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Is the Corporate's Earning Quality
positively correlated with IPO Initial
Return?

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Abstract

This study investigates the influence of earnings quality on IPO Initial return in the Chinese A-share market from 2011 to 2019, categorizing it into primary market underpricing and secondary market overpricing. Earnings quality represents the extent of managerial earnings manipulation to present a favorable financial image. The findings reveal a significant impact of earnings quality on both underpricing and overpricing. Innovations of this paper include: 1) a robust estimation of overpricing and underpricing components using fair stock value calculations, enabling deeper insights into earnings quality impact; and 2) a comprehensive measurement of earnings manipulation by incorporating accrual earnings quality and real earnings management, thus enriching the analysis of "cooking the books" behavior.

Keywords: IPO Initial return, Chinese stock market, IPO underpricing, real earnings management, accrual earnings management, earnings performance

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1 Introduction

Globally, an anomalous phenomenon has emerged across various stock markets, characterized by the issuance price of new stocks being consistently lower than the closing price during the initial stages of public offerings. This study refers to this occurrence as the "IPO Initial Return." Notably, the Chinese stock market demonstrates a substantially elevated IPO Initial Return compared to its international counterparts. Contributing factors include the market's suboptimal pricing efficiency, underdeveloped financial policies and systems, and the limited expertise of its investor base.

The phenomenon of high initial returns on IPOs can lead to investors bearing greater post-market liquidity risks (Ellul and Pagano, 2006)¹ and exacerbate irrational speculative behavior, such as the popularity of "flipping new stocks" in China. This further amplifies financial risks caused by stock prices deviating from their intrinsic value, resulting in inflated bubbles. According to established theories, there are many factors contributing to high initial returns on IPOs, with the mainstream factors including capital market regulations, information asymmetry, and investor behavior-related financial factors. Throughout the development history of the Chinese capital market, the listing issuance review system has evolved from an initial approval system to an authorization system and is now transitioning towards a comprehensive registration system. Concurrently, the stock pricing system has gradually become an inquiry

system. As various systems improve, institutional factors will increasingly impact A-share initial returns. Therefore, this paper will not delve extensively into the influence of regulations on the IPO initial returns in the Chinese stock market.

The essence of capital markets is an information market, where information plays a crucial role in the stock market. Investors need to make investment decisions based on the information they possess, making the timeliness, effectiveness, and accuracy of information critical factors in determining the efficiency of capital market operations. For IPO stocks, due to the lack of mandatory disclosure requirements for companies prior to listing, the amount of publicly available information that investors can access is limited. Consequently, the financial statements provided during the company's listing stage serve as the primary basis for underwriters and investors to assess the company's profile, profitability, operational performance, financial status, and risk factors.

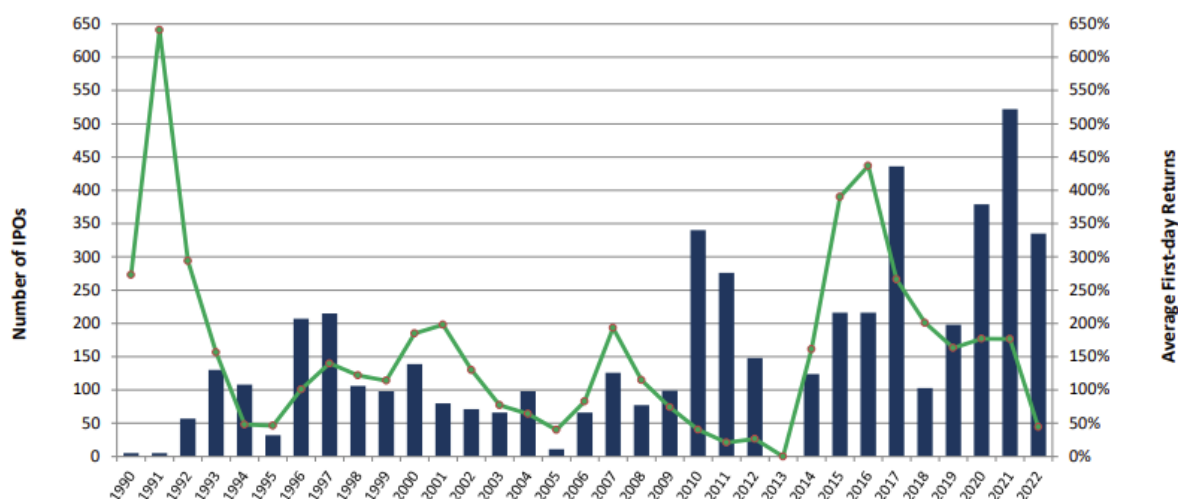


Figure 1. Annual Chinese IPO market conditions in China.²

According to Ritter's research (2022)² on the IPO initial return rates in various countries and regions, it is evident that the average IPO initial return rate in China's stock market is significantly higher than that of other countries and regions with large IPO volumes. The research spans from 1980 to 2019. The IPO initial return rates for various countries are presented in the table below:

Table 1: The number of IPOs and IPO Initial returns in countries around the world.

Country	Number of IPOs	Years	IPO Underpricing
China	4,983	1990-2022	162.2%
United States	13,757	1960-2022	17.5%
Australia	2,377	1976-2021	20.5%
Japan	4,065	1970-2022	49.0%
South Korea	2,246	1980-2021	52.7%
United Kingdom	5,309	1959-2020	15.7%
India	3,202	1990-2020	84.0%

As the data in the table 1 demonstrates, China's average IPO initial return rate is remarkably higher than the average level observed in mature capital markets. Thus, research on the initial return of IPOs in the Chinese stock market is of great significance.

