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Underwriter–Auditor Relationship and Pre-IPO Earnings Management: Evidence from China

Xingqiang Du[1] · Xu Li[2] · Xuejiao Liu[3] · Shaojuan Lai[4]

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Abstract This study examines the influence of underwriter–auditor relationship (UAR) on pre-initial public offering (IPO) earnings management. Using a sample of Chinese to-be-listed firms, we find that a close UAR, as reflected in repeated collaborations between an underwriter and an audit firm in IPOs, is positively associated with pre-IPO earnings management. This association is more pronounced for firms with politically connected auditors/underwriters, firms with less reputable auditors/underwriters, firms located in provinces with weak legal environment, firms to-be-listed on boards with lax listing requirements, and firms whose auditors are with low industry specialization, and legal liability exposures. We provide further evidence that UAR is associated with greater likelihood of irregular activities in post-IPO period and poorer post-IPO financial performance. To the extent that we control for alternative explanations and potential endogeneity, our results suggest that the *collusion incentive* is likely to drive repeated collaborations between underwriters and auditors in the Chinese IPO market. Our findings provide interesting implications for auditors, investors, and regulators seeking to understand the Chinese IPO market.

Keywords Underwriter–auditor relationship (UAR) · Earnings management · The collusion incentive · Political connections · Underwriter (auditor) reputation · Legal environment

Introduction

In recent years, repeated collaborations between underwriters and specific audit firms have prevailed in the Chinese initial public offering (IPO) market and attracted increasing attention from media and regulators.[1] During the period of 2006–2012, about 30 percent of underwriters teamed up with the same audit firm more than five times in different IPOs. Half of the underwriters had more than 7 % of the overall underwriting-related auditing service provided by the same audit firm, indicating the commonality of the repeated collaborations. Skeptics question the underlying agenda of these close underwriter–auditor relationships (hereafter UAR). Prior studies have separately examined the choices of underwriters and auditors and their associated impacts on IPO firms (Balvers et al. 1988; Carter and Manaster 1990; Carter et al. 1998; Chen et al. 2013; Pittman and Fortin 2004), but little is known about how UAR affects IPO firms. Using a sample of Chinese to-be-listed firms, this study fills the above gap by

✉ Shaojuan Lai
sjlaixmu@163.com

Xingqiang Du
xqdu@xmu.edu.cn

Xu Li
xuli1@hku.hk

Xuejiao Liu
xjluibe@outlook.com; xuejiaoliu@uibe.edu.cn

[1] Accounting Department, School of Management, Xiamen University, Xiamen 361005, Fujian, China

[2] Faculty of Business and Economics, The University of Hong Kong, Hong Kong, China

[3] School of Business, University of International Business and Economics, Beijing, China

[4] Xiamen National Accounting Institute, Xiamen 361005, Fujian, China

[1] See news coverage at: http://finance.ifeng.com/ipo/xgyw/20110801/433-453.shtml, as an example.

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investigating the effect of UAR on pre-IPO earnings management.

We conduct our study in the Chinese setting for the following reasons. First, although not publically observable in other major economies such as the U.S. under the Securities and Exchange Commission (SEC)-registered public offering system, failed IPOs are public information in China. IPO applications filed by to-be-listed firms in China are either approved or denied by an independent listing committee supervised by the China Securities and Regulatory Commission (CSRC 2006), which enables us to hand-collect the data on underwriters and auditors from the candidates' prospectuses.[2] By examining both successful and failed IPO cases simultaneously, we avoid the potential bias involved in the measure for UAR. Second, during a typical IPO underwriting in China, underwriters assemble a restructuring team that consists of an auditor, an attorney, and an asset appraiser (Chen et al. 2013). This process empowers underwriters to select auditors or affect the clients' auditor choice through "*tacit approval of the firm's current auditor or by requesting auditor change*" (Balvers et al. 1988). Moreover, the Chinese audit market is highly competitive and dispersed (Du and Lai 2015), and thus Big 4 audit firms do not dominate the Chinese audit market as do they in other markets (Chu et al. 2011). Chan and Wu (2011) find that the Big 5 (Big 4) audit firms in China audited about 3.6 % (6.9 %) of listing firms at the end of 1999 (2006). This competitive auditing market provides more variation and discretion of UAR. Finally, legal environment and investor protection in China are relatively weaker than developed countries, and thus underwriters and auditors are subject to lower litigation risk (Ball et al. 2003; Chen et al. 2006), which provide a rich environment for evaluating different incentives embedded in a UAR.

Theoretically, there are two different incentives underlying UAR formation. On the one hand, an underwriter may opt to team up with a specific audit firm to increase efficiency (the *efficiency incentive*). A close UAR helps auditors gain underwriter-specific expertise, lowers the start-up costs in each IPO underwriting process, and facilitates timely communication between the underwriter and auditor, leading to a more efficient and effective collaboration to detect and deter any pre-IPO earnings management in IPO firms. On the other hand, the large profits from successful IPOs can motivate underwriters to select auditors who are willing to succumb to their pressure to issue favorable opinions or even aid managers in "pushing the boundaries" of Generally Accepted Accounting Principles (GAAP).[3] Such a *collusion incentive* in turn jeopardizes auditor independence and leads to a deterioration in financial reporting quality. Therefore, the net effect of UAR on pre-IPO earnings management depends on the tradeoff between the efficiency and collusion incentives.[4]

To differentiate these two competing explanations, we examine the effect of UAR using a sample of 1368 Chinese A-share to-be-listed firms that filed for IPOs from 2006 to 2012. We use a variable UARRS to denote underwriter–auditor relationship and measure it as the number of collaborative IPOs between an underwriter and an audit firm scaled by the underwriter's total number of IPOs throughout the sample period.[5] A higher UARRS indicates more frequent collaborations between the underwriter and auditor. Pre-IPO earnings management into-be-listed Chinese firms, DA, is the average value of discretionary accruals estimated using modified Jones model (Jones 1991; Dechow et al. 1995). In order to compute DA, we collect financial information disclosed in firms' prospectuses across the period leading to their receipts of IPO decisions from the CSRC.[6]

Our findings show a positive association between UARRS and pre-IPO earnings management, suggesting that the *collusion incentive* embedded in UAR dominates the *efficiency incentive* and plays an undesirable role in the earnings quality of to-be-listed firms. In addition, we find that the preceding association is more pronounced for firms with politically connected auditors/underwriters, firms with less reputable auditors/underwriters, firms located in provinces with weak legal environment, firms to-be-listed on boards with lax listing requirements, and firms whose auditors are with low industry specialization and liability

[2] Starting from 2006, firms that apply for IPOs were mandated to disclose their prospectuses on the CSRC website.

[3] According to statistics taken from *MoneyWeek*, the average income for an underwriter in an IPO is over 48 million RMB, and the average income for an audit firm in an IPO is about 3 million RMB.

[4] The conceptual framework of our study is similar to that applied in studies of the effect of auditor tenure on audit quality. Although "extended auditor–client relationships" theory predicts that long tenure jeopardizes an auditor's independence and therefore has a negative effect on audit quality (International Federation of Accountants 2010; Mautz and Sharaf 1961), "new auditor learning costs" theory predicts that long tenure facilitates an auditor's knowledge accumulation and therefore has a positive effect on audit quality (Geiger and Raghunandan 2002; Myers et al. 2003; Petty and Cuganesan 1996).

[5] Of the 1368 underwritings in our sample period (2006–2012), only three were provided by more than one underwriter (i.e., syndicate), in which we measure the UAR based on the collaborations between the lead underwriters and audit firms. Our results are also robust to using raw number (UARaw) of collaborations between an underwriter and an audit firm.

[6] Our results are robust to performance-matched discretionary accruals based on the model adopted by Kothari et al. (2005) (DA_PMADJ), non-operating income (Chen and Yuan 2004) or ROA-based measure used in Aharony et al. (2000) and Kao et al. (2009) (see "Further Analyses" section).

exposures. These moderating effects lend further credence to the observation that the effect of UAR on pre-IPO earnings management is more likely to be causal than correlational (Grullon et al. 2010; Guiso et al. 2008; Jha and Chen 2014). We provide further evidence that a higher UAR leads to more post-IPO irregular activities and worse post-IPO firm performance.[7]

Note that auditor screening and underwriter/client selection may affect our results. We address this potential endogeneity concern by adopting the propensity score matching (PSM) method and the instrumental variable (IV) estimation. The results based on above approaches are consistent with our main tests. Our findings are also robust to alternative model specification, sample composition, and variable measurements of UAR and earnings quality (see "Further Analyses" section).

This study makes several contributions. It is the first to apply the concept of UAR and investigate the reason for its formation. Although previous studies have separately examined the choice of auditor and that of underwriter during IPOs (e.g., Copley and Douthett 2002; Guedhami et al. 2014; Jo et al. 2007), none has considered the underlying incentives to drive repeated collaborations between these two market intermediaries. Our study adds to prior literature by showing that, on average, *collusion incentive* plays a dominate role in close UAR formed in the Chinese IPO market.

Second, this study sheds light on the role of auditor and underwriter in the IPO market. We find that UAR is positively associated with pre-IPO earnings management, post-IPO irregularity behaviors, and negatively associated with post-IPO financial performance, which add to determinants documented by prior studies in related research strands (e.g., Ashbaugh-Skaife et al. 2008). More importantly, our results indicate that omitting the impact of UAR may lead to biased conclusion regarding the role of auditor and underwriter. It is well established that reputable auditor and underwriter could benefit IPO firms in various ways, including better earnings quality, higher first day return (i.e., lower IPO underpricing), lower post-IPO misconducts, lower cost of capital, etc. (e.g., Balvers et al. 1988; Hong et al. 2014; Pittman and Fortin 2004). However, as shown in our partition analysis on auditor and underwriter reputation, even when a reputable auditor/underwriter is involved, UAR continues to play an undesirable role.[8] Hence, jointly considering the impact of UAR may substantially alter inferences drawn by prior literature focusing only on underwriters or auditors.

Third, this study is one of few studies, if it is not the first, to address the ethical problem embedded in a close relation between auditors and underwriters. The close relationship between auditors and underwriters may lead to two distinct consequences: (1) the *efficiency incentive*; and (2) the *collusion incentive*. Our study addresses and validates the *collusion incentive*, suggesting that UAR may impair auditor independence, and eventually result in a series of unethical behavior of IPO firms, including higher pre-IPO earnings management and post-IPO irregularity behavior. Our findings imply that ethical concern is valid in the context of combination of firms' stakeholders, such as the combination of underwriters and auditors.

Fourth, our study extends prior literature on political connection, underwriter and auditor reputation, audit firm industry specialization, listing requirements, and legal environment (e.g., Brau and Johnson 2009; Chen et al. 2013; Craswell et al. 1995; Dunn and Mayhew 2004; Francis and Wang 2008) by showing their moderating effects on the relation between UAR and pre-IPO earnings management. These findings deepen our understanding of the dynamic link between UAR and its implications into-be-listed firms, and identify potential channels through which the undesirable effect of UAR on earnings quality may be constrained.

Taken together, this study provides important implications for participants in the IPO market. The current approval-based system over Chinese IPOs is criticized for distorting the IPO market and encouraging official corruption and collusion. Our study suggests a new form of collusion, i.e., through repeated collaborations between market intermediaries, and thereby heightens the necessity of considering UAR in IPO resource allocation, equity evaluation, and supervision.

