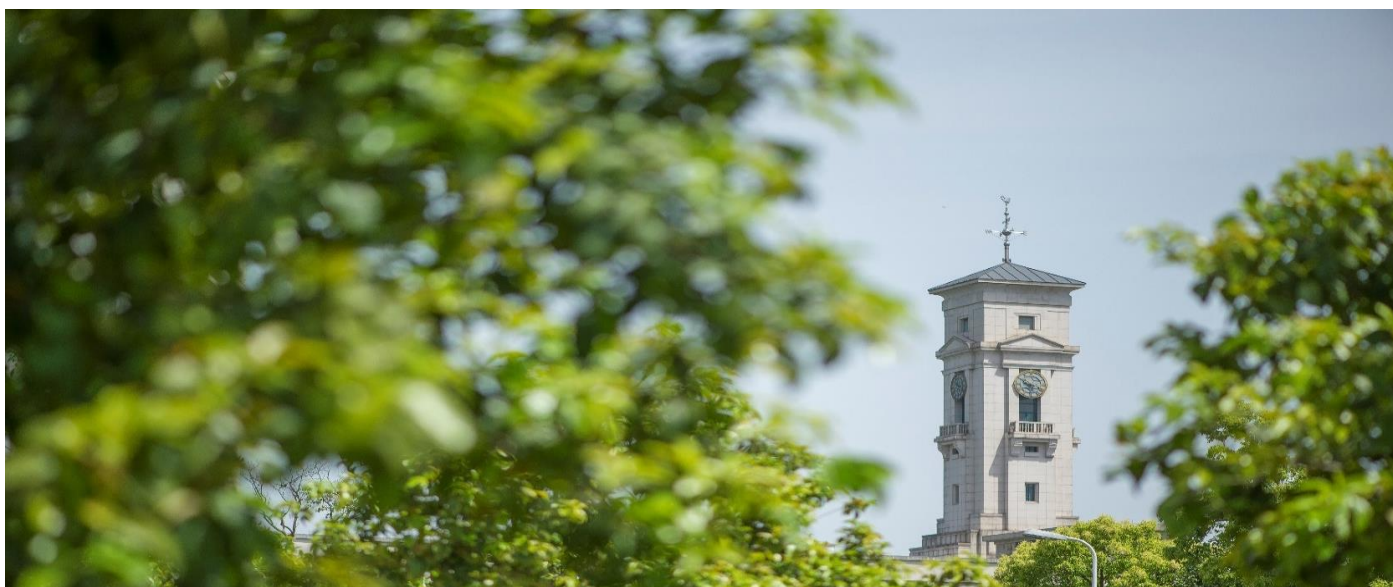


# Make a promise: the valuation adjustment mechanism in Chinese private target acquisitions

Xiaogang Bi



**University of  
Nottingham**

UK | CHINA | MALAYSIA

University of Nottingham Ningbo China, 199 Taikang East Road, Ningbo, 315100, Zhejiang, China.

First published 2021

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XiaoGang BI\*

Nottingham University Business School China

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## **Keywords:**

Valuation Adjustment Mechanism; Mergers and Acquisitions; Takeovers; Contract Design; Contingent Payment

**JEL Code:** G34; K22

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\* Corresponding author: XiaoGang BI, Department of Finance and Accounting, Nottingham University Business School (China), 199 Taikang East Road, Ningbo, P. R. China, 315100; Tel: (86) 574 88180362; Email: [x.bi@nottingham.edu.cn](mailto:x.bi@nottingham.edu.cn); The authors acknowledge the financial support from National Natural Science Foundation (Zhejiang), project ID: LQ12G02005. I also appreciate helpful comments and suggestions from the conference participants at the 2018 Chinese Academy of Management Annual Meeting and the 2018 China Financial Innovation Conference (CFIC). The paper received the excellent paper award at the 2018 Chinese Academy of Management Annual Meeting.

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## 1. Introduction

Takeovers of privately held firms represent the vast majority of transactions worldwide (Chang 1998; Draper & Paudyal 2006), and acquirers earn significant positive returns when acquiring a privately held company, especially when the method of payment is stock (Fuller et al. 2002). Positive market reactions are due mainly to either the stronger bargaining power of acquirers (a privately held target is typically illiquid) or closely monitor by target block holders (Shleifer & Vishny 1986). However, properly evaluating privately held targets and setting the transaction price is a difficult undertaking (regardless of whether cash or shares are used as the method of payment), because available information on a private target is rare. Moreover, target firms also face uncertainty in relation to acquirer-specific information revelations (acquirer sigma), especially when the acquirers are small (Alexakis & Barbopoulos 2020).

To complement the due diligence process, acquiring firms can use a mixed method of payment (Chang 1998; Fuller *et al.* 2002), thus mitigating transaction risks due to information asymmetry. In addition, the multi-stage contingent payment mechanism (the “earnout” provision) is also widely used in takeover transactions in the US and UK markets, while in the Chinese mergers and acquisitions (hereafter, M&As) market, a similar arrangement, namely the valuation adjustment mechanism<sup>1</sup> (VAM), is used in the contractual arrangement of transactions. The Chinese VAM is a contractual agreement made between acquirers and target shareholders through which

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<sup>1</sup> In Chinese “对赌协议”

the former can give additional rewards to target firm sellers<sup>2</sup> when the target meets predetermined goals; otherwise, target firm sellers are punished by repaying part of the deal value back to the acquiring firm (in the form of cash or a combination of cash and equity). The reason for setting up this contingent payment is to solve information asymmetry issues in the acquisition process, especially for a private target, which has less information transparency and a considerably higher degree of valuation risk. In addition to this information asymmetry, the other role of a VAM in contract design is the “signal” effect. Only good-quality targets (or at least targets with good short-term prospects) have the confidence to sign a VAM contract with acquirers, as target sellers are punished upon losing additional cash payments already received by the target firm’s seller from the acquiring firm. Thus, the VAM serves as a reliable “guaranteed signal” of profit improvements after an acquisition transaction, and this “quality guarantee” is especially important to poorly performing acquirers at risk of delisting<sup>3</sup> from the stock market, and it reduces acquisition uncertainty, thereby sending stronger positive signals to the financial market.

Existing empirical studies such as (Lyon *et al.* 1999; Phalippou *et al.* 2014) show that M&As may not create value for shareholders, with one of main causes being the improper valuation of targets and overpayment, due to information asymmetries between acquirers and targets – especially when targets are private firms

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<sup>2</sup> Target firm sellers are the original owners of targets. After they have sold a portion of their shares to acquirers, target firms remain as an independent firms of the acquirers. Sellers of targets are still shareholders of target firms and remain on the key managerial team of the target.

<sup>3</sup> According to CSRC regulations, when a firm consistently has three years of negative profits, it can be listed on the mainland stock market. Before being delisted, the stock name is changed to “ST+StockName.” ST refers to special treatment.

operating in high-tech or R&D-intensive industries. To mitigate this risk, acquiring firms can choose to engage in thorough due diligence and use a mixed method of payment (Fuller *et al.* 2002) or a multi-stage contingent payment (Alexakis & Barbopoulos 2020) to reduce uncertainty in the transaction, thereby protecting acquiring shareholders' interests, creating shareholder value (Barbopoulos *et al.* 2018b) and reducing future goodwill impairments (Cadman *et al.* 2014). The present research focuses on the Chinese M&A market, in which acquirers widely adopt this contract design in acquisition transactions, and I examine the roles and potential consequences of acquisition deals that adopt VAMs in transactions.

The VAM in the Chinese acquisition market displays a number of similarities to the “earnout” provision of the developed financial market, as they both include some portion of payment that is contingent upon predetermined performance (e.g. net profits), and this contingent payment can reduce information asymmetries for both bidding and target shareholders facing valuation risks when negotiating transaction prices (Barbopoulos & Sudarsanam 2012). However, VAMs in China offer several unique characteristics relative to an earnout in the developed market, including stronger signals to the capital market, higher incentives to target managerial teams and a great reduction in uncertainty by paying a higher premium. I elaborate on the details in the following section.

First, an earnout is used as a payment currency in a transaction, especially for financially constrained acquirers (Bates *et al.* 2018), whereby the target seller receives a second-stage payment contingent on the future performance of the target. Under

existing earnout arrangements, when a target cannot deliver the predetermined level of performance, nothing is lost. However, the VAM in China is a separate contract signed between acquirers and targets in addition to the negotiated prices of the transaction, and it serves as a “two-direction-payment” mechanism: under the VAM contract, when the target cannot deliver the promised level of performance (e.g., net profits), the seller has to repay part of the deal value back to the acquiring firm. On the other hand, the seller might also negotiate an additional bonus payment if performance targets are met. For example, a Shenzhen Stock Exchange-listed company (stock code: 300188) made an acquisition announcement on 08 August 2013 and signed a VAM contract with a seller. In the contract, both the bidder and the seller agreed a promised net profits target of 35.56 million RMB. If the target company were unable to meet the promised net profit target, the seller agreed that they would repay the difference between the promised and the realised (actual) net profits back to the acquirer. However, if the target company did indeed meet the promised target, the additional  $20\% * (\text{difference between realised net profits and promised net profits})$  would be paid to the seller by the acquirer as an additional bonus. This potential punishment/bonus ensures that target sellers have strong incentives to deliver the promised level of performance (net profits), and it sends a strong signal to the financial market (signaling hypothesis). These strong incentives to deliver promised profits are particularly valuable to Chinese acquirers with past poor performance, as “ensured” profit improvements constitute the fastest and easiest means to avoid being delisted.



