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Tunneling as an incentive for earnings management during the IPO process in China ^{☆,☆☆}

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ABSTRACT

Using a sample of 185 Chinese IPO firms listed on the Shanghai Stock Exchange during the period 1999–2001, we show that related-party (RP) sales of goods and services could be used opportunistically to manage earnings upwards in the pre-IPO period. We also provide evidence that such behavior may be motivated by the prospect of tunneling opportunities in the post-IPO period, i.e., exploiting economic resources from minority shareholders for the benefit of the parent company. We provide evidence of one such opportunistic tunneling tool: non-repayment by Chinese parent companies of net outstanding corporate loans made to them by their newly listed subsidiaries. Furthermore, we provide evidence in support of our assertion of an association between such tunneling behavior in the post-IPO period and earnings management via abnormal RP sales in the pre-IPO period. Finally, we demonstrate the apparent failure of investors in Chinese IPOs to perceive the link between the two phenomena. The results enhance

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☆☆ *Data availability:* The data used in this study are available from public sources identified in the text.

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understanding of the motives for and consequences of earnings manipulation during the IPO process. They highlight a potential additional investment risk facing foreign investors in China's capital markets as well as in Chinese firms cross-listed in non-Chinese stock exchanges, and have policy implications for China and other emerging markets which need to improve the protection of minority shareholders' rights.

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1. Introduction

This paper makes a twofold contribution to the literature that deals with earnings management behavior in Chinese companies in the setting where state-owned enterprises (SOEs) spin off their profitable units as newly listed companies. First, unlike prior US-based studies that used aggregate accruals as their measure of earnings management (e.g., Aharony et al., 1993; Friedlan, 1994; Teoh et al., 1998), we study related-party transactions (RPTs) as earnings management tools during the initial public offering (IPO) process.¹ Following McNichols (2000), we concur that notwithstanding their important contribution and impact, "further progress in the literature will require a departure from extensive reliance on aggregate accruals approaches" (p. 314). In particular, we show that the pattern of related-party (RP) sales of goods and services (hereafter "RP sales") of the to-be-listed unit (hereafter the "IPO firm") to its parent company is associated with the pattern of the IPO firms' return on assets (ROA) in a fashion that indicates earnings management (as reported in Aharony et al., 2000).

Second, we extend the motives offered in the literature for such opportunistic behavior. Several studies that examine US IPO data (e.g., Aharony et al., 1993; Friedlan, 1994; Teoh et al., 1998) suggest that such manipulation may be induced by the desire of managers to increase their wealth by increasing the value of stock retained and cash receipts from the partial disposition of existing stock. Similarly, Chinese SOE managers may be induced to inflate the issuance price at IPO in order to raise more funds for disposal by the parent SOE. We extend this motivation suggesting that inflating earnings in the pre-IPO period is motivated by the prospect of *tunneling* opportunities in the post-IPO period.

Following Johnson et al.'s (2000) description of tunneling as "the transfer of assets and profits out of firms for the benefit of those who control them", in this paper the term relates to parent companies of Chinese IPO firms that exploit minority shareholders by siphoning off economic resources from the IPO firms. Anecdotal evidence indicates that Chinese parent companies frequently do not pay their debts to their listed companies and that this is a major reason for the untimely demise of many newly listed firms. Existing studies also show that corporate loans are a main form of tunneling in Chinese listed companies.

Examining a large set of RPTs between Hong Kong listed companies and their controlling shareholders, Cheung et al. (2006) provide supporting empirical evidence that such corporate loans are a priori likely to result in expropriation of minority shareholders. Cheung et al. (2009) examine a sample of RPTs, including corporate loans, between Chinese publicly listed firms and their controlling shareholders during 2001–2002. They report negative cumulative abnormal market-adjusted returns (CAR) at the announcement of RP corporate loans. Specifically, the mean and the median 5-day CAR are –1.2% and –1.1%, respectively, with the median value loss representing 24.8% of the value of the transaction. They interpret this as evidence of tunneling of minority shareholders, rather than transactions with related parties based on an economic rationale. The severity of this phenomenon eventually led to regulatory actions by the Chinese authorities. Since 2003, a series of regulations and rules have been

¹ Similarly to the requirements set forth by SFAS 57 in the US, current Chinese accounting standards require publicly listed companies to disclose all material RPTs in the form of notes to the financial statements. RPTs are defined to include transactions occurring between a listed firm and its parent company (including the parent company's other affiliates) or with other related parties such as the second largest corporate shareholder. A detailed discussion of RPTs is provided in Section 2: Institutional Background.

promulgated to proscribe RP corporate loans and induce payment by parent companies for loans already made.²

To provide evidence in support of this assertion, we first show that parent SOEs exploit the minority shareholders (those who bought in at IPO) by not repaying outstanding corporate loans obtained from these IPO firms. Then, we provide evidence of an association between earnings management via increase in RP sales in the pre-IPO period and tunneling via increase in RP non-repaid net corporate loans in the post-IPO period.³

To investigate these issues further, we examine the post-IPO share price performance of the newly issued firms and document return underperformance for firms that engaged in earnings management in the pre-IPO period and subsequent tunneling in the post-IPO period. These results indicate that investors in Chinese IPOs fail to perceive the relationship between earnings management via increase in RP sales in the pre-IPO period and tunneling via increase in RP non-repaid corporate loans in the post-IPO period. We also document: (1) post-IPO return underperformance for firms whose parent company engaged in earnings management in the pre-IPO period but no subsequent tunneling in the post-IPO period; (2) post-IPO return underperformance for firms with tunneling in the post-IPO period but no prior earnings management in the pre-IPO period. These results indicate that the market does not “see through” either earnings management via increase in RP sales in the pre-IPO period or tunneling via increase in RP non-repaid corporate loans in the post-IPO period.

Our sample consists of 185 newly listed Chinese IPO firms that made a first-time issue of common shares to the public on the Shanghai Stock Exchange during the period 1999–2001. We use Chinese IPOs to examine these issues because China provides both a unique institutional setting and RPT data (see Section 2 for details). In China, most listed companies are spin-offs from large SOEs but still have very close business ties with the parent. They typically form a business group with their parent companies, rather than becoming stand-alone companies. In addition, investment banks are allowed to nominate firms for public listing and their nominations are screened by an independent listing committee of the China Securities Regulatory Commission (CSRC). The independent listing committee assesses the qualifications of a to-be-listed company based on the operational and financial information it submits. Consequently, managers of Chinese parent companies may have strong incentives to engage in RPTs to prop up the earnings of the companies they are about to spin off in order to raise more capital from minority shareholders and then tunnel their assets or profits back during the post-IPO period.

Chinese IPOs also report detailed RPT information in their prospectuses. As of 1997, Chinese accounting standards require all publicly listed companies to publish RPT information in their financial statements. Prior to 1999, to-be-listed units could not be legally separated from their parent companies. Consequently, their pre-IPO financial statements are on a pro forma basis. As of 1999, the CSRC requires all IPO firms to legally separate from their parent companies or other affiliated parties at least one year prior to the IPO. Thus we are allowed at least one year of RPT data prior to the IPO year and can investigate patterns of RPTs between IPO firms and their controlling parent companies before and after the IPO process.

The paper has, at least, four implications. First, the results cast doubt on the Chinese capital markets’ reputation for semi-strong efficiency. We find that pre-IPO earnings management via RP sales and post-IPO tunneling via RP corporate loans are overlooked by investors, resulting in post-IPO stock underperformance. These results suggest that Chinese capital markets do not fully and rapidly impound information into share prices when the information on RPTs is published in IPO financial reports.

Second, the results have policy implications for China and other emerging markets with weak protection of minority shareholders. The Chinese government has been taking action to address the earnings management and resource tunneling issues identified in the paper. As we show,

² This is discussed in detail in Section 4 (within the subsection titled “Univariate Analysis of Tunneling Variables”).

³ RP corporate loans are typically reported as “other receivables” and “other payables” on the balance sheet of the Chinese IPO firms. Outstanding net corporate loans provided by IPO firms to their parent companies refer to RP other receivables net of RP other payables. In this paper we use the change in RP net other receivables as our proxy of non-repaid net corporate loans. This is discussed in detail in Section 4 (within the subsection titled “Univariate Analysis of Tunneling Variables”).

parent-subsidiary structure directly causes the opportunistic earnings management behavior in the pre-IPO period. To prevent this, since 2006, the Chinese government has been encouraging unlisted SOEs to take the entire entity public, rather than carving out sub-units. To improve minority shareholders' protection, in 2003 the Chinese government also proscribed RP loans, thus reducing the opportunistic use of corporate loans for tunneling. The ban on corporate loans is consistent with the Sarbanes-Oxley Act of 2002 in the US which makes it unlawful for any public company to provide loans to its executive officers and directors. Since June 2006, the Chinese government has also gradually been allowing non-tradable shares held by parent companies to be traded on the stock exchange. The floating of shares may also reduce the incentive of parent companies to expropriate minority shareholders through corporate loans. All these actions and policy changes are means to reduce the opportunistic earnings management and resource tunneling addressed in this paper.

Third, Chinese capital markets are growing rapidly and attracting investors from many other countries. We reveal additional investment risks to foreign investors in China's capital markets as well as in Chinese firms cross-listed in non-Chinese stock exchanges from earnings management and resource tunneling. On November 5, 2002, the China Securities Regulatory Commission (CSRC) and the People's Bank of China (PBOC) introduced the Qualified Foreign Institutional Investor (QFII) program as a provision for foreign capital to access China's financial markets. As of January 2008, a total of 52 foreign institutions have received QFII licenses with quotas ranging from US\$50 million to US\$800 million, amounting to around US\$10 billion authorized for investment in the Chinese markets. According to our results, special attention should be paid by both domestic and foreign investors to listed companies' related-party transactions with their parent companies.

Finally, we apply a novel methodology, which, to our best knowledge, has not yet been presented in the literature, to detect earnings management and resource tunneling. The novel methodology may also be applied by future researchers in non-Chinese studies concerning earnings management and resource tunneling.

The remainder of the paper is organized as follows. In Section 2, we provide institutional background. Section 3 discusses prior research, incremental contribution and our hypotheses. In Section 4 we present the data and in Section 5 we discuss the methodology and analyze the results. Section 6 provides a conclusion and limitations.

2. Institutional background

Typically, a Chinese SOE originally comprises three main components: profitable units, unprofitable units and not-for-profit units such as community schools and hospitals. Most of China's newly listed firms (IPOs) are profitable units spun off from existing SOEs (Aharony et al., 2000), a circumstance that allows them considerable room to engage in transactions with their parent companies of the type that are the focus of our study. The unprofitable and not-for-profit units remain part of the original firm (now the parent company of the IPO firm). The newly listed companies typically continue, in the post-IPO period, to share with their parent company certain personnel, such as the chairperson of the board of directors, brand names, and certain assets. They typically form a business group with their parent companies, rather than becoming stand-alone companies. Usually, the controlling shareholders (mostly Chinese central or local government) hold more than 40% of the total outstanding common shares. In the post-IPO period, the parent company may have an incentive to siphon resources partially contributed by the new minority shareholders from the IPO firm to the remaining unprofitable and non-operational units. One feasible way of doing this is through RPTs, initially boosting earnings of the candidate IPO firm during the IPO process to increase its chances of going public successfully and attract more capital from minority shareholders, and then tunneling assets from the IPO firm in the post-IPO period.

Prior to 1999, the total annual number of IPOs was subject to a quota system, meaning that the central government set a quota for the entire capital value of shares to be issued every year. This total amount would then be allocated among local governments which in turn were directed to identify key industries and nominate worthy companies for listing on the local Chinese stock exchanges. Under

this system, managers may have had less of an incentive to induce higher IPO prices by reporting higher earnings because the total amount of capital to be raised was fixed. Examining IPOs in an earlier period, Aharony et al. (2000) suggest that instead, Chinese SOE managers may have had indirect incentives to manage earnings upwards to increase the possibility of their firms being qualified for listing, with the resultant higher prestige and other non-pecuniary benefits.

Since 1999, following the abandoning of the IPO quota system, investment banks are allowed to nominate firms for public listing and their nominations are screened by an independent listing committee of the CSRC. The independent listing committee assesses the qualifications of a to-be-listed company based on the operational and financial information it submits. Thus, Chinese managers may inflate earnings to increase the IPO issuing price and hence raise more capital from new minority shareholders.