The remainder of this paper proceeds as follows. In the second section, we briefly introduce the regulatory background and develop our hypotheses. The third section describes research design, including the sample construction, variable definitions, and empirical models. The main empirical results are reported in the fourth section. The fifth section contains further analyses such as cross-sectional analyses, the discussions about the endogeneity problem, robustness checks using alternative measures, and tests on the consequences of UAR on IPO firms. Finally,

[7] We thank the anonymous referee for suggesting us to explore more unique questions in the Chinese context.

[8] From this perspective, our contribution shares the same merits as that of Armstrong and Vashishtha (2012), which show that jointly considering the incentive of both portfolio delta and portfolio vega of executive equity-based compensation substantially alters inferences reported in prior literature. Our findings highlight the importance of joint consideration of both underwriter and auditor in the IPO situation.

the sixth section concludes and develops ethical implications.

Hypotheses Development

IPOs in China

IPOs around the world are marketed to investors in a number of different ways, including book building process, various auction mechanisms and open offer (e.g., Beatty and Ritter 1986; Sherman 2000). However, IPO process is different in China. From 1990 to 2001, the total annual number of IPOs was subject to a quota system adopted by the Chinese central government. A quota for the entire capital value of shares to be issued was set at the beginning of every year. The total amounts were allocated among local governments and directed to key industries and promising companies. Given the fixed total amount of capital to be raised and low share ownership of employees, back then managers lacked direct incentives to induce higher IPO prices through earnings management (Aharony et al. 2010). Some managers may, however, have indirect economic incentives for earnings management, as to induce increased autonomy and decreased government interference associated with listed status (Aharony et al. 2000). After 2001, the Chinese government abandoned the quota system and allowed investment banks to nominate firms for IPOs. These nominations are screened by an independent listing committee supervised by the CSRC. The committee reviews and assesses the qualification of each applicant based on their operational and financial information, which motivates the managers in these firms to manipulate earnings to increase their likelihood of being listed, as well as enhance the issuing price to raise more capital.

This IPO system in China is widely criticized for its lack of efficiency in easing the burden on country's cash-strapped enterprises and excessive involvement of regulators. As a response, China plans to gradually shift to a registration system for stock market flotations. Shiyu Liu, the chairman of the CSRC, note that "the IPO registration system reform is a set target that must be achieved for China, but its pace would depend on the development of capital market and legal conditions".[9] Also, Liu pointed out that building a multitier capital market is a precondition for promoting the IPO registration system, which will take a long process for lawmakers to work out related laws and regulations.

[9] Available at: http://www.reuters.com/article/china-ipo-regulation-idUSL3N14D1IO20151227.

Underwriter–Auditor Relationship and Pre-IPO Earnings Management

Unlike prior studies that have investigated the choices of underwriters and/or auditors in IPOs (Bachar 1989; Balvers et al. 1988; Beatty 1989; Hogan 1997; Jo et al. 2007), this study considers the recurring collaborations between underwriters and auditors across different IPOs. Specifically, we measure the underwriter–auditor relationship as the number of collaborative IPO services between an audit firm and an underwriter scaled by the total number of IPO services provided by the underwriter during the sample period. Therefore, the decision of choosing specific audit firms in our sample cases is more likely, if not all, to be made by underwriters rather than IPO firms.[10]

An underwriter's decision to constantly collaborate with a certain audit firm and thus form a stable UAR in the IPO market may stem from two different incentives. On the one hand, underwriters may choose to repeatedly work with the same audit firm due to the increased familiarity and efficiency. This argument is similar to the conjecture that longer auditor tenure is associated with better audit quality (e.g., Geiger and Raghunandan 2002; Myers et al. 2003; Petty and Cuganesan 1996). Steven Wallman, Chairman of the U.S. SEC, wrote that "*periodically rotating the audit firms of a public company seems contrary to the notion of learning as much as possible about an audit client. It also would appear to be remarkably inefficient.*" Such a relationship also applies to the effect of UAR on pre-IPO earnings management. Over time, auditors can gain underwriter-specific expertise that helps them to understand the procedures and estimates of underwriters in the IPO process, lowers the start-up costs in each IPO, and facilitates timely communication in addressing potential accounting issues. Therefore, UAR induced by the *efficiency incentive* results in a more effective monitoring of earnings management in to-be-listed firms, leading to increased financial reporting quality.

On the other side, in emerging markets such as China, the financial benefits that underwriters gain from IPOs are likely to outweigh the potential reputation and litigation costs due to weak investor protection and legal enforcement. For example, in September 2012, the CSRC subjected Pingan Securities, one of the largest securities firms in China, to a "heaviest" fine of 76.65 million RMB due to the severe misconduct of its IPO client *Wanfu Biotechnology*, which amounted to only 2.51 % of Pingan's annual revenue. This asymmetric payoff function motivates

[10] Nevertheless, we address the potential endogeneity concern associated with the choices of underwriters and auditors during a firm's IPO process in additional analyses (see "Further Analyses" section).

underwriters to collude with auditors who are willing to succumb to their pressure to issue favorable opinions and even aid management in "pushing the boundaries" of GAAP. Just as long auditor tenure may jeopardize an auditor's independence and therefore have a negative effect on audit quality (International Federation of Accountants 2010; Mautz and Sharaf 1961), UAR based on the *collusion incentive* may fail to detect or even facilitate earnings management in pre-IPO firms.

As a result, the net effect from UAR on the earnings quality of IPO firms depends on the tradeoff between the *efficiency incentive* and the *collusion incentive*. When the efficiency (collusion) incentive plays a dominant role, the UAR exerts a positive (negative) effect on the earnings quality of an IPO firm. Therefore, we formulate Hypothesis 1 as below:

Hypothesis 1 Ceteris paribus, the underwriter–auditor relationships (UAR) are significantly associated with pre-IPO earnings management.

Underwriter/Auditor Political Connection

Political connection can benefit firms in many ways, including preferential treatment in the form of access to credit from state-owned banks, government contracts, corporate bailouts in financial distress, lower tax burdens, lax regulatory enforcement, and allocation of government investment (e.g., Adhikari et al. 2006; Agrawal and Knoeber 2001; Berkman et al. 2010; Dinc 2005; Faccio et al. 2006). It plays an even more pervasive and critical role in China—the economy in which the government exercises tight control and heavy intervention. For example, Yang (2013) finds that IPO applicants may obtain regulatory benefits through political connections of their auditors and points out that such finding could be generalized to other intermediaries such as underwriters.

We conjecture that the *collusion incentive* embedded in UAR plays a more prominent role for IPO applicants with politically connected auditors/underwriters. Because politically connected auditors/underwriters may help their clients lobby for less scrutiny and more favorable regulatory decisions during IPO, providing more chances for window dressing. Moreover, since political connections shield firms that commit misconducts from punishments (Li et al. 2008; Zhou and Li 2016), auditors/underwriters that are politically connected are facing lower liability exposure during IPO process. Taken together, we make the following hypothesis:

Hypothesis 2a Ceteris paribus, the positive (negative) relation between a UAR and pre-IPO earnings management becomes stronger (weaker) when the audit firm or underwriter is politically connected.

Auditor/Underwriter Reputation

Next, we examine the effects of underwriter and auditor reputation on the association between UAR and pre-IPO earnings quality. Titman and Trueman (1986) point out that "*high quality underwriter and auditor…may also lower the likelihood of earnings management.*" Consistent with this view, Brau and Johnson (2009) document a significant negative correlation between IPO firm earnings management and the presence of prestigious auditors and underwriters. In addition, using Chinese data, Chen et al. (2013) find an inverse relationship between underwriter reputation and pre-IPO earnings management for non-SOE (stated-owned enterprise) issuers. Although the preceding studies provide evidence of the *direct* effect of auditor/underwriter reputation on earnings management in IPO firms, none has examined its *indirect* effect on pre-IPO earnings management through auditor and underwriter collaboration, i.e., UAR. We conjecture that more reputable auditors and underwriters are less likely to team up for collusion purposes due to the greater reputation cost they face in any IPO failure as a result of poor underwriting/auditing quality. We thus offer the following Hypothesis 2b:

Hypothesis 2b Ceteris paribus, the positive (negative) link between UAR and pre-IPO earnings management becomes weaker (stronger) when the reputation of the auditor/underwriter increases.

Legal Environment

The incentives of auditors and underwriters also change according to the legal environment. Francis and Wang (2008) provide evidence that earnings quality increases for firms that choose Big 4 auditors in countries with greater investor protection, as a strong legal environment and effective law enforcement result in an increased likelihood that client misreporting is detected and auditors are punished. Although Francis and Wang (2008) focus on the direct link between the legal environment and audit quality, we provide first evidence of how the legal environment may play a role via its effect on auditor and underwriter incentives throughout multiple IPO collaborations. In particular, we argue that a strong legal environment constrains the *collusion incentive* that drives a UAR by imposing increased scrutiny and costs on underwriters and auditors, and thus moderates the effect of the UAR on pre-IPO earnings management. We offer the following Hypothesis 2c.

Hypothesis 2c Ceteris paribus, the positive (negative) relation between a UAR and earnings management becomes weaker (stronger) when the legal environment is strong.

Empirical Design

Sample

Our initial sample consists of 1543 to-be-listed firms that filed for IPOs in the Chinese A-share market during 2006–2012. To count for all of the collaborations between an underwriter and an audit firm, we include to-be-listed firms regardless of whether their IPO applications were approved or denied by the CSRC. We focus on A-share issuers for three major reasons: first, there are no new B-share issuers during our sample period; second, firms issuing shares oversea (i.e., H-share issuers) are facing substantially different regulatory standards, including auditing and accounting requirements; and third, we rely on hand-collected information regarding auditor/underwriter and firm financial performance filed with the Chinese CSRC. Such information is not necessarily available for Chinese firms listed outside A-share. In addition, we start the sample selection at 2006, the earliest year in which firms that applied for IPOs were mandated to disclose their prospectuses on the CSRC website, and end it in 2012, as the CSRC shut down IPOs completely in 2013 to overhaul the application process.[11] We then exclude firms from the financial industry and firms with missing information to calculate the regression variables. We obtain the list of to-be-listed companies from the *Wind* database and hand-collect financial information from their prospectuses. We further collect information about auditor and underwriter reputation from the websites of the Chinese Institute of Certified Public Accountants (http://www.cicpa.org.cn) and the Securities Association of China (http://www.sac.net.cn), respectively. Our final sample contains 1368 unique firms, of which 1107 firms went through IPOs and 261 firms failed to go public. Panel A of Table 1 summarizes the sample selection procedure and Panel B depicts the sample distribution by year and industry.

Underwriter–Auditor Relationship

We adopt the variable UARRS to measure underwriter–auditor relationship, which is calculated as the number of IPO services provided by the underwriter with a specific audit firm divided by the total number of IPO services provided by that underwriter during the sample period (2006–2012), including both successful and unsuccessful IPO applications. Hence, a higher UARRS stands for more frequent collaborations and a closer relationship between the underwriter and audit firm. It is noteworthy that in constructing UARRS, we truncate the measure to zero if the number of cooperating services between the underwriter and audit firm equals one, as one-time collaboration is often occasional and non-recurring. In so doing, we grant a value of zero to underwriters who provided only one-time underwriting services during 2006–2012, otherwise, the UARRS value would be misleadingly high at 100 %. Our results remain qualitatively the same when replacing UARRS by the raw value of the number of collaborations between an underwriter and an audit firm, i.e., *UARaw* (see Table 10).

