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Cross-Country Evidence on Earnings Quality and Corporate Tax Avoidance: The Moderating Role of Legal Institutions

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Abstract

The purpose of this study is to investigate the relationship between earnings quality and corporate tax avoidance, while accounting for the strength of the legal institutional environment. We find robust evidence that high earnings quality mitigates corporate tax avoidance practices. Furthermore, we find that this association is particularly stronger when country-level legal institutions are powerful. Thus, this study should provide useful insights to academics, professionals as well as policy makers by emphasizing the vital role that accounting information quality could play in the fight against tax avoidance and the important support that legal institutions could provide in this regard.

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1 Introduction

Tax avoidance is attracting an increasing academic and media attention. Indeed, corporate taxes represent a critical managerial decision because they may result in enormous losses in country budget resources. In this regard, different governments have taken important strides in the fight against aggressive tax practices. Despite few previous studies that have attempted to explain the wide variation in tax avoidance between firms and across countries, our understanding of corporate tax avoidance remains largely unexplained and open to debate (Hanlon and Heitzman, 2010; Menkhoff and Miethe, 2019).

Following Dyreng et al. (2008), we consider corporate tax avoidance as any activity that decreases the firm's pre-tax earnings. In other words, it can include tax reductions, which fall in a gray area depending on law compliance activities. Traditionally, corporate tax avoidance has been viewed as a value-maximizing activity because firms that avoid taxes generate a higher amount of cash (called tax savings), which can be reinvested or distributed to shareholders (Desai and Dharmapala 2006, 2009). Under this traditional perspective, corporate tax avoidance is more likely to benefit firms by requiring a transfer of wealth from the government to shareholders.

The agency view of tax avoidance assumes that corporate tax avoidance involves obfuscation and complexity to avoid its detection by tax authorities. Those features can create a shield for managerial opportunism and can allow companies to extract rents from outside investors (Chen et al. 2010). In this perspective, Kim et al. (2011) posit that corporate tax avoidance helps concealing bad news for an extended period by creating tools and explanations for these managerial opportunistic behaviors. More recently, Chan et al. (2016) find that tax avoidance can generate cash resources for managers. In addition, some research documents that the effect of corporate tax avoidance on firm value depends on the effectiveness of monitoring mechanisms (Desai and Dharmapala 2009; Chen et al. 2010; Lanis and Richardson, 2011; Kim et al. 2011; Brown et al., 2014). Henceforth, better information quality ensures the alignment of interests and limits entrenchment or opportunistic behaviors. Combining these arguments, we expect high earnings quality to reduce corporate tax avoidance practices, particularly in an enhanced legal institutional environment.

Using a large sample of firms across 39 countries from 2010 to 2016, we examine the relationship between earnings quality (measured by accruals quality and earnings precision) and corporate tax avoidance. We find a negative association between accounting information quality and corporate tax avoidance activities. Our finding is consistent with the agency perspective on tax avoidance, which argues that a better informational environment mitigates corporate tax avoidance levels. Our results are robust when we control for the moderating role of country-level legal institutions. We find that this association is particularly stronger when country-level legal institutions are powerful.

Our study advances the literature through different important contributions. First, we complement and extend previous research on the drivers of corporate tax avoidance. This stream of research generally puts the emphasis on corporate governance or issues related to firm-specific characteristics other than earnings quality. Our paper offers a robust international evidence on whether earnings quality mitigates corporate tax avoidance using a large sample of firms across 39 countries around the world. Our findings document that earnings quality reduces corporate tax avoidance. Second, and more importantly, the existing research primarily focuses on developed economies, especially the U.S. context. In contrast,

our study uses a large sample of firms in both developed and emerging economies because we believe that corporate tax avoidance remains an important problem worldwide and has a widespread impact. This approach offers a better understanding of the determinants of corporate tax avoidance within firms and across countries. Third, country-level legal institutions is likely to play an important monitoring role for tax practices (Atwood et al. 2012; Kanagaretnam et al. 2016; Zhong et al., 2017). We measure country-level legal institutions by several proxies, such as the nature of the legal system, law enforcement, anti-self-dealing and anti-director rights indexes. Our study shows that the relationship between earnings quality and corporate tax avoidance is particularly stronger in countries with powerful legal institutions. Hence, policymakers may find our results particularly useful to improve earnings quality requirements and to strengthen legal institutions to fight against tax avoidance.

