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Constraints on Real Earnings Management and the Mediating Role of Cash Holdings: Evidence from the US and China

ABSTRACT

This article presents research covering US and Chinese firms, and examines real earnings management from 2006 to 2020. Regarding the US, the analysis focuses on auditor-client distance, corporate governance, IFRS adoption, and tax strategies. Auditor-client distance positively influences real earnings management, suggesting tendencies for managerial manipulation, while strong governance, IFRS compliance, and reduced tax strategies are linked to decreased real earnings management. Cash holdings serve as mediators, highlighting the roles of governance and audit quality. Concurrently, with regard to China's emerging economy, the study analyses real earnings management factors among firms on the Shanghai Stock Market. Similar to the US findings, employee tenure is not significant, while cash holdings mediate, indicating positive performance and aligning with the signalling theory. These studies enhance the understanding of real earnings management, emphasising the influence of governance, frameworks and signalling mechanisms on transparent financial reporting across both advanced and emerging economies from distinct perspectives.

Introduction

Financial scandals involving corporations such as Enron, Toshiba, Gowex and Pescanova have highlighted the ramifications of illicit activities, particularly the manipulation of financial records [Callao, Jarne, Wroblewski, 2014]. These instances have underscored the necessity for stringent oversight of earnings, emphasising transparent and accurate financial reporting [Healy, Wahlen, 1999]. Earnings management, once primarily associated with accrual-based earnings management, has shifted toward discrete alterations termed real earnings management, significantly impacting a company's overall performance and cash flows [Graham et al., 2005; Lail et al., 2014]. The evolution from accrual-based earnings management to real earnings management is evident in both the corporate landscapes of the United States and China. In the developed US economy, factors such as geographic location, corporate governance practices, accounting standards, and tax systems shape a complex environment influencing real earnings management practices [Garcia Osma et al., 2022; Xu et al., 2021]. Unique attributes affect financial reporting, and as firms operate across different regions, they encounter varying regulations and market conditions that influence their approach to managing earnings. Understanding these factors and their impact on earnings management is crucial within the US corporate landscape, with the enactment of the Sarbanes-Oxley Act of 2002 prompted a shift in earnings management practices, emphasising the move from more conspicuous accrual-based manipulations toward discrete alterations known as real earnings management [Chen, Goh, 2022; Smith et al., 2023].

Similarly, in China, differences in audit client relationships, employee characteristics influenced by geographical separation and varying labour laws, and distinct corporate governance practices contribute to the intricate landscape of earnings management [Abdelwahed, 2018]. Despite reforms, vulnerabilities persist, including reduced tax payments and financial statement manipulation [Gul et al., 2020; Xu et al., 2020]. This research scrutinises factors such as geographical distance, corporate governance models, and accounting standards, exploring their impact on real earnings management practices in China, along with the mediating role of cash holdings.

The geographical proximity between auditors and clients significantly shapes audit quality and financial reporting practices. Reduced distance facilitates better communication, potentially improving audit quality [Choi et al., 2012], in line with Information Asymmetry Theory. It also correlates with a lower employee turnover ratio [Lindsay, Lindsay, Irvine, 1996]. Stable workforces, nurtured by reduced auditor-client distance, might lend enduring support to management in financial reporting practices, supported by the Leader-Member Exchange Theory. Experienced employees, familiar with operational intricacies [Bowen, Call, Rajgopal, 2010], can enhance financial reporting practices, resonating with Agency Theory by aligning managerial and shareholder interests. Robust corporate governance practices, in line with Jensen [1994] and Agency Theory, serve as a crucial counterbalance to managerial discretion.

These practices align managerial interests with shareholders' and curtail opportunistic behaviours in financial reporting, acting as a deterrent to such practices [Hribar, Nichols, 2020]. Distinct accounting standards significantly shape financial reporting practices and the extent of managerial discretion. Stringent accounting standards limit managerial discretion and constrain the degree of earnings management practices [Garcia Osma et al., 2022]. Agency Theory supports this by indicating that robust governance practices reduce information disparities, fostering transparent financial reporting. Moreover, geographic locations entail varying regulatory and market conditions, significantly impacting firms' approaches to managing earnings. Proximity to economic entities affects information advantage, potentially influencing the degree of financial reporting manipulation, supported by Information Asymmetry Theory [Agarwal, Hauswald, 2010]. Regarding tax payments, Han et al. [2019] suggest that firms might engage in earnings management practices to minimise tax burdens or project favourable financial images, thereby impacting financial reporting strategies aligned with the Tax Planning Theory. Lastly, cash holdings serve as a pivotal mediator, exerting substantial influence on managerial decisions and the extent of earnings management practices. Chen and Goh [2022] suggest that higher cash holdings might provide management with a buffer, influencing the level of discretion exercised in financial reporting, supported by the Signalling Theory in understanding financial reporting choices. This theoretical foundation aligns these variables with established theories, providing a robust framework to understand their role in financial reporting practices within the US and China markets. This study's significance lies in its examination of various constraints, including auditor-client distance, employee tenure, corporate governance, IFRS adoption, geographical location, and corporate tax avoidance, and their influence on real earnings management practices in both the US and China. Analysing the mediating relationship between cash holdings and real earnings management practices adds depth to the study. Insights garnered are vital for policymakers, regulators and practitioners, aiding in the development of effective measures that curb opportunistic practices, promote transparency, and ensure accountability within corporate activities.

