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Acquisition Size and Institutional Ownership: Evidence from China

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Abstract

Firm's proper acquisition size is still an unresolved question. The extant literatures mention little about the determinants of firm's acquisition size at micro economic level. With recent available data of acquisitions in Chinese stock market (Shanghai and Shenzhen) during 2003-2008, we estimate the effect of institutional ownership on firms' acquisition size controlling financial and governance characteristics. In an industry fixed effect model, firms' acquisition size is significantly and positively associated with firm size, Tobin's Q, leverage ratio, cash holding level and internal capital expenditure. Acquisition size is positively related to some governance characteristics of firms such as board size, independency of board and activity of board, but negatively related to the duality of chairman and CEO. However, annual dividend, management holding, intangible asset, ownership concentration and the identity of ownership seems unrelated to acquisition size. The monitoring effect of different institutional ownership including qualified foreign institutional investors (QFII), social security fund (SSF), security firms (SF) and security investment funds (SIF) on the acquisition of listed firms are investigated. We find that QFII and SIF increase acquisition size of those over-acquisition firms while only SSF have significant monitoring effects on those under-acquisition firms.

Keywords: acquisition size, corporate governance, institutional ownership

JEL codes: L25, G23, G34

I. Introduction

What's a firm's proper acquisition size? It is still an unresolved question for both academics and practitioners. The extant literatures mention little about the determinants of firm's acquisition scale at the micro economic level. This paper tries to fill this gap using recent available data from Chinese stock market (Shanghai and Shenzhen) over the period 2003-2008.

Generally, the more prosperous is the capital market, the bigger acquisition size would be (Golbe and White 1988, p25-47). Anderson (1997) finds that acquisition would be fit when the market is saturated, while internal investment is more suitable if the industry is low concentrated and less competitive. He also points out that the different regulation policy also impacts on the possibility of acquisition in terms of industry. If certain industry is full of fragmented supplier and excessively predatory pricing, regulator would encourage acquisition to integrate the market. Harford (2005) documents the occurrence of shocks, such as the technique development, deregulation, plus the sufficient macro liquidity, forces the firm to adapt to the new change by acquisition, explained the explosive development of US five merger waves. Thus, market structure, macroeconomic environment and the industry characteristics would impact firms' acquisition activity.

Another strand of literatures concentrates on the financial characteristics and corporate governance of acquiring firms. Firstly, economic resource (or asset) of acquiring firms is important factor to decide whether and how much the firms should acquire. Small firms (measured as sales or total assets) are thought to be likely to grow through merger and acquisition (Dubin 1975), while more recent research (e.g., Fazzari *et al.*, 1988; and Hubbard 1998) suggests that acquisition size increases in firm size significantly. Rubin (1973) invents a model of firm investment-expansion based on resource theory and argue that firm may choose to acquire if the acquirer own a strong expertise, such as R&D department or financial department. His argument

shows the off-balanced resource owned by acquirer would influence the decision to invest.² Debt and capital expenditure are important determinants to acquisition size. Jensen and Meckling (1976) argue that increasing debt may reduce the expropriation by managers. Myers (1977) demonstrates that the excessive debt would reduce the projects with positive net present value, and result in underinvestment. Jensen (1986) continues his argument that debt would exercise a hard constraints on manager's investment, and the financial leverage is negatively related with the over investment. Since capital expenditure may be substitutionary investment to acquisition, Mills *et al.* (1995) and Lang *et al.* (1996) find that debt is negatively related to capital expenditure.

Moreover, cash dividend payout is also a very important indicator of financial resource. Managers face the conflicting choices between cash dividend and acquisition, both of which are cash out. Jensen (1986) argues that the more cash the firm owns the easier the firm acquisition will harm shareholder interest. Hence, managers may prefer acquisition rather than pay cash dividend. His argument has been cited by many authors as the Jensen free cash flow hypothesis. Among others, Hoshi *et al.* (1991) for Japan and Chapman *et al.* (1996) for Australia empirically test free cash flow hypothesis by using different countries data and reach the consensus that firms suffer the financing constraints as they invest. Malmendier and Tate (2005) find a strong positive relation between the sensitivity of investment to cash flow and executive over-confidence. Lang *et al.* (1991) develop a measure of free cash flow using Tobin's q to distinguish between firms that have good investment opportunities and those that do not.³ They find that value could be created through acquisition if high Tobin's Q firm acquires low Tobin's Q firm. Hence, we follow this tradition to use Q as proxy for investment opportunity of acquiring firms in this paper.

