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Is refinancing solely motivated by misappropriation?

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ABSTRACT

Misappropriation has become the accepted explanation for the refinancing behavior of Chinese listed companies, although the evidence in support of such an explanation is worthy of further discussion. We argue that if a planned refinancing exercise does not become a reality, post-refinancing performance depends on the initial motivation for refinancing, i.e. misappropriation or the maximization of firm value. The success and failure samples provided by the approval system of the Chinese securities market provide us with a natural laboratory in which to distinguish between these two possible motivations for the refinancing behavior of Chinese listed firms. The results show the post-refinancing performance of firms in the success sample to be significantly better than the performance in the failure sample, with the difference even more significant when larger agency costs or more financial constraints exist. These findings indicate that Chinese listed companies do not engage in refinancing for misappropriation purposes alone. Rather, refinancing is more likely to be a rational choice made in full consideration of the costs and benefits. This paper provides new ideas for reexamining the motivations for the refinancing behavior of China's listed firms. It also has one major policy implication. That is, relaxing and/or simplifying the country's refinancing regulations could help to improve the efficiency of resource allocation in the Chinese securities market.

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1. Introduction

The literature provides impressive evidence to show that no matter whether a company issues new shares (Loughran and Ritter, 1995) or convertible preferred stocks (Abhyankar and Ho, 2006), or uses convertible bonds (Lee and Loughran, 1998; Lewis et al., 2001), its post-refinancing performance is significantly inferior to that of firms that undergo no refinancing. In China, researchers have drawn a similar conclusion based on the underperformance of refinanced companies in a share-rationing scenario (Du and Wang, 2006). In China's special institutional environment, which is characterized by large shareholder control, and the particular path by which companies gain listing status, researchers have further deduced that misappropriation is the major motivation for the refinancing behavior of Chinese listed firms (Li and Song, 2003).

Such a conclusion has very important social consequences. Misappropriation has become the accepted explanation for the refinancing behavior of Chinese listed companies. However, drawing this conclusion based merely on the underperformance of post-refinancing behavior is somewhat crude and worthy of further discussion. Admittedly, misappropriation-oriented refinancing behavior results in a large amount of idle funds, which increases the probability that a company will make inefficient investments and engage in tunneling, thereby leading to underperformance after refinancing. However, it is worth noting that non-misappropriation-oriented refinancing behavior can also lead to underperformance. For example, according to pecking order theory, in the face of financing demands, companies will initially use internal funds and then consider external financing (Myers and Majluf, 1984). Spiegel and Tookes (2008) report that companies will first choose internal or private financing to engage in innovative projects with high profit potential and leave less innovative and less profitable projects for public refinancing. Put differently, prior to refinancing, a company's profitability has reached the peak of its particular commercial stage. As a result, even if companies devote all outside funds to projects with a positive net present value, their profitability is bound to decrease after refinancing (Clementi, 2002; Spiegel and Tookes, 2008).

Therefore, new research ideas are needed to help us to distinguish between possible motivations for the refinancing behavior of Chinese listed companies. It is noted in this paper that if planned refinancing does not become a reality, post-refinancing performance depends on the initial motivation for refinancing, i.e. misappropriation or the maximization of firm value. If a company refinances for misappropriation purposes alone, it is clearly not pursuing shareholder wealth maximization. Thus, if other conditions remain unchanged, then the company's performance would surely have been better if refinancing had not taken place. If, in contrast, the purpose of refinancing is to maximize firm value, then the company's performance would surely weaken if it did not undertake refinancing.

Unfortunately, there are no companies in which a planned refinancing exercise both succeeds and fails, meaning that it is impossible to know precisely what performance a company would exhibit if it did or did not refinance. However, the refinancing approval system in China offers us a unique research opportunity. Under the terms of the system, a company cannot proceed with refinancing, even if it is qualified to do so and a general meeting of shareholders has voted in favor, until it has gained approval from the China Securities Regulatory Commission (CSRC). However, companies must wait a long time for the CSRC's approval (Cheung et al., 2009). During the long waiting period, many companies abandon their refinancing plans for such exogenous reasons as changes in national financing policies, the implementation environment for the planned fund-raising project and the target market environment. Thus, the CSRC approval system works as an exogenous force dividing qualified companies with refinancing intentions into two samples: a success sample and a failure sample. The firms in the two samples are similar in a number of important respects, such as performance, motivation and refinancing methods. In other words, failed companies are the same as successful companies apart from their failure to gain the CSRC's approval for refinancing.

This setting provides us with a natural laboratory in which to distinguish Chinese listed companies' motivations for refinancing behavior. Because the expectations for a firm's post-refinancing performance are highly dependent on its motivation for refinancing, we can judge whether that motivation is misappropriation by comparing the subsequent performance of successful and failed companies. More specifically, if the post-refinancing performance of successful companies is significantly inferior to that of failed companies, then non-refinancing improves their performance and we can infer that their main purpose in refinancing was to

engage in misappropriation. If, in contrast, the post-refinancing performance of the success sample is significantly better than that of the failure sample, then non-refinancing weakens firm performance. If this is indeed the case, then the implication is that Chinese listed firms do not engage in refinancing behavior for misappropriation purposes alone. Rather, such behavior is more likely to be a rational choice made in full consideration of the costs and benefits.