Pre-IPO Earnings Management

We adopt several different measures to capture pre-IPO earnings quality. In the main analyses, we use abnormal accruals estimated based on modified Jones model [see Eqs. (1) and (2) below]. We obtain firms' financial information from their prospectuses filed with the CSRC, in which they are mandated to provide audited financial statements for a consecutive three years prior to their IPO year.

$$\frac{\mathrm{ACC}_{jt}}{\mathrm{TA}_{jt-1}} = \beta_0 + \beta_1 \frac{1}{\mathrm{TA}_{jt-1}} + \beta_2 \frac{\Delta\mathrm{REV}_{jt}}{\mathrm{TA}_{jt-1}} + \beta_3 \frac{\mathrm{PPE}_{jt}}{\mathrm{TA}_{jt-1}} + \varepsilon_{jt} \tag{1}$$

$$\frac{\mathrm{ACC}_{jt}{}'}{\mathrm{TA}_{jt-1}} = \beta_0 + \beta_1 \frac{1}{\mathrm{TA}_{jt-1}} + \beta_2 \frac{(\Delta\mathrm{REV}_{jt} - \Delta\mathrm{REC}_{jt})}{\mathrm{TA}_{jt-1}} + \beta_3 \frac{\mathrm{PPE}_{jt}}{\mathrm{TA}_{jt-1}} + \varepsilon_{jt} \tag{2}$$

where ACC is total accruals that equal to net income minus cash flow from operations (i.e., cash flow approach). TA denotes the total assets. ΔREV equals change in sales revenue. PPE represents gross property, plant, and equipment and ΔREC equals changes in accounts receivable.

Following prior literature (e.g., Dechow et al. 1995; Ashbaugh-skaife et al. 2008), we first estimate Eq. (1) using *all A-share firms that have been listed for more than one year* for each industry-year group, conditional on having at least 10 observations (e.g., DuCharme et al. 2001). We then use parameter estimates from Eq. (1) to calculate expected total accruals based on Eq. (2) for each IPO applicant in our sample within the corresponding industry-year group.

A firm's unadjusted abnormal accruals are set equal to the difference between actual accrual and expected accrual predicted using Eq. (2). Our earnings quality measure, DA,

[11] CSRC No. 32, "Administrative Measures for the Initial Public Offering and Listing of Stocks" (CSRC 2006; http://en.ce.cn/Markets/news/201407/03/t20140703_3090239.shtml).

Table 1 Sample selection

	Obs.
Panel A: Sample selection process	
Initial observations	1543
Eliminate observations pertaining to the banking, insurance, and other financial industries	(20)
Eliminate observations whose data required to measure regression variables are not available	(155)
Available observations	1368
To-be-listed firms whose IPO applications were approved by the CSRC	1107
To-be-listed firms whose IPO applications were denied by the CSRC	261

Industry	Year							Subtotal by industry	%
	2006	2007	2008	2009	2010	2011	2012		
Panel B: Sample distribution by year and industry									
Energy	1	5	4	1	8	8	2	29	2.12
Materials	13	31	20	32	68	63	28	255	18.64
Industrials	19	33	19	49	114	83	58	375	27.41
Consumer Discretionary	11	14	18	24	45	65	32	209	15.28
Consumer Staples	3	8	5	7	28	13	13	77	5.63
Health Care	2	4	8	17	26	28	18	103	7.53
Information Technology	1	2	3	1	0	0	0	7	0.51
Real Estate	10	28	16	40	78	66	59	297	21.71
Telecommunication Services	0	2	1	0	1	1	1	6	0.44
Utilities	1	0	1	1	3	3	1	10	0.73
Subtotal by year	61	127	95	172	371	330	212	1368	100
%	4.46	9.28	6.94	12.57	27.12	24.12	15.50		

Panels A and B of this table report the sample selection procedure and the distribution of our regression sample by year and industry

is the average value of calculated abnormal accruals for each IPO issuer across the period leading to their IPO year. As such, a higher value of DA indicates more abnormal accruals and lower earnings quality.

Alternatively, we measure earnings quality using: (1) the positive value of DA (+DA), as prior research shows that auditors are more concerned with constraining income-increasing accruals (Becker et al. 1998); (2) the absolute value of DA (|DA|); (3) performance-matched discretionary accruals based on the model in Kothari et al. (2005) (DA_PMADJ); (4) non-core operating income (Chen and Yuan 2004); and (5) ROA-based measures adopted by Aharony et al.(2000) and Kao et al.(2009). Our results remain qualitatively the same when using above measures (see "Further Analyses" section).

Empirical Model Specification for Hypothesis 1

Hypothesis 1 regards the effect of UAR on pre-IPO earnings management. We adopt the following OLS regression model to test Hypothesis 1:

$$\begin{aligned} \mathrm{DA} = {} & \alpha_0 + a_1\mathrm{UARRS} + a_2\mathrm{AUDPOL} + a_3\mathrm{UWPOL} \\ & + a_4\mathrm{INDSPEC} + a_5\mathrm{AUD10} + a_6\mathrm{UW5} + a_7\mathrm{SIZE} \\ & + a_8\mathrm{ROA} + a_9\mathrm{LEV} + a_{10}\mathrm{OCF} + a_{11}\mathrm{GROWTH} \\ & + a_{12}\mathrm{FIRMAGE} + a_{13}\mathrm{FIRST} + a_{14}\mathrm{DUAL} \\ & + a_{15}\mathrm{INDR} + a_{16}\mathrm{BOARD} + a_{17}\mathrm{MANSHR} \\ & + a_{18}\mathrm{STATE\%} + a_{19}\mathrm{LEGAL} \\ & + \text{year indicator} + \text{industry indicator} + \varepsilon \end{aligned} \tag{3}$$

In Model (3), the dependent variable is DA, the average value of discretionary accruals estimated based on the modified Jones model (e.g., Dechow et al. 1995). The variable of interest is UARRS, which captures the frequency of underwriter–auditor collaborations across different IPO underwritings. When the *collusion* (*efficiency*) *incentive* plays a dominant role, we expect UARRS to have a significantly positive (negative) effect on pre-IPO earnings management (DA), which can be translated into a positive (negative) coefficient on UARRS.

We include a set of controls that are suggested to affect firm earnings management by prior literature (e.g., Choi et al. 2012; Frankel et al. 2002; Johnson et al. 2002; Lim

and Tan 2010; Reichelt and Wang 2010). First, we control for political connection of underwriter and that of auditor (i.e., UWPOL and AUDPOL). UWPOL equals one if the underwriter is owned by the state, and AUDPOL equals one if any audit partner is appointed to the regulatory committee that screens prospective IPO companies (Yang, 2013).[12] We conjecture that politically connected underwriter and auditor may facilitate collusion behavior given that they could lobby for preferential treatment for IPO issuers and are facing lower litigation risk (e.g., Li et al. 2008; Zhou and Li 2016). We thus expect positive coefficients for UWPOL and AUDPOL. Second, we control for audit firm industry specialization using INDSPEC, which equals one when the audit firm has the largest market share in the industry and zero otherwise. Prior studies (e.g., Lim and Tan 2010; Reichelt and Wang 2010) indicate that audit firm industry specialization constrains earnings management. We thus predict a negative coefficient for INDSPEC. We further include AUD10 and UW5 to control for auditor and underwriter reputation, as reputable auditors/underwriters could help deter earnings management of IPO firms (e.g., Boulton et al. 2011; Chen et al. 2013). AUD10 equals one if the audit firms' annual income is ranked as the top ten by the CICPA (Chinese Institute of Certified Public Accountant) in a given year and zero otherwise; UW5 equals one if the underwriter's annual income is ranked as the top five by the SAC (Securities Association of China) and zero otherwise (e.g., Chen et al. 2001; Boulton et al. 2011).[13]

Next, we control for firm-specific characteristics that are suggested to affect firm earnings management (e.g., Cohen and Zarowin 2010; Choi et al. 2012; Frankel et al. 2002; Johnson et al. 2002). Specifically, we control for firm size using SIZE (natural logarithm of a firm's total assets), and firm profitability using ROA (return on assets), LEV (ratio of total liabilities to total assets), OCF (operating cash flows scaled by lagged assets), and GROWTH (change in sales revenue). Finally, we include FIRMAGE (the natural logarithm of the number of years since a firm was established), as older firms in China are more likely to engage in earnings management (e.g., Chen et al. 2001; DeFond et al. 2000).

Prior literature suggests that effective corporate governance constrains earnings management (e.g., Davidson et al. 2005; Klein 2002; Xie et al. 2003). We account for such an effect by including FIRST (the percentage of shares owned by the controlling shareholder), DUAL (an indicator variable that equals one if the CEO and chairman are the same person and zero otherwise), INDR (percentage of independent directors), BOARD (the natural logarithm of the number of directors serving on the board), and MANSHR (the percentage of shares held by management) in Model (3).

We further control for STATE% and LEGAL. STATE% denotes the percentage of share held by the state. LEGAL captures legal environment development in a given province per year. Specifically, LEGAL measures the development of market intermediaries, such as lawyers, auditors, and industry associations, the efficiency of the local courts and the protection of property rights (Fan et al. 2011).[14] Finally, we include year and industry indicators to control for year and industry fixed effects.

In this study, all variables (unless specified) are measured based on average values in periods before the IPO year. In addition, all continuous variables are winsorized at the top and bottom one percent to avoid the effects of extreme values. Please see Appendix Table for variables definitions in details.

Empirical Model Specification for Hypotheses 2a, 2b, and 2c

Hypothesis 2a is regarding the effects of underwriter/auditor political connection on the association between UAR and pre-IPO earnings management. We first perform the modified regression Model (3) with indicator variable UWPOL excluded on subsamples whose underwriters are with and without political connections. Similarly, we run modified Model (3) with AUDPOL excluded on subsamples whose auditors are with and without political connections.

We then examine Hypothesis 2b, which refers to the effects of underwriter and auditor reputation on the association between UAR and pre-IPO earnings management, by regressing modified Model (3) with the indicator variables AUD10 and UW5 excluded on three different subsamples classified based on auditor and underwriter

[12] Alternatively, we measure audit firm political connection by an indicator variable that equals one if the audit firm used to belong to Chinese government prior to the disaffiliation program initiated around 1997–1998 and zero otherwise. Our conclusion remains unchanged.

[13] Chen et al. (2011) measure auditor reputation (AUD') as one if the audit firm is one of the largest eight (i.e., Big 4 and largest 4 Chinese firms). Chen et al. (2013) measure underwriter reputation (UW') as one if the underwriter's market share is among top 25 %. Our measure of AUD10 (UW5) is closely correlated with AUD' (UW'), and in a robustness check our results (untabulated) are qualitatively similar when measuring auditor and underwriter reputation using alternative measures of AUD' and UW'.