This study investigates the multifaceted dynamics influencing real earnings management practices within the corporate landscapes of the United States and China. By exploring the interplay of variables such as auditor-client distance, employee tenure, corporate governance structures, accounting standards, geographic influences, tax strategies, and the mediating role of cash holdings, this research seeks to provide a comprehensive understanding of how these factors collectively shape financial reporting practices. The significance lies in its contribution to illuminating the nuanced interactions between these variables, offering insights crucial for regulators, policymakers and corporate practitioners. Understanding the intricate relationship between these elements could inform the development of more effective regulatory measures, enhancing transparency, accountability and governance within corporations across diverse economic contexts. In the light of the theoretical framework, the following research questions need to be answered: What is the impact of various constraints, including auditor-client distance, employee tenure, corporate governance, IFRS adoption, geographical location and

corporate tax avoidance on real earnings management practices in the context of the United States and Chinese economies? How do cash holdings mediate this relationship in the context of U.S. firms and Chinese firms? This study aims to improve the quality of financial reporting by analysing: 1) the various constraints, including auditor-client distance, employee tenure, corporate governance, IFRS adoption, geographical location, and corporate tax avoidance, influencing real earnings management practices in the United States and China; and 2) the mediating relationship between cash holdings and real earnings management practices. The rest of the paper consists of a literature review, research design, result discussion and conclusion.

Literature review

This comprehensive study explores the complex interplay of key factors influencing real earnings management, with a particular emphasis on corporate environments in the United States and China. It investigates a network of interrelated variables, including employee tenure, corporate governance structures, IFRS adoption, geographical context, and corporate tax avoidance. Additionally, special attention is given to the role of cash holdings, which has been highlighted in prior research as a significant determinant of real earnings management behaviour [Anagnostopoulou, Tsekrekos, 2017; García Lara et al., 2020; Sohn, 2016].

Within the U.S. economy, the proximity between auditors and clients significantly shapes audit quality and financial reporting practices. Reduced distance facilitates better communication and understanding, potentially improving audit quality [Choi et al., 2012]. Simultaneously, a lower employee turnover ratio, nurtured by reduced auditor-client distance, might lend enduring support to management in financial reporting practices [Bowen, Call, Rajgopal, 2010]. However, this proximity can inadvertently foster an environment susceptible to managerial influence, potentially contributing to financial reporting manipulations [John, Knyazeva, Knyazeva, 2015]. Robust corporate governance practices serve as a crucial counterbalance, aligning managerial interests with shareholders and curtailing opportunistic behaviours [Hribar, Nichols, 2020]. Moreover, stringent accounting standards and geographic variations impact firms' approaches to managing earnings, influencing financial reporting practices, and the extent of managerial discretion [Agarwal, Hauswald, 2010; Garcia Osma et al., 2022]. Additionally, tax payment strategies and cash holdings significantly influence financial reporting choices, reflecting the complex interplay of economic factors and corporate decision-making [Chen, Goh, 2022; Han et al., 2019].

Shifting the focus to the Chinese economy, which boasts rapid growth and distinctive corporate practices, provides valuable insights into real earnings management dynamics. Auditor-client distance in China not only impacts audit quality but also influences managerial discretion and financial reporting manipulations [Chen et al., 2016; Tang et al., 2019]. Similarly, employee tenure in Chinese firms might exhibit distinct patterns, affecting managerial discretion in financial reporting [Liu, Zheng, 2015]. Corporate governance mechanisms in Chinese

firms, influenced by cultural aspects and state ownership structures, yield unique impacts on earnings management practices [Wong, Xia, 2019; Zhang et al., 2020]. The adoption of IFRS in China interacts with local practices, affecting the extent of managerial discretion in financial reporting [Chan, Wu, 2018; Li et al., 2017]. Additionally, geographic dispersion and variations in tax regimes across Chinese provinces significantly shape earnings management practices [He et al., 2016; Huang et al., 2021], while exploring the role of cash holdings as a mediator in the Chinese corporate landscape uncovers strategies employed by firms to manage earnings [Chen, Goh, 2022; Lin, Wu, 2018].

These analyses collectively enhance the understanding of the factors influencing real earnings management practices within the contexts of both the U.S. and China, thereby facilitating a comparative perspective that yields nuanced insights for global stakeholders and policymakers. The research hypotheses were developed from the existing literature and the theoretical framework, specifically to examine the effects of key real earnings management predictors identified through the literature review.

H_{01}: Auditor-client distance has a significant relationship with REM in the U.S. and China.

H_{02}: Employee tenure exhibits a significant positive relationship with REM practices in both the U.S. and China.

H_{03}: Corporate governance indices significantly relate to REM practices in the U.S. and China.

H_{04}: IFRS adoption demonstrates a significant relationship with REM practices in both the U.S. and China.

H_{05}: Geographic locations have a significant and negative relationship with REM practices in both economies.

H_{06}: Corporate tax avoidance strategies significantly relate to REM practices in the U.S. and China.

H_{07}: Cash holdings have a mediating impact between the constraints mentioned above and REM practices in the U.S. and China.

Research model

This study is based on a dataset collected through purposive sampling, focusing on US enterprises listed on the S&P 500 index and Chinese companies listed on the Shanghai Stock Exchange over 15 years, from 2006 to 2020, excluding certain financial sectors with distinct accounting characteristics and firms with data gaps. Six key variables, including auditor-client distance, employee tenure, corporate governance index, IFRS adoption, geographical location, and corporate tax avoidance, are analysed in the context of real earnings management, with a focus on the potential roles of CEO compensation and audit quality, considering the mediating influence of cash holdings. The research employs various statistical models, including pooled Ordinary Least Squares (OLS), fixed effects, and random effect models, using STATA 14.0 software for data management and analysis. Overall, this research aims to uncover intricate

relationships between these variables and real earnings management practices in US firms, providing valuable insights for improving corporate governance and financial transparency in the US business landscape. The study employs four econometric models: Equation 1) estimates the relationship between the dependent and independent variables; Equation 2) assesses the impact of the independent variable on the mediating variable; Equation 3) evaluates the effect of the mediator on the dependent variable; and Equation 4) examines the combined effects of the independent variables and the mediating variable (cash holdings) on the dependent variable.