Using data from the Chinese A-share market during the 1998–2011 period, we show that Chinese listed companies' refinancing behavior cannot be explained by misappropriation alone. We find that in the 3 years following a refinancing exercise, the performance of firms in the success sample is significantly better than that of firms in the failure sample. The results remain robust to the use of various performance indicators, controlling for the potential influence of corporate governance and the possible omission of variables, shortening the comparison period and removing the possible influence of earnings management. In addition, a further test shows that companies with lower agency costs and larger financing constraints display greater post-refinancing performance differences. These results indicate that on the whole, Chinese listed firms do not engage in refinancing behavior solely for misappropriation purposes. Rather, refinancing appears to be a rational decision made in full consideration of the costs and benefits.

This paper's contributions lie in two major areas. First, the paper offers new research ideas that allow fresh judgment of the proposition that the refinancing behavior of Chinese listed companies can be explained by misappropriation alone. We argue that post-refinancing performance is highly dependent on the initial motivation for refinancing. The natural laboratory provided by China's refinancing approval system allows us to obtain evidence to show that the country's listed firms do not engage in refinancing behavior solely for reasons of misappropriation. We believe that the findings of this paper offer a new perspective on, and a deeper and more comprehensive understanding of, companies' refinancing behavior. We also resolve some of the endogenous self-selection problems suffered by earlier refinancing studies (Stulz, 1990; Li and Zhao, 2006).

Second, the paper offers solutions to the "refinancing puzzle" that has long been the subject of heated debate in finance research (Loughran and Ritter, 1995; Allen and Soucik, 2008). Traditional explanations, such as the window of opportunity, free cash flow and earnings management hypotheses, are all based on shareholder–manager/principal–agent theory, which are grounded in Berle and Means (1932) well-known supposition that the separation of control and management rights is strongly enforced in modern companies, a supposition that Holderness (2009) has questioned. New theoretical research shows that the refinancing puzzle is probably the result of rational decisions made by devoted managers (Clementi, 2002; Spiegel and Tookes, 2008) and empirical research carried out in the United States has provided evidence in support of this argument (Chemmanur et al., 2010). In this paper, we show that the refinancing behavior of Chinese listed companies is likely to be a rational choice made in full consideration of the costs and benefits, thus offering further support for the foregoing argument backed up by empirical evidence from the world's largest emerging market and transitional economy.

The remainder of this paper is organized as follows. Section 2 describes the research design and Section 3 reports and analyzes the empirical results. Section 4 considers and tests alternative explanations. Section 5 examines the relationship between agency costs and financial constraints and cross-sectional differences in performance to provide further evidence for our inferences. Section 6 offers concluding remarks, including a discussion of the paper's policy implications.

2. Research design

2.1. Sample selection and data sources

Our original sample includes all companies on the Chinese A-share market that intended to refinance and whose refinancing projects had received a vote of approval in general meetings of shareholders during the 1998–2008 period. As our regression analysis requires the use of data for the three-year period after refinancing, our research period covers the 13 years from 1998 to 2011. The following screening procedures were performed sequentially. We first removed companies belonging to the financial industry. Then, to eliminate the potential effects of two adjacent refinancing projects, we also removed companies that formulated a second

refinancing plan within 3 years of an initial successful or failed refinancing plan. To construct a panel data set, we further required that there be no necessary data missing for each observation for the 3 years following a successful or failed refinancing attempt. The final sample used in the regression analysis includes 454 firms, 296 in the refinancing success sample and 158 in the failed sample, over 3 years, for a total of 1362 firm-year observations. To minimize the influence of outliers, we winsorized all continuous variables at the top and bottom 1% levels.

Information on the sample companies' refinancing plans and implementation was obtained from the WIND database, and all other data was obtained from the China Securities Market and Accounting Research (CSMAR) database. In the case of any questionable data, we relied on the China Center for Economic Research (CCER), WIND and CSMAR databases for cross-checking.

2.2. Models and variable definitions

We adopt 3 years post-refinancing as our comparison benchmark and use the following basic regression model, Model (1), to investigate the differences in performance between the success and failure samples.

$$\text{Perf} = \alpha_0 + \alpha_1 * \text{Suc} + \alpha_j * \sum \text{Control}_{i,t} + \text{fixed effects} + \zeta \quad (1)$$

where Perf stands for firm performance, which we measure by net income on sales, assets and equity. To minimize the influence of extraordinary item manipulation, we also adopt return on sales, assets and equity as indicators of firm performance. The key explanatory variable in Model (1), Suc, is a dummy used to divide the sample. It takes a value of 1 if the firm belongs to the success sample, and 0 otherwise. Our main concern is the sign and statistical significance of Suc's estimation coefficient, α_1 . In line with our discussion in the introduction, if α_1 is significantly negative, the implication is that companies refinance primarily for misappropriation. If α_1 is significantly positive, company refinancing behavior is unlikely to be for misappropriation purposes alone, but instead a rational choice made in full consideration of the costs and benefits.