Secondly, M&A is strategic investment and must be approved by the board of director before any action was taken. Acquisition size should be affected by the corporate governance mechanism.

² We use intangible asset as the proxy for the non-tangible resources.

³ Tobin's Q is developed by James Tobin in 1969 as the ratio between the market value and replacement cost of total asset. It reflects the capital market expectation to the asset. Q's implication is very comprehensive, as proxy of the firm's investment opportunity, market evaluation and firm valuation, growth opportunity and management capability.

Lipton and Lorsch (1992) argue that the board suffers from dysfunction if board size increases beyond the limit (about 9 members from their results). Although monitoring function could increase accompanying board size, the growing board size would result in slow decision making, less fair-minded discussion about the managerial performance, and cause the monitoring cost overrun the reward. How frequently the board meeting should be called on relies on whether there is a significant relation between the meeting frequency and operating performance. Lipton and Lorch (1992) show that more board meeting times will lead to enhanced effectiveness of the board. Jensen (1993) and Yermack (1996) present evidence that a large board would not be as effective as small one. Vafeas (1999) finds that the frequency of board meeting is empirically negatively associated with the firm value.

Consequently, position of independent director is designed to protect the interests of minor shareholders. It is supposed to monitor the large shareholder and management. However, empirical research show mix-up results on the effect of independent director. Boyd *et al.* (1994) finds that CEO compensation is directly related to the ratio of independent director in the board. Hermalin and Weisbach (2003) empirically demonstrate that the higher ratio of independent director in board would make favorite decision to firm in the events of CEO turnover, CEO compensation, poison pills and hostile takeover. Moreover, some researchers (e.g., Boyd, 1995; Baliga *et al.*, 1996) argue that duality of CEO and chairman would help to be creative and effective in decision making, information sharing and communication, thereafter to improve the operating performance or no much difference of the two type of leadership. However, principle-agency theory implies the departure of chair of board and CEO in that person is born to be slack and opportunistic. An effective monitoring mechanism needs to be designed to prevent from moral hazard and adverse selection. CEO duality indicates that manager monitors himself, which deviate from person's nature of the self interests. The person holding position of chair should be different from that holding CEO to maintain the independency and effectiveness of the board (Goyal and Park 2000).

Since the takeover market in China is still in the infancy stage and almost no anti-taken case happens during 2003-2008, so we ignore the relation between anti-takeover and the acquisition size in this paper. One differential characteristic of Chinese listed firm from other public firm is that a large proportion shares owned by the governments at different levels. Chen *et al.* (2008) argued that China state owned listing companies confronted risks of managerial entrenchment, and managerial agent issue is quite different from other firms owned by private shareholders hence the investment behavior differs significantly. Therefore, characteristics of board, including the size of board, annual board meeting times, the extent of independence of the board members from the management, CEO duality, the identity of largest shareholder (state or private) will be taken into account with regard to expected acquisition size in Chinese financial market.⁴

Finally, Shleifer and Vishny (1986), Maug (1998), and Kahn and Winton (1998) analyze the choices faced by institution shareholders, either exerting monitoring effect on management in an attempt for shared gains or trading for private gains. However, empirical work is mixed concerning the benefits of ownership by institutional shareholders. On one hand, the institutional investors are found to be inactive in corporate governance by many authors. Black (1990) argues that the institutional shareholders suffer conflicts of interest and remain pro-manager. Roe (1994) argues that legal restrictions prevent banks, insurance companies, and mutual funds from owning large blocks of shares, and reduce their incentives to monitor. Parrino *et al.* (2003) find some institutional shareholders vote with their feet by selling their shares as long as they are not satisfied with the performance of the management. Gaspar *et al.* (2005) find institutional investors with high-turnover portfolios exert little influence on managers with regard to acquisition decision.