1) Earning quality and earnings manipulation

Although the concept of earnings management remains a subject of debate in the accounting field, many scholars define it as the practice of maximizing one's own interests by controlling or adjusting externally reported accounting earnings information within the boundaries set by

accounting standards. Since the 1980s, earnings management and earnings quality have drawn considerable attention from academia and have experienced significant development since the 1990s. In Jones' 1991 study³ on earnings management, the author used international trade cases to illustrate earnings quality. Import and export trading companies employed discretionary manipulation of their financial statements to present their companies' operating conditions as unhealthy to secure preferential policy subsidies from financial authorities, thereby benefiting both the company and its executives. The collapse of Enron in the early 2000s, followed by major accounting scandals involving companies such as WCOM, Tyco, and Time Warner, led to increased scrutiny of earnings management practices.

In stock markets where information disclosure is of utmost importance, particularly in the Chinese stock market with its large number of individual investors, examining the impact of listed companies' earnings quality on IPO pricing and market prices is a valuable endeavor. From a theoretical perspective, existing literature primarily focuses on the textual features of listed companies' prospectuses and financial statements, rather than investigating the impact of earnings manipulation on stock prices. Researchers have mainly studied factors influencing IPO initial return rates, without delving into the effects on secondary market prices and primary market pricing. This paper aims to explore whether the "behind-the-scenes manipulation" of listed companies' financial statements will influence the IPO initial return and the underlying mechanisms. From a practical standpoint, the diverse earnings quality of listed companies reflects the immaturity of the capital market. Manipulative earnings management by listed

companies can have detrimental effects on the long-term development of the company, the capital market, and market investors. By examining the negative impact of earnings management during the IPO process, the anomalously high IPO initial return phenomenon in the Chinese stock market can be fundamentally addressed, providing protection for listed companies and investors. This paper can propose and establish a new regulatory and constraint system for the Chinese stock market, based on the various types of earnings management and their distinct impacts on issuers and investors.

2 Literature Review

1) IPO Initial Return

Previous research on factors influencing the initial return of Initial Public Offerings (IPOs) has proposed various hypotheses. Ljungqvist (2007)⁴ summarized four dominant theories regarding the formation of IPO initial returns, including information asymmetry, institutional factors, behavioral finance theory, and equity structure theory. Among these, the information asymmetry theory is the most widely accepted. Beatty and Ritter (1986)⁵ and Loughran and McDonald (2013)⁶ posited that firms with higher ex-ante uncertainty should experience higher first-day returns. Uncertainty was assessed by the number of uses of proceeds listed in the prospectus and the tone of S-1 documents. However, their research exhibits two notable limitations.

First, these studies on IPO initial returns are constrained by their focus on certain objectively

existing attributes of companies, such as the professionalism of auditing firms, the tone and document features of prospectuses, and differences in the equity structure and corporate governance of listed companies. These attributes do not provide a robust objective measure for listed companies. Consequently, this paper aims to identify a more objective standard for evaluating the information quality of listed companies. Second, these scholars attribute the cause of IPO initial returns solely to the underpricing of listed companies in the primary market. As such, their research conclusions are predicated on the assumption that the closing price during the initial listing stage is fair. This is why numerous studies have employed the term "IPO underpricing" interchangeably with the IPO initial returns mentioned in this paper. These studies rely on the first day's closing price of the IPO as the fair value of the stock, an assumption that lacks rigor. In practice, however, according to behavioral finance-related theories, the stock price during a company's IPO initial stage does not represent the actual price. As Aggarwal and Rivoli (1990)⁷ suggested, IPO initial returns do not arise from underpricing in the primary market but rather from investors' over-optimism about IPO prospects, leading to abnormal initial returns despite overpricing in the primary market. Therefore, it is crucial to distinguish between the initial return of the IPO into two components.

Although the conclusions of these IPO initial return studies may seem contradictory, they are not mutually exclusive. As Gao (2010)⁸ noted, IPO initial returns comprise both underpricing components in the primary market and overpricing components in the secondary market. Thus, this paper will dissect the IPO initial return into primary market underpricing and secondary

market overpricing and investigate the distinct influences exerted on these two components.

Thus, my rationale for choosing earnings quality and earnings management of listed companies as another research subject is that earnings quality is an aspect that can simultaneously impact both components of IPO initial returns. It is a common practice for companies to embellish their financial statements prior to listing. In the Chinese stock market, due to inherent institutional flaws and the lower professional level of individual investors, the information asymmetry theory and behavioral finance theory suggest that a company's earnings quality will increase IPO initial returns, simultaneously affecting both the underpricing part in the primary market and the overpricing part in the secondary market.

2) Earning quality

Regarding earnings quality, numerous studies have aimed to measure it, and almost all research conducted in China has employed "discretionary accruals" models to investigate the manipulation of accruals to achieve earnings management goals (e.g., Jones's model (1991)). These studies focus on the opportunistic use of accruals to window-dress and mislead users of financial statements. However, the Jones model is not suitable for measuring the manipulation of financial statements by listed companies, as it is based on the context of companies whitewashing their financial statements to obtain official protection from import/export trade. The Jones model assumes that a company's total accruals are determined by the company's accounts receivable, fixed assets, and other accounting data, and cannot be applied universally to all types of listed companies. Conversely, Dechow & Dichev (2002)'s model⁹ posited that even in the absence of intentional earnings management, accrual quality would be

systematically related to firm characteristics. The DD model attempts to disentangle "intentional" estimation errors from unintentional errors, as both imply low-quality accruals and earnings. Therefore, this paper opts for the DD model to measure earnings quality, which is more accurately assessed using cash flow data.

As capital market regulations continue to improve in various countries, corporate financial statement manipulations through accrual earnings management have become increasingly restricted by law. For instance, following the introduction of the Sarbanes-Oxley Act in the United States, as noted by Cohen (2008)¹⁰, listed companies in the US have indeed experienced a significant decline in accrual earnings management behavior through the manipulation of accrual items in accounting reports. However, as the incidence of accrual earnings management has decreased, some listed companies have resorted to manipulating the less easily detectable "real earnings management" to achieve their objectives. These companies manipulate the timing of operational, financing, and investing activities to mislead market investors and ultimately achieve their earnings management goals. Studies by Roychowdhury (2006)¹¹ and Chi (2011)¹² have shown that companies adjust their actual activities to influence reported earnings. They primarily employ three main mechanisms: reducing the cost of goods sold by increasing production, enhancing sales revenue through price discounts, and cutting discretionary expenditures such as research and development, advertising, and sales, general, and administrative expenses. Consequently, solely focusing on accrual earnings management does not effectively measure the earnings quality of listed companies, an aspect that has been

overlooked by many previous studies.