In addition, factors such as firm size, risk and growth are likely to affect both a company's performance and its refinancing behavior. We thus control for these factors, following [Chen et al. \(2007\)](#). Size is measured by the natural logarithm of a company's total assets, growth by the growth rate of sales revenue and risk by the annual beta coefficient calculated by the Shanghai and Shenzhen stock exchanges. Finally, we also control for fixed year and industry effects and, in line with [Petersen \(2009\)](#) suggestion, take advantage of a modified cluster approach to control for the possible time effects resulting from the cross-sectional correlation of the observations from different years in the same sample. The definitions of the main variables in Model (1) are presented in [Table 1](#).

Table 1
Variable definitions.

Variable name	Definition
ROS	Net income on sales
adj_ROS	Return on sales
ROA	Net income on assets
adj_ROA	Return on assets
ROE	Net income on equity
adj_ROE	Return on equity
Suc	=1 if the firm belongs to the success sample, and 0 otherwise
Size	Natural logarithm of total assets at the end of the year
Risk	Annual beta coefficient calculated by the Shanghai and Shenzhen stock exchanges
Grow	Growth rate of sales revenue

3. Empirical results

3.1. Descriptive statistics

Table 2 presents the descriptive statistics. Panel A reports the descriptive features of the main variables. The differences between the mean and median values are small for all variables, which indicates that the outlier problem was largely resolved through winsorization. Judging from the standard deviations, the greatest variation is in size and growth, with the six performance indicators varying slightly, which indicate that although the sample companies display considerable differences in size and growth, they share important similarities in terms of performance. Panel B is the correlation coefficient matrix. Both the Pearson and Spearman correlation coefficients show the six performance indicators to have a significant positive correlation with Suc. It can thus be preliminarily concluded that the performance of the success sample firms is significantly better than that of those in the failure sample in the 3 years after refinancing, which indicates that misappropriation is not the sole reason for refinancing.

3.2. Regression analysis

Table 3 reports the regression results for the basic model, Model (1). Net income on sales, net income on assets, net income on equity, return on sales, return on assets and return on equity are used as the dependent variables describing firm performance in regressions (1)–(6). Although we adopt six different proxies for performance, the ordinary least squares (OLSs) results are almost the same, which indicates that our analysis is relatively robust. In Table 3, Suc, the dummy variable used to divide the sample, is significantly positive, which again shows that the performance of the successful firms is superior to that of their failed counterparts in the 3 years after refinancing. Hence, our regression results show that companies' refinancing behavior is not

Table 2
Descriptive statistics.

Variable	N	Mean	Median	Standard deviation			
<i>Panel A: Descriptive features</i>							
ROS	1362	0.0667	0.0578	0.1800			
adj_ROS	1362	0.0734	0.0649	0.1770			
ROA	1362	0.0311	0.0297	0.0552			
adj_ROA	1362	0.0362	0.0336	0.0605			
ROE	1362	0.0584	0.0620	0.1300			
adj_ROE	1362	0.0711	0.0704	0.1320			
Suc	1362	0.6520	1.0000	0.4760			
Size	1362	21.5500	21.4300	0.9800			
Risk	1362	0.9990	1.0300	0.2190			
Growth	1362	0.2870	0.1510	0.7690			
	ROS	adj_ROS	ROA	adj_ROA	ROE	adj_ROE	Suc
<i>Panel B: Correlation coefficient matrix</i>							
ROS		0.9258***	0.7895***	0.6941***	0.6149***	0.5850***	0.1369***
adj_ROS	0.9375***		0.7544***	0.7828***	0.6349***	0.6180***	0.1418***
ROA	0.7910***	0.7584***		0.9290***	0.7654***	0.7531***	0.1315***
adj_ROA	0.7316***	0.8060***	0.9398***		0.7528***	0.7777***	0.1405***
ROE	0.6674***	0.6597***	0.8838***	0.8492***		0.8579***	0.0826***
adj_ROE	0.6287***	0.6865***	0.8411***	0.8876***	0.9254***		0.0698**
Suc	0.1690***	0.1692***	0.1362***	0.1392***	0.0604**	0.0496*	

In the correlation coefficient matrix, the upper triangular matrix presents Pearson correlation coefficients and the lower triangular matrix presents Spearman correlation coefficients.

- * Significance at 10% level.
 ** Significance at 5% level.
 *** Significance at 1% level.

Table 3
Performance comparison of successful and failed refinancing companies.

	(1) ROS	(2) adj_ROS	(3) ROA	(4) adj_ROA	(5) ROE	(6) adj_ROE
Suc	0.0586*** (0.000)	0.0507*** (0.000)	0.0162*** (0.000)	0.0163*** (0.001)	0.0243*** (0.009)	0.0206** (0.047)
Size	0.0114 (0.106)	0.0220*** (0.003)	0.0054** (0.024)	0.0089*** (0.001)	0.0214*** (0.000)	0.0221*** (0.000)
Grow	0.0380*** (0.000)	0.0322*** (0.000)	0.0111*** (0.000)	0.0124*** (0.000)	0.0277*** (0.000)	0.0276*** (0.000)
Risk	-0.1055*** (0.000)	-0.1019*** (0.000)	-0.0635*** (0.000)	-0.0661*** (0.000)	-0.0997*** (0.000)	-0.1319*** (0.000)
Constant	-0.1052 (0.455)	-0.3498** (0.022)	-0.0385 (0.431)	-0.1232** (0.029)	-0.3400*** (0.002)	-0.3550*** (0.001)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>N</i>	1362	1362	1362	1362	1362	1362
adj. <i>R</i> ²	0.127	0.129	0.155	0.164	0.140	0.165

All of the continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. No collinearity problems are observed.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

motivated by misappropriation alone, but is more likely to be a rational choice made in full consideration of the costs and benefits.