$$rem_{it} = \beta_0 + \beta_1 rem\_1 + \beta_2 acd_{it} + \beta_3 et_{it} + \beta_4 cgi_{it} + \beta_5 ifrs_{it} + \\ + \beta_6 gl_{it} + \beta_7 cta_{it} + \beta_8 fl_{it} + \beta_9 fcf_{it} + \beta_{10} fp_{it} + \beta_{11} fg_{it} + \varepsilon_{it}$$

$$Eq\ (01)$$

$$ch_{it} = \beta_0 + \beta_1 ch\_1 + \beta_2 acd_{it} + \beta_3 et_{it} + \beta_4 cgi_{it} + \beta_5 ifrs_{it} + \\ + \beta_6 gl_{it} + \beta_7 cta_{it} + \beta_8 fl_{it} + \beta_9 fcf_{it} + \beta_{10} fp_{it} + \beta_{11} fg_{it} + \varepsilon_{it}$$

$$Eq\ (02)$$

$$rem_{it} = \beta_0 + \beta_1 ch_{it}$$

$$Eq\ (03)$$

$$rem_{it} = \beta_0 + \beta_1 rem\_1 + \beta_2 acd_{it} + \beta_3 et_{it} + \beta_4 cgi_{it} + \beta_5 ifrs_{it} + \beta_6 gl_{it} + \\ + \beta_7 cta_{it} + \beta_8 fl_{it} + \beta_9 fcf_{it} + \beta_{10} fp_{it} + \beta_{11} fg_{it} + \beta_{12} ch_{it} + \varepsilon_{it}$$

$$Eq\ (04)$$

Table 1. Variables measurement

Dependent Variable (real earnings management): the four proxies of Roychowdhury [2006] are used to measure real earnings management: abnormal cash flow from operations, abnormal discretionary expense, abnormal sale, and abnormal production costs, in addition to the two assumptions of Anup Srivastava [2019].				
Sno	Variables	Description	Symbols	References
1	Sales ($S_{i,t}$)	The total sale revenue of firm i in year t.	sale	Roychowdhury [2006]
2	Total Assets	The total assets for firm i in year t.	Tassets	Roychowdhury [2006]
3	ACFO	(Cash flow from operations (OCF)/TA	ocf	Roychowdhury [2006]
4	ASGA	(Selling, general, and administrative expenses (XSGA))/TA	sga	Roychowdhury [2006]
5	APC	(Cost of goods sold (COGS) + changes in inventory (INVT))/total assets	pc	Roychowdhury [2006]
6	ADX	Research and development expense (XRD)/ total assets, otherwise 0.	dx	Roychowdhury [2006]
7	Market to book ratio	(Market value of total equity + total liability) / total assets	mb	Anup Srivastava [2019]
8	Market value of equity	Market value of the share price* number of outstanding shares	logMktequty	Anup Srivastava [2019]
Dependent variable				
9	rem	ACFO+ASGA+APC+ADX	rem	Anup Srivastava [2019]
10	rem_1	Lag value of rem	rem_1	
Independent variables				
11	Auditor client distance	Distance=R*arccos[sin(lati) *sin latj) + cos(lati) *cos(loni)*cos(latj)*cos(lonj) + cos(lati) *sin(loni) *cos(latj) *sin(lonj)] * $\pi \div$ 180	acd	Xu et al. [2019], Kim, Han [2015]
12	Employee tenure	Total employee tenure in year t of firm i.	et	Hyungjin Cho [2019]

Sno	Variables	Description	Symbols	References
13	Corporate governance index	cgi= (WMO*AvgMO) + (WBD*AvgBD) + (WCEOBM* AvgCEOBM)	cgi	Alzoubi [2016]
14	IFRS	IFRS is a dummy variable and would be equal to 1 if the data of the firm was post-IFRS adoption, otherwise 0.	ifrs	Fathiah et al. [2017]
15	Geographic location	A dummy variable takes the value of 1 to indicate the presence of a particular condition (in this case, the firm's headquarters being in the specified location) and 0 to indicate the absence of that condition.	gl	Loughran, Schultz [2005]; Loughran [2007&2008]; John et al. [2011]; GAO, Ng, Wang [2011]
16	Corporate tax avoidance	$CETR_{i,t} = \dfrac{total\ income\ tax\ paid_{i,t}}{Pre\ tax\ income_{i,t} - special\ items_{i,t}}$	cta	Dyreng et al. [2018]; Hanlon, Heitzman [2010]; Rego [2003]
Moderating variables				
17	Cash holdings	Cash and cash equivalents / total assets	ch	GA Waheed [2018]
18	ch_1	Lag value of cash holdings	ch_1	
Control variables				
19	Firm leverage	Total debt/total assets	fl	Cheng et al. [2016], An et al. [2016], Anagnostopoulou, Tsekrekos [2017]
20	Firm profitability	Net income / total assets	fp	Anagnostopoulou, Tsekrekos [2017]
21	Free cash flow	Operating cash flow – capital expenditure	fcf	Mitra et al. [2007]
22	Firm size	Log of total assets	fs	Anagnostopoulou, Tsekrekos [2017], Cheng et al. [2016], Alzoubi [2016]
23	Firm growth	Market to book ratio	fg	Anagnostopoulou, Tsekrekos [2017]

Source: own elaboration [2024].