[14] Fan et al. (2011) index covers a period till year 2009. In main analyses, we take the value of year 2009 index as index values of 2010–2012. Moreover, we use the average growth rate of the index in prior one-/two-/three-year period in a given province to predict the index in the corresponding province for year 2010–2012. Our results remain unchanged.

reputation. In particular, we categorize more reputable auditors and underwriters (AUD10 = 1 and UW5 = 1) as subsample H–H, less reputable auditors and underwriters (AUD10 = 0 and UW5 = 0) as subsample L–L, and mixed combinations with more (less) reputable auditors and less (more) reputable underwriters as subsample H–L. When the collusion (efficiency) incentive plays a dominant role, we expect UAR to have a positive (negative) effect on pre-IPO earnings management and expect the effect to be more pronounced in subsample L–L (H–H).

Finally, we test Hypothesis 2c using the modified Model (3) with the variable LEGAL excluded. We partition the sample into subsamples with strong and weak legal environments based on the sample median value of LEGAL.[15] Hypothesis 2c posits that stricter investor protection has a constraining effect on the auditor–underwriter collusion incentive, which translates into UAR having a more (less) pronounced positive (negative) effect on pre-IPO earnings management in the subsample with a weak (strong) legal environment.

Empirical Results

Descriptive Statistics

Panel A of Table 2 reports the descriptive statistics of our regression variables. The mean value of DA is 0.066, revealing that the magnitudes of discretionary accruals is about 6.6 %. The mean value of UARRS is 9.7 %, suggesting that repeated collaboration is not uncommon in the Chinese IPO market.

Panel B of Table 2 reports the differences in the mean (median) value of variables between subsamples with high and low UAR, classified based on sample median of UARRS. In Panel B, the mean value of DA is significantly higher in the high-UAR group, and the median value of DA is marginally higher in high- than low-UAR group (one-tailed significant at 10 %). These findings provide preliminary evidence that the collusion incentive plays a dominant role in the UAR. Moreover, as shown in Panel B, AUDPOL (auditor political connection), AUD10 (auditor reputation), and LEV (firm leverage ratio) are significantly higher in high-UAR group, while INDSPEC (audit firm industry specialization) and UW5 (underwriter reputation) are significantly lower in high- than low-UAR group. Panel C of Table 2 reports the distributions of number of auditors, underwriters, and IPOs by UARRS.

[15] When we include the variable LEGAL in the Hypothesis 2c regressions to control for any within-subsample variations in the legal environment, our results remain qualitatively the same.

Table 3 reports the Pearson correlation coefficients for the regression variables. Most of the pair-wise correlations among the independent variables are below 0.50, suggesting that collinearity is unlikely to be an issue in our analyses. The correlation between pre-IPO earnings management (DA) and UARRS is positive and significant at 5 % level, which seem to support the collusion story of UAR. As shown in Table 3, DA is closely related to a number of other factors including SIZE, ROA, LEV, OCF, GROWTH, BOARD, MANSHR, and STATE%. We thus examine the effect of UARRS on DA in multivariate regressions.

Regression Results of Hypothesis 1

Table 4 reports the regression results for Hypothesis 1, which is regarding the effect of UAR on pre-IPO earnings management. We empirically examine H1 using a sample of Chinese A-share to-be-listed firms from 2006 to 2012. Throughout the paper, we report the *t*-statistics based on robust standard errors adjusted for heteroscedasticity.

As shown in Table 4, the coefficient of UARRS is significantly positive (0.093, $t = 2.72$), suggesting that a closer UAR leads to a higher degree of earnings management in a to-be-listed firm. This finding indicates that the *collusion incentive* in the UAR dominates the *efficiency incentive* and leads to a deterioration in earnings quality. Furthermore, the coefficient estimate on UARRS reveals that one standard deviation increase in UARRS leads to about 1.06 % increase in (the magnitude of) earnings management (DA), equaling to about 16 % of the mean value of DA (0.066). Clearly, this amount is economically significant in addition to its statistical significance.

In terms of control variables, the coefficient on AUDPOL (political connection of auditor) is significantly positive. This is consistent with our conjecture that IPO issuers may obtain favorable treatment and face less scrutiny when their auditor is on the regulatory committee of the CSRC that screens the prospective IPOs. The coefficient for INDSPEC (audit firm industry specialization) is significantly negative, suggesting that auditor specialization has a constraining effect on earnings management (DeAngelo 1981; Watts and Zimmerman 1983). In addition, we find that firm size (SIZE) and operating cash flow (OCF) are negatively related to earnings management and that return on assets (ROA) and sales growth (GROWTH) are positively related to earnings management. These findings are consistent with previous studies on earnings management (e.g., Cohen and Zarowin 2010; Choi et al. 2012; Frankel et al. 2002; Johnson et al. 2002). While prior studies find that independent board directors help mitigate earnings management (Davidson et al. 2005; Klein 2002; Xie et al.

Table 2 Descriptive statistics

Variable	N	Mean	SD	Min	Q1	Median	Q3	Max
Panel A: Descriptive statistics								
DA	1368	0.066	0.154	−0.616	−0.008	0.049	0.123	0.968
UARRS	1368	0.097	0.114	0.000	0.000	0.072	0.140	0.600
UARaw	1368	5.060	5.031	1.000	1.000	3.000	7.000	23.000
AUDPOL	1368	0.266	0.442	0.000	0.000	0.000	1.000	1.000
UWPOL	1368	0.727	0.445	0.000	0.000	1.000	1.000	1.000
INDSPEC	1368	0.338	0.473	0.000	0.000	0.000	1.000	1.000
AUD10	1368	0.376	0.485	0.000	0.000	0.000	1.000	1.000
UW5	1368	0.305	0.461	0.000	0.000	0.000	1.000	1.000
SIZE	1368	20.056	1.049	18.302	19.356	19.844	20.546	24.715
ROA	1368	0.153	0.079	0.007	0.095	0.139	0.188	0.616
LEV	1368	0.173	0.162	0.000	0.000	0.143	0.300	0.583
OCF	1368	0.187	0.129	0.022	0.103	0.155	0.230	0.743
GROWTH	1368	0.373	0.299	−0.045	0.191	0.297	0.479	1.750
FIRMAGE	1368	2.077	0.622	0.6931	1.7918	2.1972	2.4849	3.1772
FIRST	1368	0.505	0.187	0.140	0.360	0.500	0.650	0.960
DUAL	1368	0.377	0.485	0.000	0.000	0.000	1.000	1.000
INDR	1368	0.366	0.048	0.250	0.333	0.333	0.400	0.750
BOARD	1368	2.144	0.190	1.099	2.079	2.197	2.197	2.890
MANSHR	1368	0.200	0.257	0.000	0.000	0.060	0.360	0.896
STATE%	1368	0.083	0.185	0.000	0.000	0.000	0.016	0.750
LEGAL	1368	9.652	3.623	2.060	6.065	9.920	12.590	16.610

Variable	High UARRS ($n = 684$)		Low UARRS ($n = 684$)		Mean diff. *t*-stat. high–low	Median diff. *z*-stat. high–low
	Mean	Median	Mean	Median		
Panel B: Difference of earnings management measures in high (low) UAR sample						
DA	0.075	0.054	0.056	0.045	2.23**	1.45
UARRS	0.172	0.140	0.022	0.000	32.26***	32.27***
UARaw	7.463	5.000	2.656	1.000	20.11***	21.09***
AUDPOL	0.288	0.000	0.244	0.000	1.84*	1.84*
UWPOL	0.728	1.000	0.727	1.000	0.06	0.06
INDSPEC	0.314	0.000	0.361	0.000	−1.83*	−1.83*
AUD10	0.475	0.000	0.276	0.000	7.75***	7.59***
UW5	0.265	0.000	0.345	0.000	−3.24***	−3.23***
SIZE	20.069	19.859	20.042	19.836	0.47	0.05
ROA	0.151	0.139	0.154	0.138	−0.69	0.69
LEV	0.182	0.152	0.164	0.139	2.10**	1.83*
OCF	0.188	0.157	0.185	0.152	0.49	0.45
GROWTH	0.377	0.297	0.370	0.297	0.41	0.83
FIRMAGE	2.064	2.197	2.090	2.197	−0.78	− 0.94
FIRST	0.503	0.490	0.508	0.504	−0.47	−0.52
DUAL	0.361	0.000	0.393	0.000	−1.23	−1.23
INDR	0.366	0.333	0.365	0.333	0.52	0.48
BOARD	2.145	2.197	2.144	2.197	0.12	0.56
MANSHR	0.197	0.053	0.202	0.068	−0.35	−0.82
STATE%	0.075	0.000	0.091	0.000	−1.64	−2.16**
LEGAL	10.076	11.500	9.228	8.410	4.36***	4.65***

Table 2 continued

UARRS	No. of underwriters	No. of audit firms	No. of IPO cases
Panel C: Distribution of number of underwriter, auditor, and IPO by UARRS			
0	70	58	343
(0, 0.05)	9	35	204
(0.05, 0.10)	20	28	335
(0.10, 0.15)	23	21	189
(0.15, 0.20)	23	17	148
(0.20,0.25)	13	9	55
(0.25, 0.30)	2	2	5
(0.30, 0.35)	7	6	26
(0.35, 0.40)	2	2	8
(0.40, 0.45)	6	5	24
(0.45, 0.50)	4	4	9
(0.55, 0.60)	8	5	22

Panel A of Table 2 reports summary statistics. Panel B of the Table reports mean/median differences between high- and low-UAR groups. Panel C depicts the distribution of number of underwriters, audit firms, and IPO cases by UARRS. ***, **, and * represents significance at the 1, 5, and 10 % level (two-tailed). See Appendix for variable definitions

2003), Table 4 shows a significantly positive coefficient for INDR (percentage of independent board directors).[16]

Regression Results of Hypothesis 2

Results of Hypothesis 2a

Hypothesis 2a relates to the effect of underwriter/auditor political connection on the relation between UARRS and DA. Table 5 reports the regression results. In particular, Columns (1) and (2) report the results of subsamples with and without politically connected underwriters, and Columns (3) and (4) of the table report the results for subsamples with and without politically connected auditors. As shown in Table 5, the coefficients for UARRS are significantly positive in Columns (1) (0.050, $t = 2.09$) and (3) (0.158, $t = 2.66$), whereas insignificant in Columns (2) and (4). These results suggest that the undesirable impact from UAR on earnings quality is more pronounced when firms' underwriter/auditor is politically connected, which corroborate our argument for Hypothesis 2a. Turning to the control variables, we find results similar to those reported in Table 4.

Results of Hypothesis 2b

Table 6 reports regression results of Hypothesis 2b, which regards how auditor and underwriter reputation influences the effect of UAR on pre-IPO earnings management. Columns (1)–(3) of Table 6 summarize the results in the subsamples with more reputable underwriters and auditors, less reputable underwriters and auditors, and a mixed combination of more (less) reputable underwriters and less (more) reputable auditors, respectively. The coefficients of UARRS are significantly positive in subsamples L–L and H–L, yet insignificant in subsample H–H. In addition, a comparison of Column (2) and (3) (untabulated) shows that the magnitude of the positive coefficient is greater in the L–L subsample than in the H–L subsample. These findings suggest that underwriter and auditor reputation mitigates the undesirable effect of UAR on earnings quality in to-be-listed firms. Moreover, in the H–L subsample, even when a reputable auditor/underwriter is involved, UAR may still harm earnings quality, which indicates the importance of considering UAR in the IPO process. Results in Table 6, taken together, validate Hypothesis 2b.