Although the results in Table 3 show the performance of the success sample to be significantly better than that of the failure sample in the three-year period following refinancing, this superior performance may merely be the result of the more established corporate governance enjoyed by the firms in this sample. To eliminate this possibility, we also take the effects of corporate governance into consideration. We add the ownership properties of the ultimate controlling shareholder, ownership concentration, board independence and chairman-CEO duality as variables in Model (1), and repeat the analysis. Table 4 presents the regression results. It shows that after controlling for these corporate governance variables, there is no substantive change in the results of the previous tests. Suc remains significantly positive in all six regressions.

In the Tables 3 and 4 tests, net income on sales, net income on assets, net income on equity, return on sales, return on assets and return on equity, which we adopt to describe firm performance, are all traditional measures with a common defect. That is, they neglect the cost of equity capital and thus they may fail to measure exactly how much value a company creates for its shareholders. The economic value added (EVA) method addresses this defect to some extent. Because the EVA method calculates gains with all capital costs eliminated, it is more likely than other methods to reflect how much value a company creates for its shareholders. In fact, since Stern et al. (1995) first proposed the EVA method, it has become the most popular mixed-performance measurement tool (Richard et al., 2009). Accordingly, we also use EVA as a performance proxy to implement our robustness test. EVA equals a company's net operating income before interest and after taxes minus the product of its debt plus its market value and weighted average cost of capital (WACC). In calculating a firm's WACC, we use the capital asset pricing model (CAPM) to obtain its cost of equity capital. Finally, we use the absolute value of EVA thus calculated divided by a company's total assets, annual sales revenue and equity, thereby obtaining the EVA on assets (evaoa), sales (evaos) and equity (evaoe).

We then use evaoa, evaos and evaoe as dependent variables to conduct robustness tests, the results of which are presented in Table 5. Regressions (1), (2) and (3) repeat the tests of the basic regression model, Model (1), and regressions (4), (5) and (6) control for the effects of corporate governance. As we can see from Table 5, when we use EVA to measure firm performance, the key explanatory variable, Suc, is still significantly greater

Table 4
Controlling the influence of corporate Governance.

	(1) ROS	(2) adj_ROS	(3) ROA	(4) adj_ROA	(5) ROE	(6) adj_ROE
Suc	0.0611*** (0.000)	0.0497*** (0.001)	0.0171*** (0.000)	0.0165*** (0.002)	0.0261*** (0.005)	0.0201* (0.055)
Size	0.0088 (0.258)	0.0223*** (0.006)	0.0045* (0.077)	0.0085*** (0.003)	0.0198*** (0.000)	0.0225*** (0.000)
Grow	0.0329*** (0.001)	0.0267*** (0.000)	0.0089*** (0.000)	0.0100*** (0.000)	0.0223*** (0.000)	0.0217*** (0.000)
Risk	-0.1099*** (0.000)	-0.0992*** (0.001)	-0.0676*** (0.000)	-0.0664*** (0.000)	-0.1013*** (0.000)	-0.1357*** (0.000)
Owner	-0.0232 (0.126)	-0.0246* (0.097)	-0.0142*** (0.002)	-0.0167*** (0.001)	-0.0291*** (0.004)	-0.0393*** (0.000)
Con1	0.0829* (0.052)	0.0939** (0.031)	0.0384*** (0.004)	0.0471*** (0.002)	0.0833*** (0.002)	0.0915*** (0.001)
Did	-0.0764 (0.519)	-0.1299 (0.289)	-0.0403 (0.252)	-0.0509 (0.185)	-0.0263 (0.722)	-0.0794 (0.300)
Dual	0.0139 (0.499)	0.0227 (0.292)	0.0040 (0.526)	0.0063 (0.408)	-0.0027 (0.836)	0.0013 (0.922)
Constant	-0.0349 (0.835)	-0.3945** (0.028)	-0.0122 (0.820)	-0.1316** (0.033)	-0.2784** (0.029)	-0.3385*** (0.008)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	1041	1041	1041	1041	1041	1041
adj. R ²	0.149	0.155	0.179	0.190	0.150	0.187

In this table, owner stands for the ownership properties of the ultimate controlling shareholder. It takes a value of 1 if the sample firm belongs to a state-owned enterprise (SOE), and 0 otherwise. Con1 stands for ownership concentration and is measured by the ownership percentage held by the top shareholder. Did represents board independence and is equal to the proportion of independent directors on the board. Dual depicts chairman-CEO duality and takes a value of 1 if the chairman and CEO are the same person, and 0 otherwise.

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern. Because corporate governance data is missing for some firms, the number of observations in the regressions decreases to 1041.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

than zero in all six regressions, which indicates that the efficiency of the successful firms' value-creation is also superior to that of their failed counterparts in the post-refinancing period.