Second, information asymmetry can lead to adverse selection, in that the buyer offers too low a price due to valuation risks. Thus, good-quality sellers exit the M&A market while poor-quality companies of questionable value remain (Lukas & Heimann 2014). Earnout payments attempt to reconcile the different expectations of sellers and buyers in an acquisition, and they can be used to partially reduce the “adverse selection” problem caused by information asymmetry, because determining an appropriate initial-stage payment in earnout is still difficult. However, a VAM contract in China can provide additional rewards or punishments for target shareholders, and the potential additional payments to and from the target firms depend on the difference between realised profits and promised profits. This “two-directional” design ensures a fair deal transaction value for both acquirers and targets, greatly mitigates the “adverse selection” problem and ensures target quality in the acquisition market.

Third, Kohers and Ang (2000) show that even when private target owners in an earnout-financed deal do not receive a deferred payment, they still receive an initial payment that is higher than the full deal payment through a non-earnout-financed deal (Barbopoulos & Sudarsanam 2012). Barbopoulos and Adra (2016) document that target owners are incentivised to exaggerate information asymmetries and aim to motivate the inclusion of an earnout as a payment currency, meaning that owners receive an initial payment that exceeds the full payment that they would otherwise have received had the earnout not been included in the deal’s financing process (Barbopoulos & Adra 2016). The effort involved in negotiating an extreme high

first-stage payment without working hard to deliver the promised profits in later stage is called a “moral hazard”. While the Chinese VAM is not part of a payment currency in an acquisition transaction, it nevertheless serves as an additional contract term to align the interests of acquirers and targets, and the full payment made upon the announcement of the deal and the later payback mechanism – if the target cannot deliver the promised profits – can effectively solve the “moral hazard” issue of high first-stage payment problems associated with earnout payments.

Finally, both the VAM and earnouts are used to reduce information asymmetries, especially for private target acquisitions, for which detailed information on targets is not publicly available on the market. Moreover, earnout deals outperform non-earnout deals when both initial and deferred payments are in stocks (Barbopoulos *et al.* 2018b). Conversely, in the Chinese M&A market, acquirers like to use full cash payments (Boateng & Bi 2014), and the majority of acquisition targets are private. This unique M&A market setting reduces the potential contaminating effects of using stock as a payment currency in public acquisition deals. Examining the Chinese market and VAM contracts creates a clean market setting in which to scrutinise the role of contingent payments in transactions.

Due to the unique characteristics of the VAM arrangement in the Chinese M&A market, acquisition transactions with VAM agreements not only provide liquidity<sup>4</sup> to these private target sellers, but they also – more importantly – ensure good-quality

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<sup>4</sup> Listing on the Chinese mainland market is difficult and time-consuming; an alternative way for target shareholders to “cash-out” involves accepting takeover offers from listed companies.

targets, especially to poorly performing acquirers who are under pressure to improve their performance in the short term.

Using 1,023 privately-held-target acquisition deals made from 2009 to 2014, I find that acquisitions with a VAM contract generate significantly more value than deals not using a VAM. This positive effect remains significant after I apply two approaches in our empirical investigations to address endogeneity: Heckman's (1979) method to control for "self-selection bias," and propensity-score matching (PSM) to address "sample selection bias" based on observable firm characteristics. I show that the positive value-creation effect of a VAM is more pronounced for poorly performing acquirers prior to an acquisition announcement, thereby suggesting that the VAM benefits acquirers more in delisting risk, while its role as a "signal of guarantee" is used by investors as an effective means to save a "poorly performing" firm by launching an acquisition deal.

I also explore potential sources of short-term positive market reactions, with my results showing that acquisitions incorporating a VAM can significantly improve post-event operating performance, especially for poorly performing bidders. These results are consistent with those observed in cumulative abnormal return (CAR) regressions, and they suggest that VAM contracts are able to increase shareholder value. I also investigate the size of VAM contracts further and find that poorly performing bidders tend to sign larger VAM contracts with target firms, which further supports the arguments that poor bidders are eager to use VAM contracts to boost their short-term performance. In addition, I document that poorly performing bidders pay

much higher premiums to target firms.

Regarding the likelihood of adopting a VAM in a Chinese M&A transaction, I document that acquirers without pre-event holdings in target firms, and in complex transaction deals, are more likely to use a VAM as an additional contract design in a transaction. I also conduct a robustness test by applying a buy-and-hold-abnormal return and an alternative model to calculate short-term abnormal returns; in addition, I use different “poorly performing firm” proxies. I confirm that my results are robust in relation to model specification and variable measurement biases.

This paper contributes in several ways to the limited empirical evidence regarding the effects of contingent payments on firms’ investment decisions. First, I provide an updated analysis of the role of contract design in corporate acquisition decisions made in the Chinese market, in which VAMs are widely used as a contract term and are not part of the payment currency, unlike in the US market. The “two-direction payment” mechanism seen in Chinese VAM samples enables me to conduct meaningful comparative studies on the effectiveness of contingent payments made in transactions. Second, I document that VAMs can increase deal values and that this value-creation role is more pronounced for poorly performing acquirers prior to an event, due to the strong value-creating “signal of a guarantee” effect, thereby supporting empirical studies on earnouts in the US market – according to which the contingent payment can reduce information asymmetries by mitigating valuation risks. However, my research shows that the contract design of the VAM in Chinese acquisitions can significantly reduce future profit uncertainty for acquiring firms,

which, in turn, significantly increases the market value of these acquiring firms. Third, unlike previous studies focusing on listed public target firms, my empirical evidence shows that poorly performing bidders adopting VAM terms in their transactions can significantly improve acquirers' long-term operating performance, albeit the empirical evidence shows that these acquisitions with VAMs significantly increase bid premiums, as acquirers may rely heavily on promised profits from targets rather than make an effort to boost current business operations.

The rest of the paper is organised as follows. Section 2 presents the institutional background and a literature review. Section 3 discusses the data and variables, and section 4 presents empirical evidence on the impacts of a VAM on acquisition performance. Finally, section 5 reports the robustness test, and section 6 presents the study's conclusions.

## **2. Literature Review and Institutional Background**

### ***2.1 Earnout literature review***

This paper is related to several strands of the contingent payment literature. Most notably, it is related to earnout payment studies of the US M&As market that focus on why earnout payments reduce information asymmetries in transactions. "Information asymmetry" refers to the uncertainty involved in target valuation, due to the limited amount of available information regarding these targets. Meanwhile, the medium of exchange in M&As has been widely documented in empirical studies, in order to address information asymmetries. For example, Fishman (1989) and Eckbo *et*

*al.* (1990) argue that all-cash offers mitigate the mispricing of bidders arising from the bidder's information asymmetry, while a stock offer can help a bidder address overpayment risk arising from the target's information asymmetry. A mixed payment of cash and stock offers can only partially solve the information asymmetry arising from the bidder and the target. In addition to using a method of payment to mitigate the target valuation risk, a multi-stage contingent payment mechanism (earnout) is also widely used in the transaction (Barbopoulos & Sudarsanam 2012; Barbopoulos & Adra 2016; Alexakis & Barbopoulos 2020), especially in cross-border deals announced by acquirers that have no prior international business experience (Barbopoulos *et al.* 2018a). Finnerty *et al.* (2012) contend that an earnout contract can be treated as two separate components: debt and equity. The debt component enables a target to reduce the bidder's information asymmetry, while the equity component enables an acquirer to reduce the target's information asymmetry. The combination of these two components is preferred in deals when acquirers and targets present larger levels of information asymmetry. Empirical evidence (Finnerty *et al.* 2012; Barbopoulos & Adra 2016) also shows that earnout contracts generate significantly more value to shareholders; however, the earnout effect is potentially elusive, due to the presence of an acquirer-specific information revelation effect (high sigma acquirers), especially for small acquirers that have severe information asymmetry between firm managers and outside investors (Alexakis & Barbopoulos 2020). Furthermore, the potential benefits of earnout contracts could also turn out to be empty promises in countries without effective legal protection for earnout holders

(Viarengo *et al.* 2018).

The second strand of the literature examines the impact of earnout structures. For example, from 424 UK deals made between 1996 and 2010, Barbopoulos and Adra (2016) show that the structure of earnouts is significantly related to the deal premium of a transaction. More specifically, an additional 10% increase in earnout size is associated with a 6.45% higher deal premium, while the negative association between high premiums and low announcement period returns is neutralised in earnout-financed deals. This empirical result is consistent with the prediction made by Lukas *et al.* (2012) that higher premiums are allocated to target firms to compensate for sharing risk after a transaction. In terms of the length of earnout periods, Lukas and Heimann (2014) document that earnout periods are again negatively related to the bidding premium, as a longer earnout contract period will again force targets to share business risk with acquirers.

Finally, empirical studies extend contingent payment to private-equity (PE) investments by analysing the relationship between contract design and returns for PE investments. Cumming (2008) was the first to examine thoroughly the association between contract design and investment performance, while more recently, Caselli *et al.* (2013) examined 834 PE investment deals made in the EU and empirically demonstrated that a rich contract design generates more value for investors, as it incentivises managers to work on profit maximisation and serves as a “guarantee” to PE investors.

However, no empirical studies have examined the role and effectiveness of

“two-direction” contingent payments made in Chinese acquisition deals in which this “two-direction” mechanism has a considerably stronger signal effect. The present paper links the VAM contract to acquisition deal outcomes and contends that the VAM is able to add value for acquirers, especially for poorly performing firms.