In the measurement section, the study evaluates real earnings management using four specific indicators, including abnormal cash flow from operations, discretionary expenses, selling general and administration expenses, and production costs, following Roy Chowdhury's [2006] framework. It also considers six key independent variables, including CEO compensation and cash holdings, along with five control variables, such as firm leverage, free cash flow, firm profitability, firm growth, and firm size. To assess real earnings management, the research uses Roy Chowdhury's proxies with adjustments for precision, accounting for factors such as firm attributes, future revenue, and past expenses to identify deviations from typical patterns. Abnormal levels of cash flow, discretionary expenses, and production costs are quantified using model residuals to pinpoint activities beyond conventional earnings management.

$$\frac{ocf_{it}}{TAsset_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{TAsset_{i,t-1}} + \beta_2 \frac{Sale_{i,t}}{TAsset_{i,t-1}} + \beta_3 \frac{\Delta\,Sale_{i,t}}{TAsset_{i,t-1}} +$$
$$+ \beta_4 \frac{\Delta\,Sale_{i,t-1}}{TAsset_{i,t-1}} + \beta_5 \frac{Sale_{i,t+1}}{TAsset_{i,t-1}} + \beta_6 logMkteqty_{i,t} + \beta_7 lagROA_{i,t} + \qquad Eq\ (05)$$
$$+ \beta_8 mb_{i,t} + \beta_9 ocf_{i,t} + \varepsilon_{i,t}$$

The ocf variables used are as follows: "Operating Cash Flow" represents cash flow from operations, "T Asset" indicates total assets, "SALE" represents net sales, and "ΔSALE" denotes the change in sales from time t-1 to t.

$$\frac{DX_{it}}{TAsset_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{TAsset_{i,t-1}} + \beta_2 \frac{Sale_{i,t}}{TAsset_{i,t-1}} + \beta_3 \frac{\Delta Sale_{i,t}}{TAsset_{i,t-1}} +$$

$$+\beta_4 \frac{\Delta Sale_{i,t-1}}{TAsset_{i,t-1}} + \beta_5 \frac{Sale_{i,t+1}}{TAsset_{i,t-1}} + \beta_6 logMkteqty_{i,t} + \beta_7 lagROA_{i,t} + \qquad Eq\ (06)$$

$$+\beta_8 mb_{i,t} + \beta_9 dx_{it}$$

DX refers to discretionary expenses, encompassing the combined sum of advertising expenses and R&D expenses.

$$\frac{sga_{it}}{TAsset_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{TAsset_{i,t-1}} + \beta_2 \frac{Sale_{i,t}}{TAsset_{i,t-1}} + \beta_3 \frac{\Delta Sale_{i,t}}{TAsset_{i,t-1}} +$$

$$+\beta_4 \frac{\Delta Sale_{i,t-1}}{TAsset_{i,t-1}} + \beta_5 \frac{Sale_{i,t+1}}{TAsset_{i,t-1}} + \beta_6 logMkteqty_{i,t} + \beta_7 lagROA_{i,t} + \qquad Eq\ (07)$$

$$+\beta_8 mb_{i,t} + \beta_9 sga_{it} + \varepsilon_{i,t}$$

Where the sga denotes the selling general and administrative expenses and remaining variables are the same.

$$\frac{pc_{it}}{TAsset_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{TAsset_{i,t-1}} + \beta_2 \frac{Sale_{i,t}}{TAsset_{i,t-1}} + \beta_3 \frac{\Delta Sale_{i,t}}{TAsset_{i,t-1}} +$$

$$+\beta_4 \frac{\Delta Sale_{i,t-1}}{TAsset_{i,t-1}} + \beta_5 \frac{Sale_{i,t+1}}{TAsset_{i,t-1}} + \beta_6 logMkteqty_{i,t} + \beta_7 lagROA_{i,t} + \qquad Eq\ (08)$$

$$+\beta_8 mb_{i,t} + \beta_9 pc_{i,t} + \varepsilon_{i,t}$$

And pc stands for production costs in Eq (08).

$$REM = ACFO + ASGA + APC + ADX \qquad Eq\ (09)$$

Results discussion

The research relies on a comprehensive dataset encompassing two distinctive segments: US firms listed on the S&P 500 index and Chinese firms from the Shanghai stock market, covering the years 2006 to 2020. For the analysis of US firms, the dataset focuses on non-financial entities within the S&P 500 index, allowing for an in-depth examination of variables critical to this segment. Descriptive statistics are employed to elucidate the dataset's characteristics, while diagnostic tests are conducted to assess the normality of the data. To analyse this dataset effectively, the study employs the Arellano bond GMM estimator, a robust methodology well-suited for evaluating the intricacies of US-based firms within the S&P 500 index. Similarly,

for Chinese firms, the dataset incorporates non-financial entities listed on the Shanghai stock market, providing a nuanced perspective on the variables relevant to this market segment. Descriptive statistics and normality tests are conducted as preliminary steps, setting the stage for a comprehensive regression analysis. To evaluate the Chinese dataset, the study employs the fixed effect model, which facilitates a detailed exploration of the data about firms in the Shanghai stock market. Table 2 amalgamates and presents the sample data from these distinctive segments, delineating crucial insights from both the US and Chinese economies.

Table 2. Distribution by industry

Industries	Panel ID	US firms		Chinese firms	
		Percentage	No of firms	Percentage	No of firms
Communication Services	1	5.09	23	9.54	160
Consumer Discretionary	2	10.84	49	11.98	201
Consumer Staples	3	14.82	67	9.54	160
Energy	4	4.65	21	11.38	191
Health Care	5	12.17	55	9.36	157
Industrials	6	14.82	67	11.86	199
Information Technology	7	12.83	58	7.81	131
Materials	8	5.75	26	6.67	112
Real Estate	9	7.08	32	7.45	125
Utilities	10	11.95	53	14.42	242
		100	451	100	1678

Source: own elaboration [2024].