On the other hand, some types of institutional investors exert influence on corporate events, such

⁴ The proper acquisition size is also impacted seriously by the detailed process of deal, including the target selection, fitness auditing between acquirer and target, acquisition timing and payout methods (cash or stock), whether is there any third party to contest. The management's decision about these details, such as excessively over payment, wrong timing to acquire or just to fulfill the task or assignment without clear strategic planning, reflects his intention to deviate from shareholder's interest. All these are resources of management agency problem and reflected in the residual error calculated based on our specification.

as takeover amendments, R&D investment decisions, and CEO compensation (e.g. Borokhovich *et al.*, 2006). Qiu (2008) finds that PPFs (public pension funds) reduce the likelihood of bad M&A, but no effect on good M&A. The PPFs has also been discussed in Black (1990), which suggests the institutional shareholder activism is very prominent in PPFs (public pension funds) due to its size and independence, which cannot be shared by most corporate pension fund. Some other characteristics also encourage PPFs' monitoring effect in corporate governance. First, PPFs retain effective voting control of their assets. In 1993, PPFs in US retained voting control over 98.9% of the stock they owned, compared to only 66.4% for the average institutional investor (Brancato, 1993). Furthermore, indexing strategies are common among PPFs. Gillan and Starks (2000) suggest selling constraints imposed by indexing strategies provide a motivation for shareholder activism. Davis and Steil (2001) document that indexation takes 54% of public pension funds' domestic equity and only 24% of that of corporate fund.⁵

We need explore what kind of institutional investors could effectively monitor acquisition size controlling financial and governance characteristics. With recent available data in Chinese stock market (Shanghai and Shenzhen) during the period 2003-2008, we estimate the expected acquisition size using an industry fixed effect model. We hypothesize that there should be a proper acquisition size based on the characteristics of acquiring firms. After we obtain the expected size, we analyze the monitoring effect of institutional investors. The remainder of this paper is organized as follows. Section II describes our data and applies a two-step specification on the acquisition equation and the institutional ownership equation. Section III presents the basic results and discusses institutional ownership impact on acquisition size. Section IV concludes the paper.

II. Data and Methodology

The empirical tests employ the CCER (China Center for Economic Research) PLC database of financial statement, corporate governance and institutional shareholders. This dataset include all

⁵ However, some disagree with the conclusion that PPFs are effective monitors. Murphy and Van Nuys (1994) find more conservative behavior by state pension fund. Woidtke (2002) finds the negative relationship between firm relative values and public pension ownership.

PLCs in Chinese stock market (Shanghai and Shenzhen) which have successful acquisitions. The sample period covers the fiscal years 2003-2008. We exclude PLCs subject to special treatment (ST, that is, firms reporting two consecutive annual losses) and financial institutions (Global Industry Standard Classification between 401010 and 403030) because investing and financing activities are ambiguous for these firms. Then, we have 2117 firm-year observations on annual acquisition size.

Table 1 shows the 2117 observations of annual acquisition size from 2003 to 2008 in Chinese capital market. The sum of all deals total up to 797.6 billion RMB Yuan (¥, that is approximate 105 billion US dollar or 53 billion pounds in 2007).⁶ Furthermore, the pattern of the deal is time varying, with much larger deals and more firm-year observations in 2007 (476 obsvs, average annual size 0.59 billion ¥) and 2008 (515 obsvs, average annual size 0.54 billion ¥) compared to two low periods of 2003 (299 obsvs, average annual size 0.17 billion ¥) and 2005 (239 obsvs, average annual size 0.15 billion ¥). Thus, more and more Chinese PLCs are now involved into the acquisition activities, as well as increasing annual acquisition size for individual firm.

Table 1: Year distribution of acquisition size and frequency

Year	Obsvs	Total acquisition (billion ¥)	Average annual Acquisition size (billion ¥)
2003	299	50.8	0.17
2004	296	76.4	0.26
2005	239	36.0	0.15
2006	292	78.4	0.27
2007	476	280.0	0.59
2008	515	276.0	0.54
Total	2117	797.6	0.38

Data source: the CCER PLC database 2003-2008.

⁶ We are using the exchange rate of The Penn World Table (PWT 6.3) in 2007 to calculate the equivalent value in US dollars and pounds Sterling (1 US dollar=7.6075 RMB Yuan, 1 US dollar=0.4998 pounds Sterling). We keep on using the RMB Yuan as the unit of currency in this paper.