In summary, the innovative contributions of this study are as follows:

First, by calculating the fair value of listed companies' stocks, this study decomposes the IPO Initial Return into Underpricing in the primary market and Overpricing in the secondary market. This allows for a more rigorous analysis and differentiation of the impacts of earnings management on both the underwriters' pricing decisions and secondary market investors.

Second, this study offers a more robust measurement of corporate earnings quality. It compares the measurement capabilities of the Jones Model and the DD Model in assessing accrual earnings management while simultaneously evaluating earnings quality from the perspective of real earnings management. In comparison to using company characteristics and textual information to gauge information quality, this study's measurement approach is more accurate and objective.

3 Empirical Methods and Results

1) IPO Initial Return

In previous research, the phenomenon of IPO Initial Return has often been studied using the closing price on the first day of listing and the listing price. However, relying solely on the first day's data to measure IPO Initial Return is evidently insufficient and not robust. The Chinese stock market has an upper limit on price increases, and the popularity of newly listed stocks

often leads to consecutive daily limit-up occurrences. Therefore, this study adopts the closing price of the stock 30 days after listing as the market price for newly listed stocks. This paper aims to decompose IPO Initial Return into underpricing in the primary market and overpricing in the secondary market.

Specifically, previous research has used the market price during the initial listing period as the fair value of the stock. However, the market price during the initial listing period inherently contains a certain degree of overpricing in the secondary market. In this study, to measure IPO underpricing, the comparison should not be between the difference in market price and issuance price, but rather between the difference in issuance price and the fair value of the stock. The proportion of the market price that exceeds the listing price during the initial listing period is known as Initial Return. Nonetheless, this paper intends to decompose Initial Return into underpricing in the primary market and overpricing in the secondary market.

$$\text{Initial Return} = \frac{(P_{\text{market}} - P_{\text{offer}})}{P_{\text{offer}}}$$

$$\text{underpricing} = \frac{(P_{\text{fair}} - P_{\text{offer}})}{P_{\text{offer}}}$$

$$\text{overpricing} = \frac{(P_{\text{market}} - P_{\text{fair}})}{P_{\text{offer}}}$$

P_{market} represents the closing stock price on the 30th day after listing.

P_{offer} denotes the issuance price of the stock upon listing.

In this study, determining the **fair price** P_{fair} of a stock is essential. According to Kim and Ritter (1999)¹³ and Ritter and Welch (2002)¹⁴, accounting multiples fail to provide an effective explanation for IPO pricing. Consequently, this paper adopts the method proposed by Purnanandam and Swaminathan's (2004)¹⁵ to calculate the fair price. They posited that the long-term market price of a listed company represents its fair price.

$$\frac{P_{Fair}}{P_{offer}} = \frac{(P/E)_{market}}{(P/E)_{IPO}}$$

$(P/E)_{IPO}$ is Price-to-Earning Ratio of IPO company.

$(P/E)_{market}$ is the average Price-to-Earning Ratio of the comparable listed companies in the market.

In more detail, this calculation method assumes that for each company after going public, although the short-term stock market price is not the fair price (real price), the long-term stock market price will indefinitely approach the fair price. Therefore, using the P/E relative valuation method, the fair price of a company's stock during its initial public offering is calculated by comparing it to long-standing, stable-priced comparable companies within the same industry.

2) Earning quality

i. Measuring earnings quality through accruals

Accruals refer to the adjustments made to the timing of cash flow recognition from business activities under the accrual accounting method. The purpose of these adjustments is to enable earnings to better reflect a company's operational performance. Consequently, earnings can be represented as the sum of accruals and the net cash flow generated from operating activities, where the quality of accruals directly determines the quality of earnings. Sloan, R.G. (1996)¹⁶ considers accruals as an indicator of earnings quality.

Early research used simple measurement metrics, such as total accrual amounts (e.g., Healy 1985)¹⁷ and changes in total accruals (e.g., DeAngelo 1986)¹⁸ to represent earnings quality. More studies have employed specific financial variables (e.g., changes in revenue, net cash flow generated from operating activities) to regress on accruals, assessing a firm's normal level of accruals. The residual term derived from this regression represents abnormal accruals and is used as an indicator of earnings quality.

a) DD model

According to Dechow&Dichev (2002)'s Derivation result of $accruals_t$:

WCA is the working capital of the listing company. The subscript of cash flow is the time of actual receipt and payment of cash, and the superscript of cash flow is the time of accounting recognition. The prediction of working capital, is positively correlated with Past Cash Flows and Future Cash Flows and is negatively correlated with Current Cash Flows. So the DD's

Model is:

$$WCA_t = \alpha_0 + \alpha_1 CF_{i,t-1} + \alpha_2 CF_{i,t} + \alpha_3 CF_{i,t+1} + \varepsilon_t$$

The residuals from the regression reflect the accruals that are unrelated to cash flow realizations, and the standard deviation of these residuals is a firm-level measure of accrual quality, where higher standard deviation denotes lower quality. In this section of the paper, we discuss the following variables: $CF_{i,t-1}$ represents the net cash flow from operating activities of company i in year $t-1$; $CF_{i,t}$ represents the net cash flow from operating activities of company i in year t ; $CF_{i,t+1}$ represents the net cash flow from operating activities of company i in year $t+1$.

Note: All variables are deflated using the average total assets.