Results of Hypothesis 2c

Table 7 summarizes the regression results for Hypothesis 2c that addresses the moderating effect of legal environment on

[16] This could be caused as we measure earnings quality using the raw value of discretionary accruals, where a positive coefficient may indicate that independent board increases positive DA, decreases the magnitude of negative DA, or both. In further analyses (see the section of "Further Analyses"), we adopt +DA as an alternative measure of earnings quality and find insignificant coefficient for INDR (untabulated). In this regard, our finding on board independence does not contradict with prior evidence.

Table 3 Correlation matrix

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	DA	1.00																				
2	UARRS	*0.06*	1.00																			
3	UARaw	0.01	***0.25***	1.00																		
4	AUDPOL	***0.08***	0.04	−0.01	1.00																	
5	UWPOL	−0.04	0.03	***−0.16***	0.05	1.00																
6	INDSPEC	*−0.05*	−0.04	−0.01	−0.03	−0.00	1.00															
7	AUD10	−0.01	***0.19***	0.05	***0.18***	***0.11***	0.01	1.00														
8	UW5	−0.02	***−0.16***	***0.37***	0.00	−0.05	*0.06*	−0.01	1.00													
9	SIZE	***−0.27***	−0.04	−0.01	*−0.06*	***0.13***	0.00	***0.13***	***0.10***	1.00												
10	ROA	***0.29***	−0.03	0.01	***0.10***	−0.01	0.02	0.04	***0.08***	***−0.40***	1.00											
11	LEV	***−0.10***	0.04	*0.06*	***−0.12***	−0.04	−0.03	−0.03	−0.02	***0.26***	***−0.36***	1.00										
12	OCF	***−0.14***	−0.02	0.03	*0.06*	−0.01	0.01	0.02	0.05	***−0.25***	***0.67***	***−0.26***	1.00									
13	GROWTH	***0.09***	−0.01	0.00	*0.06*	0.00	−0.02	−0.01	0.00	***−0.11***	***0.27***	***−0.08***	***0.33***	1.00								
14	FIRMAGE	−0.05	0.00	−0.02	0.04	0.03	***0.11***	0.05	0.03	0.03	−0.04	***−0.10***	−0.04	***−0.11***	1.00							
15	FIRST	*−0.07*	−0.02	0.05	−0.02	*0.06*	0.02	*0.06*	0.04	***0.19***	*−0.07*	0.03	*−0.07*	***−0.10***	−0.03	1.00						
16	DUAL	0.03	−0.01	0.01	0.03	−0.00	*0.06*	0.04	0.03	***−0.15***	***0.12***	***−0.11***	*0.07*	***0.10***	***0.07***	0.03	1.00					
17	INDR	0.05	−0.02	0.04	0.01	***−0.07***	0.02	−0.01	0.04	−0.03	***0.09***	0.02	0.04	0.00	−0.02	***0.15***	***0.08***	1.00				
18	BOARD	***−0.08***	0.01	−0.05	−0.04	***0.11***	0.00	0.02	−0.01	***0.26***	***−0.16***	***0.07***	***−0.08***	−0.03	0.01	***−0.10***	***−0.09***	***−0.49***	1.00			
19	MANSHR	***0.07***	−0.01	−0.00	0.05	***−0.07***	0.02	−0.02	0.05	***−0.25***	***0.19***	−0.04	***0.11***	***0.11***	0.04	***−0.16***	***0.37***	***0.16***	***−0.16***	1.00		
20	STATE%	***−0.11***	−0.03	***−0.11***	−0.00	***0.13***	−0.03	*0.05*	−0.04	***0.38***	***−0.21***	−0.01	***−0.10***	***−0.10***	*−0.05*	***0.20***	***−0.21***	***−0.08***	***0.26***	***−0.26***	1.00	
21	LEGAL	0.00	*0.07*	***0.12***	−0.03	0.02	0.02	***0.13***	0.00	***−0.09***	***0.13***	−0.05	***0.11***	−0.00	0.03	0.00	***0.09***	***0.08***	***−0.14***	***0.08***	***−0.22***	1.00

This reports the correlation coefficient matrix among regression variables. Correlation coefficients are highlighted in *bold* (*italic*) if they are significant at the 1 % (5 %) level. See Appendix for variable definitions

Table 4 The influence of UAR on pre-IPO earnings management (Hypothesis 1)

Variable	The dependent variable = DA	
	Coefficient	*t*-stat.
UARRS	0.093***	2.72
AUDPOL	0.017**	2.11
UWPOL	−0.008	−0.88
INDSPEC	−0.019**	−2.51
AUD10	−0.007	−0.97
UW5	−0.004	−0.54
SIZE	−0.027***	−7.67
ROA	1.207***	12.47
LEV	−0.017	−0.92
OCF	−0.760***	−10.85
GROWTH	0.060***	2.80
FIRMAGE	−0.012	−1.58
FIRST	−0.028	−1.49
DUAL	−0.004	−0.51
INDR	0.146*	1.81
BOARD	0.020	0.87
MANSHR	−0.018	−0.93
STATE%	0.023	1.36
LEGAL	−0.001	−0.12
Intercept	0.483***	5.10
Industry indicators	Included	
Year indicators	Included	
Adjusted R^2	34.13 %	
Number of obs.	1368	

This table reports the regression results of Hypothesis 1, regarding the impact from UAR on pre-IPO earnings management using a sample of 1368 Chinese to-be-listed firms from 2006 to 2012. ***, **, and * represent the 1, 5, and 10 % levels of significance (two-tailed). See Appendix for variable definitions

the relation between UAR and pre-IPO earnings management. Columns (1) and (2) report the results for clients located in strong versus weak legal environments. The coefficient of UARRS is significantly positive in Column (2) yet insignificant in Column (1), indicating that stricter investor protection and effective legal enforcement attenuate the positive link between UAR and pre-IPO earnings management. These findings are consistent with Hypothesis 2c.

In general, the preceding findings related to the moderating roles of underwriter and auditor political connection, underwriter and auditor reputation, and the legal environment deepen our understanding of the dynamic link between UAR and earnings quality in to-be-listed firms, and further suggest the potential channels for investors and regulators to deter opportunistic reporting behavior around IPOs.

Further Analyses

To better understand the impacts of UAR on pre-IPO earnings management, we conduct cross-sectional analyses on: (1) audit firm industry specialization; (2) listing requirements on the Main, SME (Small- and Medium-sized Enterprises) and the Venture Boards; and (3) audit firm liability exposure.

Audit Firm Industry Specialization

Audit firms with industry specialization tend to provide high quality audits (Bell et al. 2005; DeAngelo 1981; Lim and Tan 2008, 2010; Reichelt and Wang 2010). Industry specialists have stronger incentives to maintain independence due to greater investment in technology development and reputation (DeAngelo 1981; Watts and Zimmerman 1983). Therefore, we expect a negative impact of audit firm industry specialization on the association between UAR and pre-IPO earnings management. We test this conjecture by performing modified Model (3), with variable INDSPEC excluded, on subsamples with high ($n = 462$) versus low ($n = 906$) audit firm industry specialization. As shown in Panel A of Table 8, the positive impact from UAR on earnings management is more pronounced in low industry specialization subsample, which validates our prediction.

Listing on the Main, SME, or Venture Boards

IPO issuers in China may choose to be listed in the Main Board, the SME Board, or the Venture Board. Firms listed in different boards have distinct characteristics and face different requirements, i.e., the financial requirements imposed become more relaxed from the Main Board to the Venture Board. We thus examine how listing on different boards affects the relation between UAR and pre-IPO earnings management. Empirically, we run Model (1) separately on firms filing for IPOs in the Main Board ($n = 123$), the SME Board ($n = 773$), and the Venture Board ($n = 472$). Columns (1), (2), and (3) of Panel B in Table 8 report the results for IPO issuers to-be-listed on the Main, SME, and Venture Board, respectively. The coefficient for UARRS is insignificant for IPO issuers in the Main Board, whereas significantly positive for issuers in the SME and Venture Boards. These results confirm the conjecture that different listing requirements play a crucial role on the association between UAR and pre-IPO earnings management.

Table 5 Partitioning analysis: Underwriter and auditor political connection (Hypothesis 2a)

Variable	The dependent variable = DA							
	(1) Underwriter with political connection		(2) Underwriter without political connection		(3) Auditor with political connection		(4) Auditor without political connection	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
UARRS	0.050**	2.09	0.175	1.59	0.158***	2.66	0.069	1.62
AUDPOL	0.015	1.60	0.034**	2.45	–	–	–	–
UWPOL	–	–	–	–	−0.019	−1.00	−0.005	−0.52
INDSPEC	−0.016*	−1.96	−0.011	−0.90	−0.009	−0.61	−0.024**	−2.57
AUD10	−0.001	−0.13	0.000	0.01	−0.031**	−2.00	0.004	0.40
UW5	−0.007	−0.77	−0.015	−1.34	−0.010	−0.78	−0.001	−0.06
SIZE	−0.025***	−6.77	−0.049***	−4.58	−0.039***	−4.66	−0.023***	−5.63
ROA	1.133***	10.59	1.413***	7.16	1.102***	6.58	1.267***	11.09
LEV	−0.016	−0.82	0.088**	2.05	0.011	0.27	−0.021	−0.97
OCF	−0.763***	−10.60	−0.804***	−5.71	−0.777***	−7.47	−0.756***	−8.45
GROWTH	0.063***	2.69	0.086*	1.94	0.092***	2.70	0.047*	1.75
FIRMAGE	−0.008	−0.98	−0.012	−1.30	−0.032*	−1.88	−0.006	−0.81
FIRST	0.003	0.16	−0.090***	−2.76	−0.053	−1.50	−0.022	−1.01
DUAL	−0.006	−0.67	0.006	0.49	0.013	0.78	−0.012	−1.28
INDR	0.072	0.78	−0.005	−0.03	0.182	1.06	0.133	1.42
BOARD	0.023	0.80	−0.012	−0.32	0.024	0.74	0.015	0.55
MANSHR	−0.009	−0.43	−0.039	−1.31	−0.029	−0.84	−0.014	−0.61
STATE%	0.004	0.24	0.037	0.68	0.058*	1.66	0.012	0.58
LEGAL	0.000	0.00	0.001	0.66	0.002	0.87	−0.001	−0.85
Intercept	0.447***	4.14	1.066***	4.45	0.782***	4.07	0.396***	3.58
Industry indicators	Included		Included		Included		Included	
Year indicators	Included		Included		Included		Included	
Adjusted R^2	36.68 %		29.21 %		40.30 %		31.11 %	
Number of obs.	995		373		364		1004	

This table reports the regression results of Hypothesis 2a, which regards the impact from auditor and underwriter political connection on the association between UAR and pre-IPO earnings management. Columns (1) ((2)) and Columns (3) ((4)) report regression results for firms whose underwriters are with (without) political connection and whose auditors are with (without) political connection, respectively. ***, **, and * represent the 1, 5, and 10 % levels of significance (two-tailed). See Appendix for variable definitions

Audit Firm Organizational Reform

The Chinese Ministry of Finance issued a regulation in 2010 that requires audit firms to change from a limited liability company (LLC) to a special partnership (SP) structure, in which audit partners convicted of negligence assume unlimited personal liability for the audit firm's unpaid debts. As such, auditors' litigation risk substantially increases in the post-reform regime. Prior studies indicate that litigation threat induces auditors to exert due care in the performance of audits (Chan and Pae 1998; DeFond and Subramanyam 1998; Heninger 2001; Lee and Mande 2003; Venkataraman et al. 2008), we thus utilize the 2010 reform as an external shock that increases audit quality. We run Model (3) based on subsamples in the pre-reform (2006–2009) ($n = 853$) and post-reform (2010–2012) ($n = 515$) period. Panel C of Table 8 shows that the coefficients for UARRS are significantly positive in both the pre- (0.090, $t = 2.09$) and the post-reform periods (0.085, $t = 1.84$), but the magnitude of coefficient is significantly larger in the pre-reform period, which corroborate our conjecture.