The rest of the article proceeds as follows: Section 2 describes the methodology used in this study. Section 3 reports the empirical results. Section 4 concludes the paper.

2 Methodology

2.1 Data

We select our sample from all firm-year observations in the Compustat North America and Global Compustat databases for the period from 2010 to 2016. Additionally, we obtain Big Four data from the Worldscope database and merge these two data files. Following prior studies (Atwood et al. 2012; Kanagaretnam et al. 2016; Atwood and Lewellen 2019), we remove firms for which pre-tax incomes and/or taxes payable were not available. In addition, we exclude observations with negative pre-tax incomes and zero total assets. Finally, we exclude countries with fewer than 20 firm-year observations. We use two distinct samples corresponding to two proxies of earnings quality. The first sample consists of 76,219 firm-year observations depending on the availability of data to compute accruals quality. The second sample consists of 70,848 firm-year observations, depending on the availability of data to compute earnings precision.

2.2 Regression model

To test our predictions on the role of earnings quality in corporate tax avoidance, we estimate the following model:

$$Tax\_Avoid_{i,t} = \beta_0 + \beta_1(Earnings\_Quality)_{i,t} + \beta_n\, Control\ variables_{i,t} + \alpha\, Year + \gamma\, Industry + \delta\, Country + \varepsilon_{i,t} \quad (1)$$

where the variables are defined as follows (see Appendix A for all variable definitions):

2.2.1 Dependent variable

Our measure of tax avoidance is based on Atwood et al. (2012) and Atwood and Lewellen (2019). We consider *Tax_Avoid* as the firm's pre-tax income (PTEBX) multiplied by the base country statutory tax rate (τ)[1] less the firm's actual tax expense, scaled by total assets. Because we generate our sample from different countries, the analyzed firms are confronted with a variety of home statutory tax rates. As noted below, current tax paid (CTP) must be compared with "unmanaged taxes" based on the country's statutory tax rate.

[1] We collect the statutory tax rate from KMPG and OECD reports available on their websites.

$$Tax\_Avoid_{i,t} = \frac{\sum_{t-2}^{t}(PTEBX \times \tau)_{it} - \sum_{t-2}^{t} CTP}{\sum_{t-2}^{t} Total\ assets} \quad (2)$$

Following Dyreng et al. (2008), we also construct a long-term tax avoidance measure specific to international studies (*LT_Tax_Avoid*). As it is based on a long-run period, this may include a wide range of tax avoidance activities. For example, Dyreng et al. (2008)[2] suggested that a one-year window is extremely variable and not an appropriate measure since the amount of tax paid will include refund taxes (to the tax authority) from settling tax disputes that occurred a few years earlier. In addition, Minnick and Noga (2010) argued that a short window is not as appropriate as a 5-year or 10-year window. Thus, we measure long-term *Tax_Avoid* as all pre-tax income over the 10 years multiplied by the home statutory tax rate per year and adjusted by the sum of current tax paid for each year over the same 10-year period.

2.2.2 Independent variables

Following previous research examining accounting information quality in international settings, we employ two widely used proxies of earnings quality, namely accruals quality and earnings precision (Dichev and Tang, 2009; Dechow et al., 2010). In this regard, Verrecchia (2001) argues that disclosure theories assume that investor uncertainty[3] is greater when the information is less precise (i.e. more volatile).