Although we control for the influence of corporate governance in the tests reported in Tables 4 and 5, the omitted variable problem may still exist. To reduce these concerns, we also use the panel regression method to reduce estimation and testing problems (Bhattacharya et al., 2003). Table 6 presents the panel regression results. Because there was no change in the value of Suc, the key explanatory variable, during the research period, we use random effects in the panel regressions. It can be seen from Table 6 that the estimation coefficient of Suc remains significantly positive in all six regressions. This finding indicates that the omitted variable problem has little influence on the regression results and further proves our conclusion that the post-refinancing performance of the success sample is significantly better than that of the failure sample.

Finally, we also change the criteria for the comparison period. In the previous tests, we compare the sample companies' performance in the 3 years following a successful or failed refinancing attempt. If this comparison period is too long, the test results may contain too much noise. To alleviate such fears, we reduce the comparison period to 2 years and 1 year after refinancing and re-implement the Model (1) test. Table 7 reports the results. Regressions (1)–(3) are based on a two-year comparison period, and regressions (4)–(6) on a one-year comparison. Table 7 shows that a reduction in the comparison period has no effect on the results. Suc remains significantly positive in all six regressions, which indicates that our conclusion concerning the superior performance of the success sample is not dependent on the length of the comparison period.

Table 5
EVA as a measure of firm performance.

	(1) eva _{oa}	(2) eva _{os}	(3) eva _{oe}	(4) eva _{oa}	(5) eva _{os}	(6) eva _{oe}
Suc	0.0157*** (0.001)	0.0596*** (0.000)	0.0196** (0.038)	0.0167*** (0.000)	0.0625*** (0.000)	0.0216** (0.025)
Size	0.0064** (0.010)	0.0142* (0.056)	0.0218*** (0.000)	0.0054** (0.035)	0.0114 (0.159)	0.0206*** (0.001)
Grow	0.0113*** (0.000)	0.0400*** (0.000)	0.0294*** (0.000)	0.0090*** (0.000)	0.0347*** (0.001)	0.0239*** (0.000)
Risk	-0.0622*** (0.000)	-0.1018*** (0.001)	-0.1006*** (0.000)	-0.0662*** (0.000)	-0.1053*** (0.002)	-0.1021*** (0.000)
Owner				-0.0136*** (0.004)	-0.0200 (0.200)	-0.0297*** (0.004)
Con1				0.0365*** (0.008)	0.0776* (0.091)	0.0710*** (0.010)
Did				-0.0454 (0.217)	-0.0864 (0.489)	0.0055 (0.949)
Dual				0.0024 (0.733)	0.0059 (0.802)	-0.0037 (0.789)
Constant	-0.0601 (0.236)	-0.1697 (0.258)	-0.3491*** (0.003)	-0.0369 (0.505)	-0.1079 (0.544)	-0.2923** (0.033)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	1362	1362	1362	1041	1041	1041
adj. R ²	0.144	0.123	0.127	0.162	0.139	0.131

All of the continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern. Because corporate governance data is missing for some firms, the number of observations in regressions (4)–(6) decreases to 1041.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

4. Alternative explanations

4.1. Pre-refinancing performance differences

The requirements of the CSRC approval system stipulate that a listed company may refinance only if its performance reaches a certain threshold. Hence, whether the companies in our sample succeeded or failed in their refinancing approval application, their performance must have reached or exceeded that threshold during the refinancing application period, thereby ensuring their comparability for the purposes of this study. However, if it were instead the case that the firms in the success sample exhibited superior performance to those in the failure sample prior to the refinancing application, then our conclusions would be invalid. To alleviate fears over this alternative explanation, we also carry out tests to screen the firms. On the basis of our original observations, we create panel data to compare the firms' performance in the 3 years before refinancing and rerun the basic regression, Model (1), ensuring that no data are missing for this period. The final sample for this regression contains 3 years of data on 112 successful firms and 111 failed firms, for a total of 669 firm-year observations.

Table 8 reports the results of this robustness test. The dependent variables used in regressions (1)–(6) to describe firm performance are net income on sales, net income on assets, net income on equity, return on sales, return on assets and return on equity, as in the previous tests. Table 8 shows that Suc, the dummy variable used to divide the sample, is not statistically significant in any of the six regressions, which is consistent with our assumption that prior to refinancing, the two types of companies exhibited no significant performance differences. Hence, our previous conclusions are valid.

Table 6
Panel Regressions.