Using the Propensity Score Matching Approach to Mitigate the Endogeneity

Our findings may subject to the endogeneity of auditor screening and underwriter/client selection. Thus, we

Table 6 Partitioning analysis: Underwriter and auditor reputation (Hypothesis 2b)

Variable	The dependent variable = *DA*					
	(1) H–H		(2) L–L		(3) H–L	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
UARRS	0.053	0.30	0.122**	2.10	0.082**	2.04
AUDPOL	−0.020	−0.91	0.038**	2.29	0.009	0.91
UWPOL	0.001	0.03	−0.011	−0.82	−0.007	−0.59
INDSPEC	0.015	0.61	−0.021	−1.52	−0.031***	−3.08
AUD10	–	–	–	–	–	–
UW5	–	–	–	–	–	–
SIZE	−0.050***	−4.66	−0.024***	−3.51	−0.024***	−5.10
ROA	0.852***	3.39	1.370***	8.94	1.186***	9.30
LEV	0.022	0.33	−0.020	−0.71	−0.019	−0.75
OCF	−0.624***	−3.74	−0.906***	−7.61	−0.684***	−7.25
GROWTH	0.016	0.36	0.079**	2.40	0.065*	1.92
FIRMAGE	−0.015	−0.76	−0.005	−0.49	−0.012	−1.05
FIRST	0.046	0.85	−0.043	−1.22	−0.021	−0.87
DUAL	−0.008	−0.36	0.003	0.22	−0.013	−1.07
INDR	0.202	0.78	0.128	1.01	0.191*	1.74
BOARD	0.029	0.42	0.003	0.07	0.038	1.15
MANSHR	−0.063	−1.11	−0.031	−0.94	0.003	0.10
STATE%	0.125*	1.91	0.016	0.56	0.011	0.52
LEGAL	−0.003	−0.88	0.000	0.14	−0.000	−0.26
Intercept	0.898***	2.79	0.387**	2.25	0.362***	3.02
Industry indicators	Included		Included		Included	
Year indicators	Included		Included		Included	
Adjusted R^2	27.28 %		35.60 %		34.38 %	
Number of obs.	155		592		621	

This table reports the regression results of Hypothesis 2b, which regards the impact from audit and underwriter reputation on the association between UAR and pre-IPO earnings management. Columns (1)–(3) report the regression results based on subsamples that are associated with more reputable auditors and underwriters, less reputable auditors and underwriters, and more/less reputable auditors and less/more reputable underwriters, respectively. ***, **, and * represent the 1, 5, and 10 % levels of significance (two-tailed). See Appendix for variable definitions

adopt the PSM and the instrumental variable approaches to alleviate this concern. With respect to the propensity score matching (PSM) method, in the first stage, we include a set of variables to estimate the propensity of a high UAR (based on the sample median). Specifically, we use (1) CONCENT_AUD and CONCENT_UW, audit firm and underwriter market concentration in each province, calculated as the Herfindahl index of the number of clients for each audit firm (Choi et al. 2012) and underwriter, respectively; (2) AUDPOL and UWPOL, auditor and underwriter political connection; (3) AUD10 and UW5, auditor and underwriter reputation; (4) OVERLAP, equals one if the underwriter and auditor both specialize in the same industry and zero otherwise; (5) SUCCESS, equals the ratio of successful IPOs to the total number of collaborated IPO underwritings between the underwriter and audit firm; (6) DISTANCE, the reciprocal of geographic distance between an audit firm and the underwriter; (7) client-specific characteristics, including SIZE (firm size), ROA (return on assets), LEV

Table 7 Partitioning analysis: weak versus strong legal environment (Hypothesis 2c)

Variable	The dependent variable = DA			
	(1) Strong legal environment		(2) Weak legal environment	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.
UARRS	0.030	0.67	0.164***	3.07
AUDPOL	0.023**	2.06	0.014	1.12
UWPOL	−0.011	−0.89	0.003	0.21
INDSPEC	−0.014	−1.22	−0.027**	−2.58
AUD10	−0.006	−0.57	−0.007	−0.63
UW5	−0.006	−0.55	0.000	0.04
SIZE	−0.030***	−5.47	−0.025***	−5.03
ROA	1.311***	11.47	1.089***	7.35
LEV	−0.020	−0.78	−0.023	−0.82
OCF	−0.818***	−8.75	−0.708***	−7.14
GROWTH	0.065**	2.53	0.058*	1.83
FIRMAGE	−0.003	−0.28	−0.020*	−1.93
FIRST	−0.051*	−1.83	−0.005	−0.18
DUAL	−0.012	−1.12	−0.005	−0.37
INDR	0.038	0.34	0.251**	2.07
BOARD	0.008	0.24	0.037	1.30
MANSHR	−0.029	−1.06	−0.009	−0.36
STATE%	0.021	0.82	0.007	0.31
LEGAL	–	–	–	–
Intercept	0.565***	4.03	0.393***	2.98
Industry indicators	Included		Included	
Year indicators	Included		Included	
Adjusted R^2	36.24 %		32.01 %	
Number of obs.	684		684	

This table reports the regression results of Hypothesis 2c, which regards the impact from legal environment on the association between UAR and pre-IPO earnings management. Columns (1) and (2) report the regression results based on two subsamples located in strong and weak legal environment, respectively.***, **, and * represent the 1, 5, and 10 % levels of significance (two-tailed). See Appendix for variable definitions

(leverage ratio), INV (inventory scaled by total assets), REC (accounts receivable scaled by total assets), STATE% (the percentage of shares owned by the state), and (8) LEGAL (legal environment at provincial level).

Panel A of Table 9 reports the first-stage regression results. We find that UAR tends to vary with auditor and underwriter reputation (AUD10 and UW5), the experience of their previous collaborations (SUCCESS), their geographic proximity (DISTANCE), and the IPO client's complexity (REC) and state ownership (STATE%). These findings, taken together, provide new evidence on factors affecting the collaboration between underwriters and audit firms in the IPO market.

Panels B–E of Table 9 report the second-stage regression results for Hypotheses 1, 2a, 2b, and 2c, respectively, using a matched sample of 856 firm-year observations. Overall, these findings are consistent with those reported in Tables 4, 5, 6, and 7, suggesting that our results are robust after controlling for potential endogeneity issues.

Using Instrumental Variable Estimation to Mitigate the Endogeneity

It is noteworthy that the propensity score matching (PSM) method can only reduce selection bias due to observable but not unobservable factors. Also, PSM approach restricts inferences to firms whose characteristics can be found in both the sample and control groups.[17] To further alleviate

[17] We thank the anonymous referee for raising this point.

Table 8 Cross-sectional analysis

Variable	The dependent variable = DA			
	(1) Specialist		(2) Non-specialist	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel A: Cross-sectional analysis: considering audit firm industry specialization				
UARRS	0.030	0.80	0.092**	2.00
Controls	Included		Included	
Industry indicators	Included		Included	
Year indicators	Included		Included	
Adjusted R^2	31.32 %		36.79 %	
Number of obs.	462		906	

Variable	The dependent variable: DA					
	(1) Main board		(2) SME board		(3) Venture board	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel B: Cross-sectional analysis: the main, SME, and venture boards						
UARRS	−0.023	−0.34	0.082**	2.30	0.115*	1.66
Controls	Included		Included		Included	
Industry Indicators	Included		Included		Included	
Year Indicators	Included		Included		Included	
Adjusted R^2	44.21 %		42.54 %		29.30 %	
Number of Obs.	123		773		472	

Variable	The dependent variable = DA			
	(1) Pre-reform		(2) Post-reform	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel C: Cross-sectional analysis: Considering audit firm organization reform				
UARRS	0.090**	2.09	0.085*	1.84
Controls	Included		Included	
Industry indicators	Included		Included	
Year indicators	Included		Included	
Adjusted R^2	30.52 %		41.75 %	
Number of obs.	853		515	

This table reports results of cross-sectional analysis. Panel A reports regression results considering audit firm industry specialization, and specifically, Columns (1) and (2) of Panel A report results based on two subsamples of 462 firm-years with audit firm industry specialization and 906 firm-years without audit firm industry specialization, respectively. Panel B reports regression results considering the listing boards, and specifically, Columns (1), (2), and (3) of Panel B report results based on three subsamples of 123 firm-years listed in the main board, 773 firm-years listed in the SME board, and 472 firm-years listed in the venture board, respectively. Panel C reports regression results considering audit firm organizational reform, and specifically, Columns (1) and (2) of Panel C report results based on two subsamples of 853 to-be-listed firms from 2006 to 2009 and 515 to-be-listed firms from 2010 to 2012, respectively.***,**, and * represent the 1, 5, and 10 % levels of significance (two-tailed). See Appendix for variable definitions

the concern over endogeneity, we adopt an instrumental variable estimation approach. Specifically, we use two instruments unlikely to exert an effect on pre-IPO earnings management, but should have an indirect relationship through their effects on UAR. The instruments are AUDDIS and UWDIS, which capture the average distance between an audit firm to all underwriters and vice versa. AUDDIS (UWDIS) is calculated as the reciprocal of

Table 9 PSM analysis

Variable	Coefficient	*z*-stat.
Panel A: The first stage of PSM analysis (dependent variable = high UARRS)		
CONCENT_AUD	0.392	0.69
CONCENT_UW	−0.226	−0.36
AUDPOL	0.059	0.41
UWPOL	0.072	0.52
AUD10	0.797***	5.96
UW5	−0.813***	−5.52
OVERLAP	−0.196	−0.56
SUCCESS	1.669***	9.72
DISTANCE	0.542***	2.77
SIZE	−0.058	−0.76
ROA	−0.786	−0.82
LEV	0.425	0.85
INV	0.210	0.35
REC	−1.589***	−2.65
STATE%	−0.911**	−2.37
LEGAL	0.060***	2.85
Intercept	−12.323	−0.03
Industry and year indicators	Included	
Adjusted R^2	13.32 %	
Number of obs.	1368	

Variable	Coefficient	*t*-stat.
Panel B: The second stage of PSM analysis—Hypothesis 1 (dependent variable = DA)		
UARRS	0.089**	2.11
Other controls	Included	
Industry and year indicators	Included	
Adjusted R^2	35.37 %	
Number of obs.	856	

Variable	(1) Underwriter with political connection		(2) Underwriter without political connection		(3) Auditor with political connection		(4) Auditor without political connection	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel C The second stage of PSM analysis—Hypothesis 2a (Dependent variable = DA)								
UARRS	0.046*	1.75	0.190	1.38	0.179**	2.04	0.063	1.34
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	38.60 %		33.36 %		40.02 %		33.29 %	
Number of obs.	613		243		217		639	

