effect) between accruals earnings management and sales manipulation, i.e. they can take place concurrently.

Subsequently, we wish to investigate if the substitution effect that we document in Panel A of Table 5 is more or less pronounced for firms in countries with more restrictive insider trading regulation. We introduce an interaction term between *ITR* and $|DA|$ and include it as an additional variable in equation (9) below. We continue to use the specification that controls for country, industry and year fixed effects:

$$REM_{i,t} = a_0 + a_1 ITR_{i,t} + a_2 |DA|_{i,t} + a_3 (ITR_{i,t} \times |DA|_{i,t}) + a_4 SIZE_{i,t} + a_5 MTB_{i,t} + a_6 LEV_{i,t} + a_7 ROA_{i,t} + a_8 BIG4_{i,t} + \sum Country + \sum Industry + \sum Year + \epsilon_{i,t} \quad (9)$$

where all other variables are as defined earlier.

The estimates of equation (9) are displayed in Panel B of Table 5. By looking at the result in Column (1), we find that coefficient a_1 retains its positive value (coefficient value = 0.046) and remains statistically significant at the 1% level. More relevantly though, we find that interaction coefficient a_3 is *negative* (value = -0.026) and statistically significant at the 1% level (standard error = 0.005). Since the interaction coefficient ($ITR \times |DA|$) captures the incremental effect of more restrictive insider trading regulation on the substitution effect, our findings imply that insider

trading restrictions reinforces the negative association between real activities and accruals earnings management that we uncover in Panel A of Table 5. Looking at the results in other columns in Panel B of Table 5, we find that coefficient a_8 is found to be negatively significant (at least at the 5% level) in two (RM_CFO and RM_PROD) out of the three measures of real activities earnings management.

[Intert Table 5]

Taken collectively, the results in Tables 4 and 5 are consistent with the notion that insider trading restrictions play a reinforcing role on the managerial incentives to switch from accruals to real activities earnings management.

4.3 Robustness test

We conduct a series of robustness tests to examine if the positive reinforcing role played by insider trading restrictions on the substitution effect from accruals to real activities earnings management is sensitive to changes in alternative specifications, alternative measures of insider trading restrictions, and alternative samples.¹³ First, we calculate the mean value for all the firm-specific variables for each firm and use the aggregated observations to estimate equation (8) using OLS regression model with country and industry fixed effect.¹⁴ The results are presented in Panel A of Table 6. The finding from Column (1) of Panel A indicates that the coefficient a_1 remains positively significant in three out of the four measures (values ranging from 0.007 to 0.031) of real activities earnings management. The same finding is obtained with regards to the interaction coefficient a_3 (values ranging from -0.082 to -0.044). Therefore, our main results are not affected

¹³ We also test whether the finding from the baseline regression model of a positive effect between ITR and $REAL_EM$ is robust. In our unreported results (available upon request), the positive relation is materially unchanged.

¹⁴ Essentially, instead of estimating a panel data regression, we estimate a cross-sectional regression model for all the firms in the sample.

by changes in the value of dependent and independent variables from yearly value to an aggregated value.

[Intert Table 6]

Next, we are concerned of the potential endogeneity concern that may influence our results. To mitigate this concern, we follow Kusnadi (2015) and construct a variable that captures the change in the insider trading restriction over the sample period (CH_ITR). This change can be regarded as an “exogenous” shock in the value of the ITR index. In particular the value of CH_ITR for 1998 is computed as the difference between the ITR values in 1998 and 1996. Correspondingly, the value for 1999 onwards is computed as the difference between the values in 1999 and 1998. We replace ITR and the interaction coefficient $ITR \times |DA|$ with CH_ITR and $CH_ITR \times |DA|$, and re-estimate equation (9) using OLS regression model that controls for country, industry, and year fixed effects for the smaller sub-sample from 1998 to 2007. The estimation results are presented in Column (1) of Panel B of Table 6. We find that change in insider trading restrictions index leads to higher incentives for managers to switch from accruals to real activities earnings management. Therefore, our results are robust after controlling for the change in insider trading restrictions.

Subsequently, we examine if the results are sensitive to alternative measures of insider trading restrictions. For this purpose, we replace the ITR index with the insider trading law (ITL) index and re-estimate equation (9). The results are presented in Column (2) of Panel B. We find that the coefficient on the ITL index continues to be positive and significant (value = 0.016) and the interaction coefficient between ITL and $|DA|$ remains negative and significant (value = -0.063). These results are consistent with the findings we reported in the first two hypotheses.