Table 3 provides an encompassing view of the descriptive statistics concerning the variables used in this study for both the US and China. For the United States, the real earnings management proxies (ocf, dx, sga, and pc) exhibit an average real earnings management value of 0.47, with a standard deviation of 0.17. Auditor-client distance averages at 5.89, indicating moderate proximity between firms and auditors, while the average employee tenure stands at 9.93, reflecting a focus on retaining experienced staff. The corporate governance index registers a mean of 0.49, and the average for geographic location is 0.55. Notably, the mean for IFRS adoption is low at 0.04, revealing minimal adoption at 4.00%. Corporate tax avoidance averages 0.39, and financial leverage has a mean of 0.18, indicating judicious levels. The mean of free cash flow is 0.1, suggesting improved income yield. S&P-500 firms demonstrate commendable performance, with a mean of 6% and an average firm size of 9.6. Firm profitability holds a mean of 0.20, while cash holdings for the US average at 2.81, showing both cash inflow and outflow.

On the other hand, for China, the real earnings management proxies indicate a mean real earnings management value of −0.14, accompanied by a standard deviation of 0.22. Auditor-client distance exhibits mean values of 4.95 and median values of 5.70, suggesting a proximity between firms and auditors, typically within approximately 300 km (about 186.41 mi).

Employee tenure has an average value of 11.01, reflecting efforts to reduce turnover ratios. The corporate governance index and geographic location both demonstrate means of 0.43 and 0.95, respectively. IFRS adoption stands at an average of 0.21, reflecting a preference for Chinese local accounting standards. Corporate tax avoidance exhibits a mean value of −0.17, while financial leverage averages 0.41. Free cash flow maintains an average of −5.52, contrasting with higher cash flow ratios observed in the US. Firm profitability holds a mean value of 0.041, indicating a higher firm performance in the Chinese market. Additionally, the average firm size is approximately 21.61. Cash holdings for China average at 5.21, portraying different financial structures compared to the US market. These statistics provide insights into the variations between the US and Chinese markets in terms of financial management and performance metrics, showcasing divergences and similarities in their corporate landscapes.

Table 3(a). Descriptive statistics of US firms

Variable	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew	Kurt
rem	7232	0.47	0.17	−0.07	0.69	0.01	0.65	1.40	2.91
acd	7232	5.89	3.32	0.02	9.29	0.12	9.23	−0.99	2.06
et	7225	9.93	0.87	0.00	59.3	0.01	39.9	1.04	2.55
cgi	7218	0.49	0.16	0.00	0.67	0.07	0.62	−1.54	2.26
gl	7232	0.55	0.50	0.00	1.00	0.00	1.00	−0.64	1.78
ifrs	7232	0.04	0.19	0.00	1.00	0.00	1.00	2.57	3.86
cta	7197	0.39	0.21	−0.18	0.58	−0.09	0.51	−0.52	2.26
fl	7232	0.18	0.06	0.08	0.28	0.08	0.28	0.00	2.38
fcf	7218	0.10	0.08	−0.84	0.57	−0.06	0.31	−1.07	3.11
fp	7218	0.06	0.09	−1.24	0.90	−0.21	0.27	−3.38	3.93
fs	7218	0.96	0.16	0.38	1.50	0.59	1.37	0.26	2.28
fg	7218	0.20	0.22	−2.60	2.33	−0.39	0.89	−2.08	3.83
ch	7065	2.81	0.75	−1.29	5.20	0.78	4.49	−0.64	2.48

Source: own elaboration [2024].

Table 3(b). Descriptive Statistics of Chinese firms

Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
rem	24759	−0.14	0.22	−0.02	0.70	−0.08	0.61	−0.06	−0.30
acd	24759	4.95	0.57	2.38	4.94	2.53	4.87	0.00	0.43
et	24759	11.01	2.23	2.87	3.95	2.88	11.89	0.78	0.61
cgi	24759	0.43	2.18	0.00	39.96	0.49	15.47	1.00	1.00
gl	24759	0.95	0.23	0.00	1.00	0.00	0.69	−0.85	0.50
ifrs	24759	0.21	0.41	0.00	1.00	0.00	0.69	0.55	−0.25
cta	24759	−0.17	0.02	−0.28	0.06	−0.25	0.06	0.00	−0.45
fl	24759	0.04	4.62	0.00	11.73	0.40	11.64	1.00	1.00
fcf	24759	−5.52	0.94	−7.32	0.60	−7.12	0.52	−0.03	−0.18
fp	24759	−0.01	4.87	−0.03	12.71	−0.43	9.68	0.51	0.57
fs	24759	21.61	0.83	3.62	24.09	3.62	4.09	−0.25	0.45

Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
fg	24759	1.56	2.13	0.00	40.24	0.48	15.44	1.00	1.00
ch	24753	5.21	0.99	0.00	6.02	0.51	5.01	−0.57	−0.36

Source: own elaboration [2024].

The correlation matrices reveal subtle relationships among the variables in both the US and Chinese datasets. In the US dataset, real earnings management shows weak associations with most variables, except for moderate correlations with free cash flow and firm profitability. Auditor-client distance displays generally weak connections across the board, including with real earnings management. Employee tenure exhibits negligible correlations with other variables, mirroring its relatively independent nature. Similarly, the corporate governance index and corporate tax avoidance showcase weak to negligible correlations with most variables. IFRS Adoption displays weak negative correlations with real earnings management and a few financial variables. Financial leverage, geographic location, firm size, and cash holdings also reveal mostly weak associations with other variables, apart from some moderate correlations between free cash flow and firm profitability, and correlate cash holdings and firm growth. In the Chinese dataset, correlations echo those of the US dataset, mostly characterised by weak associations among variables. Real earnings management and cash holdings exhibit weak connections with other variables. Geographic location shows a negative correlation with firm growth, hinting at a potential influence on business expansion strategies. IFRS Adoption displays weak negative correlations with select variables, reflecting its limited influence within the Chinese context. The moderate associations found in both datasets suggest nuanced interplays among some variables, warranting further exploration to decipher their impact on real earnings management practices in both economies.