Variable	(1) H–H		(2) L–L		(3) H–L/L–H	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel D The second stage of PSM analysis—Hypothesis 2b (dependent variable = DA)						
UARRS	0.253	0.83	0.094*	1.69	0.110**	2.04
Other controls	Yes		Yes		Yes	
Industry and year indicators	Included		Included		Included	
Adjusted R^2	24.28 %		41.04 %		42.39 %	
Number of obs.	83		392		381	

Table 9 continued

Variable	(1) Strong legal environment		(2) Weak legal environment	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel E: The second stage of PSM analysis—Hypothesis 2c (dependent variable = DA)				
UARRS	0.020	0.46	0.161**	2.22
Other controls	Included		Included	
Industry and year indicators	Included		Included	
Adjusted R^2	41.61 %		32.53 %	
Number of obs.	428		428	

Panels A and B–E of this table report the 1st and 2nd stage results of the PSM approach, respectively. Panels B–E report the regression results for Hypothesis 1 and Hypotheses 2a, 2b, and 2c, respectively. ***, **, and * represent the 1, 5, and 10 % levels of significance (two-tailed). See Appendix for variable definitions

average distance between an audit firm to all underwriters (the reciprocal of the average distance between an underwriter to all audit firms). We expect the geographic proximity facilitates the collaboration between auditors and underwriters and predict positive coefficients for AUDDIS and UWDIS. In the first stage, we regress UARRS on AUDDIS and UWDIS, along with other control variables specified in Model (3). In the second stage, we regress DA on predicted value of UARRS, i.e., UARRS'. We report the first- and second-stage results in Panel A, and B–E of Table 10.

In the first stage, the coefficient for AUDDIS and UWDIS are significantly positive. Our results for Hypotheses 1, 2a, 2b, and 2c are summarized in Panels B–E of Table 10, respectively, which are consistent with our previous findings. In sum, above analyses suggest our results are robust after accounting for potential endogeneity issue.

Alternative Measurement of UAR

We use the raw number of collaborations between underwriters and audit firms (UARaw) as an alternative measure of UAR and report the regression results for Hypotheses 1, 2a, 2b, and 2c in Panels A–D of Table 11, respectively. Throughout all of the columns, our findings for *UARaw* are consistent with those for UAR in Tables 4, 5, 6, and 7, suggesting that the results are robust to alternative measures of underwriter–auditor collaborations.

Alternative Measures of Pre-IPO Earnings Management

As mentioned previously, we adopt several alternative measurements of earnings quality, including (1) positive DA (i.e., +DA) given that income-increasing accruals management is of greater concern to regulators (e.g., Becker et al. 1998), (2) absolute value of DA, i.e., |DA| (e.g., Ashbaugh-Skaife et al. 2008), (3) performance-matched discretionary accruals estimated based on the model adopted by Kothari et al. (2005), i.e., DA_PMADJ, and (4) non-core operating income (NOI) (e.g., Chen and Yuan 2004). We report the regression results using above measures in Table 12. Panels A–D report the results for H1, H2a–H2c, respectively, which are consistent with our findings when measuring pre-IPO earnings management using DA.

Moreover, we follow Aharony et al. (2000) and Kao et al. (2009) to use earnings performance surrounding the IPO year, measured as net income divided by total assets excluding total cash, to document evidence of earnings management. Above studies show that ROA first increases and peaks in the IPO year then decreases in post-IPO period, which indicates earnings manipulation in IPO firms. If UAR positively affects earnings management, we expect the increase (decrease) of ROA in pre- (post-) IPO period is more pronounced for high-UAR group. We compare the change in ROA separately in the pre- and post-IPO period (i. e., $[t - 2, t]$ and $[t, t + 2]$) based on all sample firms and successful IPO issuers, respectively. As shown in Table 13, the results validate our prediction. Moreover, above mean differences between high- versus low-UAR groups are more pronounced for firms with politically connected auditor/underwriter, firms with less reputable auditor/underwriter, and firms in provinces with weak legal environment. Above findings provide further evidence for our hypotheses.

Consequences Associated with UAR

In this section, we analyze consequences associated with UAR to reinforce our finding on its undesirable impact. Specifically, we examine whether UAR leads to increased incidence of irregular activities in post-IPO periods. To do so, we adopt *Logit* regression model, with the dependent

Table 10 Instrumental variable estimation

Variable	Coefficient	*t*-stat.
Panel A: The first stage of IV analysis (dependent variable = UARRS)		
AUDPOL	0.005	0.74
UWPOL	−0.000	−0.03
INDSPEC	−0.002	−0.34
AUD10	0.048***	7.24
UW5	−0.024***	−3.96
SIZE	−0.009**	−2.30
ROA	−0.070	−1.16
LEV	0.032	1.19
OCF	0.007	0.23
GROWTH	−0.001	−0.09
FIRMAGE	0.006	1.64
FIRST	−0.006	−0.33
DUAL	−0.004	−0.58
INDR	−0.035	−0.51
BOARD	0.003	0.12
MANSHR	0.003	0.20
STATE%	−0.034	−1.47
LEGAL	0.001	1.41
AUDDIS	0.498**	2.33
UWDIS	0.568*	1.94
Intercept	0.093	0.90
Industry and year indicators	Included	
Adjusted R^2	7.17 %	
Number of obs.	1368	

Overconfidence tests of IV	(1)	(2)	(3)
	Wooldridge (1995)'s test	Sargan (1958)'s test	Basmann (1960)'s test
χ^2	1.5048	1.6211	1.5779
(*p* value)	0.2199	0.2029	0.2091

Variable	Coefficient	*t*-stat.
Panel B: The second stage of IV analysis—Hypothesis 1 (Dependent variable = DA)		
UARRS'	0.594*	1.83
Other controls	Yes	
Industry and year indicators	Included	
Adjusted R^2	Included	
Number of obs.	32.81 %	
Other controls	1368	

Variable	(1) Underwriter with political connection		(2) Underwriter without political connection		(3) Auditor with political connection		(4) Auditor without political connection	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel C: The second stage of IV analysis—Hypothesis 2a (Dependent variable = DA)								
UARRS'	0.803**	2.26	−4.739	−0.29	1.115**	2.21	0.405	1.26
Other controls	Yes		Yes		Yes		Yes	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	30.16 %		34.24 %		28.39 %		33.79 %	
Number of obs.	995		373		364		1004	

Table 10 continued

Variable	(1) H–H		(2) L–L		(3) H–L/L–H	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel D: The second stage of IV analysis—Hypothesis 2b (Dependent variable = DA)						
UARRS'	1.003	1.49	1.909**	2.46	0.236*	1.76
Other controls	Included		Included		Included	
Industry and year indicators	Included		Included		Included	
Adjusted R^2	23.23 %		35.27 %		36.02 %	
Number of obs.	155		592		621	

Variable	(1) Strong legal environment		(2) Weak legal environment	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel E: The second stage of IV analysis—Hypothesis 2c (dependent variable = DA)				
UARRS'	0.120	0.25	0.629*	1.91
Other controls	Yes		Yes	
Industry and year indicators	Included		Included	
Adjusted R^2	41.84 %		23.16 %	
Number of obs.	684		684	

Panels A and B–E of this table report the 1st and 2nd stage results of the IV estimation, respectively. Panels B–E report regression results for Hypotheses 1, 2a, 2b, and 2c, respectively. ***, **, and * represent the 1, 5, and 10 % levels of significance (two-tailed). See Appendix for variable definitions

variable being IRR (an indicator variable that equals one if a firm is involved in irregular activity in a given year, and zero otherwise) (e.g., Loebbecke et al. 1989). We obtain firm irregularity information from the CSMAR database. We then regress IRR on UARRS, with DA (pre-IPO earnings management measure) and other controls specified in Model (1) included as independent variables. Table 14 reports the regression results. Columns (1), (2), and (3) report irregular activities during t, $[t, t + 1]$, and $[t, t + 2]$, respectively. The coefficient for UARRS remains significantly positive across all columns, suggesting that UAR leads to higher post-IPO irregularities. The above results are robust when use frequency of firm irregular activities as dependent variable.

Conclusions

Using a sample of Chinese to-be-listed companies from 2006 to 2012, this study provides very first evidence of a positive association between UAR and pre-IPO earnings management, suggesting that the *collusion incentive* embedded in UAR dominates the *efficiency incentive* and leads to deteriorated earnings quality. While prior studies separately examine the choice of auditor/underwriter (e.g., Carter et al. 1998; Pittman and Fortin 2004), this study is the first to present the concept of the UAR and identify it as a determinant of earnings management around IPOs (e.g., Brau and Johnson 2009; Chen et al. 2013). We also document that the undesirable effect of UAR on earnings quality is more pronounced for firms whose auditor/underwriter is politically connected, firms with less reputable auditor (underwriter), firms located in provinces with weak legal environment, firms facing lax listing requirements, and firms whose auditors have low industry specialization or liability exposure. These moderating effects lend further credence that the observed negative relation between UAR and earnings quality is more likely to be causal than correlational (Guiso et al. 2008; Grullon et al. 2010; Jha and Chen 2014). Furthermore, we show that UAR is associated with greater irregular behavior in post-IPO period and poorer post-IPO financial performance, which further heighten the necessity of incorporating the nature of UAR in equity evaluation and resources allocation decisions. Our results are robust to alternative variable measurements, sample composition, additional controls, and to controlling for the endogeneity.

This study sheds light on the role of auditor and underwriter in the IPO market. Our results show that the *collusion incentive* plays a dominate role in UAR and induce undesirable impacts, including increased earnings management, more pronounced increase (decrease) of ROA in pre- (post-) IPO period, and more irregular behavior in post-IPO period. By jointly considering UAR

Table 11 Robustness checks using alternative measure of UAR

Variable	Coefficient	*t*-stat.
Panel A: The influence of UAR on pre-IPO earnings management —Hypothesis 1 (dependent variable = DA)		
UARaw	0.001**	2.17
Other controls	Included	
Industry and year indicators	Included	
Adjusted R^2	33.66 %	
Number of obs.	1368	

Variable	(1) Underwriter with political connection		(2) Underwriter without political connection		(3) Auditor with political connection		(4) Auditor without political connection	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel B: Partitioning analysis: Underwriter and auditor political connection—Hypothesis 2a (dependent variable = DA)								
UARaw	0.001**	2.22	−0.000	−0.15	0.002**	2.05	0.001	1.54
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	39.21 %		27.77 %		39.21 %		30.74 %	
Number of obs.	995		373		364		1,004	

Variable	(1) H–H		(2) L–L		(3) H–L/L–H	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel C: Partitioning analysis: Underwriter and auditor reputation—Hypothesis 2b (dependent variable = DA)						
UARaw	−0.000	−0.11	0.003*	1.89	0.001	0.96
Other controls	Included		Included		Included	
Industry and year indicators	Included		Included		Included	
Adjusted R^2	27.26 %		35.42 %		34.02 %	
Number of obs.	155		592		621	

Variable	(1) Strong legal environment		(2) Weak legal environment	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel D: Partitioning analysis: Legal environment—Hypothesis 2c (dependent variable = DA)				
UARaw	0.001	0.55	0.002**	2.84
Other controls	Included		Included	
Industry and year indicators	Included		Included	
Adjusted R^2	36.33 %		30.94 %	
Number of obs.	684		684	

Panels A–D of Table 11 report the regression results using UARaw as an alternative measure of UAR for Hypotheses 1, 2a, 2b, and 2c, respectively. ***, **, and * represent the 1, 5, and 10 % levels of significance (two-tailed). See Appendix for variable definitions

and impacts of auditor/underwriter, our findings change the conclusion from prior literature on market intermediaries (e.g., Brau and Johnson 2009; Chen et al. 2013). Moreover, this study adds to prior literature on determinants of earnings management and post-IPO performance (e.g., Ashbaugh-Skaife et al. 2008) and extends prior literature on the impacts of political connection, auditor/underwriter reputation, legal environment, auditor industry expertise and liability exposure, and listing requirements (e.g., Brau and Johnson 2009; Chen et al. 2013; Craswell et al. 1995; Francis and Wang 2008). Finally, our findings also provide important political implications for investors and regulators seeking to understand and oversee the Chinese IPO market.