## ***2.2 M&As and VAM in China***

There has been an explosion in the growth of the Chinese M&As market in recent years. According to the Zero2IPO database<sup>5</sup>, 2,692 deals were made in 2015, reflecting a 39.6% increase relative to 2014 values, and the value of deals has risen by 44% on an annual basis. Among these deals, 89.4% are domestic and equate to 81.4 billion RMB, reflecting a 63.7% increase relative to 2014. Of these domestic deals, Internet industries account for the largest number. Data from the CSRC show that China is now home to the world’s second largest M&As market.

The VAM is a contract signed between acquirers and target shareholders, the purpose of which is to protect shareholders’ interests and to reduce information asymmetries between bidders and targets. The first successful VAM contract created in China was signed by Morgan Stanley and MengNiu Group in 2003, in which MengNiu agreed on an annual sales growth rate of 50% for the next three years. Due to their capacities to mitigate transaction risk, VAM contracts have become popular tools in Chinese M&As deals ever since.

The contingent arrangement in M&A deals follows the practice of private

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<sup>5</sup> <http://research.pedaily.cn/report/pay/1260.shtml>



equity (PE) industry in China, as PE in good-quality, privately held firms chooses either an IPO or a takeover as the cash-out channel, and thus the contingent payment arrangement (VAM) in the takeover process is very similar to the contractual arrangement in the PE investment contract in the Chinese financial market. A typical VAM contract will involve both the acquirer and the target discussing and agreeing a predetermined performance target (e.g. net profit) before the transaction, and if this target is not met, a certain amount of cash must be paid back to the acquiring firm. The amount of payback is equal to the difference between the agreed performance target in the contract and the actual realised performance over the evaluation period. Thus, the payback amount varies according to each deal. Acquirers and targets can also negotiate a cash bonus when the latter meet the predetermined performance target, but a cash bonus<sup>6</sup> does not equate to the payback amount when the target fails to meet the performance metric, because the payback amount generally equates to the difference between a predetermined figure and the actual outcome.

### **3. Data and Variables**

In this section I discuss my samples, the main variables and the characteristics of my samples. I also present a univariate test that compares deal characteristics, classified as VAM-contract acquisition and non-VAM contract acquisition.

#### ***3.1 Sample Construction***

My sample of 1,023 Chinese domestic M&As deals was selected from the

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<sup>6</sup> A cash bonus is generally a certain percentage (20%-50%) of additional profits above the promised performance target.

GTA Corporate Restructure and Acquisition database for 2009 through 2014, as VAM contract information is available from 2009, and I also require two years' post-event financial and stock market return data available for my sample acquirers (by the end of 2016). I used the following criteria to select my final M&A sample: (1) transaction types, including mergers, tender offers and acquisitions of major assets; (2) acquirers, including domestic Chinese listed companies, with targets being domestic Chinese non-listed firms; (3) deal values representing at least 1% of the acquirer's level of market capitalisation; (4) related-party transactions (financial and utility sectors are excluded, due to the use of different financial reporting methods); (5) I exclude observations of multiple deals announced for the same firm over a one-year period, to reduce contamination effects; (6) firm-level financial and accounting data are selected from the CSMAR database and (7) no restriction on the percentage of shares bought, in order to maintain a larger available sample size<sup>7</sup>.

**【Table 1】**

Panel A of Table 1 presents a sample industry distribution for the 1,023 acquisition observations. My samples cover all major CSRC industries, excluding financial and utilities firms. The manufacturing industry presents the largest number of deals (63.83%), followed by the IT (9.78%) and real estate industries (7.72%). Acquisitions in the IT industry grew dramatically, due to the importance of IT technologies for various sectors. My sample industry distribution is very similar to

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<sup>7</sup> Baseline regressions, using a sub-sample of deals where the bidder owns less than 50% before the transaction and more than 50% thereafter, remain the same. The results are not reported in this paper, but they are available upon request.

that reported by (Deng *et al.* 2013) for the US market, who found that 57.19% of US acquirers operate in the manufacturing sector. Table 1 also presents the industry distribution for the 225 VAM samples, and the manufacturing industry still represents the largest number of deals (66.22%). The number of VAM deals made in the IT industry increased dramatically to 20%. Panel B shows the year of distribution for takeover deals, with a clear trend showing that more takeover deals adopted VAM contract terms.

### ***3.2 Measurement of Key Variables***

The main variable of interest is a dummy variable equal to 1 when acquirers adopt a VAM in a transaction; otherwise, it is equal to 0. As no database currently covers contract terms made between acquirers and targets, I manually collected VAM terms from company acquisition reports published by acquirers via the CSRC<sup>8</sup>. As illustrated in Table 1, the number of takeover deals adopting VAM terms increased significantly by the end of 2014. On average, approximately 22% of my sample uses VAM terms in transactions, and proportions of M&As using VAM terms in China are considerably larger than those reported in empirical studies by (Datar *et al.* 2001; Cain *et al.* 2011; Ewelt-Knauer *et al.* 2011)<sup>9</sup>.

To determine whether adopting VAM contract terms can improve shareholder value through acquisitions, I examine whether acquisition deals with VAM terms affect capital market responses to announcements, as measured by cumulative

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<sup>8</sup> CSRC: China Securities Regulatory Commission.

<sup>9</sup> These studies report that, on average, 3.1%-6.8% of deals adopt earnouts in transactions.

abnormal returns (CARs) over various event windows. I apply a standard event study methodology based on a standard market model benchmark, with market returns provided by the Shanghai Composite Index. Specifically, the market model calculates the abnormal return  $AR_{it}$  for firm  $i$  on day  $t$  as

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \quad (1)$$

where  $R_{it}$  is returns for firm  $i$  on day  $t$ , and  $\alpha_i$  and  $\beta_i$  are firm-specific regression parameters estimated over the 250-day period, i.e. event day -310 to event day -61. I focus on various event windows, and the event day is designated as the date of the announcement of an acquisition deal.

An alternative means of calculating CARs involves using a market-adjusted model over a market model, as documented in (Dimson 1979; Dimson & Marsh 1983). For brevity, I only report results based on the market model, but CAR results based on the market-adjusted model still hold for all of my regression analyses.

### ***3.3 Sample Statistics***

Table 2 presents summary statistics on key acquiring firm characteristics. Detailed definitions of the variables are given in the Appendix. All continuous variables are winsorised at their 1st and 99th percentiles to limit the influence of outliers. My results show that acquiring firms' CARs over two different observation periods and the mean CARs for acquiring firms fall within 1.7% and 3.1%, while the median CARs for acquiring firms range from 0.1% to 0.7%. These CAR distributions are very similar to those reported in Bi and Wang (2018), who also find that Chinese acquisitions generate significantly positive value for shareholders. The average

market capitalisation of acquirers is 5.8 billion Yuan, and the average leverage ratio for acquiring firms is 0.338. My sample's acquirers also have mean cash holdings of 22.3%, which supports Boateng and Bi (2014) argument that most Chinese acquiring firms are cash-rich. In this sample, the acquirers' average Tobin's Q ratio is 2.06, the book-to-market ratio 0.59 and the price run-up (measured from a pre-event 12-month BHAR) 8.1%. In terms of operating performance measures, my sample's acquiring firms present a higher industry median-adjusted ROA that is 1.7% higher than the industry median value. The acquirers' Tobin's Q ratio is similar to that reported by Schmidt (2015), but it has a higher leverage ratio than that of US acquirers. The average relative value of the deals is 11.9% of acquirer assets, indicating that the acquisitions considered in my study are non-trivial investments. I also measure acquiring firms' idiosyncratic stock return volatility (sigma), with an average value of 0.03. Regarding the proxies for corporate governance, 17.1% of my acquirers have managerial holdings, and 36.9% of board members are independent directors. The controlling shareholders of the sample's acquirers hold more than 50.13% of outstanding shares, thus revealing the very concentrated ownership structure typical of Chinese capital markets.

#### **【Table 2】**

### ***3.4 Univariate test***

Table 3 presents a univariate test of key acquiring firm characteristics based on the presence of VAM contract terms in M&As deals. I observe that firms in the two subgroups have different firm characteristics. Table 3 demonstrates that acquiring

firms with VAM terms are larger, have higher price run-up values and a higher Tobin's Q ratio and are less likely to pay in cash than firms with non-VAM contracts. Moreover, there is no significant difference between cash holdings and pre-event operating performance. In addition, average market reactions around announcements (CARs) are positive for both subsamples, while the VAM subsample experiences significantly higher short-term market reactions than the non-VAM subsample. Collectively, these univariate results suggest that markets react positively to acquirers who adopt VAM terms in transactions.

【Table 3】

## 4. Empirical Analysis

### 4.1 Announcement Effect

If adopting VAM contract terms can generate more value for acquisition deals than a non-VAM contract deal, I expect such firms to make better acquisitions and to receive stronger market reactions in relation to these events. In the following section, I examine whether a VAM generates better acquisition deals, by presenting estimates from multivariate regressions using  $CAR(-1/1)$  as the dependent variable, and the dummy variable *VAM* as a key independent variable. The regression of acquisition returns controls for determinants of acquirers' performance illustrated in previous studies (Huang *et al.* 2014; Phalippou *et al.* 2014; Bi & Wang 2018). Specifically, *ROA* measures pre-event accounting performance (Harford 1999), and the *pre-event price run up* measures stock price performance. I also use *Cash Holding* to control for the agency costs of free cash flows (Jensen 1986), *Book-to-market Ratio* to control for

investment opportunities (Officer 2003) and sigma to control for the acquirer-specific information revelation effect (Alexakis & Barbopoulos 2020). Other firm and deal characteristics include firm size, leverage, the Tobin's Q ratio and the method of payment. In addition to including common control variables used in the M&As literature, I consider corporate governance variables available to the Chinese market in regressions, including *CEO duality*, *managerial holding*, *independent directors* and the *share concentration ratio* (Boateng & Bi 2014). The regressions also control for industry and year fixed effects. I use the following multivariate regression:

$$CAR_{(-1,1),i} = \beta_0 + \beta_1 VAM_i + \gamma_1 DealControl_i + \gamma_2 CGControl_i + \varepsilon_i \quad (2)$$

where dependent variable  $CAR_{(-1,1),i}$  is the announcement cumulative abnormal return calculated from the market model in the (-1,1) event window for firm  $i$ . The main variable of interest is  $VAM_i$ , a dummy variable equal to one when a deal adopts a VAM term in a transaction, and otherwise equal to zero.