We also construct dummy variable (ENF) that equals one if the countries have enforced insider trading laws by 1999, and zero otherwise. Similarly, replace ITR with ENF in the estimation of

equation (9) and present the results in Column (3) of Panel B. While, coefficient a_1 retains its positive significance (value = 0.012, significant at the 10% level), the value of the interaction coefficient a_3 is negative (value = -0.025) but insignificant. In this aspect, we can only find evidence that the enforcement of insider trading laws is positively related to real activities earnings management.

Apart from using alternative measures of insider trading restrictions, we are also interested in testing whether the results are robust to using alternative sample period and sample countries. In particular, we remove periods that correspond to the Asian financial crisis (1997-1998), the technology bubble period (2000). Observations in these years may confound the results as managers are likely to have more incentives to engage in earnings manipulation. We re-estimate equation (9) for the sample periods that excludes the crisis periods mentioned above and the results in Column (4) of Panel B demonstrate that the main findings are unchanged.

We observe that three countries dominate the sample (Japan, UK, and US), accounting for more than 51,000 firm year observations which represents more than 70% of the total sample. In order to investigate whether the main results are driven by observations from these three countries, we exclude observations from these three countries and re-estimate equation (9) for the remaining observations from 25 countries. The results are presented in Column (5) of Panel B. Although the coefficient on *ITR* is positive but insignificant, we continue to find that the interaction coefficient $ITR \times |DA|$ displays negative and significant relation with *REAL_EM* (value = -0.017, significant at the 5% level). Therefore, insider trading restrictions index play an important role in influencing managerial incentives to switch from accruals to real activities earnings management, even in the smaller sub-sample of 25 countries.

4.4 Suspect firm-years analysis

Following prior studies (Roychowdhury, 2006; Zang, 2012), we construct a dummy variable, *SUSPECT*, that equals one for firms with earnings before interest and taxes divided by total assets that are between 0 and 0.005; and zero otherwise. We investigate whether our main result is different for the sample of firms that are regarded to have strong incentives to manage their earnings (i.e. *SUSPECT* = 1) as compared to those that are regarded to have low incentives to manage their earnings (i.e. *SUSPECT* = 0). The results of the estimation of equation (9) for the two sub-samples, using OLS model that controls for country, industry, and year fixed effects are presented in Table 7.

As shown in Column (1), the coefficient a_1 continues to be positively significant (value = 0.110) at the 10% level. However, the interaction coefficient a_3 is positive but insignificant. Therefore, while insider trading restrictions increases real activities earnings management, there is no evidence of a substitution effect in the sample of firms that are suspected to have the strongest incentives to manage their earnings.

In contrast, the coefficient a_1 is positively significant (value = 0.044) and the interaction coefficient a_3 is negatively significant (value = -0.026) in Column (2). These findings suggest that the insider trading restrictions plays a reinforcing role on the substitution effect from accruals to real activities earnings management, only in the sub-sample of firms which are *not* suspected to have strong earnings management incentives (ie, *SUSPECT* = 0).

[Insert Table 7]

4.5 The effect of country-level institutional infrastructure

We further test whether the role of insider trading restrictions documented in the previous subsection is influenced by the strength of country-level institutional infrastructure. We use the legal origin dummy variable from La Porta et al. (1998) and La Porta et al. (2006) as a proxy for the country-level institutions. We estimate equations (8) and (9) in civil law countries ($LO = 0$) and common law countries ($LO = 1$) separately to test our third hypothesis.

Columns (1) and (2) of Table 8 present the regression estimates of equation (8), without the interaction term $ITR \times |DA|$. We find that the coefficient of ITR (a_1) is positive but insignificant in both columns. However, we find that the coefficient of $|DA|$ (a_2) is negative and statistically significant (value = -0.038) only in the sample of firms in common-law countries (Column (2)). In other words, managers of firms in countries characterized by stronger institutional infrastructure have more incentives to switch from accruals to real activities earnings management. This finding complements the prevalence of the substitution effect in studies examining the U.S. firms (Cohen and Zarowin, 2008; Zarowin, 2010; Zang, 2012) and one explanation for this result is that the substitution effect serves a potential response by managers to increasing disclosure requirements due to more restrictive regulations (such as SOX in the US) or stronger institutions.