The first proxy for earnings quality is *Accruals_Quality*. A higher value of *Accruals_Quality* refers to better information quality. Firstly, we regress the model of Dechow et al. (2010) and estimate the residuals[4]. Then, we calculate the standard deviation of the residuals from e_{t-4} to e_t across the five years. In addition, we multiply the standard deviation by -1. A higher standard deviation indicates greater accruals quality and in turn higher information quality.

The second proxy is *Earnings_Precision,* which captures the volatility on reported earnings. Following Dichev and Tang (2009), we calculate earnings volatility as the standard deviation of earnings before extraordinary items scaled by average total assets over the most recent five years and multiplied by -1. Thus, a high value of *Earnings_Precision* reflects a higher level of information quality.

2.2.3 Control variables

Motivated by prior research on corporate tax avoidance (Chen et al. 2010; Brown et al., 2014), we include both firm and country-level variables including pre-tax ROA, corporate leverage, firm size, Big Four auditors, tangibility, losses, multinational activity indicator, and home statutory tax rates. We also include year, industry, and country fixed effects in all models. The country fixed effect approach is considered as a common approach in cross-country studies for controlling country-specific effects and addressing potential issues linked to country-level variables (Doidge et al. 2007)[5].

3 Results

3.1 Summary statistics

In Table 1, we report descriptive statistics for the full sample. The level of tax avoidance represents an average (median) of 2.80% (2.04%), which is comparable to the findings of

[2] Dyreng et al. (2008) build a long-term corporate tax avoidance model (5 and 10 years) for American firms. They conclude that a large window for tax avoidance is more appropriate than a small window (such as 1 year).
[3] Investor uncertainty relates to information asymmetry and/or future firm performance.
[4] See Appendix A for more details.
[5] We winsorized all continuous variables at the 1% and 99% levels in order to avoid outliers.

Atwood and Lewellen (2019) for a non-tax haven sub-sample. The average of *Earnings_Quality* estimated by *Accruals_Quality* is -7.2%, while the average of *Earnings_Precision* is -4.6%. We also notice that our sampled firms have, on average, a pre-tax return on assets of 22.4% and long-term debt ratio of 12.0%. The average for home-country statutory tax rate is closer to 31.4%. These findings are consistent with those of Chen et al. (2010), who state that the government generally takes more than one-third share of a firm's pre-tax profits.

Table 2 reports the Pearson correlation matrix for our variables. As predicted, the two proxies of earnings quality are significantly and negatively correlated with the tax avoidance measure (*Tax_Avoid*). In addition, *Accruals_Quality* is positively and significantly correlated with *Earnings_Precision*. As the correlation coefficients are relatively small, we can reasonably assume that the variables do not suffer from multicollinearity issues. We also compute the Variation Inflation Factor (VIF) [6] values that do not exceed 1.26.

3.2 Regression analyses

Table 3 displays the estimation results of Eq. (1) using ordinary least squares regression with robust standard errors clustered at the firm level to control for unobserved firm heterogeneity. Our dependent variable (*Tax_Avoid*) refers to the level of corporate tax avoidance based on Atwood et al. (2012). The regressions include year, industry, and country fixed effects. In Column 1, we find that there is a significant and negative association between earnings quality and corporate tax avoidance. This suggests that transparent environments lead managers to less engage in riskier corporate tax avoidance. This finding suggests that, in case of low information asymmetry, conflicts of interests are reduced, leading to less opportunistic managerial behavior through tax reduction activities. Additionally, in Column 2, we run a regression of earnings quality on corporate tax avoidance by using earnings precision as an alternative measure of earnings quality. As shown in Table 3, the estimated coefficient for tax avoidance is significantly negative. This result confirms that a lower degree of information uncertainty leads to lower levels of corporate tax avoidance.