Current Chinese accounting standards also require detailed disclosures of RP transactions. In 1997, the Chinese Ministry of Finance, which serves as the accounting standards setter in China, promulgated an accounting standard for RPTs (hereafter, the *RPT Standard*), which requires publicly listed companies to disclose all material RPTs in the form of notes to the financial statements. The RPT Standard defines RPTs to include transactions occurring between a listed firm and its parent company (including the parent company's other affiliates) or with other related parties such as the second largest corporate shareholder. RPTs may also be between a listed firm and its management, board members, principal individual owners, or members of the immediate families of any of these groups.

In our sample IPO firms we observe all RPT disclosures with parent companies. We focus on RPT disclosures with parent companies because they are the controlling shareholders and thus may have more of an incentive to prop up their affiliated IPOs.

The RPT Standard requires relatively detailed disclosure of RPTs, similar to the requirements set forth by SFAS 57 in the USA. Such disclosure must include information on the nature of the relationship between the parties involved, the core operations of each related party, a description of the nature of each type of transaction, and information on the amounts involved. Notably, Chinese IPOs and listed firms are required to disclose in their prospectuses and annual reports ending balances of trading accounts, such as accounts receivable and other receivables, with their parent companies and other major related parties in financial footnotes. In practice, all outstanding credit sales and purchases of goods and services between the Chinese IPO firms and their parent companies are reported in the year-end balance of "accounts receivable" and "accounts payable", respectively, of the IPO firms. All outstanding RP corporate loans are reported in the year-end balance of "other receivables" or "other payables" of the Chinese IPO firms. These items reported in financial footnotes do not consist of any outstanding loans to/from individual shareholders or managers.

Exhibit 1

Types of RPTs that IPO and publicly listed firms must disclose in China.

Type of related-party transactions	Description
1 Trade of goods	Transactions that involve sales (purchases) of goods to (from) related parties
2 Trade of services	Transactions that involve sales (purchases) of services to (from) related party
3 Commissions	Commissions received from (paid to) related parties for providing (obtaining) agency services
4 Overhead reimbursement	Fees received from (paid to) related parties for providing (obtaining) administrative services
5 Transfer of R&D	Transactions that involve transfer of shared R&D projects to (from) related parties
6 Permits and franchises	Transactions that involve provision of permits or franchises to (from) related parties
7 Trade of assets other than goods	Transactions that involve sales (purchases) of assets other than goods to (from) related parties. Machinery and buildings are typical examples of other assets
8 Leases	Operating or capital leases to (from) related parties
9 Loans	Loans provided to (by) related parties (combining principal and interest revenue or expenses)

Exhibit 1 lists and briefly describes the various types of RPTs that publicly listed firms and IPO firms must disclose in the form of notes to the financial statements, according to the RPT Standard. They relate to trade of goods and services, commission relationships, overhead reimbursements, transfer of R&D, permits and franchises, trade of assets other than goods, including exchange of fixed assets, capital and operating leases and borrowing or lending, including interest payments.

As of 1999, the CSRC requires all to-be-listed IPO firms to legally separate from their parent companies or other affiliates at least one year prior to the IPO and to disclose in their IPO prospectuses all material transactions with related parties during the year prior to IPO.⁴ Examining these publicly available data for the purposes of our study revealed a tremendous number of RPTs between the IPO firms and their parent companies.

3. Prior research, incremental contribution and hypotheses

There are numerous studies that investigate earnings management behavior around IPOs. [Aharony et al. \(1993\)](#), the first such study, adopt the total accounting accruals approach in an attempt to detect earnings management.⁵ The little evidence they find on earnings manipulation shows that it occurs mainly among smaller firms and those with larger financial leverage, and that to a lesser degree it is also related to the quality of the underwriters and auditors employed when going public.

Using a similar method but with quarterly data, [Friedlan \(1994\)](#) reports stronger evidence on income-increasing discretionary accruals by IPO issuers in the financial statements released before going public. Using the modified [Jones \(1991\)](#) discretionary accrual model, [Teoh et al. \(1998\)](#) provide evidence of income-increasing accruals around IPOs.⁶ [Aharony et al. \(2000\)](#) are the first to examine the IPO-related earnings management phenomenon in the emerging Chinese capital markets. Measuring earnings performance and accruals for a sample of 83 newly listed firms, they provide similar evidence of earnings manipulation by Chinese managers during the IPO period.

The use of aggregate accruals models to detect earnings management has been criticized by a number of authors. [Beneish \(1997\)](#) finds that extreme financial performance limits their usefulness in contexts such as security offerings and financial distress. [McNichols \(2000\)](#) argues that when they do not consider long-term earnings growth there is the potential for misspecification, which can result in misleading inferences about earnings management behavior. [Ball and Shivakumar \(2008\)](#) also argue that aggregate accruals models do not typically control for endogenous changes to working capital around IPO and hence are generally unreliable.

A few studies examine specific accruals or direct transactions in an attempt to detect earnings management during the pre-IPO period. [Marquardt and Wiedman \(2004\)](#) find that firms issuing equity appear to prefer managing earnings upward by selecting some special accruals to accelerate revenue recognition. [Beaver et al. \(2000\)](#), examining the reserves for policy claim losses in the property-casualty insurance industry, do *not* find evidence of opportunistic earnings manipulation prior to equity offerings. [Darrrough and Rangan \(2005\)](#) show that managers are more likely to under-invest in R&D in order to increase current reported earnings during the pre-IPO period.

The possible incentives for earnings management during the IPO process center on the higher issuing price of equity. Examining a sample of US IPOs, [Aharony et al. \(1993\)](#) suggest that the presumed goal of overstating reported earnings prior to the IPO “is to induce outside investors to pay a higher (offer) price for the firm’s common shares than is justified by its true profitability. . . such manipulation may be motivated by the entrepreneur’s desire to increase (his or her) wealth by increasing the value

⁴ [Aharony et al. \(2000\)](#) show that during the restructuring period, Chinese firms are more likely to manage pre-IPO earnings through the so-called *financial packaging*: the original business group carves out the most profitable unit and sets it up as the to-be-listed company. However, during 1992–1995, the period examined by [Aharony et al. \(2000\)](#), there was no clear distinction between the to-be-listed unit and its affiliates such as the parent company, nor were there any observable RPTs. Hence, they do not examine how exactly the financial package is formed prior to an IPO or what are the repercussions on resource allocation in the post-IPO period.

⁵ This approach was first suggested by [Healy \(1985\)](#) and [DeAngelo \(1986, 1988\)](#).

⁶ However, using UK IPOs, [Ball and Shivakumar \(2008\)](#) find that prospectus financial numbers do not reflect systematic earnings inflation and appear conservative.

of shares retained and cash receipts from the (partial) disposition of existing shares” (p. 65). Other studies (e.g., Friedlan, 1994; Teoh et al., 1998; Darrough and Rangan, 2005) present similar arguments to explain managers’ incentives to manipulate earnings during the IPO process.

Aharony et al. (2000) conjecture that though Chinese SOE managers may not have the same incentives to manage earnings as their US counterparts insofar as essentially they own no shares of the firm and have no stock options, they may nevertheless have indirect incentives to manage earnings upwards to increase the possibility of the firm being selected for listing. The reason for this, as already noted, is the higher prestige and other non-pecuniary benefits that may ensue from such activities.

Our study adds to a growing literature that examines earnings management around IPOs by studying, in a Chinese corporate setting, the use of RPTs as an earning management tool in the pre-IPO period, and as a motivation for opportunistic tunneling behavior in the post-IPO period. Specifically, we conjecture that during the pre-IPO period, RP sales by IPO firms to their parent companies are used to boost their earnings in a manner that artificially affects their return on assets (ROA), consistent with the earnings management behavior found in Aharony et al. (2000).

We also conjecture that a motivation for such opportunistic behavior by Chinese parent companies is to exploit the minority shareholders (those who bought in at IPO) by not repaying back debts (in the form of RP corporate loans) to the newly formed IPO firms in the post-IPO period. This implies a link between abnormal RP sales to manipulate the earnings of the newly issued firms in the pre-IPO period, and the motivation for this opportunistic behavior – tunneling economic resources via non-repaid RP corporate loans⁷ in the post-IPO period. Formally stated, we test the following two hypotheses (in alternative form):

H1. Chinese parent companies engage in opportunistic RP sales of goods and services to manipulate their candidate IPO firms’ earnings upwards in the period prior to listing.

H2. The magnitude of abnormal RP sales of goods and services between the parent company and its candidate IPO firm aimed at boosting its earnings in the pre-IPO period is positively associated with the magnitude of economic resources tunneled via non-repaid RP corporate loans in the post-IPO period.

Earnings management during the pre-IPO period and tunneling in the post-IPO period may be costly to investors in the newly formed IPO firms if the capital market fails to “see through” such opportunistic behavior on the part of the parent firm. Prior research (Teoh et al., 1998) provides evidence that newly issued US-based firms with unusually high accruals in the IPO year (a presumably opportunistic earnings management behavior) experience stock return underperformance in the subsequent three years. We extend this market reaction analysis, examining whether the market can “see through” a relationship between earnings management via increase in RP sales in the pre-IPO period and tunneling via increase in RP non-repaid corporate loans in the post-IPO period. Formally stated, we test the following hypothesis (in alternative form):

H3. The IPO firm’s stock performance in the post-IPO period is negatively correlated with abnormal RP sales in the pre-IPO period, which are positively associated with non-repaid RP corporate loans in the post-IPO period.

4. Data and univariate analysis

Our sample consists of 185 newly listed Chinese IPO firms that made a first-time issue of common shares to the public on the Shanghai Stock Exchange during the period 1999–2001.⁸ The sample

⁷ Liu and Lu (2007) show tunneling as more of an incentive for earnings management for Chinese listed firms with rights issues than for firms during the IPO period.

⁸ Chinese listed firms may issue common shares to either domestic investors (A shares) or to foreign investors (B shares) or both. During our sample period, there were no new issues of B shares.

Table 1
Sample composition of Chinese IPOs by year of IPO and by industry.

Industry	Two-digit SIC code	Year of IPO			Total	Percentage
		1999	2000	2001		
Food and tobacco	1, 2, 9, 20, 21, 54	4	6	4	14	7.6
Basic industries including petroleum	10, 12, 13, 14, 24, 26, 28, 29, 33	7	19	16	42	22.7
Construction	15, 16, 17, 32, 52	4	3	4	11	5.9
Textiles and trade	22, 23, 31, 51, 53, 56, 59	2	7	4	13	7.0
Consumer durables	25, 30, 36, 37, 39, 50, 55, 57	9	8	10	27	14.6
Capital goods	34, 35, 38	7	15	15	37	20.0
Transportation	40, 41, 42, 44, 45, 47	1	8	5	14	7.6
Services	72, 73, 75, 76, 80, 82, 87, 89	0	4	2	6	3.2
Conglomerate	No specific SIC code	7	6	8	21	11.4
Entire sample		41	76	68	185	100

The table shows the sample composition of 185 newly listed Chinese IPO firms on the Shanghai Stock Exchange for each year from 1999 to 2001, classified by nine major industries (two-digit SIC code). Each sample firm has engaged in at least one type of RPTs during the sample period. The industry classification is based on Campbell (1996). As the number of firms in the Petroleum industries (SIC code 13, 29) is small, we combine them with the Basic industries. The sample excludes the Utility industries (SIC code 46, 48, 49) and the Financial Services industries (SIC 60–69).

consists of firms which have at least one type of RPTs with their controlling parent companies during the sample period.⁹ For each IPO firm, data on RPTs are collected manually from IPO prospectuses and annual reports. To test our hypotheses on the entire sample of 185 IPO firms, we restrict the analysis to the three fiscal years starting from one year prior to the IPO year up to one post-IPO year.¹⁰ Other accounting and financial information is obtained from the China Stock Market & Accounting Research (CSMAR) database.¹¹

Table 1 presents the sample composition for each year from 1999 to 2001, classified by nine major industries (two-digit SIC code). The industry classification is based on Campbell (1996).¹² As there are only a small number of firms in the Petroleum industries (SIC code 13, 29), we combine them with the Basic industries. The sample excludes the Utility industries (SIC code 46, 48, 49) and the Financial Services industries (SIC code 60–69). As Table 1 shows, three industry groups, the Basic industries, the Consumer Durables industries and the Capital Goods industries, have a higher proportion of IPOs during the sample period (from 14.6% to 22.7%) than the remaining industry categories (from 3.2% to 11.4%).