#### 【Table 4】

The results are reported in Table 4. Column 1 presents estimates of the  $VAM$  coefficient without control variables. The coefficient is 0.055 and is significantly positive at the 1% level. This result suggests that the average CAR for acquiring firms that adopt a VAM term is 5.5% higher than the average CAR for acquiring firms that do not adopt such a term. Column 2 illustrates estimates made after controlling for the determinants of acquirer announcement returns identified in previous studies, and these control variables include the acquirer's size, the leverage ratio, the acquirer's cash holdings prior to the event, the acquirer's Tobin's Q ratio, the book-to-market

ratio, the percentage share held after the transaction, sigma and the acquirer's pre-event performance. In addition, I include additional corporate governance variables for the Chinese market, including the *percentage of managerial holdings*, *CEO duality* and the *percentage of independent directors* (Boateng & Bi 2014). I find that coefficient estimates for the VAM term are reduced to 0.024, but it remains positive and significant at the 1% level. Thus, even after controlling for various firm- and deal-specific characteristics, acquisition deals with VAM terms generate higher returns than deals that do not use them. Table 4 provides strong evidence in support of the notion that VAM contract terms create value for shareholders.

The announcement of CARs is also significantly related to certain firm- and deal-specific characteristics. Consistent with previous findings, such as those presented by (Faccio *et al.* 2006), there is a significantly negative relationship between acquirer CARs and acquirer size. In my sample, acquirer CARs are also negatively related to the cash-payment dummy and are positively related to the relative value of deals.

#### ***4.2 Identification Concerns***

In this section, I address concerns regarding endogeneity. Following (Fich *et al.* 2013), I correct omitted variable bias by including a year and an industry dummy in all baseline regressions, because industry and/or time trends could affect the incidence of takeovers and the decision to adopt a VAM contract, in order to reduce uncertainty.

I additionally adopt two approaches to address endogeneity in the empirical



investigations: the Heckman (1979) method, to control for “self-selection bias,” and propensity-score matching (PSM), to address sample selection bias based on observable firm characteristics.

I first consider the endogeneity of bidder-VAM matching arising from the decision to use a VAM being correlated with certain unobserved firm- or deal-specific characteristics, as a VAM contract may be preferred by a specific type of acquirer, thereby potentially rendering OLS estimates biased. To address this concern, I follow methods presented by (Heckman 1979; Golubov *et al.* 2012) to control for this potential “self-selection bias.” Heckman (1979) argues that self-selection bias is similar in nature to a specification error (omitted variable bias) and proposes a two-stage procedure for controlling it. I apply this procedure where the first-stage equation models the selection of a VAM contract in the acquisition period while the second-stage equation corrects for the selection bias<sup>10</sup>. Following Li and Prabhala (2007), this instrumental variable should affect the decision to adopt a VAM contract, but it should not directly affect the outcomes of *current* acquisition deals. In the spirit of Fang (2005) and Golubov *et al.* (2012), I use “*scope*” to serve as such an identification restriction. “*Scope*” measures the extent to which acquirers use a VAM contract prior to an IPO. In this paper, the *scope* variable takes a value of one, once an acquirer has signed a VAM contract with a private-equity investor before being listed on the stock market, and a value of zero otherwise.

Table 5 presents the results of this analysis. The *scope* variable is highly significant (at the 1% level) in determining the choice to use a VAM contract in the acquisition period. This means that the extent to which acquirers use a VAM contract before an IPO is positively related to the decision to sign one with a target, again

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<sup>10</sup> Refer to (Golubov *et al.* 2012) for theoretical arguments and for practical applications of this methodology.

during the acquisition period. The probability of using a VAM contract is also positively related to the acquirer's percentage of managerial holdings, while the decision to use one is negatively related to the acquirer's degree of leverage, the book-to-market ratio and the method of payment. The pseudo-R<sup>2</sup> of the first stage indicates that the model explains up to 37.7% of the decision to use a VAM contract.

#### 【Table 5】

From the first-stage equation I construct, I add an inverse mills ratio as an additional regressor to the second-stage equation. As highlighted in Table 5, this selection term is insignificant at conventional levels, thereby indicating that the coefficient estimates of the baseline regressions (Table 4) are reliable. In other words, unobserved characteristics that affect the likelihood of using a VAM contract do not have significant effects on M&A outcomes. Thus, I can conclude that the use of a VAM contract is associated with higher announcement returns.

My second means of addressing endogeneity issues involves using the propensity score-matching method, which can correct for sample selection biases resulting from observable differences between a treatment and a control group (Dehejia & Wahba 2002). I compare the mean CARs of portfolios of deals for which VAM contracts were used with control groups not using VAM contracts. The control deal is identified using the propensity score matching (PSM) process. I first build a propensity score model, using a logit model that estimates the use of VAM contracts during acquisition with a dependent variable equal to one when a VAM contract is present, and equal to zero otherwise. The independent variables include firm size, leverage, cash-holding, Tobin's Q ratio, the book-to-market ratio, sigma, the price

run-up and pre-event operating performance. I then apply 1-to-1 nearest neighbour matching without replacement and select the non-VAM deal with the propensity score closest to the VAM deal. The sensitivity of the conclusion to the potential unobserved covariate from each propensity score estimator is examined through the Rosenbaum bounds method (Rosenbaum 2009; Alexakis & Barbopoulos 2020).

#### 【Table 6】

The selection model estimation is reported in Panel A of Table 6. Acquirers with a superior pre-event operating performance and a stronger pre-event stock market performance are more likely to sign VAM contracts with target firms; meanwhile, acquirers with a larger sigma also significantly increase the likelihood of using a VAM contract. In Panel B of Table 6, I report the statistical difference of covariates between the treated and control samples, whereby all variables are test insignificant, thereby confirming successful matching sequences. In Panel C of Table 6, I report the mean difference in CARs observed between the treatment and control samples. As reported in Table 3, the treatment samples have average CARs ranging from 6.5% to 7.4% over two different event windows, while the control samples' CARs are around 2.7% over the same event windows and the difference between these two groups is test significant. The results remain consistent when using a market index-adjusted model to calculate CARs. The results derived from the PSM method therefore confirm the results of the univariate analysis shown in Table 3 and those from the multiple regression analysis shown in Table 4. Overall, these findings reveal higher abnormal acquirer returns when a VAM is used during an acquisition. Finally, the Rosenbaum bounds test is reported in Panel D of Table 6, where gamma represents how influential

an unobserved covariate needs to be in order to invalidate the treatment effect on a random variable (Alexakis & Barbopoulos 2020).

#### ***4.3 Poorly performing bidders and short-term returns***

The results provided in Table 4 suggest that a VAM term does add value for shareholders. However, VAM contracts do not mitigate information asymmetry issues solely, as another role of a VAM in a contract's design is rooted in its "signal" effect. Only high-quality targets have the confidence to sign VAM contracts with acquirers, as sellers of targets are punished upon losing additional cash payments already received by sellers of target firms from acquiring firms. Thus, a VAM serves as a reliable "guarantee" of good performance after a transaction, and I expect this additional "guarantee" to send a strong message to the capital market regarding the opportunities for value creation from this transaction. This "quality guarantee" is especially important for poorly performing acquirers at risk of delisting<sup>11</sup> from the stock market, and an acquisition with the VAM term constitutes the easiest and fastest way to improve performance in the near future. Thus, I expect to find that reducing levels of acquisition uncertainty sends a stronger positive signal to the financial market.

#### **【Table 7】**

I perform the CAR regression as in equation (2) by interacting the *VAM* dummy with a *poorly performing bidder* dummy, defined as dummy variable = 1 if

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<sup>11</sup> According to CSRC regulations, when a firm has consistently had three years of negative profits, this firm can then be delisted from the mainland stock market.

the acquirer's pre-event ROA is smaller than the median value, otherwise = 0. The dependent variable given in Table 7 is the acquirer's CAR (-1/1), and all other control variables are the same as those used in Table 4. The estimated coefficient for *VAM* remains positive. More importantly, the significantly positive coefficient on the interaction term *VAM* × *poorly performing bidder* suggests that the value creation effect of the VAM term is more pronounced when poorly performing acquirers adopt a VAM contract in a transaction. Taken together, the results provided in Table 7 indicate that the value creation effects of a VAM are highly valued for this additional guarantee of performance improvements. An alternative definition/proxy of the *poorly performing bidder* dummy is discussed and examined in section 5.2 of this paper.

#### ***4.4 Poorly performing bidder and operating performance***

In the following section, I explore the potential effects of a VAM on an acquirer's operating performance, in order to explain why VAM contracts add value to poorly performing bidders' shareholders.

$$OP_i = \beta_0 + \beta_1 VAM_i + \beta_2 PoorBidder + \beta_3 VAM \times PoorBidder + \gamma_1 Control_i + \varepsilon_i \quad (3)$$

The dependent variable is the industry median adjusted *ROA* & *ROE* one year following an acquisition, defined as the difference between raw data and the industry median value. I also calculate the change in operating performance one year before and one year after the acquisition as an alternative measure of operating performance. All regressions control for the acquiring firm's characteristics and for deal

characteristics as defined in the Appendix.