Our findings in the Chinese context are important in their own right given China's increasingly important role in the world economy and the rapid development of its financial intermediaries service industry. Our results should provide suggestive evidence on the role of auditor and underwriter in other developing economies with high level of government intervention. However, we acknowledge the possibility that the institutional differences between China and the U.S., for example, the market share of underwriters

Table 12 Robustness checks using alternative measures of pre-IPO earnings management

Dependent variable Variable	|DA| (1)		+DA (2)		DA_PMADJ (3)		NOI (4)	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel A: The influence of UAR on pre-IPO earnings management—Hypothesis 1								
UARRS	0.081***	2.68	0.117***	3.29	0.084**	2.22	0.008**	2.06
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	30.16 %		31.85 %		22.41 %		11.02 %	
Number of obs.	1368		987		1368		1368	
Panel B: Partitioning analysis: Underwriter and auditor political connection—Hypothesis 2a								
B-1: Underwriter with political connection								
UARRS	0.037*	1.69	0.062**	2.33	0.067*	1.84	0.007*	1.69
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	33.19 %		36.81 %		23.68 %		11.55 %	
Number of obs.	995		722		995		995	
B-2: Underwriter without political connection								
UARRS	0.121	1.19	0.151	1.46	0.176	1.48	0.010	1.23
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	29.74 %		25.14 %		17.21 %		10.06 %	
Number of obs.	373		265		373		373	
B-3: Auditor with political connection								
UARRS	0.106**	2.04	0.128*	1.91	0.127*	1.81	0.008*	1.85
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	30.70 %		36.48 %		28.23 %		8.16 %	
Number of obs.	364		269		364		364	
B-4: Auditor without political connection								
UARRS	0.034	1.07	0.054	1.55	0.060	1.31	0.006	1.53
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	32.49 %		30.62 %		18.92 %		11.64 %	
Number of obs.	1,004		718		1,004		1,004	
Panel C: Partitioning analysis: Underwriter and auditor reputation— Hypothesis 2b								
C-1: H–H								
UARRS	−0.162	−0.98	−0.084	−0.51	−0.114	−0.44	0.033	1.48
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	25.53 %		33.80 %		16.84 %		12.75 %	
Number of obs.	155		112		155		155	
C-2: L–L								
UARRS	0.108**	2.17	0.165***	2.75	0.107*	1.79	0.011*	1.77
Other controls	Yes		Yes		Yes		Yes	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	29.36 %		30.45 %		23.58 %		4.64 %	
Number of obs.	592		433		592		592	
C-3: H–L/L–H								
UARRS	0.072**	1.99	0.109**	2.33	0.060	1.10	0.001	0.30
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	33.53 %		31.57 %		16.25 %		12.10 %	
Number of obs.	621		442		621		621	

Table 12 continued

Dependent variable Variable	|DA| (1)		+DA (2)		DA_PMADJ (3)		NOI (4)	
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Coefficient	*t*-stat.
Panel D: Partitioning analysis: Legal environment—Hypothesis 2c								
D-1: Strong legal environment								
UARRS	0.043	1.22	0.081*	1.91	−0.032	−0.62	0.005	1.04
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	30.78 %		35.69 %		22.72 %		8.19 %	
Number of obs.	684		494		684		684	
D-2: Weak legal environment								
UARRS	0.119**	2.41	0.135**	2.30	0.167***	2.68	0.010*	1.72
Other controls	Included		Included		Included		Included	
Industry and year indicators	Included		Included		Included		Included	
Adjusted R^2	29.57 %		29.23 %		16.97 %		12.53 %	
Number of obs.	684		493		684		684	

Panels A–D of Table 12 report the regression results using alternative measures of pre-IPO earnings management for Hypotheses 1, 2a, 2b, and 2c, respectively. ***, **, and * represent the 1, 5, and 10 % levels of significance, respectively, for two-tailed tests. See Appendix for variable definitions

Table 13 Robustness checks using ROA-based measures

Variable	Section A: pre-IPO					Section B: post-IPO				
	(1) High UAR		(2) Low UAR		*t*-stat.	(3) High UAR		(4) Low UAR		*t*-stat.
	N	Mean	N	Mean		N	Mean	N	Mean	
Panel A: Mean difference of ROA (Hypothesis 1)										
△ROA	684	0.393	684	0.296	1.54*	344	−0.238	344	−0.193	−2.16**
Panel B Mean difference of ROA partitioned based on auditor/underwriter political connection (Hypothesis 2a)										
Underwriter with political connection										
△ROA	498	0.424	497	0.324	1.28*	250	−0.235	250	−0.179	−2.06**
Underwriter without political connection										
△ROA	187	0.322	186	0.209	1.09	94	−0.239	94	−0.236	−0.08
Auditor with political connection										
△ROA	182	0.934	182	0.569	1.07	82	−0.245	81	−0.192	−1.38*
Auditor without political connection										
△ROA	502	0.364	502	0.293	1.09	263	−0.197	262	−0.225	1.20
Panel C Mean difference of ROA partitioned based on auditor/underwriter reputation (Hypothesis 2b)										
H–H										
△ROA	78	0.721	77	0.441	0.81	34	−0.250	34	−0.237	−0.25
L–L										
△ROA	296	0.381	296	0.260	1.71*	157	−0.241	157	−0.198	−1.75*
H–L										
△ROA	311	0.369	310	0.237	1.54*	152	−0.231	152	−0.181	−1.33*
Panel D Mean difference of ROA partitioned based on legal environment (Hypothesis 2c)										
Strong legal environment										
△ROA	342	0.383	342	0.276	1.27	172	−0.225	172	−0.191	−0.93
Weak legal environment										
△ROA	342	0.437	342	0.297	1.56*	172	−0.248	172	−0.198	−2.26**

***, **, and * represent the 1, 5, and 10 % levels of significance (one-tailed). See Appendix for variable definitions

Table 14 The influence of UAR on post-IPO irregularity

Variable	(1) 1 Year after IPO		(2) 2 Years after IPO		(3) 3 Years after IPO	
	Coefficient	*z*-stat.	Coefficient	*z*-stat.	Coefficient	*z*-stat.
UARRS	3.629**	2.13	1.638*	1.73	1.333*	1.74
DA	−0.956	−0.33	1.029*	1.86	0.034	0.07
Other controls	Included		Included		Included	
Industry and year indicators	Included		Included		Included	
Adjusted R^2	43.22 %		21.33 %		20.82 %	
Number of obs.	1005		1005		1005	

***, **, and * represent the 1, 5, and 10 % levels of significance, respectively, for two-tailed tests. See Appendix for variable definitions

and big audit firms, might limit the generalizability of our findings.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Appendix

See Table 15.

Table 15 Variable definition

Variable	Definition
Measurements of pre-IPO earnings quality	
DA	Average value of abnormal accruals estimated based on modified Jones model for periods prior to IPO
|DA|	Absolute value of DA
+DA	Positive value of DA, which indicates the magnitude of income increase earnings management
DA_PMADJ	Average value of performance-matched abnormal accruals based on Kothari et al.'s (2005) approach for periods prior to IPO
NOI	Average non-core operating income, calculated as the after-tax non-operating income divided by equity and adjusted by the industry median for periods prior to IPO (Chen and Yuan 2004)
Measurement of auditor–underwriter relationship	
UARRS	The cooperating service ratio between underwriters and auditors, calculated as the number of IPO underwritings collaborated between an underwriter and a specific audit firm scaled by the total number of underwriters' IPO services. For underwriter with only one-time IPO service, we measure UARRS as 0
UARaw	The number of collaborative IPO services for an underwriter with a specific audit firm
Other control variables	
AUDPOL	1 if any audit partner is assigned to the regulatory committee that screens prospective IPOs in the CSRC (Yang 2013) and 0 otherwise
UWPOL	1 if the underwriter is owned by the state and 0 otherwise
INDSPEC	1 if the audit firm has a largest number of clients in each two-digit CSRC industry code and 0 otherwise
AUD10	1 if the audit firm is one of the top 10 based on the CICPA annual ranking and 0 otherwise
AUD'	1 if the audit firm is one of the Big 8 and 0 otherwise (Chen et al. 2011)
UW5	1 if the underwriter is one of the top 5 based on the SAC annual ranking and 0 otherwise
UW'	1 if the underwriter's market share is among the top 20 % and 0 otherwise (Chen et al. 2013)
SIZE	Natural logarithm of total assets

Table 15 continued

Variable	Definition
ROA	Average value of return on total assets
LEV	Ratio of liabilities with interest to total assets
OCF	Average value of operating cash flows scaled by lagged total assets for periods prior to IPO
GROWTH	Average value of change in sales revenue for periods prior to IPO
FIRMAGE	Nature logarithm of the number of years since a firm is founded
DUAL	1 if the CEO and the chairman of the board are the same person
INDR	Ratio of the number of independent directors to the total number of directors on board
BOARD	Natural logarithm of the number of directors on board
MANSHR	Percentage of shares owned by a firm's top managers
STATE%	Percentage of shares owned by the state
LEGAL	Fan et al. (2011) index of market intermediaries development and institutional environment, which captures the development of market intermediaries such as lawyers, auditors, and various industry associations, the efficiency of the local courts and the protection of property rights
CONCENT_AUD	Audit firm market concentration in each province, measured as the Herfindahl index of the number of clients for each audit office (Choi et al. 2012)
CONCENT_UW	Underwriter market concentration in each province, measured as the Herfindahl index of the number of clients for each underwriter
OVERLAP	1 if the underwriter and the auditor are both a specialist in an industry and 0 otherwise
SUCCESS	Ratio of cooperating services which are approved by the CSRC between an underwriter and an audit firm
DISTANCE	Reciprocal geographic distance between the audit firm and the underwriter
INV	Inventories scaled by total assets
REC	Accounts receivables scaled by total assets
DIS_AUDUW	Reciprocal of aggregated distance between an audit firm to all underwriters
DIS_UWAUD	Reciprocal of aggregated distance between an underwriter to all audit firms
IRR	1 if the firm is involved in any irregular activities and 0 otherwise

Unless otherwise specified, variables used are measured in the latest fiscal year prior to firms' IPO

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