As for control variables, firms with higher returns on assets have greater incentive to engage in corporate tax avoidance. In addition, firm size, multinational activity, and losses are negatively and significantly associated with tax avoidance. Similar to Kanagaretnam et al. (2016), we find that audit quality (as measured by the Big Four) is negatively associated with the likelihood of corporate tax avoidance. Moreover, we note that home statutory tax rate is positively linked to corporate tax avoidance. This result is consistent with that of Atwood et al. (2012). This finding is coherent because generally when the statutory tax rate is higher, firms are more likely to engage in corporate tax avoidance to reduce the amount of tax liabilities.

To deepen our understanding of the impact of earnings quality on the level of corporate tax avoidance, we consider the role of legal institutions in this relationship. Table 4 reports the results of this analysis. The impact of earnings quality may not be similar across various institutional contexts. In the rest of the analyses, we investigate the extent to which the level of legal institutions shapes this relationship. Previous research shows that corporate tax avoidance is lower in countries with strong legal institutional environments (Atwood et al. 2012; Kanagaretnam et al. 2016; Atwood and Lewellen 2019). Following El Ghoul et al. (2016) and Breuer et al. (2018), we re-estimate our main regression model Eq. (1) using two

[6] We test the VIF for each regression used in our study and find that none of the VIFs is over 1.26.

subsamples of high and low levels of legal institutions. More precisely, we divide our sample into two subsamples depending on the level of the legal institutions[7].

We use four sets of country-level legal institutions. First, we rely on the revisited anti-director rights index, which was introduced by Porta et al. (1998). It is widely used as an investor protection proxy and reflects the protection of minority shareholders in the corporate decision-making process, including the right to vote. Second, we control for legal enforcement, which is considered as a prominent proxy for the level of investor protection. It is measured by the mean score across three legal variables defined by Laporta et al. (1998), i.e. the efficiency of the judicial system, the assessment of the rule of law, and the corruption index. Third, we use the anti-self-dealing index, which is a revisited value replicated by Djankov et al. (2008) that refers to the average of ex-ante and ex-post private control of self-dealing, ranging from 0 to 5. Finally, we control for the nature of the legal system using a dummy variable that equals one if the country is a common law country and zero otherwise.

Table 4 shows that the negative relationship between earnings quality and corporate tax avoidance is more pronounced in countries where legal institutions are stronger. Specifically, we find in lower legal institutional environments, estimated by the anti-self-dealing and the anti-director rights (ADRI) indexes, that there is no significant relationship between the quality of earnings and corporate tax avoidance. Additionally, we find that the negative relationship between earnings quality and tax avoidance is more pronounced in common law countries. This result may be explained by the fact that common law countries have stronger legal institutional environments. Hence, when the country-level legal institutions are higher, the results turn negative and statistically significant. Following Breuer et al. (2018), we add a chow test for the difference in coefficients of Earnings Quality variable in countries with high versus low level of investor protection. The differences in coefficients between both sub-samples (low and high) are all statistically significant at the 1% level providing further robustness of our results. These findings suggest that the country's legal institutional environment plays a prominent role in avoiding account manipulations and in supporting the earnings quality effect on corporate tax avoidance.

3.3 Sensitivity analyses

We conduct additional sensitivity tests to assess the robustness of our findings. We remove Japanese and American firms from the sample to reduce concerns that our results may be driven by the predominance of those countries. We also use an alternative measure of tax avoidance (*LT_Tax_Avoid*). Dyreng et al. (2008), suggest that corporate tax avoidance is a dynamic activity and recommend using a ten-year measure. We calculate the sum of the firm's pre-tax income before extraordinary items over ten years rather than three years. The results, not reported here, are qualitatively similar to our main results.

4 Conclusion

This study examines the effect of earnings quality on corporate tax avoidance around the world, considering the moderating role of legal institutions. Using a large sample of firms from 39 countries for the period from 2010 to 2016, our empirical findings suggest that greater earnings quality reduces corporate tax avoidance. This finding is consistent with the agency theory perspective.