**【Table 8】**

As illustrated in Table 8, the coefficient for the *poorly performing bidder* dummy is negative, suggesting that on average poorly performing bidders continuously have long-term lower operating performance compared to industry peers after an acquisition. However, when I examine the interaction term  $VAM \times \textit{poorly performing bidder}$ , the results show that the interaction terms become significantly positive, thereby suggesting that improvements in operating performance are more pronounced when poorly performing bidders adopt VAM contracts in transactions. These results are consistent with the CAR regression reported in Table 7. Taken together, the results provided in Tables 7 and 8 indicate that guaranteed performance improvements serve as an efficient way to enhance the operating performance of poorly performing acquirers and are highly valued by market participants.

By looking into the detail of each contract term, I further explore the source of improvements made in operating performance, and I examine the size of the VAM contract signed with targets, in order to explore why poorly performing acquirers benefit more from the VAM contract.

$$VAM\ Size_i = \beta_0 + \beta_1 PoorBidders + \gamma_1 Controls_i + \varepsilon_i \quad (4)$$

The dependent variable is *VAM Size*, defined as net profits promised by targets (raw numbers) and net profits promised by targets scaled by the acquirer's pre-event net profits. All regressions control for the acquiring firm's characteristics and for the deal characteristics defined in the Appendix.

### 【Table 9】

The coefficient for the *poorly performing bidder* dummy is significantly positive, thus suggesting that on average, poorly performing bidders signing a large VAM contract to guarantee improved operating performance. I also control for target pre-event performance (*Target ROE*) and *Target size*, the results for which indicate that VAM contract terms are not related to target quality. I add additional corporate governance variables into the regression, and these results show that the coefficients for the *poorly performing bidder* remain positive, thereby indicating that poorly performing acquirers greatly rely on large VAMs to improve operating performance.

#### **4.5 Poorly performing bidders and bid premium**

The results shown in Tables 7 and 8 indicate that VAMs are valuable to acquirers and especially to poorly performing acquirers in transactions; thus, a natural question to ask concerns whether a target firm might also benefit from signing a VAM contract with a bidder. In the following section, I examine whether a VAM can affect bid premiums, by running a multiple regression model, similar to that illustrated by equation 5. Since not every deal publicly discloses the bid premium, the following analyses are thus based on deals with available bid premium data.

### 【Table 10】

The results in Table 10 suggest that signing a VAM contract alone does not provide a significantly higher premium to target firms, because the “cash-out” channels for the shareholders (especially for firms held by private equities) of these

private target firms in China are either an IPO or an acquisition, and an IPO in China is a long process with lots of uncertainties. Therefore, a relatively easy option for private firm shareholders is acquisitions initiated by listed firms, thereby providing liquidity to target firms and enabling target shareholders to cash-out as soon as possible. Due to the “cash-out” and “liquidity” benefits for these private target firms, it is less likely we will observe a significantly higher premium paid to target shareholders. However, when I examine the interaction term  $VAM \times \text{poorly performing bidder}$ , the results in column (1) of Table 10 show that it is significantly positive at the 5% level, thus indicating that acquirers tend to compensate targets with significantly higher premium when the latter sign a VAM contract with a poorly performing bidder. Column (2) of Table 10 focuses on the VAM sample only, and the regression results show that the bid premium is not determined by the target quality, since *Target ROE* is not test significant in the regression analyses.

#### ***4.6 The likelihood of adopting a VAM contract***

If adopting a VAM contract creates value for the shareholders of certain acquiring firms, do firms realise this gain and rationally choose to adopt such a contract? In this section, I investigate the determinants of acquiring firms’ decisions on adopting a VAM contract. I perform the following logit regression:

$$Prob(VAM)_i = \beta_0 + \gamma_1 FirmControl_i + \gamma_2 DealControl_i + \varepsilon_i, \quad (5)$$

where the dependent variable  $Prob(VAM)$  is a dummy that equals one if the acquiring firm adopts a VAM, and zero otherwise. I include various firm and deal characteristics as the explanatory variables.



Table 11 presents the results. The main variables of interest are the pre-holding dummy and the complex deal proxy. According to the information asymmetry hypothesis, acquiring firms should be more likely to adopt a VAM contract if they do not have a prior holding in a target firm (face severe information asymmetry) and in more complex transactions (defined as *high relative deal size*). The results confirm this prediction. The coefficient on the pre-holding dummy is significantly negative, suggesting that acquirers are more likely to adopt a VAM when they know less about a target firm. The coefficient on the complex deal dummy is significantly positive, implying that acquirers are more likely to adopt a VAM when deals are complex.

【Table 11】

## **5. Robustness Check**

### ***5.1 Market-adjusted CAR and BHAR***

Another concern in calculating abnormal returns used in the regression analysis is model specification bias, because the Chinese domestic market is less liquid compared with Western markets, and this illiquidity could bias the estimation of market model parameters (Dimson 1979; Dimson & Marsh 1983). To solve this problem, I use an alternative market-adjusted model to calculate CARs by re-running the baseline regression in Table 4. Columns 1 and 2 of Table 12 illustrate the results, using the market-adjusted model with the deal-level and corporate governance controlling variables, while fixed effects are controlled by year and industry dummies. The coefficients for the VAM dummy all remain significant and positive at the 1% level, thereby indicating that they do indeed create value for acquirers' shareholders, even if I use different model and event periods.

I additionally calculate the buy and hold abnormal return in the post-event 12-

and 24-month periods. As show in Columns 3 & 4 of Table 12, the coefficient of the VAM term is not test significant, thus demonstrating that there are no return reversions following the short-term positive market reaction by adopting the VAM contract, further supporting the argument that VAMs create value for acquirers.

【Table 12】

### ***5.2 Alternative proxy of poorly performing acquirers***

Throughout this paper, I have defined the poorly performing bidder by using *ROA* as a proxy of operating performance, while another robustness check involves using *ROE* as an alternative measure of operating performance, as it considers returns to equity holders and also takes out the impact of firms' financing decisions (capital structure). All regressions in Table 13 are consistent with those reported in Table 8, indicating that the results are robust to different operating performance proxies.

My final robustness check dummy the *poorly performing bidder* dummy as equalling 1 if an acquirer's pre-event *ROA* is negative, and results using this alternative definition are qualitatively similar to those reported in Table 8 and Table 13 (available from the authors upon request).

【Table 13】

## **6. Conclusion**

This study empirically analyses the relationship between VAM contracts and acquisitions in China. I find that acquisitions with VAM contract terms generate significantly higher value than those deals without a VAM, especially for poorly

performing acquirers. Further investigations regarding operating performance again document that the VAM can significantly increase poorly performing acquirers' post-event operating performance and bidding premiums. Finally, I show that acquirers without pre-event holdings, and in complex deals, are more likely to adopt a VAM contract in the transaction. Collectively, this paper contributes to the understanding of contingent payments in acquisition transactions.

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**Table 1: Sample distribution by CSRC industry and year**

This table reports our sample distribution by acquirer industry and acquisition year. Our sample consists of 1023 M&A deals from GTA M&As databases, and industry classification follows CSRC industry code.

<b>Panel A</b>	<b>CSRC Industry Classification</b>	<b>All Samples</b>		<b>VAM Samples</b>	
		<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
	Manufacturing	653	63.83%	149	66.22%
	IT	100	9.78%	45	20.00%
	Real estate	79	7.72%	2	0.89%
	Wholesale and retail trade	39	3.81%	2	0.89%
	Mining	31	3.03%	2	0.89%
	Transportation, storage	24	2.35%	0	0.00%
	Other communication and cultural industries	16	1.56%	2	0.89%
	Construction	16	1.56%	9	4.00%
	Agriculture, forestry, livestock farming, fishery	16	1.56%	6	2.67%
	Leasing and other business service	13	1.27%	3	1.33%
	Professional, scientific research service	13	1.27%	5	2.22%
	Public facilities service	12	1.17%	0	0.00%
	Catering and Hotels	6	0.59%	0	0.00%
	Comprehensive	4	0.39%	0	0.00%
	Hygiene, health care , nursing service and other social services	1	0.10%	0	0.00%
	<b>Total</b>	<b>1023</b>	<b>100.00%</b>	<b>225</b>	<b>100.00%</b>

<b>Panel B</b>	<b>YEAR</b>	<b>All Samples</b>		<b>VAM Samples</b>	
		<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
	2009	58	5.67%	1	0.44%
	2010	97	9.48%	5	2.22%
	2011	135	13.20%	12	5.33%
	2012	192	18.77%	23	10.22%
	2013	239	23.36%	45	20.00%
	2014	302	29.52%	139	61.78%
	<b>Total</b>	<b>1023</b>	<b>100.00%</b>	<b>225</b>	<b>100.00%</b>

**Table 2: Variables Summary Statistics**

This table reports the number, mean, standard deviations, 25th percentile, median, 75th percentile of acquirer and deal characteristics. See Appendix for the definition of variables.