By separately regressing the cross-sectional data for each year across six major industry categories, we obtain the cross-sectional regression residuals ε_{it} for each firm in each year. We obtained the earnings quality of each publicly listed company during their respective listing periods.

b) Jones model

$$NDA_{i,t} = a_1 \left(\frac{1}{A_{i,t-1}} \right) + a_2 \left[\frac{(\Delta REV_{i,t} - \Delta AR_{i,t})}{A_{i,t-1}} \right] + a_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right)$$

$NDA_{i,t}$ represents the non-discretionary accruals of company i in year t .

$\Delta REV_{i,t}$ represents the difference in revenue between period t and period $t-1$ for company i .

$\Delta AR_{i,t}$ represents the difference in net accounts receivable between period t and period $t-1$ for

company i .

$PPE_{i,t}$ represents the total value of fixed assets such as plants and equipment for company i at the end of period t .

$A_{i,t-1}$ represents the total assets of company i at the end of period $t-1$.

a_1, a_2, a_3 are characteristic parameters for different industries and different years. By performing separate regressions for each of the six major industry categories on cross-sectional data for each year, the cross-sectional regression residuals ε_{it} for each company are obtained for each year. We obtained the earnings quality of each publicly listed company during their respective listing periods.

Firstly, the Jones model is primarily designed to measure the earnings quality of import and export businesses. However, pre-IPO companies may exhibit significant differences in terms of their business models, capital structures, and sources of income compared to import and export businesses. As a result, applying the Jones model to pre-IPO companies may lead to inaccurate assessments of earnings quality. Secondly, the Jones model mainly focuses on a company's accounting data. Pre-IPO companies often lack sufficiently long accounting data records, limiting the accuracy of the Jones model when applied to these companies. Additionally, the design of the Jones model is relatively complex, which may present difficulties for pre-IPO companies in practical application. Thirdly, the Jones model primarily targets changes in earnings quality resulting from intentional manipulation by accounting

personnel, while neglecting other factors that may affect earnings quality. The earnings quality of pre-IPO companies may be influenced by various factors such as market risk, management decisions, and macroeconomic environment. In contrast, the DD model can capture not only changes in earnings quality due to intentional manipulation by accounting personnel but also any other factors leading to a decline in earnings quality. Lastly, pre-IPO companies generally face higher business risks and uncertainties. Under such circumstances, fluctuations in earnings quality may be more pronounced, and the Jones model's ability to capture these fluctuations is limited. In comparison, the DD model is better suited for analyzing changes in earnings quality, thereby providing investors and regulators with a more accurate assessment of the earnings quality of pre-IPO companies. In summary, given the differences between pre-IPO companies and import and export businesses, as well as the limitations of the Jones model in analyzing the earnings quality of pre-IPO companies, this paper argues that the Jones model is less suitable for pre-IPO companies in the stock market compared to the DD model.

ii. Measuring earnings quality through real business

Considering the significant differences between the manipulation methods and objects in real earnings management and accrual-based earnings management, the purpose of real earnings management is to mislead stakeholders into believing that the company has achieved its expected financial targets through normal business activities. Moreover, real earnings management involves the manipulation of a company's actual operating activities rather than merely items in financial statements. Therefore, the measurement methods for real earnings

management have their own distinct approaches.

In accordance with Dechow (1998)¹⁹ and the Sugata Roychowdhury (2006)¹¹ model, this paper measures the level of real earnings management in enterprises. Roychowdhury posits that the normal operating cash flow is a linear function of the difference between current sales revenue and sales revenue. This leads to the construction of a cross-sectional regression model estimated by industry and year to calculate abnormal cash flow, as follows:

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{REV_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t}$$

$$\frac{PROD_{i,t}}{A_{i,t-1}} = b_0 + b_1 \frac{1}{A_{i,t-1}} + b_2 \frac{REV_{i,t}}{A_{i,t-1}} + b_3 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + b_4 \frac{\Delta REV_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t}$$

$$\frac{DISEXP_{i,t}}{A_{i,t-1}} = c_0 + c_1 \frac{1}{A_{i,t-1}} + c_2 \frac{REV_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t}$$

Abnormal operating cash flow: ε of CFO;

Abnormal production cost: ε of PROD;

Abnormal discretionary expense: ε of DISEXP;

$$TREM_{i,t} = (-1) \varepsilon \text{ of } CFO_{i,t} + \varepsilon \text{ of } PROD_{i,t} + (-1) \varepsilon \text{ of } DISEXP_{i,t}$$

$CFO_{i,t}$ represents the net operating cash flow of firm i in year t .

$PROD_{i,t}$ refers to the company's production cost, equivalent to the sum of the current operating cost and inventory change.

$DISEXP_{i,t}$ denotes the company's discretionary expenses, equal to the sum of sales expenses and administrative expenses.

$REV_{i,t}$ stands for firm i 's operating revenue in year t .

$\Delta REV_{i,t}$ signifies the change in operating revenue for firm i in year t .

$\Delta REV_{i,t-1}$ is the change in operating revenue for firm i in year $t-1$.

$A_{i,t-1}$ represents the elimination of scale effects using the total assets at the end of period $t-1$.

Industry and year regressions are conducted to obtain regression residuals for each indicator, which are then considered abnormal values.

The $TREM_{i,t}$ is calculated according to the formula, with larger values indicating higher levels of real earnings management.

Hence, this paper selects the residual values from the DD Model and the Roychowdhury (2006) model to measure the quality of accrual-based earnings and real earnings.

3) Regression model

This paper will conduct regression analysis on the relationship between IPO initial returns and earnings quality, and further regress the two components of IPO initial returns separately against earnings quality. Consequently, the main regression equations in this paper include the following three:

Examines whether a company's Earnings Quality is positively correlated with IPO

initial returns:

$$\text{Initial return}_{i,t} = \beta_0 + \beta_1 EQ_{i,t} + \beta_{\text{control}} X + \varepsilon \quad 1$$

Examines whether a company's Earnings Quality is positively correlated with IPO initial returns.

$$\text{underpricing}_{i,t} = \beta_0 + \beta_1 EQ_{i,t} + \beta_{\text{control}} X + \varepsilon \quad 2$$

Examines whether a company's Earnings Quality is positively correlated with IPO initial returns.

$$\text{overpricing}_{i,t} = \beta_0 + \beta_1 EQ_{i,t} + \beta_{\text{control}} X + \varepsilon \quad 3$$

$\beta_{\text{control}} X$ refers to the relevant literature, this paper selects the age of the enterprise, the asset size of the enterprise and the return on net assets as variables to control for the pre-IPO characteristics of the enterprise; the winning rate is selected to control for the market impact factors.