Columns (3) and (4) of Table 8 present the regression estimates of equation (9), with the interaction term $ITR \times |DA|$. While we continue to find that the coefficient a_1 is positive and insignificant, the coefficient on the interaction term (a_3) is found to be negatively significant only for the sample of firms in countries with common law legal origin (value = -0.023). Therefore, we provide additional evidence to suggest that the reinforcing role played by insider trading restrictions on the switching effect is more pronounced for firms in countries characterized by

stronger legal regime and institution, highlighting the differential role played by insider trading restrictions in shaping corporate financial reporting quality.¹⁵

[Intert Table 8]

5. Conclusions

There is an increasing attention by academics in the accounting and finance literature on real activities earnings management. In addition, there is an existing debate on whether insider trading laws are beneficial or detrimental to shareholders values. Since real activities earnings management is more difficult to be detected by auditors, it is important to examine whether insider trading restrictions influence managerial incentives to engage in real activities earnings management. Using an international sample of 28 countries that covers the sample period from 1992 to 2007, we find that real activities earnings management increases with insider trading restrictions. Moreover, we find that accruals and real activities earnings management are negatively and significantly related, which is consistent with the substitution hypothesis. In other words, managers of international firms in our sample are inclined to substitute accruals earnings management for real activities earnings management.

More importantly, we find that insider trading restrictions play a reinforcing role on the substitution. In other words, the result is found to be stronger for firms in countries with more restrictive insider trading regulation, than those in countries with less restrictive regulation. This finding complements those found in prior studies and one potential explanation for the substitution effect is that it serves as a response by managers to an increase in disclosure requirement or firm-specific incentives.

¹⁵ Kusnadi (2015) also find that the role of insider trading restrictions on corporate risk taking is asymmetric for firms located in countries with high vs low institutional infrastructure.

We perform a series of robustness tests and in general, our empirical findings remain unchanged to alternative measures of real activities earnings management and insider trading restrictions, alternative sample period as well as potential endogeneity concern. Additional analysis also reveals that the reinforcing role of insider trading restrictions on the substitution effect is found to be stronger in common law countries, than in civil law countries.

Overall, our results are important in highlighting the role of insider trading restrictions in shaping corporate financial reporting policies. In particular, we find strong evidence to suggest that the extent of restriction of such laws influence managerial incentives to engage in earnings manipulation through real activities. Moreover, such incentives are further influenced by the strength of country-level institutional infrastructure.

Our findings provide policy implications for lawmakers, in terms of outlining the benefits and drawbacks of more restrictive insider trading laws on incentives of corporate managers. This becomes more important especially capital markets around the world become more liberalized and behave more like the established markets (such as the UK and US) and there could lead to increasingly more cases of insider trading activities.

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All remaining errors are ours.

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Appendix A
Variables Definition

Variables	Definitions
<i>Country-level variables</i>	
<i>ITR</i>	Insider trading restriction index, obtained from the Global Competitiveness Report (1996, 1998, 1999).
<i>ITL</i>	Insider trading law index, obtained from Beny (2005).
<i>ENF_YEAR</i>	First-year of enforcement of insider trading law, obtained from Bhattacharya and Daouk (2006).
<i>ENF</i>	A dummy variable that equals 1 if the country has enforced insider trading laws by 1999, and 0 otherwise.
<i>LO</i>	A dummy variable that equals 1 for common law countries, and 0 for civil law countries, obtained from La Porta et al. (1998, 1999).
<i>Firm-specific financial variables</i>	
<i> DA </i>	Absolute value of discretionary accruals, constructed using the modified cross-sectional Jones model (Dechow et al., 1995) that controls for industry and time effects (Defond and Jiambalvo, 1994) as described in equation (6) in the main text. This is a proxy for accruals earnings management.
<i>RM_CFO</i>	Abnormal value of cash flows from operations, obtained from estimation of cross-sectional regression of equation (1) in the main text, multiplied by -1.
<i>RM_PROD</i>	Abnormal value of production cost, obtained from estimation of cross-sectional regression of equation (4) in the main text.
<i>RM_DISCEXP</i>	Abnormal value of production cost, obtained from estimation of cross-sectional regression of equation (5) in the main text, multiplied by -1.
<i>REAL_EM</i>	Composite measure of real activities earnings management, measured as the average value of <i>RM_CFO</i> , <i>RM_PROD</i> and <i>RM_DISCEXP</i>
<i>SIZE</i>	Firm size, defined as the natural logarithm of the market value of equity.
<i>MTB</i>	Market-to-book, defined as the ratio of market value of equity to book value of equity.
<i>ROA</i>	Return on assets, defined as earnings before extraordinary items divided by lagged total assets.
<i>LEV</i>	Ratio of total liabilities to total assets
<i>BIG4</i>	A dummy variable that equals 1 if the firm is audited by a Big 4 audit firm, and 0 otherwise
<i>SUSPECT</i>	A dummy variable that equals 1 for those firms with ROA between 0 and 0.005, and 0 otherwise.