Variable	N	MEAN	STD	P25	P50	P75
<b>Cumulative Abnormal Return from Market Model</b>						
CAR <sub>mkt</sub> (-1,1)	1023	0.017	0.076	-0.026	0.007	0.049
CAR <sub>mkt</sub> (-2,2)	1023	0.019	0.094	-0.033	0.006	0.056
<b>Cumulative Abnormal Return Adjusted by Market Return</b>						
CAR <sub>mktadj</sub> (-1,1)	1023	0.027	0.078	-0.021	0.011	0.058
CAR <sub>mktadj</sub> (-2,2)	1023	0.031	0.098	-0.028	0.013	0.067
<b>Buy and Hold Abnormal Return (10-size reference portfolios)</b>						
12 months	1023	0.020	0.532	-0.293	-0.067	0.246
24 months	1023	0.036	0.772	-0.397	-0.099	0.312
<b>Operating Performance (one year post-event)</b>						
Ind adj ROE	1023	0.008	0.050	-0.017	0.002	0.032
Ind adj ROA	1023	0.005	0.084	-0.032	0.003	0.043
ΔROA (-1Y/ 1Y)	1023	-0.008	0.062	-0.029	-0.008	0.012
ΔROE (-1Y/ 1Y)	1023	-0.011	0.102	-0.040	-0.005	0.029
<b>Acquirer and Deal Characteristics</b>						
Bid premium	651	10.878	50.760	1.378	2.500	5.162
Size (in Billions)	1023	5.820	6.165	2.374	3.942	6.832
Lev	1023	0.338	0.217	0.154	0.301	0.493
Cash Holdings	1023	0.223	0.174	0.093	0.169	0.314
Tobin's Q	1023	2.060	1.169	1.317	1.654	2.298
BM	1023	0.591	0.218	0.435	0.605	0.760
Run-up	1023	0.081	0.471	-0.197	-0.011	0.256
ROA	1023	0.017	0.053	-0.010	0.014	0.043
ROE	1023	0.023	0.086	-0.016	0.015	0.058
Pre-holdings (%)	1023	13.529	25.508	0.000	0.000	1.653
Post-holdings (%)	1023	72.253	29.235	51.000	80.000	100.000
Relative Size	1023	0.119	0.243	0.020	0.039	0.105
All-cash (0/1)	1023	0.841	0.366	1.000	1.000	1.000
Managerial Holdings	1023	0.171	0.227	0.000	0.013	0.362
CEO Duality (0/1)	1023	0.338	0.473	0.000	0.000	1.000
Independent Directors	1023	0.369	0.050	0.333	0.333	0.400
Shareholding concentration (%)	1023	50.138	15.414	38.814	51.658	62.280
Z Index	1023	8.796	17.333	1.669	3.618	7.789
Sigma	1023	0.030	0.079	0.021	0.025	0.030
<b>VAM Contract Characteristics (VAM Sample only)</b>						
VAM Size (million)	225	168.297	187.206	56.250	108.000	192.220
Acq pre-event Net Profits (million)	225	84.300	115.000	21.800	55.500	111.000
VAM Size/ Net Profits	225	3.134	9.807	0.486	1.415	3.842
Target pre-event ROE	225	-4.543	196.830	8.824	13.015	18.026
Target Size (million)	225	274.972	509.865	49.161	142.225	256.095



**Table 3: Univariate Tests of key variables**

This table reports acquirer and deal characteristics for VAM sample and the non-VAM sample, respectively. See Appendix for the definition of variables.

Variable	Non VAM	VAM	Diff	P-Value
<b>Cumulative Abnormal Return from Market Model</b>				
CAR <sub>mkt</sub> (-1,1)	0.007	0.065	-0.058	0.000
CAR <sub>mkt</sub> (-2,2)	0.006	0.074	-0.068	0.000
<b>Cumulative Abnormal Return Adjusted by Market Return</b>				
CAR <sub>mktadj</sub> (-1,1)	0.014	0.084	-0.070	0.000
CAR <sub>mktadj</sub> (-2,2)	0.015	0.099	-0.085	0.000
<b>Buy and Hold Abnormal Return (10-size reference portfolios)</b>				
12 months	0.034	0.063	-0.029	0.559
24 months	0.040	0.053	-0.012	0.862
<b>Operating Performance (one year post-event)</b>				
Ind adj ROE	0.005	0.009	-0.003	0.399
Ind adj ROA	0.000	0.009	-0.009	0.164
$\Delta$ ROA (-1Y/ 1Y)	-0.015	0.000	-0.015	0.001
$\Delta$ ROE (-1Y/ 1Y)	-0.021	0.000	-0.022	0.008
<b>Acquirer and Deal Characteristics</b>				
Bid premium	9.582	10.257	-0.675	0.881
Size (in Billions)	5.500	5.300	0.160	0.000
Lev	0.336	0.298	0.038	0.026
Cash Holdings	0.225	0.226	0.000	0.975
Tobin's Q	1.897	2.438	-0.541	0.000
BM	0.638	0.502	0.136	0.000
Run-up	0.061	0.272	-0.212	0.000
ROA	0.017	0.012	0.006	0.176
ROE	0.020	0.016	0.004	0.573
Pre-holdings (%)	15.722	7.272	8.449	0.000
Post-holdings (%)	72.165	81.964	-9.798	0.000
Relative Size	0.076	0.308	-0.232	0.000
All-cash (0/1)	0.953	0.377	0.576	0.000
Managerial Holdings	0.175	0.245	-0.070	0.000
CEO Duality (0/1)	0.380	0.367	0.013	0.743
Independent Directors	0.371	0.370	0.001	0.733
Shareholding concentration (%)	50.221	49.837	0.384	0.755
Z Index	9.520	6.498	3.021	0.031
Sigma	0.030	0.029	0.001	0.882

**Table 4: VAM and CAR**

This table presents results from the regression of acquirer CARs on the VAM dummy and other acquirer and deal-specific characteristics for a sample of China M&As. The dependent variable is acquirer CAR from market model. Variables are defined in Appendix. All regressions control for year and industry fixed effects. The p-values reported in parentheses are based on standard errors adjusted for heteroscedasticity and clustered at the firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
Dep.var = CAR <sub>mkt</sub> (-1/1)		
VAM (0/1)	0.055*** (0.000)	0.024*** (0.008)
Size		-0.013*** (0.000)
Leverage		-0.007 (0.605)
Cash Holding		-0.019 (0.291)
Tobins' Q		-0.004 (0.205)
BM		-0.030 (0.103)
Run-up		0.013** (0.030)
ROA		0.013 (0.676)
Pre-holdings		-0.004 (0.598)
Post-holdings		0.001 (0.867)
Relative Size		0.018* (0.062)
All-cash		-0.040*** (0.001)
Managerial Holdings		-0.005 (0.698)
CEO Duality		-0.001 (0.881)
Independent Directors		0.011 (0.791)
Shareholding concentration (%)		0.028* (0.054)
Sigma		-0.185*** (0.000)
Intercepts	0.003 (0.833)	0.242*** (0.000)
N	1023	1023
R sqr	0.092	0.162
Year Dummy	Y	Y
Industry Dummy	Y	Y

**Table 5: Addressing Endogeneity: Heckman Two-Stage Procedure for Acquirer CARs**

This table presents results of the Heckman two-stage procedure for acquirer CARs during M&A announcements. The first column reports the first-stage selection equation estimated by a Probit regression, where the dependent variable is one if the acquiring firm signed the VAM contract with target in the M&A process, and zero otherwise. The second column reports the second-stage regression, where the dependent variable is acquirer CAR and the inverse Mills ratio adjusted for potential self-selection bias. Variables are defined in Appendix. The Scope variable equals one if the acquirers signed the VAM contract with private-equity investors before IPO, and zero otherwise. The p-values reported in parentheses are based on standard errors adjusted for heteroscedasticity and clustered at the firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Selection	Outcome (CARs)
Scope	1.111*** (0.000)	
Size	0.041 (0.614)	-0.022* (0.056)
Lev	-0.543* (0.089)	0.052 (0.188)
Cash Holdings	-0.408 (0.284)	0.002 (0.966)
Tobin's Q	-0.094 (0.217)	0.007 (0.458)
BM	-1.850*** (0.000)	0.010 (0.888)
Run-up	0.125 (0.280)	0.029** (0.016)
ROA	-2.061** (0.037)	0.077 (0.526)
Pre-holdings	-0.400 (0.116)	0.001 (0.964)
Post-holdings	-0.050 (0.808)	-0.037 (0.190)
Relative Size	0.037 (0.826)	-0.016 (0.306)
All-cash	-1.495*** (0.000)	-0.016 (0.667)
Managerial Holdings	0.834*** (0.001)	0.003 (0.927)
CEO Duality	-0.058 (0.619)	-0.004 (0.745)
Independent Directors	-1.148 (0.285)	0.017 (0.896)
Share Concentration Ratio	0.295 (0.442)	0.038 (0.415)
Sigma	-1.390 (0.516)	-0.801 (0.310)
Inverse Mills Ratio		-0.029 (0.295)
Intercept	1.421 (0.304)	0.454** (0.023)
Observations	1023	1023
First stage Pseudo R2	0.377	

**Table 6: VAM and CAR, propensity score approach**

This table presents results from the propensity score matching approach. We build propensity score matching process using a logit model that estimates the usage of VAM contract in the acquisition, with dependent variable equal to one if VAM contract is present and zero otherwise. CAR is cumulative abnormal return. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

## Panel A: Logistic Regression

Variables	Coefficients	P-value
Size (in Billions)	0.152	0.191
Lev	0.933	0.041
Cash Holdings	-0.504	0.347
Tobin's Q	0.117	0.268
BM	3.043	0.000
Run-up	0.628	0.000
ROA	3.441	0.019
Sigma	4.525	0.017
Intercepts	3.531	0.059
Pseudo R2		0.078
N		1023