In terms of industry distribution (table 2), the acquiring firms in China are mainly in Non-daily consumption (21.6%), Industrials (20.2%) and Raw materials (18.6%), However, the percentages of total acquisition are in different ranking: Industrials (27%), Raw materials (21.7%) and Real Estate (17.3%). It is consistent with the much lower average annual acquisition size in the Non-daily consumption industry (only 0.19 billion ¥) than the average level (0.38 billion ¥). We find that the average annual acquisition size occurring in industries such as Telecommunication Services (2 billion ¥), Energy (0.82 billion ¥) and Real Estate (0.71 billion ¥) are much higher than others. It suggests that those more concentrated industries such as Telecommunication Services, Energy and Real Estate may have fewer firms participating in acquisition, but their acquisition size is much bigger than firms in other industries. Therefore, industry heterogeneity in acquisition size demands a better control on industry characteristics.

Table 2: distribution of acquisition based on industry (Global Industry Standard Classification)

Industry	Obvs	Percentage of total Obvs (%)	Total acquisition (billion ¥)	Percentage of total acquisition (%)	Average annual Acquisition size (billion ¥)
Energy	61	2.9	50.2	6.3	0.82
Raw materials	390	18.6	172.0	21.7	0.44
Industrials	424	20.2	214.0	27.0	0.50
Non-daily consumption	453	21.6	87.8	11.1	0.19
Daily Consumptions	144	6.9	19.6	2.5	0.14
Medical and health care	158	7.5	27.1	3.4	0.17
Real Estate	192	9.2	137.0	17.3	0.71
IT	157	7.5	16.9	2.1	0.11
Telecommunication Services	5	0.2	10.0	1.3	2.00
Public utility	114	5.4	58.5	7.4	0.51
Total	2098	100.0	793.1	100.0	0.38

Data source: the CCER PLC database 2003-2008.

We follow the same strategy in Richardson (2006) to analyze the over/under investment problem given the financial constraints such as cash flow and corporate governance environment. Since acquisition is a part of investment expenditure, we assume the factors influencing the size of investment will also affect acquisition size. In the first step, we decompose the acquisition size of

firm i in the industry j and year t , i.e. AS_{ijt} into two parts: expected acquisition size, $E(AS_{ijt}|Fin_{ijt}, Gover_{ijt}, Year_t, Ind_j)$ given known financial constraints (Fin_{ijt}), corporate governance environment ($Gover_{ijt}$), macroeconomic time dynamics ($Year_t$) and industry fixed effects (Ind_j), and the residual/unexpected acquisition size (ASR_{ijt}), which could be expressed as follows:

$$AS_{ijt} = E(AS_{ijt}|Fin_{ijt}, Gover_{ijt}, Year_t, Ind_j) + ASR_{ijt} \quad (1)$$

The difference between actual acquisition size and expected acquisition size cannot be captured by the first step model. Negative (positive) values of residual acquisition size (AR_{it}) correspond to under- (over-) acquisition. Assuming a Translog acquisition function, under- (over-) acquisition has a residual acquisition size less (more) than 1 in a log form equation as follows:

$$\ln AS_{ijt} = \beta_0 + \beta_1 Fin_{ijt} + \beta_2 Gover_{ijt} + \beta_3 Year_t + \beta_4 Ind_j + \varepsilon_{ijt} \quad (2)$$

where $\ln AS_{ijt}$ is the log form annual acquisition size of firm i in the industry j and year t ; β_0 is the constant term; β_1 is the vector of coefficients of financial variables (Fin_{ijt}) including Q_{ijt} (Tobins' Q ratio, book value of total assets deflated by market value of total assets, indicating the growth opportunity); $Leverage_{ijt}$ (book value of total debt deflated by the book value of total asset); $\ln Cash_{ijt}$ is the log of annual cash holding, including cash and tradable financial assets; $\ln Capexp_{ijt}$ is the log of capital expenditure (the cash payment on purchasing fixed asset, intangible asset and other fixed asset minus the cash received by selling fixed asset, intangible asset and other fixed asset, a measure of internal investment); $\ln Sales_{ijt}$ is log of annual sales as a proxy for firm size; $\ln Intast_{ijt}$ is log of intangible asset of the firm; and $CashDiv_{ijt}$ is annual cash dividend payout.