Table 1
Sample Distribution

Panel A: Sample Selection Procedures		
	No. Observations	No. Firms
Firm-year observations from Compustat between 1992 and 2007	219,236	36,297
Less: Observations in countries with no ITR data:	(29,716)	(6,788)
Observations with missing values of earnings management:	(42,566)	(2,454)
Observations with firms in finance industry (SIC between 6000 and 6999):	(2,333)	(338)
Observations with missing control variables for the main tests:	(72,210)	(10,190)
Total usable observations	72,411	16,527

Panel B Sample Distribution by Countries								
Country	Country Code	N	<i>ITR1996</i>	<i>ITR1998</i>	<i>ITR1999</i>	<i>ITL</i>	<i>ENF</i>	<i>LO</i>
Australia	AUS	1,705	5.04	5.27	5.59	3	1996	1
Brazil	BRA	84	3.14	3.8	3.72	2	1978	0
Canada	CAN	986	4.45	5.03	5.55	3	1976	1
Switzerland	CHE	190	4.8	5.3	4.67	3	1995	0
Chile	CHL	123	4.56	4.56	4.16		1996	0
Germany	DEU	2,346	4.35	5.8	5.24	3	1995	0
Finland	FIN	98	4.58	5.26	5.53	3	1993	0
France	FRA	1,813	3.87	4.69	5.17	3	1975	0
UK	GBR	8,176	4.47	5.64	5.85	3	1981	1
Greece	GRC	39	3.46	3.5	3.41	2	1996	0
Hong Kong	HKG	2,307	4.17	4.32	3.94	2	1994	1
Indonesia	IDN	230	2.82	3.33	3.56	2	1996	0
India	IND	1,412	2.49	3.42	3.53	2	1998	1
Israel	ISR	72	4.4	5.58	5.19	2	1989	1
Italy	ITA	26	2.92	3.88	4.38	3	1996	0
Japan	JPN	18,910	4.85	5.05	5.26	2	1990	0
South Korea	KOR	723	3.81	3.73	4.1	3	1988	0
Malaysia	MYS	2,759	3.69	3.65	3.42	2	1996	1
Netherlands	NLD	90	4.63	4.62	5.2	3	1994	0
Norway	NOR	169	4.08	4.67	4.24	1	1990	0
Philippines	PHL	12	2.79	3.32	3.48	3		0
Singapore	SGP	1,037	5.1	5.54	5.58	3	1978	1
Sweden	SWE	403	4.35	5.48	5.58	2	1990	0
Thailand	THA	583	4.24	3.25	3.29	3	1993	1
Turkey	TUR	38	3	4.26	3.58		1996	0
Taiwan	TWN	3,784	3.1	3.42	3.18		1989	0
US	USA	24,162	4.63	5.13	5.64	3	1961	1
South Africa	ZAF	134	3.76	3.87	3.74	2		1
TOTAL		72,411						
Mean			3.98	4.48	4.49	2.52		
Standard Deviation			0.75	0.85	0.91	0.59		

Panel A of the table outlines the process in obtaining the final sample of 72,411 firm-years observations from 1992 to 2007. Panel B presents the sample distribution by countries and the country-level variables.

Table 2
Descriptive statistics of firm-specific financial variables

	N	Mean	Std.Dev.	Q1	Median	Q3
<i>/DA/</i>	72,411	0.085	0.115	0.021	0.049	0.102
<i>REAL_EM</i>	72,411	0.006	0.061	-0.017	0.004	0.031
<i>RM_CFO</i>	72,411	-0.020	0.131	-0.077	-0.012	0.038
<i>RM_PROD</i>	72,411	0.009	0.191	-0.091	0.000	0.102
<i>RM_DISCEXP</i>	72,411	0.026	0.180	-0.039	0.029	0.114
<i>SIZE</i>	72,411	6.792	2.846	4.545	6.657	8.873
<i>MTB</i>	72,411	2.242	2.985	0.806	1.450	2.639
<i>LEV</i>	72,411	0.507	0.243	0.328	0.505	0.663
<i>ROA</i>	72,411	0.003	0.168	-0.012	0.027	0.073
<i>BIG4</i>	72,411	0.525	0.499	0.000	1.000	1.000

This table reports the summary descriptive statistics for all the firm-specific variables. The sample period is from 1992 to 2007. The definitions of these variables are in the Appendix. All continuous variables are winsorized at 1% and 99%.