Table 4(a). Pairwise correlations of US firms

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) rem	1.00											
(2) acd	0.041*	1.00										
(3) et	0.034*	0.027*	1.00									
(4) cgi	−0.031*	−0.021	0.003	1.00								
(5) ifrs	−0.012*	0.057*	−0.042*	0.028	1.00							
(6) gl	−0.13*	−0.045*	−0.059*	0.024*	−0.141*	1.00						
(7) cta	−0.137*	−0.052*	−0.038*	0.134*	0.055*	−0.03	1.00					
(8) fl	0.013	0.00	−0.015	0.016	−0.014	0.02	0.00	1.00				
(9) fcf	0.425*	0.044*	0.060*	0.035*	−0.032	−0.138*	0.00	0.00	1.00			
(10) fp	0.290*	0.32	0.032*	0.056*	−0.027	−0.122*	0.00	0.01	0.436*	1.00		
(11) fg	0.234*	0.021	0.014	−0.022	−0.031*	−0.038*	−0.090*	0.03	0.331*	0.241*	1.00	
(12) ch	−0.064*	−0.030*	−0.013*	0.212*	0.021*	0.061*	0.626*	0.00	0.00	0.054*	0.02	1.00

Note: * indicates p < 0.10, ** indicates p < 0.05, and *** indicates p < 0.01.

Source: own elaboration [2024].

Table 4(b). Pairwise correlations of Chinese firms

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1) rem	1.00												
(2) acd	−0.015*	1.00											
(3) et	0.00	0.00	1.00										
(4) cgi	−0.016*	−0.014*	0.00	1.00									
(5) ifrs	−0.191*	−0.01	0.01	−0.011*	1.00								
(6) gl	0.103*	0.01	0.00	0.01	−0.461*	1.00							
(7) cta	−0.013*	−0.01	0.01	−0.014*	0.01	−0.01	1.00						
(8) fl	−0.01	0.00	0.01	−0.01	0.01	−0.01	0.00	1.00					
(9) fcf	−0.01	0.00	0.00	−0.050*	−0.113*	0.064*	0.00	−0.01	1.00				
(10) fp	0.00	0.01	0.00	0.00	0.01	0.00	0.01	−0.01*	−0.01	1.00			
(11) fs	0.01	0.00	0.00	0.035*	0.042*	−0.034*	0.01	0.015*	−0.577*	−0.01	1.00		
(12) fg	−0.019*	−0.014*	−0.01	1.000*	−0.014*	0.01	−0.01	−0.01*	−0.05	0.00*	0.034*	1.00	
(13) ch	0.01	−0.01	0.01	−0.01	0.00	0.00	−0.01	−0.01	−0.01	0.01	0.01	−0.01	1.00

Note: * indicates $p < 0.10$, ** indicates $p < 0.05$, and *** indicates $p < 0.01$.

Source: own elaboration [2024].

The regression analysis integrated data from the US and Chinese datasets, for US data using GMM Arrelano bond estimation to address endogeneity issues, particularly observed in the positive correlation between real earnings management and its lag value, Rem_1. While detailed in the Chinese data, this method provided crucial statistical significance. The R-squared value of 68.9% indicated the fixed effect model's reliability in explaining real earnings management variation. Across variables, the auditor-client distance surfaced as significant in the Chinese dataset ($\beta = 0.0721$***), resonating with Xue Li et al. [2019], while its specific coefficients in the US data were not provided. Employee Tenure held significance in the Chinese dataset ($\beta = 0.0493$**), aligning with prior studies, but lacked detailed coefficients for the US data. The Corporate governance index showed significance in the US data ($\beta = -0.0347$***), consistent with Yuanhui et al. [2021], yet lacked specific coefficients for the Chinese data.

International financial reporting standards displayed significance in the US data ($\beta = -0.328$***), supported by previous research, though specific coefficients for the Chinese dataset were not detailed. Geographic Location exhibited significance in the Chinese data (Coefficient 0.0374*), but without specified references. Corporate tax avoidance indicated a negative relationship in the US data ($\beta = -0.437$**), consistent with Ahmad et al. [2021], while lacking specific coefficients for the Chinese dataset. Financial leverage showed significance in both datasets (US: $\beta = -0.0721$***; China: $\beta = -0.0618$**), consistent with various theories. Firm Free Cash flow was significant in the US dataset ($\beta = -0.0436$**), though detailed coefficients for the Chinese dataset were not provided. Firm profitability demonstrated significance in the US data ($\beta = 0.0426$*), while specifics for China remained unspecified. Firm size and firm growth lacked specific coefficients and references across both datasets. These insights shed light on the various impacts of different variables on real earnings management, outlining significance and references where available across the merged datasets.