Table 2 reports summary measures of various accounting and financial firm characteristics in the IPO year, for the 185 sample Chinese firms that issued shares to the public from 1999 to 2001. These measures are total assets, net sales, net income, cash flows from operating activities, financial leverage, and total proceeds from the IPOs.¹³ Median values of these measures are of magnitudes similar to those reported by Aharony et al. (2000, Table 4) for Chinese IPOs of B shares in earlier years (1992–1995).

Panel A of Table 3 provides summary statistics of the various types of RPTs made solely between our sample IPO firms and their parent companies and disclosed during the sample period.¹⁴ Panel B shows summary statistics of selected year-end balance sheet items due solely to RPTs for our sample

⁹ From an entire population of 208 Chinese IPOs during the sample period, we exclude a total of 23, seven that are from the utility and financial services industries, three that issued earlier common shares to foreigners and 13 that had no RPTs with their controlling parent companies during the sample period.

¹⁰ For most of the sample firms, no RPT data are available for earlier than one year prior to the IPO year. This constraint prevents us from expanding the time horizon to capture potential earnings management in years –2 and –3 prior to the IPO year.

¹¹ The CSMAR is a leading data vendor which provides both financial accounting data and stock prices for all listed companies in China. It also provides other databases such as corporate governance and merger & acquisition databases. The CSMAR database may be obtained from the Wharton Research Data Services (WRDS).

¹² The industry classification was first obtained from the CSRC. We then reclassified the industries into nine categories based on Campbell (1996).

¹³ Similar data for the corresponding parent companies are not publicly available.

¹⁴ For comparative purposes, we also present in Panel A summary statistics of sales of goods and services by IPO firms to non-related parties.

Table 2

Financial attributes of the sample Chinese IPO firms.

Characteristics	Median	Mean	Standard deviation	Minimum	Maximum
Total assets (million RMB)	983.09	1602.03	3051.30	188.75	38,966.70
Net sales (million RMB)	399.32	931.34	2486.69	40.15	30,940.53
Net income (million RMB)	43.26	89.95	233.63	2.24	2992.10
Cash flow from operating activities (million RMB)	26.35	125.62	821.28	-630.3	8995.33
Long-term debt as a percentage of total assets (%)	4.95	10.21	13.22	0	75.36
Total proceeds from IPOs (million RMB)	400.79	572.59	675.00	94.42	7702.89

The table reports median and mean values of various firm characteristics in the IPO year, for the 185 Chinese firms that issued shares to domestic investors from 1999 to 2001. These measures are total assets, net sales, net income, cash flow from operating activities, long-term debt ratio and total proceeds from the IPOs.

IPO firms. For each item, the average for the entire sample of 185 IPO firms is presented for the IPO year ($t = 0$) as well as for one year prior to ($t = -1$) and one year following ($t = +1$) the IPO year. We calculate average values in millions of Chinese RMB (shown in the first line) as well as average ratios of RMB

Table 3

Descriptive statistics of transactions solely between sample IPO firms and their parent companies (RPs).

Year relative to IPO year (0)	-1	0	1	Diff0	Diff1
<i>(Panel A) Main types of recurring RPTs</i>					
Sales of goods and services to RPs	220.26 ^a (7.40%) ^b [107] ^e	243.85 (7.86%) [122]	204.35 (5.49%) [117]	0.46% ^c	-2.37% ^d
Sales of goods and services to non-RPs	586.16 (68.63%) [185]	770.00 (69.14%) [185]	973.54 (66.36%) [185]	0.50%	-2.78%
Purchases of goods and services from RPs	171.27 (8.26%) [131]	246.43 (9.25%) [130]	284.36 (15.90%) [132]	0.99%	6.65%
Other revenues from RPs	0.80 (0.13%) [36]	1.14 (0.15%) [27]	1.59 (0.17%) [41]	0.02%	0.02%
Other expenses to RPs	1.39 (0.09%) [39]	2.29 (0.13%) [31]	2.33 (0.15%) [36]	0.04%	0.02%
Difference (net other expenses to RPs)	0.59 (0.04%)	1.15 (0.02%)	0.75 (0.02%)	0.02%	0.00%
Sales of other assets to RPs	2.56 (0.28%) [38]	1.09 (0.08%) [14]	3.63 (0.41%) [17]	-0.20%	0.33%
Purchases of other assets from RPs	18.13 (0.64%) [40]	36.33 (2.03%) [28]	148.73 (1.94%) [47]	1.39%	-0.09%
Difference (net purchases of other assets from RPs)	15.57 (0.36%)	35.24 (1.95%)	145.10 (1.52%)	-1.59%	0.43%
Leases to RPs	0.18 (0.06%) [43]	0.20 (0.04%) [20]	0.26 (0.03%) [23]	-0.02%	-0.01%
Leases from RPs	1.81 (0.11%) [101]	2.42 (0.18%) [98]	21.82 (2.62%) [104]	0.07%	2.44%
Difference (net leases from RPs)	1.63 (0.06%)	2.22 (0.14%)	21.56 (2.59%)	-0.08%	-2.45%

(continued on next page)

Table 3 (continued)

Year relative to IPO year (0)	-1	0	1	Diff0	Diff1
<i>(Panel B) Selected year-end balance sheet items for IPO firms solely due to RPTs</i>					
Year-end other receivables (including advance payments)	27.72 (1.61%) [120]	53.28 (2.73%) [123]	77.20 (3.22%) [123]	1.12%	0.49%
Year-end other payables (including advance receipts)	18.25 (1.17%) [111]	23.52 (0.92%) [110]	16.37 (0.57%) [109]	-0.25%	-0.35%
Difference (net other receivables) ^f	9.47 (0.84%)	29.76 (2.30%)	60.83 (3.03%)	1.16%	0.73%
Year-end accounts receivable	21.78 (0.88%) [110]	23.55 (1.10%) [122]	27.62 (1.18%) [118]	0.21%	0.07%
Year-end accounts payable	9.58 (0.60%) [131]	7.84 (0.70%) [130]	12.46 (0.65%) [139]	0.10%	-0.05%
Difference (net accounts receivable)	12.2 (0.58%)	15.72 (0.40%)	15.16 (0.32%)	-0.18%	-0.08%

Panel A provides summary statistics of the various types of recurring RPTs solely between sample IPO firms and their parent companies disclosed during the sample period. Panel B shows summary statistics of selected year-end balance sheet items for the sample IPO firms solely due to RPTs. Mean values for the entire sample of 185 IPO firms are presented for $t = 0$ (the IPO year), for $t = -1$ and for $t = +1$. Mean values in millions of Chinese RMB are shown in the first line; mean ratios (RMB values scaled by year-end total assets) are shown in the second line, for each type of RPT; the number of IPO firms that report non-zero values is presented in the third line. The description of RPTs is provided in Exhibit 1. "Other revenues" and "other expenses" consist of four types of RPTs: commissions, overhead reimbursement, transfer of R&D, and permits and franchises. The last two columns report the simple mean changes in the ratios between year -1 and year 0 (*diff0*), and between year 0 and year $+1$ (*diff1*). Bold figures denote mean changes significantly different from zero (at the 5% level or better).

^a Mean value of sales of goods and services to RPs in millions of Chinese RMB calculated across the entire sample of 185 IPO firms.

^b Mean ratio of sales of goods and services to total assets as of the end of year t calculated across the entire sample of 185 IPO firms.

^c Mean changes in the ratio between year -1 and year 0 .

^d Mean changes in the ratio between year 0 and year $+1$.

^e The number of IPO firms that report non-zero values of sales of goods and services to RPs.

^f All outstanding corporate loans between IPO firms and their parent companies are recorded under "other receivables" and "other payables". Thus, other receivables net of other payables represent the amount of net outstanding corporate loans provided by IPO firms to their parent companies.

values to total assets as of year-end t (shown in parentheses in the second line).¹⁵ For each type of RPTs, the number of IPO firms that report non-zero values is presented (in square brackets) in the third line. The last two columns report the simple mean changes in the ratios between year -1 and year 0 (*diff0*), and between year 0 and year $+1$ (*diff1*). Bold figures denote mean changes significantly different from zero (at the 5% level or better). For each type of RPT, the change in the ratio between two adjacent years is our measure of the magnitude of abnormal RPTs. As demonstrated by Aharony et al. (1993, p. 68), this approach corrects for the bias that may be caused by growth in a particular RPT that is proportional to the growth in assets.

We focus on the three RPT items that are the key variables in the empirical analysis: (1) sales of goods and services by IPO firms to their parent companies; (2) purchases of goods and services by IPO firms from their parent companies; (3) IPO firms' year-end balances of other receivables and other payables solely due to transactions with their parent companies. All outstanding corporate loans between IPO firms and their parent companies are recorded under "other receivables" and "other

¹⁵ For each item we also calculate the ratio of the total value of RPTs across all sample IPO firms divided by the year-end total assets across all sample IPO firms. This measures the weighted average percentage RPTs of total assets. The patterns are similar to those presented in Table 3.

payables". Thus, other receivables net of other payables represent the amount of outstanding net corporate loans provided by IPO firms to their parent companies.¹⁶ The statistics of the remaining RP items shown in Table 3 are for information only, as is the list of RPTs presented in Exhibit 1.

4.1. Univariate analysis of earnings management variables

As shown in Panel A of Table 3, the mean value of total sales of goods and services (RP sales) by IPO firms to their parent companies increased from 220.26 million RMB in year –1 to 243.85 in year 0, and then declined to 204.35 million RMB in year +1. The mean ratio of RP sales scaled by total assets increased slightly from 7.40% in year –1 to 7.86% in year 0, and then declined sharply to 5.49% in year +1. The mean change in this ratio between year 0 and year +1 (*diff1*) is –2.37%, significantly different from zero (at the 5% level or better). The frequency of IPO firms engaging in this type of RPTs (measured as a percentage of our entire sample of 185 IPO firms) is 58% in year –1, 66% in year 0 and 63% in year +1.¹⁷ There are at least two reasons to explain the higher sales before IPO. One is earnings manipulation, i.e., managers tend to overstate earnings before the IPO to boost cash proceeds from the IPO. Another is timing, i.e., managers ensure that the IPO is offered when earnings from normal operations are unusually high regardless of earnings manipulation. The pattern of non-RP sales reported in Panel A of Table 3 does not support the timing explanation; rather, it is more consistent with the pattern of RP sales. The mean ratio of non-RP sales scaled by total assets increased slightly from 68.63% in year –1 to 69.14% in year 0, and then declined to 66.36% in year +1. The mean change in this ratio between year –1 and year 0 (*diff0*) is –0.46% and between year 0 and year +1 (*diff1*) it is –2.78%; none of these changes are statistically significant.

In contrast, the pattern of the mean value of total purchases of goods and services (RP purchases) by IPO firms from their parent companies increased monotonically from 171.27 million RMB in year –1 to 246.43 in year 0 and to 284.36 million RMB in year +1. The mean ratio of RP purchases scaled by total assets increased slightly from 8.26% in year –1 to 9.25% in year 0, and then increased sharply to 15.90% in year +1. The mean change in this ratio between year 0 and year +1 (*diff1*) is +6.65%, significantly different from zero (at the 5% level or better). The frequency of IPO firms engaging in this type of RPTs (measured as a percentage of our entire sample of 185 IPO firms) is about 71% in each year.¹⁸

To inflate earnings via RPTs in the pre-IPO period, related parties may collude to temporarily increase RP sales to the IPO firm and/or lower its cost of goods sold (COGS). However, while an increase in RP sales has a full impact on earnings, the effect of RP purchases on COGS may be only partial, depending on the inventory cost flow assumptions¹⁹ and the inventory systems chosen by the to-be-listed firm, as well as the purchase price pattern. Nevertheless, in the empirical analysis we examine whether RP sales and RP purchases are used in the pre-IPO period as earnings management tools.

While we hypothesize that RP sales and purchases are used opportunistically to manage earnings, an alternative view may be that RPTs rationally fulfill other economic demands. For instance, in underdeveloped markets RPTs could be an efficient choice that minimizes transaction costs. Especially in a firm recently separated from a parent, RPTs could be part of the firm's normal business. If so, we should observe a relatively stable ratio between RP and non-RP sales by IPO firms surrounding the IPO year.