Therefore, the control variables are mainly selected as corporate age, corporate asset size and winning rate as control variables. The specific variable meanings and calculations are shown in the table below.

Table 2 Meaning of variables and calculation methods

Type	Variable name	Variable symbol	Meaning
Explained variables	Initial return	Initial return	30-day post-IPO returns for IPO companies
	Underpricing	Underpricing	$\frac{(P_{\text{fair}} - P_{\text{offer}})}{P_{\text{offer}}}$
	Overpricing	Overpricing	$\frac{(P_{\text{market}} - P_{\text{fair}})}{P_{\text{offer}}}$
Explanatory variable	Accrual Earning quality	EQ	Model residuals obtained through the DD model, represents the difference between the actual and estimated working capital of the Company.
	Real Earning quality	Real	Model residuals obtained through the Roychowdhury model, measuring the manipulation of earnings in financial statements by enterprises through genuine business activities.

Table 3 Meaning of control variables and calculation methods

Variable name	Explanation	Calculation method
Age	Age of the company at time of IPO	IPO year - year of inception, logarithmic
Size	Size of company assets at the time of IPO	-
Amount raised	Amount of funds raised	-
Market	Market Index Return for the month of IPO	$(T \text{ Day Market Closing Index} / (T-1) \text{ Day Market Closing Index}) \times 100\%$
Winning rate	Probability of winning applying for IPO shares	$(\text{Number of shares issued} / \text{number of shares validly subscribed}) \times 100\%$
Turnover	Frequency of stock traded on the day of listing.	$(\text{Volume within the day of IPO} / \text{Number of shares outstanding}) \times 100\%$
SOE	Whether the company is a state- owned enterprise	SOE=1, private=0
Industry	Dummy variables	Dummy variables
Year	Dummy variables	Dummy variables

EQ and real represents the independent variable set in this paper, which is the accrual earnings quality of listed companies before going public, calculated using the previously mentioned DD model and Roychowdhury model. The residual from the DD model and Roychowdhury model indicates the earnings quality of a company, with larger residuals suggesting lower earnings quality.

Based on the control variables table and referring to relevant literature, this paper selects firm age, firm asset size, funds raised, and whether the company is an SOE as variables to control for pre-IPO characteristics of the firm. Market index, winning rate, turnover, as well as industry and listing year are chosen to control for market influencing factors. The specific variable definitions and calculations are presented in the table above.

4) Data

In China's stock market, financial statement manipulation is prevalent due to the approval-based issuance system. Additionally, the Chinese stock market imposes stringent requirements on listed companies' profitability, capital market expectations, and social responsibilities. This study selects 1,135 companies listed on the Chinese A-share market between 2010 and 2019 as the research sample. The following sample screening procedures are then conducted: 1) Excluding companies in the financial and insurance industries, considering their unique characteristics. 2) Removing companies with incomplete variable data. The financial data of the listed companies are sourced from the WIND Information database, while the stock prices and earnings data are obtained from the CSMAR database.

The data used in this paper are derived from IPO-related information from the WIND database and earnings quality-related data from the CSMAR database. After screening, a total of 1,135 valid samples were obtained.

Table 4 Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
InitialReturn	1135	.748	.562	-.688	2.669
Underpricing	1135	.479	.488	-2.72	1.928
Overpricing	1135	.234	.813	-3.745	2.597
EQ	1135	.001	.001	0	.018
EQ(Jones model)	1135	.001	.001	0	.026
Real	1135	.043	.218	0	.893
Age	1135	2.686	.354	1.549	4.129
Size	1135	7688.389	27272.838	382.731	541941.14
Market	1135	.014	.056	-.143	.206
Winningrate	1135	.317	.852	.012	15.529
Turnover	1135	8.125	22.725	.007	95.149
SOE	1135	.135	.342	0	1
lnAmountraised	1135	5.985	.717	3.425	9.472

The descriptive statistics for the variables are presented below. As evidenced by the descriptive statistics, the IPO Initial Return varies significantly among different companies, with a considerable range: the minimum value is -0.668, while the maximum value reaches as high as 2.699. There is also a substantial disparity in the accrual-based earnings quality and real earnings quality across companies. The fact that the minimum value is very close to zero suggests that some companies have exceptionally high earnings quality.

Table 5 Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) InitialReturn	1.000											
(2) Underpricing	0.528	1.000										
(3) Overpricing	0.651	-0.168	1.000									
(4) EQ	0.119	0.167	0.009	1.000								
(5) Real	0.024	-0.039	0.055	0.030	1.000							
(6) Age	-0.002	0.014	-0.041	-0.011	-0.005	1.000						
(7) Size	-0.018	-0.091	0.027	-0.094	-0.010	-0.152	1.000					
(8) Market	0.233	0.107	0.182	0.038	0.001	0.003	-0.059	1.000				
(9) Winningrate	-0.230	-0.141	-0.080	-0.008	0.005	-0.145	0.086	-0.045	1.000			
(10) Turnover	-0.003	-0.006	-0.094	-0.071	0.020	-0.003	-0.031	-0.063	0.039	1.000		
(11) SOE	0.051	-0.026	0.093	-0.064	0.074	-0.030	0.153	0.002	0.114	0.034	1.000	
(12) lnAmountraised	-0.052	-0.034	-0.054	-0.057	-0.029	-0.097	0.074	-0.066	0.032	0.031	0.099	1.000

Table 5 primarily presents the correlation coefficients among all variables in this study. As shown in the table, the correlation coefficients between variables are all below 0.5 (except for Initial return, underpricing, and overpricing), indicating that the explanatory variables are independent of each other and there is no issue of multicollinearity. In this section, we pay particular attention to the correlation coefficient between Real and EQ. Since the correlation coefficient between these two variables is less than 0.5, there is no issue of multicollinearity in this research.