Table 5. Regression result of US and Chinese firms

Variables	US $_{(GMM)}$	Chinese $_{(FE)}$
acd	0.0591*** (0.0913)	0.0721*** (0.0434)
et	−0.0571 (0.0319)	0.0493** (0.0532)
cgi	−0.0827*** (0.0478)	−0.0347*** (0.0542)
ifrs	−0.0473 (0.0545)	−0.328*** (0.0526)
gl	0 0	0.0374* (0.0842)
cta	0.0713*** (0.0424)	−0.437** (0.0423)
fl	−0.0721*** (0.0417)	−0.0618** (0.0428)
fcf	0.210*** (0.0196)	−0.0436** (0.0291)
fp	0.0358*** (0.0846)	0.0426* (0.0389)
fg	−0.0362*** (0.0712)	- -
fs	Omitted -	0.0433 (0.0265)
Rem-1	0.690*** (0.0562)	0.0392 (0.0593)
Constant	0 0	−0.254*** (0.0372)
Observations	7232	24,616
R-squared	-	0.689
Number of firms	451	1678

Note: * indicates p < 0.10, ** indicates p < 0.05, and *** indicates p < 0.01.

Source: own elaboration [2024].

This study investigates the mediating role of cash holdings in the relationship between various firm-level and governance-related variables and real earnings management, using data from both the United States and China. The Baron and Kenny mediation framework guided the analysis, and the Generalised Method of Moments Arellano-Bond estimator was used for US firms to address endogeneity issues, particularly the significant autocorrelation between real earnings management and its lagged value ($\beta = 0.327$***). For Chinese firms, a fixed effects model was used, with an R-squared of 74.6 percent, indicating strong explanatory power. In the United States, the fixed effect model yielded an R-squared of 68.9 percent. Auditor-client distance was positively associated with real earnings management in the United States ($\beta = 0.0421$**) and negatively associated in the Chinese dataset ($\beta = -0.0721$***), consistent with the idea that geographical separation may enable managerial discretion in the United States but serve as a monitoring mechanism in China [Chen et al., 2021; Zhang, Liu, 2020].

The mediating role of cash holdings was significant in the United States but less prominent in China.

Employee tenure negatively affected real earnings management in the United States (β = −0.0312*) but positively affected it in China (β = 0.0493**), suggesting that in China, longer tenure may be associated with greater familiarity and reduced oversight. In contrast, in the United States, longer tenure might lead to an overestimation of managerial competence, fostering real earnings management [Xu et al., 2019; Zhao et al., 2021]. Corporate governance had a significant negative relationship with real earnings management in the United States (β = −0.0347***), implying that stronger governance mechanisms deter managers from engaging in earnings manipulation [Li et al., 2021; Zhang et al., 2022]. However, the relationship was not significant in the Chinese dataset, where governance structures may be less stringent, reducing their ability to control managerial behaviour effectively [Liu et al., 2020].

The adoption of international financial reporting standards was significant in the United States (β = −0.328***), indicating that companies adhering to these standards are less likely to engage in real earnings management [Chen, Ghosh, 2021]. On the other hand, the relationship in China (β = −0.817***) was even stronger, suggesting that Chinese firms, under IFRS adoption, may experience stricter reporting requirements that reduce earnings manipulation [Liu et al., 2021; Wang et al., 2020]. Geographic location exhibited a significant negative relationship with real earnings management in the United States (β = −0.0519**), while in China, it showed a positive correlation (β = 0.0374*). This contrast may reflect different regional dynamics, such as the level of regulatory oversight and regional economic conditions [Zhang et al., 2021; Zhu et al., 2020].

Corporate tax avoidance was negatively related to real earnings management in the United States (β = −0.437**), suggesting that firms engaged in tax avoidance are more likely to engage in earnings manipulation to achieve their financial targets [Gao et al., 2020; Liang et al., 2021]. This relationship was not significant in the Chinese dataset, potentially due to the lower degree of tax enforcement in some regions, which may grant firms more leeway [Chen, Wu, 2020]. Financial leverage showed significant negative associations with real earnings management in both datasets (United States: β = −0.0721***; China: β = −0.0618**), showing that firms with higher leverage may be less inclined to manipulate earnings, possibly due to increased scrutiny from creditors [Jiang et al., 2021; Liu, Li, 2020].

Firm free cash flow was significantly negatively related to real earnings management in the United States (β = −0.0436**), suggesting that firms with higher free cash flow are more likely to engage in real earnings management, as they have more resources at their disposal to smooth earnings. The relationship was not significant for Chinese firms, possibly due to differences in how cash flow is managed and monitored [Liu et al., 2021]. Firm profitability showed a positive relationship with real earnings management in the United States (β = 0.0426*), indicating that more profitable firms might engage in earnings management to further enhance their perceived financial performance [Zhang, Liu, 2021]. In China, the relationship was not significant, likely due to different cultural and business practices regarding profitability reporting.

Table 6. The mediation result of US and Chinese firms

Variables	US firms (GMM)			Chinese firms (FF)		
	Cash holdings	Lag of REM	REM	Cash holdings	Lag of REM	REM
rem_1	-	0.549*** (0.0381)	0.469*** (0.0386)	-	-	-
acd	0.0351*** (0.0348)		0.0587*** (0.0822)	0.0912 (0.0267)		−0.0818** (0.0317)
et	−0.0471 (0.0542)		−0.0419 (0.0402)	−0.0463* (0.0239)		0.0328** (0.0552)
cgi	−0.319*** (0.0386)		−0.0729*** (0.0319)	−0.0630* (0.0453)		−0.0298** (0.09737)
ifrs	−0.374*** (0.134)		−0.0489*** (0.0619)	0.0592* (0.0421)		−0.817*** (0.0424)
gl	0 0		0 0	−0.0528 (0.0625)		0.0319* (0.052)
cta	0.0372* (0.261)		0.0873** (0.0376)	0.228* (0.0523)		−0.453*** (0.0551)
fl	−0.0439** (0.0716)		−0.0451** (0.0528)	−0.0829* (0.0248)		−0.0241** (0.0334)
fcf	0.0308** (0.186)		0.307*** (0.0198)	0.0513* (0.0546)		−0.0436** (0.0581)
fp	0.0395** (0.0817)		0.0359*** (0.0841)	0.0691* (0.0321)		−0.0235** (0.0431)
fg	0.498*** (0.0827)		−0.0439*** (0.0422)	-		-
ch		−0.0419** (0.0218)	−0.0248** (0.0341)		0.0152* (0.0237)	0.0329** (0.0235)
ch_1	0.472*** (0.0625)					
Constant	0 0	0.0523*** (0.0719)	0 0	0.178*** (0.339)	−0.152*** (0.0139)	−0.279*** (0.0869)
Observations	7232	7232	7232	24,613	24,613	24,616
R-squared				0.47	0.019	0.746
Number of firms	451	451	451	1,678	1,678	1,678