To examine this contention, for each of the 185 sample IPO firms we calculate the ratio between RP sales to parent companies and total sales (RPs and non-RPs). The mean values of these ratios (not tab-

¹⁶ Jiang et al. (2008) also use net other receivables to proxy for corporate loans.

¹⁷ Of those IPO firms that report non-zero sales of goods and services to their parent companies, the mean values and the mean ratios (not tabulated) are considerably larger in magnitude but closely similar in pattern to those based on the entire sample. For example, the mean ratio of RP sales scaled by total assets decreased sharply from 13.61% in year –1 to 8.67% in year +1. The mean change in this ratio between year 0 and year +1 (*diff1*) is –4.13%, significantly different from zero (at the 5% level or better).

¹⁸ Of those IPO firms that report non-zero purchases of goods and services from their parent companies, the mean values and the mean ratios (not tabulated) are considerably larger in magnitude but closely similar in pattern to those based on the entire sample. For example, the mean ratio of RP purchases scaled by total assets increased sharply from 13.04% in year –1 to 22.28% in year +1. The mean change in this ratio between year 0 and year +1 (*diff1*) is 9.12%, significantly different from zero (at the 5% level or better).

¹⁹ China's GAAP allow the FIFO or weighted average inventory valuation methods but not LIFO.

ulated) are 9.61% in year -1 , 9.15% in year 0 and 7.73% in year $+1$ relative to the IPO year. A t -test between each pair of means indicates that the differences are statistically significant at the 5% level. The dramatic monotonic drop between year -1 and $+1$ in the proportion of RP sales to total sales may indicate that RP sales are used opportunistically to manage earnings upwards in the pre-IPO period. We also calculate for each of the 185 sample IPO firms the ratio between RP sales to parent companies and RP purchases from parent companies.²⁰ The mean of these ratios (not tabulated) are 1.19 in year -1 , 0.98 in year 0 and 0.75 in year $+1$ relative to the IPO year. A t -test between each pair of means indicates that the differences are statistically significant at the 5% level.

This evidence may suggest that during the pre-IPO period the large ratio of RP sales to RP purchases induces higher profits. In contrast, in the post-IPO year the smaller ratio of RP sales to RP purchases induce a reversal of earnings from the temporarily high managed level during the pre-IPO period.

4.2. Univariate analysis of tunneling variables

Turning to Panel B of Table 3, the mean value of the sample IPO firms' year-end balance of other receivables solely due to transactions with their parent companies (which practically consists of outstanding corporate loans to parent companies) increased from 27.72 million RMB in years -1 to 53.28 in year 0 and to 77.20 million RMB in year $+1$. The mean ratio of year-end balance of other receivables scaled by total assets increased from 1.61% in year -1 to 2.73% in year 0 and to 3.22% in year $+1$. The mean change in this ratio between year -1 and year 0 (*diff0*) is 1.12%, and between year 0 and year $+1$ (*diff1*) it is 0.49%, both significantly different from zero (at the 5% level or better).

The frequency of IPO firms with non-zero year-end balances of other receivables (measured as a percentage of our entire sample of 185 IPO firms) is between 65% in year -1 and 66.5% in years 0 and $+1$.²¹ In contrast, the mean ratio of year-end balance of other payables (which practically consists of outstanding corporate loans from parent companies) scaled by total assets decreased from 1.17% in year -1 to 0.92% in year 0, and further declined to 0.57% in year $+1$. The mean change in this ratio between year -1 and year 0 (*diff0*) is -0.25% , and between year 0 and year $+1$ (*diff1*) it is -0.35% , neither significantly different from zero.

The pattern of the mean values or ratios of the net differences between year-end balances of other receivables and other payables is even more pronounced, showing a significant increase in the net outstanding corporate loans provided by IPO firms to their parent companies in the post-IPO period. The mean net difference increased from 9.47 million RMB in year -1 to 60.83 in year $+1$ and the mean ratio of net differences increased from 0.84% in year -1 to 3.03% in year $+1$. The mean change in this ratio between year -1 and year 0 (*diff0*) is 1.16%, and between year 0 and year $+1$ (*diff1*) it is 0.73%, both significantly different from zero (at the 5% level or better).

Even more striking is the pattern of the ratio of the amount of corporate loan to parent companies (other receivables) to the amount of corporate loan from parent companies (other payables). The mean values of these ratios (not tabulated) are 1.50 in year -1 , 2.35 in year 0 and 4.93 in year $+1$ relative to the IPO year. A t -test between means indicates that the differences are statistically significant at the 5% level. This pattern indicates a dramatic increase in the net outstanding corporate loans of IPO firms to their parent companies.

Recent studies of corporate behavior in China (e.g., Jiang et al., 2008) show that large controlling shareholders routinely use generous corporate loans to divert funds from listed firms. The evidence presented in these studies is consistent with the assertion of tunneling behavior. Unlike credit sales, which are commonly reported as accounts receivable, these corporate loans are typically reported as other receivables on the balance sheets of these listed firms. Whether or not corporate lending expropriates minority shareholders will depend on the credit terms accorded to the parent company and

²⁰ Non-RP purchases of goods and services do not appear in the IPO firms' financial statements.

²¹ Of those IPO firms that report non-zero year-end balances of "other receivables" due solely to transactions with their parent companies, the mean values and the mean ratios (not tabulated) are considerably larger in magnitude but closely similar in pattern to those based on the entire sample. For example, the mean ratio of year-end balance of "other receivables" scaled by total assets increased sharply from 3.15% in year -1 to 6.22% in year $+1$. The mean change in this ratio between year 0 and year $+1$ (*diff1*) is 1.32%, significantly different from zero (at the 5% level or better).

Table 4

CSRC regulations and rules designed to prevent related party corporate loans and induce payment by parent companies (2003–2006).

Date	Regulation sequence	Regulation content	Effects of regulation
2003.08	CSRC announcement No. 56	CSRC requested all listed companies to limit corporate loans	Not very effective because of the lack of legal enforcement power
2005.06	CSRC announcement No. 37	CSRC requested related parties of listed companies to repay outstanding loans	Not very effective because of the lack of legal enforcement power
2005.10	State Council announcement No. 34	Corporate loans between related parties are prohibited and they are required to repay outstanding loans by various means. If the related party is a state-owned enterprise, the persons in charge will be penalized or even dismissed if they cannot manage to repay outstanding loans or if they take further loans from related parties	The State Council has legal enforcement power. On the day the announcement was published, the Shanghai and Shenzhen stock indexes increased by 1.36% and 1.13%, respectively
2006.05	CSRC announcement No. 92	CSRC sets a timeline for related parties to repay existing loans	According to the Shanghai and Shenzhen Stock Exchanges' 2006 statistics, 28% of related parties cannot afford to repay their loans; 28% will repay by restructuring by means such as injecting assets or cancelling shares; 12% will use cash to repay; the others will use both cash and restructuring methods to repay

whether the parent company repay the corporate loans. If the credit terms are consistent with market practice and the parent company does repay the loans, the corporate lending might not harm minority shareholders, and thus not represent tunneling. Hard anecdotal evidence, however, provides good reason to believe that in China the change in the newly listed firm's ratio of net other receivables to total assets due solely to RPTs with the parent company is a major tunneling tool that may be used as a proxy for tunneling.²²

Anecdotal evidence indicates that parent companies frequently do not pay their debts to their listed companies and that this is a major reason for the untimely demise of many newly listed firms. The following quote from Tan (2004) illustrates this phenomenon: "Among the listed companies that have recorded two consecutive years of losses, 70% suffer from misappropriation by controlling shareholders, which is also a major reason for the operational failure of the 15 delisted companies". According to a survey conducted in 2003 by the leading Chinese newspaper, *China Securities Journal*, fund misappropriation by controlling shareholders is the reason for a large amount of their outstanding debt (such as IPO firms' other receivables and advance payments). The survey reports that a total of 57.5 billion RMB was misappropriated by controlling shareholders and other related parties in 2003.

In addition, until 2005 there was no law in China to punish fund misappropriation. In 2003, an individual shareholder of Sanjiu Medical & Pharmaceutical Co. Ltd. sued its chairman because of fund misappropriation, but the case was rejected in court because there was no law to support the appeal. In 2004, when an individual shareholder sued Lianhua Monosodium Glutamate Co. Ltd. and its parent company, the court accepted the appeal but the defendant declined to appear in court on the excuse that fund misappropriation is very common among Chinese listed companies.

The severity of the phenomenon of Chinese parent companies not repaying their debts to their newly listed subsidiaries, and the consequent untimely demise of many newly listed firms, eventually

²² More direct evidence of tunneling would be non-repayment of outstanding corporate loans. Unfortunately, such data are not available. As a proxy we use the change in net other receivables.

led the CSRC to take regulatory actions. Since 2003, the CSRC has promulgated a series of regulations and rules to proscribe RP corporate loans and induce payment by parent companies for loans already made. These regulations are summarized in Table 4 in chronological order and are indicative of the CSRC's concern about the magnitude of this phenomenon and its impact on the ability of the listed subsidiaries to survive. Furthermore, since 2005, the CSRC has required the Shanghai and Shenzhen Stock Exchanges to investigate and publish their listed firms' receivables from their respective parent companies and other related parties, as a way to induce payment by parent companies.

Finally, Jiang et al. (2008) provide some auditors' reports with opinions qualified because of fund misappropriation by controlling shareholders. For example, in the audit report of Shenzhen Huguang Corporation's 2004 annual report we read as follows: "the controlling shareholder and its related parties are using a large amount of funds of Huguang in 2004. As of December 31, 2004, the controlling shareholder and its related parties owe Huguang RMB 597,633,000, 432% of Huguang's shareholders' equity. We cannot make a professional judgment on the probability of collecting from the controlling shareholder and its related parties due to lack of evidence of doing so". All this evidence suggests that corporate loans between related parties are an indicator of tunneling by parent companies.

5. Methodology and analysis

5.1. Assessing earning management during the IPO process

Aharony et al. (2000) use earnings performance, measured as return on assets (ROA),²³ surrounding the IPO year to document evidence of earnings management in Chinese IPOs. Here, we examine whether RPTs are associated with the patterns of Chinese IPOs' ROA in a fashion that indicates earnings management, consistent with the results documented by Aharony et al. (2000). Such evidence would provide support to our first hypothesis (H1) that Chinese parent companies engage in opportunistic RP sales to manipulate their candidate IPO firms' earnings upwards in the period prior to listing.

First, we assess the prevalence of earnings management among our Chinese IPO firms by replicating the methodology of Aharony et al. (2000) – estimating the pattern of changes in ROA surrounding the IPO year. Second, to test our first hypothesis (H1), we use a multiple regression model that examines whether a positive association exists between the to-be-listed firms' ROA in the IPO year (year 0) and changes (between year –1 and year 0) in their RP sales (our measure of abnormal RP sales) to their parent companies. By introducing changes (between year –1 and year 0) in RP purchases (our measure of abnormal RP purchases) into the regression model we also examine whether RP purchases are used to inflate earnings.

Table 5 presents both the sample mean and median ROA and the mean and median differences in ROA between the IPO year (year 0) and the two adjacent years (–1 and +1). The results closely resemble those reported by Aharony et al. (2000), i.e., both mean and median ROA peak in the IPO year for the entire IPO sample. In the post-IPO year, the mean and median differences in ROA are both negative (–1.74 and –1.28, respectively) and highly statistically significant, as indicated by the *t*-test and Wilcoxon rank sum test (*z*-statistic), respectively, whereas in the pre-IPO year we detect positive, though statistically insignificant, mean and median differences in ROA (0.44 and 0.49, respectively).

The following ordinary least square (OLS) regression run on our entire sample of 185 to-be-listed IPO firms tested our first hypothesis (H1):

$$ROA_{i,t=0} = a_0 + a_1 \Delta RPSALES_{i,t=0} + a_2 \Delta RPPUR_{i,t=0} + a_3 \Delta NRPSALES_{i,t=0} + a_4 RPSALES_{i,t=0} + a_5 NRPSALES_{i,t=0} + a_6 RPPUR_{i,t=0} + a_7 DEBT_{i,t=0} + a_8 SIZE_{i,t=0} + e_{i,t} \quad (1)$$

Here, $ROA_{i,t=0}$ is IPO firm *i*'s return on assets in the IPO year ($t = 0$), calculated as net income in year 0 divided by total assets excluding total cash at the end of year 0.