Table 3
Correlation analysis

	<i>/DA/</i>	<i>REAL_EM</i>	<i>RM_CFO</i>	<i>RM_PROD</i>	<i>RM_DISCEXP</i>	<i>ITR</i>	<i>SIZE</i>	<i>MTB</i>	<i>LEV</i>	<i>ROA</i>	<i>BIG4</i>
<i>/DA/</i>	1.00	0.09***	0.00	0.01	0.07***	0.17***	-0.31***	0.12***	-0.06***	-0.05***	0.17***
<i>REAL_EM</i>	-0.00	1.00	0.10***	0.41***	0.39***	0.15***	-0.06***	0.03***	-0.05***	-0.11***	0.09***
<i>RM_CFO</i>	0.09***	0.14***	1.00	-0.35***	-0.19***	-0.15***	-0.07***	-0.24***	0.19***	-0.39***	-0.15***
<i>RM_PROD</i>	-0.01***	0.44***	-0.34***	1.00	-0.32***	0.06***	0.06***	0.20***	-0.15***	0.16***	0.06***
<i>RM_DISCEXP</i>	-0.07***	0.42***	-0.26***	-0.35***	1.00	0.20***	-0.07***	-0.02***	-0.01***	0.00	0.13***
<i>ITR</i>	0.08***	0.08***	-0.08***	0.05***	0.09***	1.00	-0.34***	0.20***	-0.03***	-0.06***	0.27***
<i>SIZE</i>	-0.26***	-0.03***	-0.09***	0.06***	-0.03***	-0.18***	1.00	0.11***	0.08***	0.21***	-0.29***
<i>MTB</i>	0.10***	-0.01**	-0.12***	0.17***	-0.10***	0.08***	0.08***	1.00	-0.05***	0.32***	0.20***
<i>LEV</i>	-0.02***	-0.04***	0.16***	-0.14***	-0.01**	0.05***	0.03***	-0.01*	1.00	-0.19***	-0.10***
<i>ROA</i>	-0.28***	-0.07***	-0.45***	0.11***	0.17***	-0.14***	0.24***	0.03***	-0.10***	1.00	0.11***
<i>BIG4</i>	0.10***	0.05***	-0.13***	0.05***	0.10***	0.03***	-0.30***	0.12***	-0.08***	0.00	1.00

This table reports the Pearson's correlation (below the diagonal) and Spearman's correlation (above the diagonal) between the firm level financial variables and the country-level *ITR* variable. The sample period is from 1992 to 2007. The definitions of the variables are in the Appendix. All continuous variables are winsorized at 1% and 99%. ***, **, and * indicate statistical significance at the 1%, 5%, and 10%, respectively.

Table 4

The impact of insider trading restrictions on real activities earnings management

	(1)	(2)	(3)	(4)
	<i>REAL_EM</i>	<i>RM_CFO</i>	<i>RM_PROD</i>	<i>RM_DISCEXP</i>
<i>ITR</i>	0.043^{***} (0.013)	-0.001 (0.011)	0.102^{***} (0.031)	0.030^{**} (0.015)
<i>SIZE</i>	-0.000 (0.000)	-0.005 ^{***} (0.000)	0.002 ^{***} (0.000)	0.003 ^{***} (0.000)
<i>MTB</i>	-0.001 ^{***} (0.000)	-0.001 ^{***} (0.000)	0.009 ^{***} (0.000)	-0.011 ^{***} (0.000)
<i>LEV</i>	-0.005 ^{***} (0.001)	0.031 ^{***} (0.002)	-0.089 ^{***} (0.003)	0.042 ^{***} (0.003)
<i>ROA</i>	-0.011 ^{***} (0.003)	-0.396 ^{***} (0.005)	0.148 ^{***} (0.006)	0.250 ^{***} (0.008)
<i>BIG4</i>	0.003 ^{***} (0.001)	-0.006 ^{***} (0.001)	0.013 ^{***} (0.002)	0.004 ^{**} (0.002)
<i>Constant</i>	-0.173 ^{***} (0.050)	0.037 (0.044)	-0.401 ^{***} (0.120)	-0.160 ^{***} (0.058)
Observations	72,411	72,411	72,411	72,411
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
<i>Adj R</i> ²	0.067	0.336	0.102	0.120

This table presents the cross-sectional differences in the regression results of real activities earnings management (*REAL_EM*, *RM_CFO*, *RM_PROD*, *RM_DISCEXP*) on insider trading restrictions (*ITR*) and other firm-specific control variables. The sample period is from 1992 to 2007. The definitions of the variables are described in Appendix A. The standard error for each coefficient is reported in parentheses and is based on the White's heteroskedasticity corrected standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10%, respectively.