	(1) ROS	(2) adj_ROS	(3) ROA	(4) adj_ROA	(5) ROE	(6) adj_ROE
Suc	0.0622*** (0.000)	0.0472*** (0.001)	0.0169*** (0.000)	0.0151*** (0.003)	0.0257*** (0.006)	0.0194** (0.044)
Size	0.0069 (0.351)	0.0231*** (0.002)	0.0033 (0.166)	0.0083*** (0.001)	0.0196*** (0.000)	0.0217*** (0.000)
Grow	0.0224*** (0.000)	0.0193*** (0.001)	0.0084*** (0.000)	0.0102*** (0.000)	0.0229*** (0.000)	0.0225*** (0.000)
Risk	-0.1099*** (0.000)	-0.0931*** (0.000)	-0.0593*** (0.000)	-0.0536*** (0.000)	-0.0982*** (0.000)	-0.1302*** (0.000)
Owner	-0.0209 (0.129)	-0.0229* (0.094)	-0.0115*** (0.008)	-0.0140*** (0.003)	-0.0280*** (0.003)	-0.0365*** (0.000)
Con1	0.0744* (0.077)	0.1082*** (0.010)	0.0362*** (0.007)	0.0527*** (0.000)	0.0883*** (0.002)	0.0949*** (0.001)
Did	-0.0291 (0.785)	-0.1043 (0.318)	-0.0117 (0.725)	-0.0288 (0.424)	-0.0202 (0.791)	-0.0583 (0.451)
Dual	0.0097 (0.576)	0.0179 (0.291)	0.0022 (0.679)	0.0048 (0.409)	-0.0038 (0.759)	-0.0018 (0.887)
Constant	0.0112 (0.947)	-0.4011** (0.017)	0.0020 (0.971)	-0.1392** (0.018)	-0.2764** (0.014)	-0.3344*** (0.004)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	1041	1041	1041	1041	1041	1041
adj. R ²	0.1743	0.1792	0.2007	0.2085	0.1784	0.2139

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern. Because some of the corporate governance data is missing, the number of observations in the regressions decreases to 1041.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

4.2. Pre-refinancing earnings management

Another alternative explanation for our findings is that Chinese regulators are able to discriminate companies characterized by a high level of earnings management from those that legitimately want to refinance (Chen and Yuan, 2004). Accordingly, they can force the former to abandon their refinancing plans. If this is the case, companies with a high level of earnings management are more likely to be included in the failure sample. In addition, the reversal effects of earnings management are certain to lead to a greater decline in performance among these firms, and thus the performance of firms in the success sample would be significantly better in comparison.

To determine the veracity of this alternative explanation, we also investigate the differences in earnings management between the two types of companies in the 3 years prior to refinancing. We use the same sample as that in Section 4.1 and measure earnings management using the basic Jones model and modified KS model, as suggested by Xia (2003). Table 9 presents the results. Regressions (1) and (2) report the OLS results with EMJS and EMKS serving as the dependent variables, referring to earnings management calculated using the basic Jones model and modified KS model, respectively. Regressions (3) and (4) are the Logit regression results. The dependent variable used in these regressions is a dummy variable adopted to show whether a company has adjusted its earnings upward. EMJS_d or EMKS_d equals 1 if EMJS or EMKS is greater than zero, and 0 otherwise. The results show that Suc lacks statistical significance in all four regressions, indicating that there was no significant difference in earnings management between the two types of firms in the pre-refinancing period. Compared with their successful counterparts, the failed firms exhibit neither greater upward adjustments in earnings nor any greater ability to engage in such adjustments. Hence, this alternative

Table 7
Reduction in comparison period.

	Two years after successful or failed refinancing			One year after successful or failed refinancing		
	(1) ROS	(2) ROA	(3) ROE	(4) ROS	(5) ROA	(6) ROE
Suc	0.0636*** (0.000)	0.0188*** (0.000)	0.0363*** (0.002)	0.0863*** (0.000)	0.0251*** (0.000)	0.0487*** (0.008)
Size	0.0096 (0.278)	0.0050* (0.073)	0.0234*** (0.000)	-0.0003 (0.979)	0.0032 (0.375)	0.0239** (0.023)
Grow	0.0490*** (0.000)	0.0147*** (0.000)	0.0348*** (0.000)	0.0579*** (0.000)	0.0139*** (0.000)	0.0337*** (0.000)
Risk	-0.0855*** (0.005)	-0.0540*** (0.000)	-0.0624*** (0.003)	-0.0622 (0.116)	-0.0499*** (0.000)	-0.0270 (0.418)
Constant	-0.0849 (0.637)	-0.0400 (0.485)	-0.4218*** (0.003)	-0.0141 (0.958)	-0.0230 (0.775)	-0.4974** (0.031)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	908	908	908	454	454	454
adj. R ²	0.148	0.160	0.129	0.167	0.157	0.123

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. No collinearity problems are observed.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

Table 8
Pre-refinancing performance differences.

	(1) ROS	(2) adj_ROS	(3) ROA	(4) adj_ROA	(5) ROE	(6) adj_ROE
Suc	0.0062 (0.786)	0.0160 (0.434)	0.0028 (0.815)	0.0085 (0.366)	0.0360 (0.202)	0.0336 (0.163)
Size	0.0299 (0.113)	0.0255* (0.094)	0.0157 (0.213)	0.0124 (0.165)	0.0305* (0.082)	0.0386*** (0.010)
Grow	0.0112 (0.243)	0.0073 (0.377)	0.0104* (0.086)	0.0084* (0.071)	0.0258** (0.049)	0.0233** (0.031)
Risk	-0.1255** (0.011)	-0.1182*** (0.004)	-0.0684** (0.021)	-0.0662*** (0.002)	-0.1519** (0.020)	-0.1401** (0.010)
Constant	-0.3139 (0.388)	-0.2512 (0.408)	-0.1832 (0.422)	-0.1291 (0.435)	-0.3864 (0.270)	-0.5824* (0.051)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	669	669	669	669	669	669
adj. R ²	0.115	0.166	0.050	0.099	0.004	0.026

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. No collinearity problems are observed.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

hypothesis does not provide a good explanation for our empirical results. In other words, the paper's conclusions are not substantively troubled by this explanation.