## Panel B: Covariate Balance

	Non-VAM (Control)	VAM (Treatment)	Diff	P value
Size (in Billions)	15.105	15.223	-0.117	0.139
Lev	0.280	0.310	-0.030	0.284
Cash Holdings	0.253	0.226	0.027	0.138
Tobin's Q	2.585	2.498	0.087	0.637
BM	0.496	0.502	-0.005	0.807
Run-up	0.236	0.276	-0.039	0.528
ROA	0.011	0.009	0.002	0.803
sigma	0.027	0.029	-0.002	0.045

## Panel C: CARs difference between treatment and control groups

	Non-VAM (Control)	VAM (Treatment)	Diff	P value
<b>Cumulative Abnormal Return from Market Model</b>				
CAR <sub>mkt</sub> (-1,1)	0.027	0.065	-0.038	0.000
CAR <sub>mkt</sub> (-2,2)	0.027	0.074	-0.047	0.000
<b>Cumulative Abnormal Return Adjusted by Market Return</b>				
CAR <sub>mktadj</sub> (-1,1)	0.028	0.066	-0.038	0.000
CAR <sub>mktadj</sub> (-2,2)	0.031	0.079	-0.048	0.000

## Panel D: Rosenbaum bounds

Rb: p-value of estimated difference at gamma=1	0.000
Rb: critical value of $\Gamma$ at cut-off p=0.05	1.800
Rb: critical value of $\Gamma$ at cut-off p=0.10	1.900

**Table 7: Poorly performing bidder, VAM and CARs**

This table presents results from the regression of acquirer CARs on the VAM dummy, its interaction with poorly performance bidders and other acquirer and deal-specific characteristics. The dependent variable is acquirer CAR(-1/1) from market model. Variables are defined in Appendix. All regressions control for year and industry fixed effects. The p-values reported in parentheses are based on standard errors adjusted for heteroscedasticity and clustered at the firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
Dep. var. = CAR <sub>mkt</sub> (-1/1)		
VAM	0.023** (0.032)	0.013 (0.262)
Poorly performing bidders	0.006 (0.361)	-0.002 (0.775)
VAM × Poorly per bidder		0.036* (0.054)
Acquirer Controls	Y	Y
Deal Controls	Y	Y
Fixed Effects	Year, Industry	Year, Industry
Observations	1023	1023
Adjusted R <sup>2</sup>	0.187	0.192

**Table 8: Poorly performing bidder, VAM and post-event operating performance**

This table presents results from the regression of post-event operating performance on the VAM dummy, poorly performance bidders and other acquirer and deal-specific characteristics. The dependent variables are industry median adjusted ROA/ ROE 1 year after-event, and change of ROA/ROE 1 year before-event to 1 year after-event. Variables are defined in Appendix. The p-values reported in parentheses are based on standard errors adjusted for heteroscedasticity and clustered at the firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. var. = Operating Performance	Industry Adjusted		$\Delta$ (-1Y/ 1Y)	
	ROA1Y (1)	ROE1Y (2)	ROA (3)	ROE (4)
VAM	-0.011** (0.021)	-0.012 (0.136)	-0.007 (0.197)	-0.005 (0.587)
Poorly performing bidders	-0.030*** (0.000)	-0.052*** (0.000)	0.022*** (0.000)	0.037*** (0.000)
VAM $\times$ Poorly per bidder	0.015*** (0.008)	0.026*** (0.005)	0.019** (0.012)	0.031** (0.023)
Size	0.013*** (0.000)	0.022*** (0.000)	-0.001 (0.725)	0.009 (0.113)
Leverage	-0.001 (0.934)	0.054** (0.026)	0.050*** (0.002)	-0.018 (0.559)
Cash Holding	0.038*** (0.002)	0.034* (0.054)	0.026* (0.091)	0.041* (0.086)
Tobins' Q	0.001 (0.695)	-0.001 (0.896)	0.005 (0.155)	0.008* (0.062)
BM	-0.023 (0.162)	-0.034 (0.234)	0.003 (0.876)	0.046 (0.128)
Run-up	0.002 (0.483)	0.002 (0.704)	0.008** (0.038)	0.022* (0.056)
Pre-holdings	0.003 (0.632)	0.007 (0.524)	0.008 (0.299)	0.032** (0.016)
Post-holdings	-0.007 (0.197)	-0.015* (0.092)	-0.011 (0.192)	-0.017 (0.191)
Relative Size	0.000 (0.999)	-0.007 (0.552)	0.012 (0.138)	-0.020 (0.196)
All-cash	-0.012** (0.017)	-0.018** (0.023)	-0.007 (0.256)	-0.022** (0.011)
Managerial Holdings	0.009 (0.165)	0.010 (0.367)	0.015* (0.057)	0.024* (0.059)
CEO Duality	-0.007** (0.037)	-0.009 (0.152)	-0.000 (0.954)	-0.000 (0.980)
Independent Directors	-0.041 (0.126)	-0.060 (0.217)	-0.038 (0.362)	-0.036 (0.603)
Shareholding concentration (%)	0.035*** (0.001)	0.069*** (0.000)	0.005 (0.659)	0.031 (0.149)
Sigma	-0.021 (0.382)	-0.007 (0.862)	-0.053** (0.033)	-0.173** (0.036)
Intercepts	-0.173*** (0.000)	-0.327*** (0.000)	-0.030 (0.588)	-0.223** (0.027)
N	1023	1023	1023	1023
R sq	0.232	0.184	0.176	0.095
Year Dummy	Y	Y	Y	Y
Industry Dummy	Y	Y	Y	Y

**Table 9: Poorly performing bidder and size of VAM contract (VAM samples)**

This table presents results from the regression of size of VAM contract on the poorly-performing bidder and other acquirer and deal-specific characteristics (VAM Sample only). The dependent variable is size of VAM contract, measured by the total promised net profits by targets and total promised net profits by targets scaled by acquirers' pre-event net profits. Variables are defined in Appendix. The p-values reported in parentheses are based on standard errors adjusted for heteroscedasticity and clustered at the firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. var. = VAM Contract Size	(1) VAM Size	(2) VAM Size/ Net Profit
Poorly performing bidders	0.213* (0.092)	4.028*** (0.001)
Size	0.356*** (0.001)	0.191 (0.907)
Leverage	-0.183 (0.579)	-9.118 (0.108)
Cash Holding	-1.189*** (0.003)	-5.757 (0.189)
Tobins' Q	-0.217* (0.075)	-0.749 (0.606)
BM	-0.994 (0.147)	-6.427 (0.415)
Run-up	0.041 (0.617)	1.097 (0.340)
Pre-holdings	0.388 (0.299)	4.717 (0.241)
Post-holdings	-0.789*** (0.007)	-3.962 (0.292)
Relative Size	0.696*** (0.000)	1.840 (0.650)
All-cash	-0.457*** (0.004)	0.624 (0.688)
Managerial Holdings	-0.323 (0.166)	1.127 (0.641)
CEO Duality	0.017 (0.873)	0.216 (0.869)
Independent Directors	1.135 (0.309)	3.057 (0.807)
Shareholding concentration (%)	-0.015 (0.967)	1.797 (0.730)
Target ROE	0.000 (0.595)	-0.001 (0.426)
Target Size	0.089*** (0.002)	0.938** (0.029)
Intercepts	4.482** (0.019)	31.656 (0.224)
N	225	225
R sq	0.317	0.148
Year Dummy	Y	Y
Industry Dummy	Y	Y

**Table 10: Poorly performing bidder, VAM and bid premium**

This table presents results from the regression of bidding premium on the VAM dummy, its interaction with poorly-performing bidder and other acquirer and deal-specific characteristics. The dependent variable is bid premium. Variables are defined in Appendix. All regressions control for year and industry fixed effects. The p-values reported in parentheses are based on standard errors adjusted for heteroscedasticity and clustered at the firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. var. = Bid premium	All Samples	VAM Samples
VAM (0/1)	-5.037 (0.401)	
Poorly performing bidders	-8.160* (0.088)	11.942 (0.249)
VAM × Poorly per bidder	19.840** (0.047)	
Size	7.176** (0.023)	4.169 (0.431)
Leverage	3.269 (0.580)	-2.077 (0.823)
Cash Holding	-13.876 (0.267)	-24.437 (0.241)
Tobin Q	-3.502** (0.035)	-2.347 (0.522)
BM	-8.480 (0.523)	-16.352 (0.488)
Run-up	4.709 (0.257)	2.273 (0.584)
Pre-holdings	11.897 (0.431)	-17.217 (0.345)
Post-holdings	11.597 (0.176)	25.899 (0.339)
Relative Size	6.847** (0.020)	7.037 (0.172)
All-cash	8.783 (0.251)	22.566 (0.298)
Managerial Holdings	24.417 (0.102)	24.272 (0.271)
CEO Duality	1.468 (0.756)	-1.536 (0.702)
Independent Directors	2.059 (0.963)	-49.546 (0.263)
Shareholding concentration (%)	20.126* (0.074)	24.812 (0.304)
Sigma	-38.933 (0.162)	-58.116 (0.824)
Target Size		-1.467 (0.208)
Target ROE		0.030 (0.746)
Intercepts	-107.314* (0.055)	-61.461 (0.520)
N	651	156
R sqr	0.023	0.022
Year Dummy	Y	Y
Industry Dummy	Y	Y