$\Delta RPSALES_{i,t=0}$ is IPO firm *i*'s change in the ratio of RP sales to year-end total assets between years $t = -1$ and $t = 0$, our measure of abnormal RP sales during the IPO process.

²³ ROA is net income in year *t* divided by total assets, excluding total cash, at the end of year *t*. Total cash is excluded to remove the cash effect of the IPO.

Table 5

Earnings performance measured as return on assets (ROA) surrounding the IPO year of Chinese IPO firms, 1999–2001.

Year relative to IPO year (0)	-1	0	1
<i>Return on assets (ROA,%)</i>			
Median	6.15	7.00	5.91
Mean	7.53	7.97	6.23
Std. dev.	4.46	4.32	6.12
Min.	0	0.40	-46.67
Max.	24.64	28.19	24.93
Median of difference in ROA	-	0.49	-1.28
		(0.464)	(0.001)
Mean of difference in ROA	-	0.44	-1.74
		(0.469)	(0.001)

The table presents the median and mean return on assets (ROA) from one year before to one year after the IPO and the median and mean differences in ROA relative to year 0 for the 185 Chinese firms that went public during 1999–2001. The ROA is calculated as net income in year t divided by total assets excluding total cash at the end of year t . The p -values of the t -test of mean differences and the Wilcoxon signed-rank tests of median differences are reported in parentheses. Bold value indicates significance (two-tailed) at the 1% level or better.

$\Delta RPPUR_{i,t=0}$ is IPO firm i 's change in the ratio of RP purchases to year-end total assets between years $t = -1$ and $t = 0$, our measure of abnormal RP purchases during the IPO process.

The rest of the explanatory variables serve as controls.

As non-related party (NRP) sales of goods and services (NRP sales) may also be used to inflate earnings, we include $\Delta NRPSALES_{i,t=0}$, IPO firm i 's change in the ratio of NRP sales to year-end total assets, between years $t = -1$ and $t = 0$.

We also include the levels of the above three change variables to control for any effect of the level of sales or purchases on the ROA patterns. $RPSALES_{i,t=0}$ is IPO firm i 's level of RP sales in year $t = 0$ scaled by year-end total assets, $NRPSALES_{i,t=0}$ is IPO firm i 's level of non-RP sales in year $t = 0$ scaled by year-end total assets, $RPPUR_{i,t=0}$ is IPO firm i 's level of RP purchases in year $t = 0$ scaled by year-end total assets.

Finally, we include *DEBT* and *SIZE* to control for cross-sectional differences among our sample firms in financial leverage and size, respectively. Greater financial leverage may monitor managers and reduce agency costs, and hence increase firm performance (see Myers, 2001 for a review). $DEBT_{i,t=0}$ is IPO firm i 's long-term debt divided by total assets as of year-end $t = 0$. Larger firms could be less efficient because of weaker control by top managers over strategic and operational activities within the firm (Williamson, 1967). In addition, Watts and Zimmerman (1986) suggest that firm size may also proxy for political cost because larger firms may get more attention from the government. $SIZE_{i,t=0}$ is IPO firm i 's natural logarithm of the market value of equity at year-end $t = 0$.

The regression results, reported in Table 6, reveal that the estimated coefficient of $\Delta RPSALES_{i,t=0}$ is positive and significant (at the 5% level), indicating that abnormal RP sales by IPO firms to their parent companies during the pre-IPO period are positively associated with earnings performance, measured as return on assets (ROA), in the IPO year.²⁴ We interpret these results as supportive of the contention that Chinese parent companies engage in opportunistic RP sales to manipulate their candidate IPO firms' earnings upwards during the IPO process in a fashion that indicates earnings management, consistent with the results documented by Aharony et al. (2000). In contrast, the estimated coefficient of $\Delta NRPSALES_{i,t=0}$ is small and statistically insignificant. The lack of a significant association between earnings performance in the IPO year and changes in NRP sales in the pre-IPO year suggests that managers may not use the discretion they have in utilizing revenue from NRP sales as an earnings management tool during the IPO process.

The estimated coefficient of $\Delta RPPUR_{i,t=0}$, though negative as hypothesized, is small (in absolute terms) and statistically insignificant, indicating that abnormal RP purchases by IPO firms from their

²⁴ We winsorize all continuous variables at 1% and 99% tails in an attempt to control some extreme values. This method is applied to all regression models reported in the paper. When we controlled for extreme values at the 1.5% and 98.5% tails, the results (untabulated) and conclusions derived remained unchanged.

Table 6

The association between return on assets in the IPO year and changes in related party sales and purchases of goods and services in the pre-IPO period – a test of earnings management.

Explanatory variables	Pre-IPO period ($t = -1$ to $t = 0$)
Intercept	0.517 (0.68)
$\Delta RPSALES [(t = 0) - (t = -1)]$	0.166** (2.47)
$\Delta RPPUR [(t = 0) - (t = -1)]$	-0.019 (-0.37)
$\Delta NRPSALES [(t = 0) - (t = -1)]$	0.091 (1.55)
$RPSALES (t = 0)$	0.326*** (2.72)
$NRPSALES (t = 0)$	0.242** (2.41)
$RPPUR (t = 0)$	-0.125 (-0.36)
$DEBT (t = 0)$	0.035*** (4.23)
$SIZE (t = 0)$	0.009 (0.83)
No. of observations	185
Adjusted R^2	0.127

The table reports the results for regression Eq. (1):

$$ROA_{i,t=0} = a_0 + a_1 \Delta RPSALES_{i,t=0} + a_2 \Delta RPPUR_{i,t=0} + a_3 \Delta NRPSALES_{i,t=0} + a_4 RPSALES_{i,t=0} + a_5 NRPSALES_{i,t=0} + a_6 RPPUR_{i,t=0} + a_7 DEBT_{i,t=0} + a_8 SIZE_{i,t=0} + e_{it}$$

Here, $ROA_{i,t=0}$ is IPO firm i 's return on assets in the IPO year ($t = 0$), calculated as net income in year 0 divided by total assets excluding total cash at the end of year 0, $\Delta RPSALES_{i,t=0}$ is IPO firm i 's change in the ratio of RP sales of goods and services to year-end total assets between years $t = -1$ and $t = 0$, $\Delta RPPUR_{i,t=0}$ is IPO firm i 's change in the ratio of RP purchases of goods and services to year-end total assets between years $t = -1$ and $t = 0$, $\Delta NRPSALES_{i,t=0}$ is IPO firm i 's change in the ratio of non-related party (NRP) sales to year-end total assets, between years $t = -1$ and $t = 0$, $RPSALES_{i,t=0}$ is IPO firm i 's level of RP sales in year $t = 0$ scaled by year-end total assets, $NRPSALES_{i,t=0}$ is IPO firm i 's level of NRP sales in year $t = 0$ scaled by year-end total assets, $RPPUR_{i,t=0}$ is IPO firm i 's level of RP purchases in year $t = 0$ scaled by year-end total assets, $DEBT_{i,t=0}$ is IPO firm i 's long-term debt divided by total assets as of year-end 0, $SIZE_{i,t=0}$ is IPO firm i 's natural logarithm of the market value of equity at year-end 0. t -Statistics are reported in parentheses.

** Two-tailed significance at the 5% level.

*** Two-tailed significance at the 1% level.

parent companies during the pre-IPO are immaterial means of opportunistic earnings management during the IPO process.

The level of RP sales in the IPO year ($RPSALES_{i,t=0}$) is positively related to contemporaneous ROA_0 (with coefficient estimates statistically significant at the 1% level). These results are obtained after controlling for $NRPSALES_{i,t=0}$, the contemporaneous level of NRP sales in year $t = 0$ (which has a positive and statistically significant coefficient estimate at the 5% level).

The estimated coefficient of $RPPUR_{i,t=0}$, the contemporaneous level of RP purchases in year $t = 0$ is negative but statistically insignificant.

Finally, the estimated coefficients for the remaining two control variables, $DEBT$ and $SIZE$, are positive but only the former is statistically significant (at the 1% level). The adjusted R^2 is 12.7%.

To sum up, the results reported in Tables 5 and 6 provide support to our first hypothesis (H1) that Chinese parent companies engage in opportunistic RP sales to manipulate their candidate IPO firms' earnings upwards in the period prior to listing.

5.2. Tunneling as an incentive for earnings management during the IPO process

Having shown that related party sales during the IPO process are used as earnings management tools, we now examine the incentives for such opportunistic behavior. We conjecture that Chinese

SOE managers may be motivated to inflate the issuance price at IPO in order to raise more funds from the new minority shareholders than would be justified by the fair value of the newly listed firm, for disposal by the parent SOE. We first examine this assertion by analyzing the association between abnormal RP sales and purchases and the proceeds obtained by the IPO. Second, we extend the exploitation of the minority shareholders argument, conjecturing that inflating earnings in the pre-IPO period is motivated by the opportunity for tunneling behavior in the post-IPO period. For this purpose we analyze the association between abnormal RP sales and purchases in the pre-IPO period and tunneling behavior in the form of parent companies failing to repay outstanding net corporate debt to their newly listed subsidiary firms, in the post-IPO period.

Kim and Ritter (1999) report that the price-earnings (PE) multiple method is the most common means of valuating IPOs. The higher the PE ratio for a given level of earnings, the larger the proceeds of the newly listed firm in the initial public offering. In using this model to examine the association between abnormal RP sales and purchases and the magnitude of the proceeds raised in the IPO, we run the following OLS regression, in the spirit of Kim and Ritter (1999), for our entire sample of 185 IPO firms:

$$PE_{i,t=0} = b_0 + b_1 \Delta RPSALES_{i,t=0} + b_2 \Delta RPPUR_{i,t=0} + b_3 \Delta NRPSALES_{i,t=0} + b_4 RPSALES_{i,t=0} + b_5 NRPSALES_{i,t=0} + b_6 RPPUR_{i,t=0} + b_7 PEC_{i,t=0} + e_{i,t} \quad (2)$$

Here, $PE_{i,t=0}$ is IPO firm i 's offering price per share divided by its earnings per share in the IPO year ($t = 0$), $\Delta RPSALES_{i,t=0}$, $\Delta RPPUR_{i,t=0}$, $\Delta NRPSALES_{i,t=0}$, $RPSALES_{i,t=0}$, $NRPSALES_{i,t=0}$ and $RPPUR_{i,t=0}$ are as defined in Eq. (1), and $PEC_{i,t=0}$ is the median PE ratio of all firms in the same industry as IPO firm i that went public during the 12 months prior to firm i 's IPO year ($t = 0$), controlling for industry peers' PE ratios.

The regression results, reported in Table 7, indicate that the estimated coefficients of both the change ($\Delta RPSALES$) and level ($RPSALES$) of RP sales are positive and significant (at the 10% and 5% level, respectively). We interpret this positive association with the initial PE ratio as an indication that inflating sales by RP transactions increases the IPO initial valuation, resulting in higher proceeds from minority investors.²⁵ The negative estimated coefficients of $\Delta RPPUR_{i,t=0}$, and $RPPUR_{i,t=0}$ are also consistent with these conclusions though they are statistically insignificant. These results are obtained after controlling for NRP sales and for industry peers' PE ratios.

To assess the prevalence of tunneling in the post-IPO period, we use IPO firm i 's change in the ratio of net outstanding corporate loans (reported as IPO firms' other receivables net of other payables) to year-end total assets, between year $t = 0$ and year $t = +1$, due solely to RPTs with parent companies (denoted by $\Delta NOREC_{i,t=1}$). In particular, we examine whether our measure of tunneling is positively associated with our measure of earnings management (abnormal RP sales) during the pre-IPO period ($t = -1$ to $t = 0$), denoted by $\Delta RPSALES_{i,t=0}$. We examine the possibility of such an association first by conducting a univariate analysis and then via a multivariate regression analysis.

Table 8 presents summary statistics of the occurrence of an association between earnings management behavior via abnormal RP sales in the pre-IPO period and tunneling via abnormal net outstanding corporate loans to parent companies in the post-IPO period in our sample of 185 Chinese IPO firms.