Table 9
Pre-refinancing earnings management.

	(1) EMJS	(2) EMKS	(3) EMJS_d	(4) EMKS_d
Suc	−0.0006 (0.951)	0.0190 (0.216)	0.1401 (0.491)	0.1847 (0.392)
Size	−0.0010 (0.875)	−0.0023 (0.794)	0.0118 (0.923)	0.0432 (0.733)
Grow	−0.0040 (0.698)	−0.0092 (0.433)	−0.1516 (0.165)	−0.0864 (0.254)
Risk	−0.0115 (0.686)	−0.0111 (0.773)	0.2630 (0.529)	0.4997 (0.258)
Constant	0.1043 (0.465)	0.1190 (0.542)	1.2005 (0.650)	0.1401 (0.959)
Year	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled
<i>N</i>	669	669	669	669
adj./Pseudo <i>R</i> ²	0.070	0.108	0.0569	0.0734

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

5. Further tests: cross-sectional performance comparison

The results of the tests reported in the previous section validate our main finding that the post-refinancing performance of firms in the success sample is significantly better than that of those in the failure sample, thus supporting our conclusion that the refinancing behavior of Chinese listed companies is not motivated by misappropriation alone, but is most likely a rational choice made in full consideration of the costs and benefits. If this conclusion is indeed valid, then any cross-sectional differences in performance should be related to agency costs and financial constraints prior to the implementation of refinancing. A company with low agency costs is more likely to make use of an optimal financing opportunity and thus the benefits or losses associated with whether its refinancing behavior becomes a reality should be much greater. At the same time, the more financially constrained a firm is, the greater its financing demands. Hence, regardless of whether its refinancing initiative is successful, the associated benefits or losses will be much greater. Following this line of thought, we predict that if the refinancing behavior of Chinese listed companies is more inclined to be a rational choice made after balancing the costs and benefits than it is to be a bid for misappropriation, then lower agency costs or greater financial constraints should result in greater cross-sectional differences in performance.

To test this prediction and provide further support for our findings, we build the following regression model, Model (2), based on basic regression model (1) to determine the influence of agency costs and financial constraints on cross-sectional differences in performance.

$$\text{Perf} = \beta_0 + \beta_1 * \text{Suc} + \beta_2 * \text{acost}(\text{fc}) + \beta_3 * \text{Suc} * \text{acost}(\text{fc}) + \beta_j * \sum \text{Control}_{i,t} + \text{fixed effects} + \eta \quad (2)$$

where *acost* represents agency costs and *fc* represents financial constraints, both using data for the year prior to refinancing (whether a success or failure). We consider agency costs by the extent to which a company has been tunneled and, following Jiang et al. (2010), we calculate it as other receivables divided by tradable market capitalization at the end of the year. With regard to financial constraints, prior research has demonstrated that in China, the longer a company has been established, the greater the financial constraints that it faces, with private firms facing greater financial constraints than SOEs (Wang, 2009). We thus first adopt the age of the company and the ownership properties of the ultimate controlling shareholder as two single variables to depict the level of financial constraint a company faces prior to a refinancing initiative. At the same time, to overcome the inherent defects of these two single variables, we also calculate the widely used KZ index to

illustrate the financial constraints that a company undergoing refinancing faces (Lamont et al., 2001). We use the following equation to calculate the annual value of the KZ index for the sample firms.

$$KZ = -1.002(CF/K) + 0.283(Q) + 3.139(Debt/Capital) - 39.368(Div/K) - 1.315(Cash/K),$$

where CF represents annual net cash flow; K represents the value of fixed assets at the end of the year; Q is the Tobin's Q ratio; Debt and Capital stand for year-end total liabilities and total equity, respectively; D is the amount of cash dividends paid out; and Cash is the sum of cash and short-term investments. After calculations according to this equation, the higher a company's annual KZ index, the greater the financial constraints it suffers in that year.

Table 10 reports the regression results for Model (2). What we are most concerned with is the sign and statistical significance of β_3 , which is the interaction between Suc and agency costs or financial constraints. The aim of regression (1) is to test the moderating effects of agency costs. As Table 10 shows, an increase in agency costs prior to refinancing leads to a dramatic decrease in the cross-sectional difference between companies with successful and failed refinancing attempts. The regression coefficient of the interaction term is significantly negative at the 5% level, which shows that among companies characterized by lower agency costs, the

Table 10
Cross-sectional differences in performance.