5) Regression results

i. IPO Initial return

Table 6: Regression Results of IPO Initial Return and Earnings Quality

InitialReturn	(1)	(2)	(3)
EQ	-29.056***		-28.84***
Real		-.117**	-.115**
Age	-.085***	-.084***	-.086***
Size	0***	0***	0***
Market	1.454***	1.48***	1.464***
Winningrate	.008	.007	.008
Turnover	-.005***	-.005***	-.005***
SOE	.114***	.128***	.122***
lnAmountraised	-.411***	-.404***	-.417***
d2012	-.333***	-.322***	-.331***
d2014	-.245***	-.26***	-.255***
d2015	.276***	.25***	.267***
d2016	.442***	.428***	.437***
d2017	.054	.048	.046
d2018	.104**	.088*	.095*
d2	.214***	.237***	.174**
d4	.027*	.07*	-.246**
d5	-.204	-.177	-.007
d6	.028	.06	-.063
Constant	3.295***	3.198***	3.37***

Based on the regression results presented in Table 6, there is a significant negative correlation between IPO initial returns and earnings quality (EQ), with a coefficient of -28.84, significant at the 1% level. This suggests that as EQ increases, or in other words, as the quality of accrual-based earnings decreases, IPO initial returns decrease as well. Furthermore, real earnings

quality (Real) exhibits a significant negative correlation, indicating that the larger the residuals of the real earnings quality model, or the lower the real earnings quality, the lower the IPO initial returns. Additionally, firm age (Age) demonstrates a significant negative correlation, implying that older firms tend to have lower IPO initial returns. Both market index (Market) and state ownership (SOE) exhibit significant positive correlations at the 1% level, suggesting that higher market index returns or state-owned enterprises are associated with higher IPO initial returns. Moreover, the natural logarithm of funds raised (lnAmountRaised) displays a significant negative correlation, indicating that the more funds a company raises, the lower its IPO initial returns. The R-squared value is 0.638, indicating that approximately 63.8% of the variation in IPO initial returns can be explained by the variables included in the model. This suggests that the model has a relatively strong explanatory power in capturing the relationship between IPO initial returns and earnings quality, as well as other control variables such as firm age, market index, state ownership, and the natural logarithm of funds raised.

ii. **IPO Underpricing in the primary market part**

Table 7: Regression Results of IPO Underpricing and Earnings Quality

Underpricing	(1)	(2)	(3)
EQ	17.5**		17.647**
Real		-.077	-.078
Age	-.014	-.016	-.015
Size	0	0	0
Market	-.087	-.09	-.08
Winningrate	-.023	-.022	-.023
Turnover	-.008**	-.008***	-.008***
SOE	-.045	-.044	-.04
lnAmountraised	-.081***	-.093***	-.085***
d2012	.323	.318***	.324***
d2014	.154***	.15***	.147***
d2015	.538***	.543***	.533***
d2016	.523***	.525***	.52***
d2017	.356***	.35***	.351***
d2018	.159***	.157***	.153***
d2	.245***	.262***	1.083***
d4	.847***	.826***	.753***
d5	.884***	.872***	.898***
d6	.856	.874	.822
Constant	.68***	.755***	-.134

According to the regression results in Table 7, there is a significant positive relationship

between IPO underpricing and accrual earnings quality (EQ), with a coefficient of 17.647, which is significant at the 5% level. This indicates that as EQ increases, meaning lower accrual earnings quality, IPO underpricing also increases. Meanwhile, real earnings quality (Real) exhibits a negative but not significant relationship. The R-squared value of 0.506 suggests that approximately 50.6% of the variation in underpricing can be explained by the independent variables included in the model. The F-test statistic of 60.213 (p-value = 0.000) implies that the overall model is highly significant. In conclusion, the regression results provide evidence for a positive association between earnings quality and IPO underpricing, while also highlighting the influence of other factors such as turnover, the amount raised, year of IPO, and industry sectors.

iii. **IPO Overpricing in the secondary market part**

Table 8: Regression Results of IPO Overpricing and Earnings Quality

Overpricing	(1)	(2)	(3)
EQ	-66.922***		-66.717***
Real		-.115	-.11
Age	-.159***	-.155**	-.16***
Size	0***	0***	0***
Market	2.706***	2.752***	2.715***
Winningrate	.057*	.054*	.057*
Turnover	.002	.002	.002
SOE	.264***	.287***	.271***
lnAmountraised	-.588***	-.564***	-.593***
d2012	-.695***	-.672***	-.694***
d2014	-.583***	-.605***	-.593***
d2015	-.294***	-.343***	-.302***
d2016	-.025	-.051	-.03
d2017	-.445***	-.449***	-.452***
d2018	-.011	-.035	-.019
d2	.034	.055	-.687***
d4	.709***	.758***	-.761***
d5	-.738***	-.705***	-.709***
d6	-.707***	-.743***	-.744***
Constant	4.352***	4.112***	5.107***

Based on the regression results of IPO overpricing in the secondary market presented in Table 8, there is a significant negative relationship between accrual earnings quality (EQ) and IPO

overpricing, with a coefficient of -66.717, which is significant at the 1% level. This suggests that as the residual of the accrual earnings quality model increases, i.e., accrual earnings quality decreases, IPO overpricing in the secondary market diminishes. Company age (Age) displays a significant negative relationship, with a coefficient of -0.16, which is significant at the 1% level, indicating that as the company's age increases, IPO overpricing in the secondary market decreases. Company size (Size) presents a significant positive relationship, implying that as company size increases, IPO overpricing in the secondary market also increases. Market index (Market) demonstrates a significant positive relationship, with a coefficient of 2.715, which is significant at the 1% level, suggesting that as market index returns increase, IPO overpricing in the secondary market escalates.