Table 5

The impact of insider trading restrictions on shift of earnings management

Panel A: Without the interaction term				
	(1)	(2)	(3)	(4)
	<i>REAL_EM</i>	<i>RM_CFO</i>	<i>RM_PROD</i>	<i>RM_DISCEXP</i>
<i>ITR</i>	0.044 ^{***}	-0.001	0.103 ^{***}	0.033 ^{**}
	(0.013)	(0.011)	(0.031)	(0.015)
<i> DA </i>	-0.027 ^{***}	0.017 ^{**}	-0.016 [*]	-0.085 ^{***}
	(0.004)	(0.008)	(0.008)	(0.010)
<i>SIZE</i>	-0.000	-0.005 ^{***}	0.002 ^{**}	0.003 ^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
<i>MTB</i>	-0.001 ^{***}	-0.001 ^{***}	0.009 ^{***}	-0.011 ^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
<i>LEV</i>	-0.005 ^{***}	0.031 ^{***}	-0.089 ^{***}	0.042 ^{***}
	(0.001)	(0.002)	(0.003)	(0.003)
<i>ROA</i>	-0.015 ^{***}	-0.396 ^{***}	0.148 ^{***}	0.250 ^{***}
	(0.003)	(0.005)	(0.006)	(0.008)
<i>BIG4</i>	0.003 ^{***}	-0.006 ^{***}	0.013 ^{***}	0.004 ^{**}
	(0.001)	(0.001)	(0.002)	(0.002)
<i>Constant</i>	-0.175 ^{***}	0.037	-0.401 ^{***}	-0.160 ^{***}
	(0.050)	(0.044)	(0.120)	(0.058)
Observations	72,411	72,411	72,411	72,411
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
<i>Adj R</i> ²	0.069	0.336	0.102	0.120

Panel B: With Interaction Term				
	(1)	(2)	(3)	(4)
	<i>REAL_EM</i>	<i>RM_CFO</i>	<i>RM_PROD</i>	<i>RM_DISCEXP</i>
<i>ITR</i>	0.046 ^{***} (0.013)	0.003 (0.011)	0.100 ^{***} (0.031)	0.037 ^{**} (0.015)
<i>/DA/</i>	0.110 ^{***} (0.026)	0.247 ^{***} (0.063)	-0.153 ^{***} (0.054)	0.173 ^{***} (0.046)
<i>ITR</i> × <i>/DA/</i>	-0.026 ^{***} (0.005)	-0.043 ^{***} (0.012)	0.026 ^{**} (0.010)	-0.049 ^{***} (0.009)
<i>SIZE</i>	-0.000 (0.000)	-0.005 ^{***} (0.000)	0.002 ^{***} (0.000)	0.003 ^{***} (0.000)
<i>MTB</i>	-0.001 ^{***} (0.000)	-0.001 ^{***} (0.000)	0.009 ^{***} (0.000)	-0.010 ^{***} (0.000)
<i>Leverage</i>	-0.005 ^{***} (0.001)	0.031 ^{***} (0.002)	-0.089 ^{***} (0.003)	0.041 ^{***} (0.003)
<i>ROA</i>	-0.016 ^{***} (0.003)	-0.394 ^{***} (0.005)	0.147 ^{***} (0.006)	0.236 ^{***} (0.008)
<i>Big4</i>	0.003 ^{***} (0.001)	-0.006 ^{***} (0.001)	0.013 ^{***} (0.002)	0.003 (0.002)
<i>Constant</i>	-0.186 ^{***} (0.050)	0.018 (0.044)	-0.390 ^{***} (0.120)	-0.187 ^{***} (0.058)
Observations	72,411	72,411	72,411	72,411
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
<i>Adj R</i> ²	0.071	0.337	0.103	0.123

This table presents the cross-sectional differences in the regression results of real activities earnings management (*REAL_EM*, *RM_CFO*, *RM_PROD*, *RM_DISCEXP*) on insider trading restrictions (*ITR*), accruals earnings management (*/DA/*) and other firm-specific control variables. The sample period is from 1992 to 2007. The definitions of the variables are described in Appendix A. The standard error for each coefficient is reported in parentheses and is based on the White's heteroskedasticity corrected standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10%, respectively.