**Table 11: Likelihood of adopting VAM in transaction**

This table presents results from the logit regression of the decision adopt VAM on acquirer and deal-specific characteristics. The dependent variable is a dummy variable that equals one if the acquiring firm adopts VAM and zero otherwise. Variables are defined in Appendix. The p-values are reported in parentheses. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. var. = Prob(using VAM)	(1)	(2)	(3)
Pre-event Holding (0/1)	-0.808*** (0.000)		-0.486** (0.031)
Complex deals		3.482*** (0.000)	3.247*** (0.000)
Size	-0.092 (0.450)	0.151 (0.247)	0.145 (0.268)
Leverage	-0.504 (0.277)	-0.956* (0.060)	-0.909* (0.072)
Cash Holding	-0.997* (0.081)	-1.446** (0.020)	-1.489** (0.016)
Tobins' Q	-0.108 (0.291)	-0.259** (0.025)	-0.233** (0.041)
BM	-3.479*** (0.000)	-3.471*** (0.000)	-3.377*** (0.000)
Run-up	0.536*** (0.001)	0.411** (0.018)	0.407** (0.018)
ROA	-3.409** (0.021)	-3.300** (0.033)	-3.365** (0.030)
Post-holdings	1.506*** (0.000)	0.704** (0.028)	0.837** (0.011)
Managerial Holdings	1.831*** (0.000)	1.991*** (0.000)	1.975*** (0.000)
CEO Duality	-0.119 (0.500)	-0.015 (0.933)	-0.024 (0.898)
Independent Directors	-1.132 (0.481)	-2.289 (0.185)	-2.268 (0.188)
Shareholding concentration (%)	0.318 (0.589)	0.078 (0.899)	0.055 (0.929)
Sigma	-4.711 (0.315)	-8.378 (0.273)	-8.609 (0.260)
Intercepts	1.807 (0.393)	-0.765 (0.732)	-0.740 (0.742)
Observations	1023	1023	1023
Pseudo R <sup>2</sup>	0.137	0.196	0.200

**Table 12: Robustness Check - CAR (market adjusted model) and BHAR**

This table presents results from the regression of acquirer CARs & BHAR on the VAM dummy and other acquirer and deal-specific characteristics for a sample of China M&As. The dependent variable is acquirer CAR(-1,1) and CAR(-2/2) based on market index-adjusted model, and BHAR based on 10 size-decile reference portfolios. Variables are defined in Appendix. All regressions control for year and industry fixed effects. The p-values reported in parentheses are based on standard errors adjusted for heteroscedasticity and clustered at the firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Market Adjusted Model		BHAR	
	CAR(-1/1)	CAR(-2/2)	12M	24M
VAM (0/1)	0.031*** (0.001)	0.033*** (0.004)	-0.006 (0.928)	-0.000 (0.997)
Size	-0.014*** (0.000)	-0.024*** (0.000)	-0.092*** (0.000)	-0.148*** (0.000)
Leverage	-0.002 (0.884)	-0.004 (0.832)	0.052 (0.589)	-0.116 (0.376)
Cash Holding	-0.004 (0.836)	-0.006 (0.805)	0.003 (0.980)	-0.159 (0.361)
Tobins' Q	-0.006* (0.073)	-0.008* (0.072)	-0.048** (0.026)	0.005 (0.867)
BM	-0.047** (0.014)	-0.067*** (0.007)	-0.286** (0.035)	0.089 (0.663)
Run-up	0.015*** (0.001)	0.023*** (0.000)	-0.037 (0.374)	-0.114* (0.067)
ROA	0.022 (0.535)	0.054 (0.297)	-0.155 (0.505)	-0.088 (0.825)
Pre-holdings	-0.007 (0.385)	-0.009 (0.433)	0.184** (0.017)	0.206* (0.056)
Post-holdings	0.004 (0.583)	0.006 (0.562)	-0.126** (0.043)	-0.263*** (0.008)
Relative Size	0.022** (0.029)	0.034** (0.020)	-0.024 (0.632)	-0.172*** (0.006)
All-cash	-0.044*** (0.000)	-0.056*** (0.000)	-0.071 (0.360)	-0.062 (0.528)
Managerial Holdings	-0.009 (0.422)	-0.016 (0.282)	0.009 (0.919)	0.112 (0.404)
CEO Duality	0.001 (0.796)	-0.000 (0.996)	0.017 (0.659)	-0.017 (0.749)
Independent Directors	0.015 (0.715)	-0.002 (0.974)	-0.524 (0.114)	-0.040 (0.939)
Shareholding concentration (%)	0.032** (0.031)	0.031 (0.102)	0.385*** (0.000)	0.690*** (0.000)
Sigma	-0.083*** (0.010)	-0.093** (0.025)	0.455 (0.111)	0.936** (0.029)
Intercepts	0.266*** (0.000)	0.463*** (0.000)	1.869*** (0.000)	1.873*** (0.004)
N	1023	1023	1023	1023
R sqr	0.201	0.219	0.040	0.062
Year Dummy	Y	Y	Y	Y
Industry Dummy	Y	Y	Y	Y

**Table 13: Robustness check – alternative measure of pre-event performance**

This table presents results from the regression of post-event operating performance on the VAM dummy, poorly performance bidders (ROE) and other acquirer and deal-specific characteristics. The dependent variables are industry median adjusted ROA/ ROE 1 year after-events, and change of ROA/ROE 1 year before-event to 1 year after-event. Variables are defined in Appendix. The p-values reported in parentheses are based on standard errors adjusted for heteroscedasticity and clustered at the firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. var. = Operating Performance	Industry Adjusted		$\Delta (-1Y/ 1Y)$	
	ROA1Y (1)	ROE1Y (2)	ROA (3)	ROE (4)
VAM	-0.010* (0.051)	-0.011 (0.180)	-0.005 (0.358)	-0.001 (0.888)
Poorly performing bidders (ROE)	-0.027*** (0.000)	-0.050*** (0.000)	0.023*** (0.000)	0.038*** (0.000)
VAM $\times$ Poorly per bidder (ROE)	0.011* (0.051)	0.024** (0.014)	0.016** (0.034)	0.025* (0.070)
Acquirer controls	Y	Y	Y	Y
Deal Controls	Y	Y	Y	Y
Intercepts	-0.174*** (0.000)	-0.340*** (0.000)	-0.033 (0.555)	-0.232** (0.022)
N	-0.166*** (0.000)	-0.307*** (0.000)	-0.046 (0.414)	-0.247** (0.010)
Year Dummy	1023	1023	1023	1023
Industry Dummy	0.226	0.185	0.178	0.096

## Appendix: Variable Definition

Variables	Definitions
CARMktadj(-1,1)	Cumulative abnormal return adjusted by the market return during the event window (-1,1)
CARMktadj(-2,2)	Cumulative abnormal return adjusted by the market return during the event window (-2,2)
CARMkt(-1,1)	Cumulative abnormal return calculated from the market model during the event window (-1,1)
CARMkt(-2,2)	Cumulative abnormal return calculated from the market model during the event window (-2,2)
BHAR	Buy and hold abnormal return based on 10-size reference portfolio
Ind adj ROE1Y	Industry median adjusted ROE 1 year after-events
Ind adj ROA1Y	Industry median adjusted ROA 1 year after-events
$\Delta$ ROA (-1Y/ 1Y)	Change of ROA 1 year before-event to 1 year after-event
$\Delta$ ROE (-1Y/ 1Y)	Change of ROE 1 year before-event to 1 year after-event
VAM (0/1)	Dummy variable = 1 if acquiring firms adopt VAM term in the transaction, otherwise = 0.
Bid Premium	Transaction value paid/ Target book value
Size (in billions)	Acquire market capitalization (in Billions) at year end prior to acquisition announcements
Lev	Acquirer leverage ratio, defined as total liability scaled by total assets, at year end prior to acquisition announcements
Cash holdings	Acquirer cash-to-total assets ratio at year end prior to acquisition announcements
Tobin's Q	Acquirer Tobin's Q at year end prior to acquisition announcements
BM	Acquirer book-to-market equity ratio at year end prior to acquisition announcements
Run-up	Acquirer 12-month buy and hold abnormal return prior to acquisition announcements
ROA/ROE	Acquirer end of year return-on-asset/ return-on-equity prior to acquisition announcements
Pre-holdings	Percentage shares of target firm held by acquirers before acquisitions
Post-holdings	Percentage shares of target firm held by acquirer after acquisitions
Relative Size	Deal transaction value scaled by acquirer total assets prior to acquisition announcements
All-cash (0/1)	A dummy variable that equals one when payment is 100% cash and zero otherwise
Managerial holdings	Percentage shares of target firm held by managerial team of acquirers prior to acquisition announcements
CEO Duality (0/1)	A dummy variable that equals one if CEO and Chairman are the same person and zero otherwise
Independent directors	Percentage of independent directors on the board of directors
Shareholding concentration %	Percentage shares hold by controlling shareholders
VAM Size	The total promised net profits by targets in VAM contract
Acq. pre-event net profits	Acquirer net profits at year end prior to acquisition announcements
VAM Size/ Net Profits	Total promised net profits by targets scaled by acquirers' pre-event net profits
Complex deal	High relative size.
Scope	Dummy equals to one when an acquirer once signed a VAM contract with private-equity investors before being listed in the stock market and a value of zero otherwise
Poorly performing bidder (ROA)	Dummy variable =1 if acquirer's pre-event ROA is smaller than the median value of all acquirers, otherwise =0.
Poorly performing bidder (ROE)	Dummy variable =1 if acquirer's pre-event ROE is smaller than the median value of all acquirers, otherwise =0.

Sigma	The standard deviation of the residuals from the market model that is estimated from t-250 days before M&A announcement to t-40. T0 is the M&A announcement day.
Target ROE	Target end of year return-on-equity prior to acquisition announcements
Target Size	Target book value at year end prior to acquisition announcements

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