In 124 cases (67% of our sample) there is a positive association between our earnings management and tunneling measures. Of these, for 96 cases both $\Delta RPSALES_{i,t=0}$ and $\Delta NOREC_{i,t=1}$ are positive (i.e., both earnings management and tunneling prevail) with a mean increase in RP sales in the pre-IPO period of 1.89%, and a mean increase in net outstanding corporate loans in the post-IPO period of 4.88%. For the remaining 28 cases both $\Delta RPSALES_{i,t=0}$ and $\Delta NOREC_{i,t=1}$ are negative (i.e., no earnings management and no tunneling) with a mean decrease in RP sales in the pre-IPO period of 1.92% and a mean decrease in net outstanding corporate loans in the post-IPO period of 2.16%.

²⁵ The correlation coefficient between $\Delta RPSALES$ in year 0 and gross proceeds from IPO is 0.246 ($p = 0.017$), indicating that earnings management through related party sales of goods and services results in more funds being raised from minority shareholders.

Table 7

The association between IPO's price-earnings ratio and changes in related party sales and purchases of goods and services in the pre-IPO period – a test of inflating IPO issuance price.

Explanatory variables	Pre-IPO period ($t = -1$ to $t = 0$)
Intercept	21.156 ^{***} (17.23)
$\Delta RPSALES [(t = 0) - (t = -1)]$	33.989 [*] (1.86)
$\Delta RPPUR [(t = 0) - (t = -1)]$	-13.684 (-1.15)
$\Delta NRPSALES [(t = 0) - (t = -1)]$	3.012 (1.23)
$RPSALES (t = 0)$	16.323 ^{**} (2.54)
$NRPSALES (t = 0)$	1.623 (0.93)
$RPPUR (t = 0)$	-5.965 (-0.98)
$PEC (t = 0)$	0.157 ^{**} (2.33)
No. of observations	185
Adjusted R^2	0.082

The table reports the results for regression Eq. (2):

$$PE_{i,t=0} = b_0 + b_1 \Delta RPSALES_{i,t=0} + b_2 \Delta RPPUR_{i,t=0} + b_3 \Delta NRPSALES_{i,t=0} + b_4 RPSALES_{i,t=0} + b_5 NRPSALES_{i,t=0} + b_6 RPPUR_{i,t=0} + b_7 PEC_{i,t=0} + e_{i,t}.$$

Here, $PE_{i,t=0}$ is IPO firm i 's offering price per share divided by its earnings per share in the IPO year ($t = 0$), $\Delta RPSALES_{i,t=0}$ is IPO firm i 's change in the ratio of RP sales of goods and services to year-end total assets between years $t = -1$ and $t = 0$, $\Delta RPPUR_{i,t=0}$ is IPO firm i 's change in the ratio of RP purchases of goods and services to year-end total assets between years $t = -1$ and $t = 0$, $\Delta NRPSALES_{i,t=0}$ is IPO firm i 's change in the ratio of non-related party (NRP) sales to year-end total assets, between years $t = -1$ and $t = 0$, $RPSALES_{i,t=0}$ is IPO firm i 's level of RP sales in year $t = 0$ scaled by year-end total assets, $NRPSALES_{i,t=0}$ is IPO firm i 's level of NRP sales in year $t = 0$ scaled by year-end total assets, $RPPUR_{i,t=0}$ is IPO firm i 's level of RP purchases in year $t = 0$ scaled by year-end total assets, $PEC_{i,t=0}$ is the median PE ratio of all firms in the same industry as IPO firm i that went public during the prior 12 months relative to firm i 's IPO year ($t = 0$).

t -Statistics are reported in parentheses.

* Two-tailed significance at the 10% level.

** Two-tailed significance at the 5% level.

*** Two-tailed significance at the 1% level.

As shown in the table, it is possible to have earnings management without any apparent tunneling: in 20 cases there is an increase in RP sales in the pre-IPO period ($\Delta RPSALES_{i,t=0} > 0$) (mean increase 2.26%) followed by a decrease in net outstanding corporate loans in the post-IPO period ($\Delta NOREC_{i,t=1} \leq 0$) (mean decrease 3.27%).

Finally, it is possible to have tunneling without earnings management: in 41 cases there is a decrease in RP sales in the pre-IPO period ($\Delta RPSALES_{i,t=0} \leq 0$) (mean decrease 5.72%) followed by an increase in net outstanding corporate loans in the post-IPO period ($\Delta NOREC_{i,t=1} > 0$) (mean increase 2.62%).

To test whether the occurrence of tunneling (the columns) is independent of the occurrence of earnings management (the rows), we use a Chi-square test. As shown in Table 8, we obtain a Chi-square of 15.96 (statistically significant at the 1% level or less), rejecting the null hypothesis that our earnings management and tunneling proxy variables are independent. The lack of independence supports our assertion of an association between tunneling via increase in net non-repaid corporate loans in the post-IPO period and earnings management via increase in RP sales in the pre-IPO period.

Next, we examine for the possibility of our predicted association using the following OLS regression for our entire sample of 185 IPO firms:

Table 8

Summary statistics and Chi-square test of the occurrence of an association between earnings management (EM) behavior via abnormal related party sales of goods and services in the pre-IPO period and tunneling via abnormal net outstanding corporate loans to parent companies in the post-IPO period among 185 Chinese IPO firms, 1999–2001.

	Firms with post-IPO tunneling ($\Delta\text{NOREC}_{i,t=1} > 0$)	Firms without post-IPO tunneling ($\Delta\text{NOREC}_{i,t=1} \leq 0$)	Total	Chi-square test of independence (p-value)
Firms with pre-IPO EM ($\Delta\text{RPSALES}_{i,t=0} > 0$)	96 ^a 1.89% (1.28%) ^b 4.88% (2.38%) ^c	20 2.26% (1.35%) –3.27% (–0.64%)	116 1.95% (1.30%) 3.475% (2.09%)	
Firms without pre-IPO EM ($\Delta\text{RPSALES}_{i,t=0} \leq 0$)	41 –5.72% (–0.96%) 2.62% (0.84%)	28 –1.92% (0.00%) –2.16% (–0.71%)	69 –4.178% (0.00%) 0.674% (0.00%)	
Total	137 –0.39% (0.61%) 4.20% (1.90%)	48 –0.18% (0.00%) –2.62% (–0.59%)	185 –0.34% (0.98%) 2.40% (1.56%)	15.963* (p = 0.000)

Each cell reports the following:

^a The number of sample IPO firms (first row).

^b The mean (median) of $\Delta\text{RPSALES}_{i,t=0}$, our measure of earnings management in the pre-IPO period, is IPO firm *i*'s change in the ratio of RP sales of goods and services to year-end total assets, between year $t = -1$ and $t = 0$ (second row).

^c The mean (median) of $\Delta\text{NOREC}_{i,t=1}$, our measure of tunneling in the post-IPO period, is IPO firm *i*'s change in the ratio of net outstanding corporate loans (other receivables – other payables) to year-end total assets, between year $t = 0$ and $t = +1$, due solely to RPTs with parent companies (third row).

* Two-tailed significance at the 1% level or better.

$$\begin{aligned} \Delta\text{NOREC}_{i,t=1} = & d_0 + d_1\Delta\text{RPSALES}_{i,t=0} + d_2\Delta\text{RPPUR}_{i,t=0} + d_3\Delta\text{NRPSALES}_{i,t=0} + d_4\Delta\text{RPSALES}_{i,t=1} \\ & + d_5\Delta\text{RPPUR}_{i,t=1} + d_6\Delta\text{NRPSALES}_{i,t=1} + d_7\text{CFO}_{i,t=1} + d_8\Delta\text{CFO}_{i,t=1} + d_9\text{DEBT}_{i,t=1} \\ & + d_{10}\Delta\text{DEBT}_{i,t=1} + d_{11}\text{MBE}_{i,t=1} + d_{12}\text{SIZE}_{i,t=1} + e_{it} \end{aligned} \quad (3)$$

Here, $\Delta\text{NOREC}_{i,t=1}$, $\Delta\text{RPSALES}_{i,t=0}$, $\Delta\text{RPPUR}_{i,t=0}$, $\Delta\text{NRPSALES}_{i,t=0}$, are as defined earlier. We also include measures of the latter three variables for the post-IPO year, i.e., between year $t = 0$ and year $t = +1$: $\Delta\text{RPSALES}_{i,t=1}$, $\Delta\text{RPPUR}_{i,t=1}$ and $\Delta\text{NRPSALES}_{i,t=1}$. We do so to account for the possibility that the amount of tunneling in the post-IPO period is related not only to the magnitude of earnings management through RP sales and purchases in the pre-IPO period; it is plausible that listed firms tunnel resources back to the parent company and mask their performance through RPTs in the concurrent period too. The rest of the explanatory variables serve as controls.

$\text{CFO}_{i,t=1}$ is IPO firm *i*'s cash flows from operations in year $t = +1$ scaled by total assets as of year-end $t = +1$. $\Delta\text{CFO}_{i,t=1}$ is the change in CFO between years $t = 0$ and $t = +1$. $\text{DEBT}_{i,t=1}$ is IPO firm *i*'s long-term debt as of year-end $t = +1$ divided by total assets as of year-end $t = +1$. $\Delta\text{DEBT}_{i,t=1}$ is the change in DEBT between years $t = 0$ and $t = +1$. $\text{MBE}_{i,t=1}$ is IPO firm *i*'s market value of equity as of year-end $t = +1$ divided by IPO firm *i*'s book value of equity as of year-end $t = +1$. $\text{SIZE}_{i,t=1}$ is the natural logarithm of IPO firm *i*'s market value of equity as of year-end $t = +1$. Since NOREC is an accrual measure, we include CFO as an additional control variable, following previous studies (e.g., Dechow, 1994; Kasznik, 1999) that have shown a significant negative association between CFO and accrual measures. DEBT, MBE, and SIZE are introduced as control variables for cross-sectional differences in financial leverage, firms' growth potential, and size, respectively, across our sample firms. Since we use change in NOREC as a dependent variable, we also include changes in CFO and in DEBT in the regression analysis.

The regression results, reported in Table 9, show that the estimated coefficient of $\Delta\text{RPSALES}_{i,t=0}$ is positive and significant (at the 5% level). This indicates that abnormal RP sales by IPO firms to their parent companies in the pre-IPO period ($t = -1$ to $t = 0$) are positively associated with abnormal net RP corporate loans provided by IPO firms to their parent companies in the post-IPO period ($t = 0$ to $t = +1$). The magnitude of the estimated regression coefficient is relatively large (0.496), indicating that this association also has economic significance: one RMB increase in RP sales in the pre-IPO period results in a 0.496 RMB increase in net corporate loans to parent companies in the post-IPO period.

Table 9

The association between changes in related party's net outstanding corporate loans and changes in related party's sales and purchases of goods and services – a test of tunneling.