[7] Low level of legal institutions refers to firm observations located in countries that have a value for legal institutions in the bottom quartile of the whole sample and high level of legal institutions refers to firm observations in countries that have a value for legal institutions in the top quartile of the full sample.

Furthermore, we build on the existing literature and test whether the strength of the legal institutional environment affects the relationship between earnings quality and corporate tax avoidance. Our results show that the association between earnings quality and corporate tax avoidance is stronger in countries with higher levels of legal institutions. Therefore, this study should provide useful insights to academics, professionals as well as policy makers by emphasizing the vital role that accounting information quality could play in the fight against tax avoidance and the important support that legal institutions could provide in this regard.

This study has practical implications since policy makers may help improving financial reporting quality to constrain the engagement in corporate tax avoidance activities. Lastly, as country-level institution is a complement for firm-level informational environment to decrease tax avoidance practices, governments may also invest and develop new rule enforcement to strengthen country's institutional infrastructure.

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Table 1: Descriptive statistics (full sample)

Variables	Mean	Std. Dev.	Min	25	Median	75	Max
Tax_Avoid	0.028	0.044	-0.078	0.001	0.0204	0.048	0.220
LT_TaxAvoid	0.167	0.222	-0.979	0.040	0.158	0.338	0.993
Accruals_Quality	-0.072	0.096	-1.412	-0.081	-0.044	-0.025	-0.004
Earnings_Precision	-0.046	0.076	-1.351	-0.049	-0.026	-0.014	-0.002
Pretax_ROA	0.224	0.185	0.004	0.097	0.178	0.295	1.128
LEV	0.120	0.145	0.000	0.002	0.071	0.189	1.069
SIZE	9.130	3.018	-0.749	6.891	9.300	11.258	16.167
TANG	0.279	0.214	0.000	0.101	0.239	0.408	0.957
Tax_Rate	0.314	0.702	0.165	0.25	0.3333	0.3801	0.4069
FREQUENCY	**0**			**1**			
BIG4	0.562			0.437			
LOSS	0.981			0.018			
MULTI	0.109			0.890			

Table 1 presents descriptive statistics for our full sample of firms from 39 countries for the period from 2010 to 2016. Variable definitions are provided in Appendix A.

Table 2: Pearson correlation matrix

Variables	Tax_Avoid	Accruals_Quality	Earnings_Precision	Pretax_ROA	LEV	SIZE	BIG4	TANG	LOSS	MULTI
Tax_Avoid	1									
Accruals_Quality	-0.0335*	1								
Earnings_Precision	-0.1918*	0.3623*	1							
Pretax_ROA	0.3561*	-0.0819*	-0.2481*	1						
LEV	-0.0900*	0.1067*	0.0473*	-0.1654*	1					
SIZE	0.1017*	0.2221*	0.1799*	-0.0391*	0.1650*	1				
BIG4	0.0537*	0.1113*	0.0925*	-0.0365*	-0.0684*	0.0795*	1			
TANG	-0.0441*	0.1661*	0.0828*	-0.0960*	0.2693*	0.1856*	-0.0177*	1		
LOSS	-0.0729*	-0.0070*	-0.0069	-0.0894*	0.0343*	-0.0040	-0.0044	0.0070*	1	
MULTI	-0.0711*	-0.0283*	0.0808*	-0.0916*	-0.1709*	-0.0979*	0.3076*	-0.0017	0.0042	1
Tax_Rate	0.3304*	0.0746*	0.0429*	-0.0488*	0.0690*	0.1911*	-0.1497*	-0.0199*	-0.0126*	-0.3176*