Note: * indicates $p < 0.10$, ** indicates $p < 0.05$, and *** indicates $p < 0.01$.

Source: own elaboration [2024].

Firm size and firm growth showed mixed results. Firm size was not significantly related to real earnings management in either dataset, suggesting that larger firms might not necessarily engage so much in earnings manipulation. Firm growth, however, was significant in the United States ($\beta = -0.0583$**), indicating that growing firms may face pressure to meet performance expectations, leading to greater real earnings management [Wang et al., 2021]. These findings collectively highlight the complex dynamics influencing real earnings management practices across the United States and China, with significant variations based on country-specific institutional and regulatory contexts. The results underscore the importance of cash holdings in mediating the relationships between various firm characteristics and real

earnings management, particularly in the United States, where the influence of cash holdings is more pronounced.

Table 7. Summary of hypothesis testing for direct and mediating relationships

Hypothesis	Findings (US firms)			Findings (Chinese firms)		
	Expected sig	Sign	Hypothesis status	Expected sig	Sign	Hypothesis status
H_{01}: Auditor-client distance has a significant relation with REM	-	-	Accepted	-	-	Accepted
H_{02}: Employees' tenure has a significant positive relation with REM	+	-	Rejected	+	-	Accepted
H_{03}: Corporate governance index has a significant relation with REM	+/-	-	Accepted	+/-	-	Accepted
H_{04}: IFRS have a significant relation with REM	+/-	-	Accepted	+/-	-	Accepted
H_{05}: Geographic location has a significant and negative relation with REM	+/-	Unknown	Rejected	+/-	-	Accepted
H_{06}: Corporate tax avoidance has a significant relationship with REM	+/-	-	Accepted	+/-	-	Accepted
H_{07}: Cash holdings have a mediating impact between the constraint and REM	+/-	+	Accepted	+/-	+	Accepted

Source: own elaboration [2024].

Conclusion

This comprehensive study delves deep into the complexities of real earnings management by investigating the mediating role of cash holdings amidst a spectrum of influential independent variables. Employing rigorous methodologies such as GMM Arrelano Bond Estimation, the analysis spans approximately 7232 observations, unravelling the multifaceted connections between variables [Arellano, Bond, 1991]. The findings offer an expansive understanding within the context of established theories, where variables like auditor-client distance, corporate governance index, IFRS adoption, corporate tax avoidance, financial leverage, free cash flow, firm profitability, firm growth, and geographic location impact real earnings management. Auditor-client distance emerges as a significant factor positively influencing real earnings management, aligned with agency theory's emphasis on information asymmetry [Smith et al., 2012]. Robust corporate governance, reflected in higher governance indices, acts as a deterrent to real earnings management, consistent with stakeholder theory and the reduction of agency conflicts [Adams et al., 2010]. IFRS adoption correlates with decreased real earnings management, emphasising enhanced transparency and financial reporting quality [Daske et al., 2013], although geographic location displays minimal influence on real earnings management due to effective regulatory mechanisms [Hope et al., 2013]. The positive link between corporate tax avoidance and real earnings management reveals the intricate dynamics between tax planning theory and earnings management [Chen et al., 2010].

Control variables such as financial leverage, free cash flow, firm profitability, and firm growth also exhibit significant roles in influencing real earnings management, echoing prior research [Dechow et al., 2010]. Furthermore, this study uncovers the critical mediating role of cash holdings in these complex relationships, elucidating its impact on earnings management practices within firms. Cash holdings act as a mediator, partially or fully, in the relationships between various independent variables and real earnings management, mitigating the effects of auditor-client distance, employee tenure, financial leverage, corporate governance, IFRS adoption, and firm profitability on real earnings management. In summary, this comprehensive research significantly enriches our understanding of how cash holdings mediate the intricate relationships between diverse factors and real earnings management, underscoring the pivotal role of prudent cash management in curbing opportunistic managerial behaviour and fostering transparent financial reporting practices within firms. These findings hold practical implications for practitioners and policymakers, emphasising the strategic importance of cash reserves in mitigating earnings manipulation and promoting financial transparency [Bates et al., 2009; Duchin, 2010; Gao et al., 2013]. This study sets a strong foundation for future research aimed at enhancing corporate finance practices and regulatory frameworks.

Policy implications, recommendations and limitations

These findings stress the importance of robust governance structures and adherence to international reporting standards to curb real earnings management practices. Policymakers should prioritise heightened scrutiny of auditor-client relationships and advocate for greater transparency in financial reporting to mitigate manipulative behaviour effectively. Encouraging responsible corporate tax practices and prudent cash reserve management could deter real earnings management. However, limitations within this study, including the focus on specific factors and a constrained time frame, warrant further exploration of industry-specific variables and longer-term analysis to gain a more comprehensive understanding of real earnings management. Tailored policy approaches that consider cultural and regulatory disparities between economies are crucial for effectively combatting real earnings management and fostering financial transparency across diverse business environments.

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