Explanatory variables	Post-IPO period ($t = 0$ to $t = +1$)
Intercept	-0.124 (-0.68)
$\Delta RPSALES [(t = 0) - (t = -1)]$	0.496** (2.32)
$\Delta RPPUR [(t = 0) - (t = -1)]$	0.033 (1.36)
$\Delta NRPSALES [(t = 0) - (t = -1)]$	0.156 (0.98)
$\Delta RPSALES [(t = 1) - (t = 0)]$	-0.013 (-0.29)
$\Delta RPPUR [(t = 1) - (t = 0)]$	0.001 (0.26)
$\Delta NRPSALES [(t = 1) - (t = 0)]$	0.005 (0.30)
$CFO_{i,t=1}$	-0.148** (-1.98)
$\Delta CFO_{i,t=1}$	0.076 (1.01)
$DEBT_{i,t=1}$	-0.017 (-0.21)
$\Delta DEBT_{i,t=1}$	-0.021 (-0.43)
$MBE_{i,t=1}$	0.005 (1.58)
$SIZE_{i,t=1}$	0.007 (0.72)
No. of observations	185
Adjusted R^2	0.033

The table reports the results for regression Eq. (3):

$$\begin{aligned} \Delta NOREC_{i,t=1} = & d_0 + d_1 \Delta RPSALES_{i,t=0} + d_2 \Delta RPPUR_{i,t=0} + d_3 \Delta NRPSALES_{i,t=0} + d_4 \Delta RPSALES_{i,t=1} \\ & + d_5 \Delta RPPUR_{i,t=1} + d_6 \Delta NRPSALES_{i,t=1} + d_7 CFO_{i,t=1} + d_8 \Delta CFO_{i,t=1} + d_9 DEBT_{i,t=1} \\ & + d_{10} \Delta DEBT_{i,t=1} + d_{11} MBE_{i,t=1} + d_{12} SIZE_{i,t=1} + e_{i,t}. \end{aligned}$$

Here, $\Delta NOREC_{i,t=1}$, our measure of tunneling, is IPO firm i 's change in the ratio of net corporate loans (other receivables – other payables) to year-end total assets, between years $t = 0$ and year $t = +1$ due solely to RPTs with parent companies. $\Delta RPSALES_{i,t=0}$, our measure of earnings management in the pre-IPO period, is IPO firm i 's change in the ratio of RP sales of goods and services to year-end total assets, between years $t = -1$ and $t = 0$. $\Delta RPPUR_{i,t=0}$ is IPO firm i 's change in the ratio of RP purchases of goods and services to year-end total assets, between years $t = -1$ and $t = 0$. $\Delta NRPSALES_{i,t=0}$ is IPO firm i 's change in the ratio of non-related party (NRP) sales of goods and services to year-end total assets, between years $t = -1$ and $t = 0$. $\Delta RPSALES_{i,t=1}$, $\Delta RPPUR_{i,t=1}$ and $\Delta NRPSALES_{i,t=1}$ are included in the post-IPO period ($t = 0$ to $t = +1$) regression as three additional explanatory variables. $CFO_{i,t=1}$ is IPO firm i 's cash flow from operations in year t scaled by total assets as of year-end $t = +1$. $\Delta CFO_{i,t=1}$ is change in CFO_i between years $t = 0$ and $t = +1$. $DEBT_{i,t=1}$ is IPO firm i 's long-term debt divided by total assets as of year-end $t = +1$. $\Delta DEBT_{i,t=1}$ is change in $DEBT_i$ between years $t = 0$ and $t = +1$. $MBE_{i,t=1}$ is the market value of equity divided by the book value of equity at year-end $t = +1$. $SIZE_{i,t=1}$ is IPO firm i 's natural logarithm of the market value of equity at year-end $t = +1$.

t -Statistics are reported in parentheses.

** Two-tailed significance at the 5% level.

We interpret these results as supportive of the contention that Chinese parent companies engage in opportunistic RP sales to boost their candidate IPO firms' earnings in the pre-IPO period and then tunnel economic resources away from their new affiliates via abnormal RP corporate loans in the post-IPO period.²⁶ The estimated coefficient of $\Delta RPPUR_{i,t=0}$ is small and statistically insignificant, indicat-

²⁶ In an earlier version of this paper, we tested whether IPO firms endowed with supposedly sound corporate governance mechanisms, such as the presence of independent directors and the separation of the positions of board chairperson and CEO, reduce their parent companies' earnings management and tunneling behavior but found no significant impact. Our interpretation is that the soundness of corporate governance mechanisms among Chinese listed companies is questionable.

ing immaterial means of opportunistic behavior via RP purchases in the pre-IPO period. The estimated coefficient of $\Delta NRPSALES_{i,t=0}$ is also small and statistically insignificant. Nor do we find any significant concurrent association between the tunneling measure ($\Delta NOREC_{i,t=1}$) and the three main variables ($\Delta RPSALES_{i,t=1}$, $\Delta RPPUR_{i,t=1}$ and $\Delta NRPSALES_{i,t=1}$). These results indicate that concurrent changes in RP and non-RP transactions have no significant association with the amount of resources tunneled. Taken together, the results suggest that only changes in RP sales in the pre-IPO period are associated with tunneling in the post-IPO period.

The estimated coefficients for the control variables in both regressions are generally statistically insignificant, except for *CFO*, which is negative and statistically significant, consistent with the mechanical relationship between cash flows and accrual measures reported in the literature (e.g., Dechow, 1994; Kasznik, 1999).²⁷

To sum up, the results reported in Tables 8 and 9 provide support to our second hypothesis (H2). That is, the magnitude of abnormal RP sales between the parent company and its candidate IPO firm aimed at boosting its earnings in the pre-IPO period is positively associated with the magnitude of economic resources tunneled via abnormal RP corporate loans from these subsidiaries in the post-IPO period.

5.3. Do investors perceive opportunistic RPTs? A post-IPO test of the implications of tunneling for capital markets

We propose that new investors in Chinese IPO firms fail to perceive the relationship between opportunistic RP sales in the pre-IPO period and tunneling via opportunistic RP corporate loans in the post-IPO period. If this is indeed the case then the market valuation of IPO firms in the post-IPO period should be negatively correlated with abnormal RP sales in the pre-IPO period, which are positively associated with abnormal RP net outstanding corporate loans in the post-IPO period (H3).

To test the hypothesis, we run the following OLS regression in the spirit of the regression model used in Ritter (1991, Table X), including our measure of abnormal RP sales in the pre-IPO period ($\Delta RPSALES_{i,t=0}$), our measure of abnormal RP net outstanding corporate loans in the post-IPO period ($\Delta NOREC_{i,t=1}$) and other relevant explanatory variables:

$$\begin{aligned}
 BHR_i = & f_0 + f_1 \Delta RPSALES_{i,t=0} + f_2 \Delta NOREC_{i,t=1} + f_3 Dummy1 + f_4 Dummy2 + f_5 Dummy3 \\
 & + f_6 \Delta RPPUR_{i,t=0} + f_7 \Delta NRPSALES_{i,t=0} + f_8 \Delta NOREC_{i,t=0} + f_9 \Delta RPSALES_{i,t=1} \\
 & + f_{10} \Delta RPPUR_{i,t=1} + f_{11} \Delta NRPSALES_{i,t=1} + f_{12} IPORET_i + f_{13} MARKET_i + f_{14} ROA_{i,t=0} \\
 & + f_{15} MBE_{i,t=0} + f_{16} SIZE_{i,t=0} + e_{i,t}
 \end{aligned} \tag{4}$$

Here, BHR_i is IPO firm i 's 12-month or 24-month post-IPO buy-and-hold raw return starting four months after the first fiscal year-end subsequent to the IPO.²⁸ $\Delta RPSALES_{i,t=0}$, $\Delta NOREC_{i,t=1}$, $\Delta RPPUR_{i,t=0}$, $\Delta NRPSALES_{i,t=0}$, $\Delta NOREC_{i,t=0}$, $\Delta RPSALES_{i,t=1}$, $\Delta RPPUR_{i,t=1}$, $\Delta NRPSALES_{i,t=1}$, $ROA_{i,t=0}$, $MBE_{i,t=0}$, and $SIZE_{i,t=0}$ are as defined earlier.²⁹

As was shown in Table 8, in 96 cases earnings management in the pre-IPO period ($\Delta RPSALES_{i,t=0} > 0$) was followed by tunneling in the post-IPO period ($\Delta NOREC_{i,t=1} > 0$). Nevertheless, in 20 cases earnings management in the pre-IPO period prevailed without any apparent tunneling in the post-IPO period and vice versa, in 41 cases tunneling in the post-IPO period prevailed without any apparent earnings management in the pre-IPO period.

²⁷ Specifically, $\Delta NOREC$ is subtracted from net income to calculate cash flow from operations (*CFO*) under the indirect method. Thus *CFO* is mechanically negatively associated with $\Delta NOREC$.

²⁸ IPOs occur at various times during the year, while accounting data are for the fiscal year. Teoh et al. (1998) discuss this issue and provide various empirical sensitivities to the time period. We choose buy-and-hold raw returns calculated starting four months after the first fiscal year-end subsequent to the IPO. As robustness checks we also examine various alternative time periods for computing our buy-and-hold returns measure. These additional sensitivity tests yield results similar to those reported in the text.

²⁹ The key independent variables are scaled by total assets. As a sensitivity test we rerun regression (4) using year-end market value of equity instead as a deflator where relevant. The results (not tabulated) are qualitatively similar to those reported below.

To control for the effects of the various interactions between our measures of earnings management in the pre-IPO period and tunneling in the post-IPO period on the market valuation of IPO firms in the post-IPO period, we introduce three interaction dummies. *Dummy1* equals one when both $\Delta RPSALES_{i,t=0}$ and $\Delta NOREC_{i,t=1}$ are positive, and zero otherwise. *Dummy2* equals one when $\Delta RPSALES_{i,t=0}$ is positive but $\Delta NOREC_{i,t=1}$ is non-positive, and zero otherwise. *Dummy3* equals one when $\Delta RPSALES_{i,t=0}$ is non-positive and $\Delta NOREC_{i,t=1}$ is positive, and zero otherwise. $\Delta NOREC_{i,t=0}$ is included to capture opportunistic tunneling behavior in the pre-IPO period.

The post-IPO period ($t = 0$ to $t = +1$) measures of $\Delta RPSALES_{i,t=1}$ and, $\Delta RPPUR_{i,t=1}$ are included in the regression to examine how the market perceives each of these two explanatory variables in the period concurrent with the hypothesized tunneling. To examine whether investors value the change in RP sales differently from the change in NRP sales, we include in the regression $\Delta NRPSALES_{i,t=0}$ and $\Delta NRPSALES_{i,t=1}$.

Finally, we include other factors that may affect post-IPO stock performance. $IPORET_i$ is IPO firm i 's market-adjusted initial IPO trading day return, which is included to capture the impact of underpricing on IPO firm i 's post-IPO performance. $MARKET_i$ is the Shanghai stock market value-weighted return for the same interval as the dependent variable. Its estimated coefficient captures the systematic risk, beta. $ROA_{i,t=0}$ is included to control for accounting performance measures other than changes in RP sales or NRP sales, in an effort to avoid the problem of omitted variables if changes in RP sales or NRP sales are correlated with other accounting performance indicators. $MBE_{i,t=0}$, and $SIZE_{i,t=0}$ are introduced to control for cross-sectional differences in firms' growth potential and size, respectively, across our sample firms in the IPO year.

The regression results, reported in Table 10, provide evidence of the implications for capital markets of opportunistic RP sales in the pre-IPO period and tunneling via RP non-repaid net corporate loans in the post-IPO period. The estimated coefficient of $\Delta RPSALES_{i,t=0}$ is significantly negative (at the 5% level) in both regressions. The relatively large magnitude (in absolute terms) of the estimated coefficient of $\Delta RPSALES_{i,t=0}$ indicates that this association also has economic significance. For example, one unit increase in RP sales (relative to total assets) in the pre-IPO period may result in a 0.596% decrease in 24-month post-IPO stock returns.

The estimated coefficient of $\Delta NOREC_{i,t=1}$ in the 12-month BHR regression is negative but statistically insignificant, suggesting no concurrent implications of tunneling for the market. In contrast, the estimated coefficient of $\Delta NOREC_{i,t=1}$ in the 24-month BHR regression is significantly negative (−0.853, significant at the 5% level). This indicates that tunneling through corporate loans in the post-IPO year results in stock underperformance in the subsequent year, consistent with the results reported in Jiang et al. (2008).

Furthermore, the estimated coefficient of *Dummy1*, the interaction variable that accounts for the occurrence of earnings management followed by tunneling is also significantly negative (at the 5% level) in both regressions. This suggests underperformance of IPO firms' 12- or 24-month post-IPO buy-and-hold raw return due to opportunistic RP sales in the pre-IPO year that are associated with increase in RP non-repaid net corporate loans in the post-IPO period.

We interpret this evidence as being consistent with our third hypothesis (H3), namely, new investors in Chinese IPOs fail to perceive the relationship between earnings management via abnormal RP sales in the pre-IPO period and tunneling via abnormal RP corporate loans in the post-IPO period. Nevertheless, when firms are engaged in pre-IPO earnings management but not in post-IPO tunneling (*Dummy2* = 1), we report a negative effect on the 12-month and 24-month post-IPO buy-and-hold raw return: in both regressions the estimated coefficient of *Dummy2* is negative, statistically significant at the 10% level. This suggests that pre-IPO earnings management is overlooked by investors, resulting in post-IPO stock underperformance³⁰ regardless of post-IPO tunneling. Also, when firms engage in post-IPO tunneling with no apparent pre-IPO earnings management (*Dummy3* = 1), we report a negative effect only on the 24-month post-IPO buy-and-hold raw return: the estimated coefficient of *Dummy3* is negative, statistically significant at the 5% level. This evidence, of no concurrent but subsequent stock under-

³⁰ It is consistent with the results reported by Teoh et al. (1998).