	(1) Perf	(2) Perf	(3) Perf	(4) Perf
Suc	0.0729*** (0.000)	-0.0385 (0.369)	0.0796*** (0.000)	0.0398*** (0.001)
acost	-0.0000 (0.852)			
Suc*acost	-0.0003** (0.028)			
Age		-0.0057** (0.049)		
Suc*age		0.0079** (0.036)		
Owner			0.0050 (0.787)	
Suc*owner			-0.0363* (0.098)	
KZ				-0.0159*** (0.000)
Suc*KZ				0.0068* (0.097)
Size	0.0136* (0.072)	0.0104 (0.134)	0.0132** (0.029)	0.0107* (0.075)
Grow	0.0331*** (0.001)	0.0370*** (0.000)	0.0375*** (0.000)	0.0329*** (0.001)
Risk	-0.1062*** (0.000)	-0.1153*** (0.000)	-0.1052*** (0.000)	-0.0993*** (0.000)
_cons	-0.1274 (0.388)	0.0006 (0.997)	-0.1395 (0.316)	-0.0560 (0.697)
Year	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled
N	1332	1362	1362	1332
adj. R^2	0.133	0.133	0.130	0.143

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern. The results in this table use ROS as the dependent variable. Because some data is missing, the number of observations in regressions (1)–(4) decreases to 1332. The use of other performance measures as the dependent variable leads to no substantial changes in our results.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

cross-sectional difference between those with a successful and failed refinancing attempt are more notable. The aims of regressions (2), (3) and (4) are all to test the moderating effects of financial constraints. The results show that increases in age and the KZ index lead to a dramatic rise in the cross-sectional difference between successful and failed firms, whereas the results for SOEs are quite the opposite. There are more remarkable cross-sectional differences between successful and failed firms among those facing greater financial constraints prior to a refinancing application. To sum up, our investigation of the relationship between agency costs/financial constraints and cross-sectional performance differences conforms in full to our previous expectations. This exercise thus provides further empirical support for our supposition that the refinancing behavior of Chinese listed companies is not oriented only toward the benefits of misappropriation.

6. Conclusion

In this paper, we reinvestigate the long-standing assumption that the refinancing behavior of Chinese listed companies is misappropriation-oriented. We argue that firm performance may decline in the wake of refinancing, regardless of whether refinancing took place for the purpose of misappropriation. Hence, it is inappropriate to deduce from such underperformance that misappropriation was the sole purpose of the refinancing exercise. More importantly, it is noted in this paper that if the planned refinancing is not implemented, firms' post-refinancing performance depends on their initial motivation for refinancing, i.e. misappropriation or the maximization of firm value. Although there are no companies that both succeed and fail in refinancing, the Chinese approval system serves as an exogenous force to divide companies with refinancing plans into success and failure samples. Because both types of firms have already met the CSRC's threshold for refinancing eligibility, they share considerable similarities in terms of performance and motivation for and methods of refinancing. Hence, they serve as ideal references for one another. The CSRC approval system thus provides us with a natural laboratory in which to compare the post-refinancing performance of companies that were successful in and failed to achieve their refinancing plans and determine whether those plans were formulated for misappropriation purposes. Our reasoning is as follows. If the post-refinancing performance of the success sample is significantly inferior to that of the failure sample, then non-refinancing improves performance, and thus the planned refinancing must have been motivated by misappropriation alone. If, in contrast, non-refinancing leads to poor firm performance, then the company's motivation for refinancing is unlikely to have been misappropriation, but rather the maximization of firm value. In other words, the decision to refinance was a rational one made in full consideration of the costs and benefits.

Using data from the Chinese A-share market during the 1998–2011 period, this paper demonstrates that the refinancing behavior of Chinese listed companies cannot be explained by misappropriation alone. We find that in the 3 years after a refinancing intention is declared, firms that were successful in their refinancing bids exhibited significantly superior performance to those that failed. This finding remains robust to implementation of a series of tests carried out to ensure its reliability, namely, (1) the adoption of a variety of performance indicators, including EVA; (2) controlling for the effect of corporate governance; (3) using panel regression methodology; and (4) reducing the length of the comparison period. We also consider two alternative explanations for our findings. That is, our findings are the result of pre-refinancing performance differences or differences in pre-refinancing earnings management. The tests of these alternative explanations produce little substantive change in our research results, which indicates that our conclusions are robust. Finally, we also investigate the relationship between agency costs or financial constraints and cross-sectional performance differences. We discover greater performance differences between the success and failure samples for companies with lower agency costs or fewer financial constraints, thus providing further support for our proposition that the refinancing behavior of Chinese listed firms is, on the whole, the result of a rational choice made in full consideration of the costs and benefits, rather than a desire to engage in misappropriation.

The refinancing behavior of Chinese listed companies has long been thought to result from a desire to misappropriate funds, an assumption that has exerted a highly negative influence on the resource redistribution function of China's capital markets. It is unsurprising that refinancing behavior labeled as misappropriation would prompt tougher regulatory supervision and result in higher financing costs. The end result is a waste of regulatory resources and the cancelation of many investment projects that could have created positive firm value, undoubtedly leading to immeasurable economic losses. This paper thus has important policy

implications, as its findings suggest the need for a reassessment of whether the refinancing behavior of Chinese listed companies is motivated by misappropriation alone. We argue here, and our findings demonstrate, that we must distinguish legitimate refinancing from misappropriation and return to an impartial stance when evaluating the refinancing behavior of Chinese listed firms. On this basis, we also argue for loosening of the regulatory requirements governing refinancing in China. Simplification of the CRSC's approval process would further expand the development of China's refinancing markets and improve the efficiency of resource redistribution in its capital markets.

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