Table 6
Robustness Tests

Panel A: Cross-sectional regression model				
	(1)	(2)	(3)	(4)
	<i>REAL_EM</i>	<i>RM_CFO</i>	<i>RM_PROD</i>	<i>RM_DISCEXP</i>
<i>ITR</i>	0.007*** (0.001)	-0.017* (0.009)	0.007** (0.003)	0.031*** (0.008)
<i> DA </i>	0.191*** (0.044)	0.374** (0.154)	-0.235** (0.093)	0.323*** (0.087)
<i>ITR</i> × <i> DA </i>	-0.044*** (0.008)	-0.069*** (0.024)	0.036** (0.018)	-0.082*** (0.014)
<i>SIZE</i>	-0.000 (0.000)	-0.002*** (0.001)	0.003*** (0.001)	-0.001* (0.001)
<i>MTB</i>	-0.001** (0.000)	-0.001** (0.001)	0.010*** (0.002)	-0.012*** (0.002)
<i>LEV</i>	-0.004 (0.003)	0.033*** (0.007)	-0.092*** (0.010)	0.045*** (0.015)
<i>ROA</i>	-0.018* (0.011)	-0.402*** (0.021)	0.119*** (0.033)	0.275*** (0.036)
<i>BIG4</i>	0.007*** (0.002)	-0.026*** (0.009)	0.014 (0.009)	0.031*** (0.006)
<i>Constant</i>	-0.026*** (0.006)	0.077 (0.051)	-0.018 (0.020)	-0.131*** (0.035)
Observations	16,527	16,527	16,527	16,527
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	No	No	No	No
<i>Adj R</i> ²	0.040	0.362	0.089	0.130

Panel B: Alternative measures of insider trading restrictions, alternative sample periods, and alternative sample countries

	(1) <i>CH_ITR</i>	(2) <i>ITL</i>	(3) <i>ENF</i>	(4) <i>Exclude Financial Crisis Years</i>	(5) <i>Exclude US, UK, and Japan</i>
<i>ITR</i>				0.049*** (0.013)	0.042 (0.037)
<i>CH_ITR</i>	0.047*** (0.014)				
<i>ITL</i>		0.016*** (0.001)			
<i>ENF</i>			0.012* (0.007)		
<i> DA </i>	0.115*** (0.026)	0.147*** (0.024)	-0.002 (0.054)	0.113*** (0.026)	0.082** (0.032)
<i>ITR× DA </i>				-0.026*** (0.005)	-0.017** (0.007)
<i>CH_ITR× DA </i>	-0.027*** (0.005)				
<i>ITL× DA </i>		-0.063*** (0.009)			
<i>ENF× DA </i>			-0.025 (0.054)		
<i>SIZE</i>	-0.000 (0.000)	0.001*** (0.000)	-0.000*** (0.000)	0.000 (0.000)	-0.001** (0.000)
<i>MTB</i>	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001** (0.000)
<i>LEV</i>	-0.004*** (0.001)	-0.003** (0.001)	-0.003*** (0.001)	-0.006*** (0.001)	-0.008*** (0.002)
<i>ROA</i>	-0.015*** (0.003)	-0.021*** (0.002)	-0.019*** (0.002)	-0.018*** (0.003)	-0.006 (0.005)
<i>BIG4</i>	0.003*** (0.001)	0.003*** (0.001)	0.007*** (0.001)	0.002*** (0.001)	-0.003** (0.001)
<i>Constant</i>	-0.232*** (0.069)	-0.075*** (0.008)	-0.037*** (0.010)	-0.196*** (0.050)	-0.119 (0.128)
Observations	70,432	68,466	72,411	67,137	21,163
Country FE	Yes	No	No	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
<i>Adj R²</i>	0.067	0.050	0.042	0.067	0.015