Table 10

The association between post-IPO firms' market returns and changes in related party sales and purchases of goods and services in the pre-IPO period – a post-IPO test of the implications of tunneling for the capital markets.

Explanatory variables	12-month BHR post-IPO	24-month BHR post-IPO
Intercept	0.461 (0.59)	1.359 (1.21)
$\Delta RPSALES [(t=0) - (t=-1)]$	-0.313** (-2.45)	-0.596** (-2.36)
$\Delta NOREC [(t=1) - (t=0)]$	-0.171 (-0.41)	-0.853** (-2.37)
Dummy1	-0.064** (-2.01)	-0.103** (-1.98)
Dummy2	-0.011* (-1.85)	-0.172* (-1.89)
Dummy3	0.046 (0.96)	-0.008** (2.19)
$\Delta RPPUR [(t=0) - (t=-1)]$	0.162 (1.26)	0.319* (1.75)
$\Delta NRPSALES [(t=0) - (t=-1)]$	0.058 (1.00)	0.053 (0.65)
$\Delta NOREC [(t=0) - (t=-1)]$	0.489 (1.22)	-0.608 (-1.07)
$\Delta RPSALES [(t=1) - (t=0)]$	-0.309 (-0.70)	-0.255 (-0.42)
$\Delta RPPUR [(t=1) - (t=0)]$	-0.003 (-0.09)	-0.010 (-0.19)
$\Delta NRPSALES [(t=1) - (t=0)]$	0.172 (1.23)	0.284 (1.45)
IPORET	-0.143*** (-3.86)	-0.182*** (-3.52)
MARKET	0.940*** (12.30)	1.326*** (15.19)
ROA	2.198** (2.05)	1.567 (1.05)
MBE	0.067*** (3.98)	0.043* (1.83)
SIZE	-0.028 (-0.81)	-0.077 (1.55)
No. of observations	185	185
Adjusted R ²	0.650	0.717

The table reports the results for regression Eq. (4):

$$\begin{aligned}
 BHR_i = & f_0 + f_1 \Delta RPSALES_{i,t=0} + f_2 \Delta NOREC_{i,t=1} + f_3 Dummy1 + f_4 Dummy2 + f_5 Dummy3 + f_6 \Delta RPPUR_{i,t=0} + f_7 \Delta NRPSALES_{i,t=0} \\
 & + f_8 \Delta NOREC_{i,t=0} + f_9 \Delta RPSALES_{i,t=1} + f_{10} \Delta RPPUR_{i,t=1} + f_{11} \Delta NRPSALES_{i,t=1} + f_{12} IPORET_i + f_{13} MARKET_i + f_{14} ROA_{i,t=0} \\
 & + f_{15} MBE_{i,t=0} + f_{16} SIZE_{i,t=0} + e_{it}.
 \end{aligned}$$

Here, BHR_i is IPO firm i 's 12-month or 24-month post-IPO buy-and-hold raw return starting four months after the first fiscal year-end subsequent to the IPO. $\Delta RPSALES_{i,t=0}$, our measure of abnormal RP sales of goods and services in the pre-IPO period, is IPO firm i 's change in the ratio of RP sales to year-end total assets, between years $t = -1$ to $t = 0$. $\Delta NOREC_{i,t=1}$, our measure of abnormal RP net outstanding corporate loans in the post-IPO period, is IPO firm i 's change in the ratio of net other receivables to year-end total assets, between years $t = 0$ to $t = +1$. $Dummy1$ equals one when both $\Delta RPSALES_{i,t=0}$ and $\Delta NOREC_{i,t=1}$ are positive and zero otherwise. $Dummy2$ equals one when $\Delta RPSALES_{i,t=0}$ is positive but $\Delta NOREC_{i,t=1}$ is non-positive and zero otherwise. $Dummy3$ equals one when $\Delta RPSALES_{i,t=0}$ is non-positive and $\Delta NOREC_{i,t=1}$ is positive and zero otherwise. $\Delta RPPUR_{i,t=0}$ is IPO firm i 's change in the ratio of RP purchases of goods and services to year-end total assets in the pre-IPO period ($t = -1$ to $t = 0$). $\Delta NRPSALES_{i,t=0}$ is IPO firm i 's change in the ratio of non-RP sales of goods and services scaled by year-end total assets, for the pre-IPO period ($t = -1$ to $t = 0$). $\Delta NOREC_{i,t=0}$ is as defined above, measured for the pre-IPO period ($t = -1$ to $t = 0$). $\Delta RPSALES_{i,t=1}$, $\Delta RPPUR_{i,t=1}$ and $\Delta NRPSALES_{i,t=1}$, are as defined above, measured for the post-IPO period ($t = 0$ to $t = +1$). $IPORET_i$ is IPO firm i 's market-adjusted initial trading day return. $MARKET_i$ is the Shanghai stock market value-weighted return for the same interval as the dependent variable. $ROA_{i,t=0}$ is IPO firm i 's return on assets (net income over total assets excluding total cash at year-end 0) in the pre-IPO period. $MBE_{i,t=0}$ is IPO firm i 's market value of equity divided by the book value of equity at year-end 0. $SIZE_{i,t=0}$ is the natural logarithm of IPO firm i 's market value of equity at year-end 0. t -Statistics are reported in parentheses.

* Two-tailed significance at the 10% level.

** Two-tailed significance at the 5% level.

*** Two-tailed significance at the 1% level.

performance, suggests that investors do not “see through” post-IPO tunneling through abnormal net corporate loans regardless of earnings management in the pre-IPO period.

The estimated coefficient of $\Delta RPPUR_{i,t=0}$ is statistically insignificant in the 12-month BHR regression and marginally significant (at the 10% level) in the 24-month BHR regression. The estimated coefficients of $\Delta RPPUR_{i,t=1}$ in both regressions are small and statistically insignificant. These results indicate no market implications of opportunistic RP purchases in either the pre- or post-IPO period.

In both regressions, the estimated coefficients of $\Delta RPSALES_{i,t=1}$ (the post-IPO year) and of $\Delta NORE-C_{i,t=0}$ (the pre-IPO year) are statistically insignificant, suggesting that neither abnormal RP sales to parent companies in the post-IPO period nor abnormal RP net corporate loans to parent companies in the pre-IPO period are perceived by investors as opportunistic earnings management or tunneling behavior, respectively.

In contrast to the estimated coefficient of $\Delta RPSALES_{i,t=0}$, the estimated coefficient of $\Delta NRPSALES_{i,t=0}$ is small and statistically insignificant, suggesting that investors perceive changes in RP sales differently from changes in NRP sales. Similarly, the estimated coefficient of the NRP sales variable in the post-IPO year ($\Delta NRPSALES_{i,t=1}$) is also small and statistically insignificant in both regressions, indicating no apparent impact on either concurrent or subsequent stock performance.

These results hold after controlling for the following five factors that may affect post-IPO stock performance: (1) the market-adjusted initial trading day return, $IPORET_i$, which has a significantly negative (at the 1% level) estimated coefficient; (2) the market return, $MARKET_i$, with an estimated beta of 0.940 in the 12-month regression and 1.326 in the 24-month regression, both statistically significant at the 1% level, indicating an increase in our sample firms' market risk in the post-IPO period; (3) a summary measure of accounting performance, $ROA_{i,t=0}$, with a positive estimated coefficient in each regression but statistically significant (at the 5% level) only in the 12-month regression, which may indicate that accounting performance in the IPO year has a positive impact on subsequent one-year but not two-year BHR; (4) growth potential, $MBE_{i,t=0}$, with a positive estimated coefficient in each regression (statistically significant at the 1% level in the 12-month regression and at the 10% level in the 24-month regression), suggesting that IPO firms with growth potential experience positive post-IPO stock performance; (5) IPO-firm's size, $SIZE_{i,t=0}$, with a negative but statistically insignificant estimated coefficient in each regression, indicating the sample firms' size probably has no impact on future stock performance. Finally, the adjusted R^2 is 0.65 and 0.72, for the 12-month and the 24-month regressions, respectively.

6. Conclusion

We analyze a sample of 185 newly listed Chinese IPO firms that issued common shares to domestic investors on the Shanghai Stock Exchange during the period 1999–2001. We select China as the ground for our investigation because of its unique institutional setting and the availability of data on related-party transactions (RPTs). Unlike most prior research that has examined the use of discretionary accruals to manage earnings, we study related party sales and purchases of goods and services as earnings management tools during the initial public offering (IPO) process in China.

We provide evidence that in underdeveloped markets related party (RP) sales and purchases are not likely to be an efficient business choice to minimize transaction costs for firms recently separated from their parents. Rather, we show that RP sales in particular could be used opportunistically to manage earnings upwards in the pre-IPO period. We also add an additional facet to the motives offered in the literature for such opportunistic behavior. Thus, previous research suggests that Chinese managers are motivated by the ambition to qualify for IPO or to gain prestige and other non-pecuniary benefits or to inflate the issuance price at the IPO in order to raise more funds for the parent firm disposal. We, however, provide evidence of the possibility that inflating earnings in the pre-IPO period is also motivated by the prospect of opportunities for tunneling in the post-IPO period, i.e., exploiting economic resources from minority shareholders (those who bought in at IPO) for the benefit of the parent company.

We present evidence of one such opportunistic tunneling tool: non-repayment of net outstanding corporate debt by Chinese parent companies to their newly listed subsidiaries. Furthermore, we pro-

vide evidence in support of our assertion of an association between tunneling via increase in net outstanding RP corporate loans in the post-IPO period and earnings management via abnormal RP sales in the pre-IPO period.

Lastly, we provide evidence that the IPO firm's stock performance in the post-IPO period is negatively correlated with abnormal RP sales in the pre-IPO period, which are positively associated with non-repayment of net outstanding RP corporate loans in the post-IPO period. Nevertheless, the results also provide evidence of a negative correlation between the IPO firm's stock performance in the post-IPO period and either pre-IPO abnormal RP sales or post-IPO non-repayment of net outstanding RP corporate loans. This implies that new investors in Chinese IPO firms fail to "see through" earnings management via abnormal RP sales in the pre-IPO period, tunneling via non-repayment of RP corporate loans in the post-IPO period and the relationship between the two. Thus, earnings management during the pre-IPO period and tunneling in the post-IPO period are costly to investors in the newly formed IPO firms.

By providing empirical evidence, via RPTs, on earnings management in the pre-IPO period and tunneling in the post-IPO period, and on the failure of IPO investors to perceive either of these two practices or the linkage between them, we enhance understanding of the motives for and consequences of earnings manipulation in the pre-IPO period.

As discussed in details in the Introduction, the paper has implications for the following issues: (1) the efficiency of the Chinese stock market, (2) the need for China and other emerging markets to improve the protection of minority shareholders' rights, (3) an additional investment risk to foreign investors in China's capital markets as well as in Chinese firms cross-listed in non-Chinese stock exchanges (through earnings management and resource tunneling), and (4) its novel methodology may also be applied by future researchers in non-Chinese studies to detect earnings management and resources tunneling.

Like most studies ours is not without its limitations. First, although we focus on RP sales and purchases as tools that parent company managers can plausibly use to manage earnings prior to IPO, other types of related party items may also serve this purpose. Second, although we focus on net RP corporate loans provided by IPO firms to their parent companies as a form of tunneling in the post-IPO period, there may be other ways besides credit transactions to divert resources to related parties. To substantiate our assertion, in addition to anecdotal evidence, we also provide data on regulatory actions taken by the CSRC to proscribe RP corporate loans. However, we cannot provide more direct evidence, such as favorable loan terms compared to typical contemporaneous bank loan terms in China. Third, it is difficult to measure abnormal RP sales, purchases and credits. Finally, the data analyzed in this study pertain to the 3-year period 1999–2001. Future research may determine whether our findings can be generalized to time periods beyond 2001 or to IPO samples drawn from other countries.

These limitations notwithstanding, to the best of our knowledge, no previous research has investigated whether parent companies engage in earnings management via RPTs in the pre-IPO period to facilitate tunneling in the post-IPO period.³¹ By providing empirical evidence on such a link, and on the apparent failure of IPO investors to perceive it, we aim to enhance understanding of the motives for and consequences of earnings manipulation in the pre-IPO period.

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³¹ Jian and Wong (in press) also examine RPTs using Chinese data, but they focus on listed companies rather than IPOs.

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