Table 3. Relation between earnings quality and corporate tax avoidance

Variables	Predicted sign	(1) Earnings_Quality = Accruals_Quality		(2) Earnings_Quality = Earnings_Precision	
		Coef.	t-value	Coef.	t-value
Earnings_Quality	-	-0.017***	(-6.97)	-0.034***	(-9.59)
Pretax_ROA		0.135***	(50.78)	0.130***	(46.48)
LEV		0.003*	(1.67)	0.003	(1.56)
SIZE	+	-0.001***	(-7.39)	-0.001***	(-6.27)
BIG4	-	-0.002***	(-4.22)	-0.002***	(-4.10)
TANG		0.000	(0.60)	-0.000	(-0.48)
LOSS		-0.006***	(-10.53)	-0.007***	(-10.62)
MULTI		-0.001**	(-2.07)	0.001	(-1.51)
Tax_Rate	+	0.000***	(11.09)	0.000***	(10.65)
Constant		-0.001	(-0.1)	-0.005	(-0.59)
Observations		76,219		70,848	
R-Squared		46.27%		46.39%	
Year Fixed Effects		YES		YES	
Industry Fixed Effects		YES		YES	
Country Fixed Effects		YES		YES	

Table 3 reports the panel regression results of the association between information quality (estimated by accruals quality and earnings precision) and corporate tax avoidance. Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All of the regressions report heteroscedasticity-consistent standard errors clustered at the firm level. Appendix A provides all variable definitions.

Table 4: Earnings Quality, corporate tax avoidance: The role of legal institutional environments

	Anti-Director Rights Index		Legal Enforcement		Anti- Self-Dealing		Legal System	
	Low	High	Low	High	Low	High	Civil	Common
	1	2	3	4	5	6	7	8
Earnings_Quality	-0.030	-0.065***	-0.007**	-0.034***	0.001	-0.028***	-0.009*	-0.000***
	(-0.94)	(-2.85)	(-2.04)	(-6.11)	(0.17)	(-7.23)	(-1.82)	(-6.83)
Pretax_ROA	0.374***	0.282***	0.104***	0.127***	0.194***	0.110***	0.168***	0.113***
	(18.60)	(16.36)	(19.59)	(31.16)	(43.43)	(29.24)	(32.23)	(37.63)
LEV	0.036*	0.018	0.009**	0.004	-0.011***	0.002	-0.017***	0.008***
	(1.91)	(0.85)	(2.49)	(1.20)	(-3.15)	(0.97)	(-5.25)	(3.48)
SIZE	-0.009***	-0.005***	0.000**	-0.001***	0.002***	-0.001***	0.002***	-0.001***
	(-5.50)	(-3.51)	(2.12)	(-6.19)	(14.67)	(-7.41)	(10.64)	(-9.11)
BIG4	-0.013	-0.015**	0.004***	-0.004***	0.001**	-0.005***	0.002***	-0.005***
	(-1.63)	(-2.24)	(3.21)	(-3.51)	(2.31)	(-6.78)	(3.87)	(-6.61)
TANG	-0.172	0.048***	-0.002	-0.000	-0.002	0.003	-0.001	0.001
	(-0.70)	(2.94)	(-1.06)	(-0.01)	(-0.85)	(1.40)	(-0.49)	(0.84)
LOSS	-0.161***	-0.123***	-0.005***	-0.009***	-0.004***	-0.007***	-0.005***	-0.007***
	(-7.30)	(-6.13)	(-4.28)	(-5.05)	(-7.17)	(-6.13)	(-7.38)	(-6.25)
MULTI	-0.014	-0.006	-0.004	-0.001*	0.004*	-0.002**	0.004**	-0.004**
	(-1.57)	(-0.27)	(-1.44)	(-1.94)	(1.68)	(-2.88)	(2.42)	(-4.85)
Tax_Rate	0.003	0.003***	0.000***	0.002***	0.001***	0.001***	0.002***	0.001***
	(1.47)	(3.36)	(4.01)	(18.23)	(30.21)	(24.81)	(36.32)	(24.01)
Intercept	-0.033	-0.039	-0.003	-0.035***	-0.081***	0.046***	-0.093	-0.025***
	(-0.3)	(-0.70)	(-0.36)	(-3.89)	(-11.49)	(-6.66)	(-12.14)	(-5.58)
Observations	23,725	21,565	19,897	20,139	33,584	31,731	37,187	39,032
R-Squared	20.16%	17.66%	23.16%	43.60%	46.63%	40.02%	46.86%	35.68%
Test of the difference between Earnings_Quality coefficients	Chi2 = 37.41*** P-value = 0.000		Chi2 = 27.47*** P-value = 0.000		Chi2 = 717.20*** P-value = 0.000		Chi2 = 852.89*** P-value = 0.000	