Panel A of this table presents the regression results based on the mean values for all variables on each firm. Panel B of this table presents the cross-sectional differences in the regression results of real activities earnings management on alternative measures of insider trading restrictions real activities earnings management on insider trading restrictions (*ITR*), accruals earnings management (*DA*) and other firm-specific control variables. and other firm-specific control variables. The dependent variable is the measure of real activities earnings management (*REAL_EM*). Columns (1) to (3) use *CH_ITR* (the change in the *ITR* index), *ITL* (the insider trading law index), and *ENF* (is a dummy variable that equals one for years after first-time enforcement of insider trading laws, and zero otherwise) as the measure of insider trading restrictions. Columns (4) and (5) exclude the financial crisis years (1998, 1999, 2000) and observations from the three biggest countries (US, UK, and Japan), respectively. The sample period is from 1992 to 2007 for Columns (2) and (3). The definitions of the variables are described in Appendix A. The standard error for each coefficient is reported in parentheses and is based on the White's heteroskedasticity corrected standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10%, respectively.

Table 7
Suspect firm-years analysis

	(1) <i>SUSPECT = 1</i>	(2) <i>SUSPECT = 0</i>
<i>ITR</i>	0.110* (0.059)	0.044*** (0.013)
<i> DA </i>	-0.126 (0.151)	0.112*** (0.026)
<i>ITR</i> × <i> DA </i>	0.034 (0.029)	-0.026*** (0.005)
<i>SIZE</i>	0.001 (0.001)	-0.000 (0.000)
<i>MTB</i>	-0.001 (0.000)	-0.001*** (0.000)
<i>LEV</i>	0.001 (0.004)	-0.006*** (0.001)
<i>ROA</i>	-0.314 (0.584)	-0.016*** (0.003)
<i>BIG4</i>	0.003 (0.004)	0.003*** (0.001)
<i>Constant</i>	-0.423* (0.224)	-0.177*** (0.051)
Observations	2,685	69,726
Country FE	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
<i>Adj R</i> ²	0.079	0.071

This table presents the effect of institutional variable on the regression results of real activities earnings management on insider trading restrictions, accruals earnings management (*|DA|*) and other firm-specific control variables. The dependent variable is the measure of real activities earnings management (*REAL_EM*). Column (1) presents the results for sample of firms with strong incentives to manage their earnings (*SUSPECT = 1*). Column (2) presents the results for sample of firms with strong incentives to manage their earnings (*SUSPECT = 0*). The sample period is from 1992 to 2007. The definitions of the variables are described in Appendix A. The standard error for each coefficient is reported in parentheses and is based on the White's heteroskedasticity corrected standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10%, respectively.

Table 8
Effect of Country-Level Institutional Variable

	(1) <i>Civil Law Countries</i>	(2) <i>Common Law Countries</i>	(3) <i>Civil Law Countries</i>	(4) <i>Common Law Countries</i>
<i>ITR</i>	0.041 (0.038)	0.006 (0.006)	0.041 (0.038)	0.008 (0.006)
<i> DA </i>	0.025*** (0.009)	-0.038*** (0.004)	0.056 (0.056)	0.088*** (0.031)
<i>ITR</i> × <i> DA </i>			-0.006 (0.011)	-0.023*** (0.006)
<i>SIZE</i>	-0.001*** (0.000)	0.000 (0.000)	-0.001*** (0.000)	0.000 (0.000)
<i>MTB</i>	-0.000* (0.000)	-0.001*** (0.000)	-0.000* (0.000)	-0.001*** (0.000)
<i>LEV</i>	-0.004** (0.002)	-0.006*** (0.001)	-0.004** (0.002)	-0.007*** (0.001)
<i>ROA</i>	-0.015** (0.006)	-0.014*** (0.003)	-0.016** (0.006)	-0.014*** (0.003)
<i>BIG4</i>	-0.007*** (0.002)	0.005*** (0.001)	-0.007*** (0.002)	0.005*** (0.001)
<i>Constant</i>	-0.141 (0.154)	-0.032 (0.031)	-0.143 (0.154)	-0.040 (0.031)
Observations	29,078	43,333	29,078	43,333
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
<i>Adj R</i> ²	0.012	0.095	0.012	0.096

This table presents the cross-sectional differences in the effect of institutional variable on the regression results of real activities earnings management on insider trading restrictions, accruals earnings management (*|DA|*) and other firm-specific control variables. The dependent variable is the measure of real activities earnings management (*REAL_EM*). Columns (1) and (3) present the results for civil law countries (*LO* = 0). Columns (2) and (4) present the results for common law countries (*LO* = 1). The sample period is from 1992 to 2007. The definitions of the variables are described in Appendix A. The standard error for each coefficient is reported in parentheses and is based on the White's heteroskedasticity corrected standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10%, respectively.