4 Robustness

Table 9: Robustness Tests Results of IPO Initial Return and Earnings Quality

Initial Return	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
JonesModelEQ	-21.687	13.05	-1.66	.097	-47.292	3.919	*
Real	-.114	.049	-2.34	.019	-.21	-.019	**
Age	-.088	.03	-2.94	.003	-.147	-.029	***
Size	0	0	7.56	0	0	0	***
Market	1.493	.2	7.45	0	1.1	1.886	***
Winningrate	.007	.016	0.44	.662	-.024	.038	
Turnover	-.005	.001	-8.30	0	-.007	-.004	***
SOE	.125	.032	3.93	0	.063	.187	***
lnAmountraised	-.409	.017	-23.45	0	-.444	-.375	***
NDA	6.123	8.186	0.75	.455	-9.939	22.185	
d2012	-.321	.069	-4.67	0	-.456	-.186	***
d2014	-.258	.049	-5.26	0	-.354	-.162	***
d2015	.255	.045	5.67	0	.167	.343	***
d2016	.429	.043	10.06	0	.345	.513	***
d2017	.047	.038	1.23	.219	-.028	.121	
d2018	.09	.05	1.82	.069	-.007	.188	*
d2	.239	.071	3.38	.001	.1	.378	***
d3	.084	.101	0.83	.409	-.115	.282	
d4	-.167	.107	-1.57	.118	-.376	.042	
d5	.059	.067	0.87	.383	-.074	.191	
Constant	3.252	.161	20.20	0	2.936	3.567	***
Mean dependent var		0.748	SD dependent var			0.562	
R-squared		0.635	Number of obs			1135	
F-test		96.944	Prob > F			0.000	
Akaike crit. (AIC)		811.467	Bayesian crit. (BIC)			917.189	

*** $p < .01$, ** $p < .05$, * $p < .1$

Table 10: Robustness Tests Results of IPO Underpricing and Earnings Quality

Underpricing	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
JonesModelEQ	24.024	13.187	1.82	.069	-1.85	49.898	*
Real	-.081	.049	-1.65	.1	-.178	.015	*
Age	-.012	.03	-0.39	.7	-.071	.048	
Size	0	0	-0.83	.409	0	0	
Market	-.1	.203	-0.49	.622	-.497	.298	
Winningrate	-.022	.016	-1.38	.167	-.054	.009	
Turnover	-.008	.001	-11.45	0	-.009	-.006	***
SOE	-.041	.032	-1.26	.207	-.103	.022	
InAmountraised	-.088	.018	-4.98	0	-.122	-.053	***
NDA	-7.993	8.272	-0.97	.334	-24.224	8.238	
d2012	.317	.07	4.57	0	.181	.454	***
d2014	.147	.05	2.96	.003	.05	.244	***
d2015	.538	.045	11.84	0	.449	.627	***
d2016	.524	.043	12.15	0	.439	.608	***
d2017	.351	.038	9.13	0	.276	.427	***
d2018	.155	.05	3.08	.002	.056	.254	***
d2	.26	.071	3.63	0	.119	.4	***
d3	-.841	.102	-8.22	0	-1.042	-.641	***
d4	-.084	.108	-0.78	.437	-.295	.128	
d5	.076	.068	1.11	.268	-.058	.209	
Constant	.698	.163	4.29	0	.379	1.018	***
Mean dependent var		0.479	SD dependent var			0.488	
R-squared		0.506	Number of obs			1135	
F-test		57.036	Prob > F			0.000	
Akaike crit. (AIC)		835.183	Bayesian crit. (BIC)			940.906	

*** $p < .01$, ** $p < .05$, * $p < .1$

Table 11: Robustness Tests Results of IPO Overpricing and Earnings Quality

Overpricing	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
JonesModelEQ	-51.352	26.465	-1.94	.053	-103.279	.574	*
Real	-.108	.099	-1.10	.272	-.302	.085	
Age	-.165	.061	-2.71	.007	-.285	-.046	***
Size	0	0	6.07	0	0	0	***
Market	2.8	.407	6.89	0	2.002	3.597	***
Winningrate	.054	.032	1.68	.093	-.009	.118	*
Turnover	.002	.001	1.25	.212	-.001	.004	
SOE	.277	.064	4.31	0	.151	.404	***
lnAmountraised	-.578	.035	-16.32	0	-.647	-.508	***
NDA	9.9	16.601	0.60	.551	-22.673	42.474	
d2012	-.672	.139	-4.82	0	-.946	-.399	***
d2014	-.6	.099	-6.03	0	-.795	-.404	***
d2015	-.328	.091	-3.60	0	-.507	-.149	***
d2016	-.049	.087	-0.57	.569	-.219	.12	
d2017	-.45	.077	-5.84	0	-.602	-.299	***
d2018	-.029	.101	-0.29	.774	-.227	.169	
d2	.06	.143	0.42	.678	-.222	.341	
d3	.791	.205	3.85	0	.388	1.194	***
d4	.019	.216	0.09	.932	-.406	.443	
d5	.04	.137	0.29	.771	-.229	.308	
Constant	4.25	.326	13.02	0	3.609	4.89	***
Mean dependent var		0.234	SD dependent var			0.813	
R-squared		0.282	Number of obs			1135	
F-test		21.835	Prob > F			0.000	
Akaike crit. (AIC)		2416.455	Bayesian crit. (BIC)			2522.177	

*** $p < .01$, ** $p < .05$, * $p < .1$

Tables 9, 10, and 11 present the results of the robustness tests. In these tests, we use the EQ derived from the Jones Model (JonesModelEQ) as a substitute for the previous EQ. The following is an analysis of these results:

Initial Return: The Jones Model EQ (JonesModelEQ) exhibits a negative relationship with the IPO initial return, with a coefficient of -21.687 and a significance level within 10%. This finding suggests that when employing the Jones Model's calculated accrual earnings quality (EQ), its relationship with the IPO initial return remains valid.