Table 4 reports the estimation regression results of corporate tax avoidance on the information quality (estimated by accruals quality) and control variables for subsamples below 25 quintile (Low), and above 75 quintile (High) of legal institutional variables. Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. All the regressions report heteroscedasticity-consistent standard errors clustered at the firm level. Appendix A provides all variable definitions.

Appendix A
Variable definitions

Variables	Definitions
Dependent variables	
Tax Avoidance	Following Awtood et al. (2012), we measure corporate tax avoidance as follows: $\textbf{Tax\_Avoid}_{it} = \frac{[\sum_{t-2}^{t}(\text{PTEBX} \times \tau)_{it} - \sum_{t-2}^{t} CTP]}{\sum_{t-2}^{t} PTEBX_{it}}$ PTEBX = pre-tax income before extraordinary items (Pre-tax income – extraordinary items); τ = home country statutory corporate income tax rate (hand-collected from KMPG tax summary global guide and OCED tax reports); CTP = current tax paid; **LT_Tax_Avoid$_{it}$ =** the sum of all pre-tax income over the 10 years multiplied by the home statutory tax rate per year and adjusted by the sum of current tax paid for each year over the same ten-year period.
Independent variables	
Accruals_Quality	We calculate the standard deviation of the residuals from the regression model below of Dechow et al. (2010) across the five years from e_{t-4} to e_t. We multiply the standard deviation by -1. A higher standard deviation indicates a greater accruals quality. $\Delta WC_t = a + \alpha_1 CFO_{t-1} + \alpha_2 CFO_t + \alpha_3 CFO_{t+1} + \alpha 4\ \Delta REV + \alpha 5\ PPE_t + e_t$
Earnings_Precision	We capture earning precision from the reported earnings volatility. Following Dichev and Tang (2009), we calculate earnings volatility as the standard deviation of earnings before extraordinary items scaled by the average total assets over the most recent five years and multiplied by -1.
Firm-level control variables	
Pretax_ROA	Pretax income scaled by total asset;
LEV	Financial leverage measured as long-term liabilities divided by total assets;
SIZE	The natural logarithm of dollar value of total book value of assets;
BIG4	An indicator variable that takes the value of 1 if the annual financial statement is audited by a Big4 company and 0 otherwise.
TANG	The ratio of property, plant, and equipment to total assets;
LOSS	An indicator variable that takes the value of1 if firm reports a loss and 0 otherwise.

Country-level control variables	
Anti-Director Rights Index	The Anti-Director Rights Index was first introduced by (Porta et al. 1998). It has been widely used as an investor protection proxy in previous literature and reflects the protection of minority shareholders in the corporate decision-making process, including the right to vote;
Legal Enforcement	The Legal enforcement is measured as the mean score of three legal variables used in La Porta et al. (1998): (1) the efficiency of the judicial system, (2) the assessment of rule of law, and (3) the corruption index;
Anti-Self-Dealing Index	The Anti-Self-Dealing Index is a revisited value specified by Djankov and al. (2008) and refers to the average of ex-ante and ex-post private control of self-dealing, ranging from 0 to 5;
Legal System	The Legal System is an indicator variable that equals to 1 if the country is a common law country and 0 otherwise;
MULTI	A multinational operations indicator that takes the value of 1 if the foreign income taxes > 0 and 0 otherwise;
Tax_Rate	Home country statutory corporate income tax rate.