Underpricing: The Jones Model EQ (JonesModelEQ) demonstrates a positive relationship with IPO underpricing, with a coefficient of 24.024 and a significance level within 10%. This result indicates that the relationship between the Jones Model's calculated accrual earnings quality (EQ) and IPO underpricing still holds in the robustness tests.

Overpricing: The Jones Model EQ (JonesModelEQ) shows a negative relationship with IPO overpricing, with a coefficient of -51.352 and a significance level within 10%. This finding reveals that in the robustness tests, the relationship between the Jones Model's calculated accrual earnings quality (EQ) and IPO overpricing remains significant.

In summary, when conducting robustness tests and using the Jones Model's calculated accrual earnings quality (EQ) as a substitute for the previous EQ, its relationship with IPO initial return, underpricing, and overpricing remains significant. Consequently, we can assert that these results provide evidence, to some extent, that the previous analytical conclusions possess robustness in the context of the robustness tests within an economics research paper.

5 Conclusion and future direction

Based on our regression analysis, we find that the lower the earnings quality of listed companies, the lower the IPO initial return. This may suggest that investors harbor doubts about the accuracy and reliability of financial statement information, thereby affecting their expectations of the IPO's initial return. Additionally, the higher the level of real earnings management of a listed company, or the lower the real earnings quality, the lower the IPO initial return. This conclusion appears to be inconsistent with the findings of previous researchers, as a decrease in earnings quality may increase pre-listing uncertainty, leading to underpricing of the IPO.

To further understand the impact of earnings quality on IPO pricing, we examine its influence on underpricing in the primary market and overpricing in the secondary market. Our analysis of underpricing in the primary market reveals that as the earnings quality of listed companies decreases, the underpricing of IPOs increases, meaning IPO pricing is more likely to be below the actual value. This finding aligns with previous research. When a company's earnings quality is low, the IPO is likely to experience higher underpricing, resulting in the company's IPO issue price being further below its actual value. Companies with lower earnings quality may face more stringent scrutiny before listing, with investors and regulators demanding more information to mitigate potential risks. To meet these requirements, companies might have to attract investors with lower issue prices.

Further investigating overpricing in the secondary market, we find that the lower the earnings quality of listed companies, the lower the overpricing of IPOs in the secondary market. This finding further indicates that investors take earnings quality into account when making investment decisions in the secondary market. This may be because earnings quality reflects the authenticity of a company's financial statements and the integrity of its management, leading investors to believe that higher-quality earnings better represent a company's future profitability and growth potential. As a result, investors may assign higher valuations to companies with higher earnings quality in their investment strategies, while adopting a more cautious approach toward companies with lower earnings quality. This risk management strategy is crucial for investors, as it can help reduce potential investment risks.

Two prospective research avenues are outlined in order to enhance our understanding of this relationship and its implications for investors and market efficiency.

- a) Future research can build on our findings by quantifying the influence of changes in earnings quality on return gains or losses. This would enable us to comprehend the implications of our results and the significance of earnings quality to investors. For instance, one could investigate the amount of return gains or losses that would be realized when the accounting report deteriorates by a certain percentage (e.g., X%). Such an analysis would necessitate the incorporation of our findings with previously conducted research on corporate governance, transparency, and their effects on market efficiency. By

quantifying the effect of earnings quality on investment outcomes, this line of research can provide investors seeking to manage risk and make informed investment decisions with useful insights.

- b) **Expansion of Earnings Quality Measurement Models' Scope:** Our research focuses predominantly on the DD model and the Jones model for measuring earnings quality in the brief period preceding an IPO. However, future research could investigate the use of alternative models and methodologies that incorporate longer time periods. By employing models that cover longer time periods, researchers are able to assess the earnings and accounting practices of a company over time in a more comprehensive manner. This would facilitate not only a more nuanced comprehension of the relationship between earnings quality and IPO pricing, but also the identification of trends and patterns in earnings quality across different industries and market conditions.

6 Implication and recommendation

Based on the conclusions drawn, we propose the following policy recommendations for the Chinese A-share stock market:

- a) **Improve the quality of financial reporting for listed companies:** Regulatory authorities should strengthen the supervision of financial reports of listed companies to ensure the accuracy and reliability of their reported earnings quality, thereby enhancing market confidence and transparency(Armstrong, Guay, & Weber, 2010) . Listed companies should strengthen their internal financial management and focus on improving earnings quality to

gain higher market valuations and investor trust.

- b) Strengthen scrutiny and information disclosure: The China Securities Regulatory Commission (CSRC) and other relevant departments should intensify their scrutiny of IPO applicants, requiring companies to provide more detailed financial information and disclose more internal information related to their operations (Leuz & Wysocki, 2016). This would help reduce information asymmetry and enable investors to gain a more comprehensive understanding of the financial conditions and future growth potential of listed companies when making investment decisions.
- c) Enhance investor education: Governments and regulatory authorities should strengthen investor education and improve investors' abilities to analyze financial statements, enabling them to better understand and evaluate the earnings quality of listed companies (Lusardi & Mitchell, 2014). Investors should pay attention to and fully appreciate the importance of earnings quality to ensure a more robust and healthy market development.
- d) Optimize the IPO pricing mechanism: Governments and regulatory authorities should explore and study ways to improve the IPO pricing mechanism, making it fairer, more reasonable, and transparent. When formulating and refining IPO pricing policies, factors such as earnings quality should be taken into account to ensure IPO pricing better reflects the true value of listed companies.
- e) Encourage market-oriented investment decisions: Governments and regulatory authorities should promote market-oriented reforms, respect market rules, and allow investors to

make independent investment decisions in the secondary market. Market competition can help better identify and penalize companies with low earnings quality, facilitating market self-regulation and the survival of the fittest.

By implementing these policy recommendations, we hope to enhance the efficiency and stability of the Chinese A-share stock market, creating a fair, transparent, and orderly investment environment for investors, listed companies, and regulatory authorities alike.

7 Reference

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