β_2 is the vector of coefficients of corporate governance variables ($Gover_{ijt}$) including $Magtholding_{ijt}$ is the shares percentage holding by senior management; $BoardSize_{ijt}$ is the number of directors of a company; $Meetingtimes_{ijt}$ is the board meeting times per annum; $Inddprop_{ijt}$ is portion of number of independent directors among board members; $Nationalowned_{ijt}$ is dummy representing the ownership (status of the largest share-holder having 7 different natures, designate 1 as state owned company and 0 for all others); $Duality_{ijt}$ is CEO duality, representing leadership

structure of board (0 represents the situation that CEO holds the position of Chair of the board of Directors, while 1 refers to splitting two positions between two different individuals); $(Nation*Duality)_{ijt}$ is an interaction dummy (1 refers to the situation that the company is state owned and CEO and chairman is separate, 0 otherwise). $Year_t$ dummies capture time dynamics (t=2003...2008) while $Industry_j$ is a vector of indicator variables to capture industry fixed effect (j=1...10) according to Global Industry Standard Classification, using Energy industry as the baseline; ε_{ijt} is a random error, also the residual unexpected acquisition size.

There are still some factors influencing acquisition size, known but hard to quantify. These factors include the some details of deal: the target selection, fitness auditing between acquirer and target, acquisition timing and payout methods (cash, stock, or combination of both), whether there is any third party to contest. Due to agency cost problem, behaviors by management deviate from shareholder's interest, such as excessively over payment, bad timing to acquire, and blurred acquisition motivation. All elements mentioned above are reflected in the residual error which cannot be captured by the model.

In second step, we choose those firms with over/under acquisition size to analyze the effect of institutional investor on the residual acquisition size. Currently, there are eleven kinds of investors in Chinese capital market. They are social security funds, qualified foreign institutional investors, insurance firms, occupational funds, trust firms, securities firms, security investment funds brokers set financial plans, individuals, and others. Among them, we concentrate on the most important four types of institutional investor: social security funds (SS), qualified foreign institutional investors (QFII), securities firms (SF) and securities investment funds (SIF), since they are most typical institutional investors in China.

The residual error ε_{ijt} in the first step has been taken out as an indicator for the under/over acquisition in the second step equation. We regress the holding of shares by institutional investors and control variables as above on acquisition size again, but also for those acquiring firms with

under/over acquisition size. The model to test the impact of institutional investors on discretionary acquisition could be expressed in the following equation:

$$\ln AS_{ijt} = \alpha_0 + \alpha_1 insholding_{ijt} + \alpha_2 control_{ijt} + \delta_{ijt} \quad (3)$$

where $\ln AS_{ijt}$ is still the log form annual acquisition size of firm i in the industry j and year t ; $insholding_{ijt}$ represents the annual average share proportions held by institutional investors. The control variables include all above financial and corporate governance variables, industry and year dummies, and a new variable of top 5 shareholders' proportions in the total shares to represent the share concentration; δ_{ijt} is a random error.⁷

III. Empirical Results

We adopt stepwise method to examine the sensitivity of variables. Four different specifications are established to quantify the expected acquisition size in the first step equation. All four specifications include year dummies and industry dummies. Table 3 presents the results from these models. Column 1 shows the expected signs of variables from theory. The first model in the column 2 only includes the firm finance variables, without taking account of the governance impact on acquisition size. This simple model shows that variables Tobin's Q, leverage, cash-holding and capital expenditure are significantly positively associated with acquisition size. Chinese PLCs do not suffer financial constrains as public firms do in other countries as they are better financially supported in terms of acquisition. The fact that cash dividend payout does not have important role in the size of acquisition suggests that Chinese listed company does not take the dividend into account when making the acquisition decision. There is no significant relation could be found between sales/intangible asset and acquisition size. It suggests that firm size is not important for acquisition in Chinese PLCs. Resources which acquirer based to acquire target is still the tangible asset such as cash rather than the intangible asset such as R&D, branding.

Based on the first model, extra variables concerning governance characteristics are added into the second model to examine whether and how certain governance mechanisms impact the

⁷ See detailed variable statistics in Appendix.

acquisition size. These governance characteristics include management holding, board size, the portion of independent directors in board, board activity. Column 3 shows that, the same variables remain the significant impact on acquisition size, consistent with how they behave in the first model. Except management holding, all governance characteristics are found to be significantly positively related to acquisition size. Giving shares to executives shows a good self-monitoring effect. These results confirm findings in literature that bigger board may bring more irresponsible acquisition while independent directors could not reduce this problem.

We further explore another two corporate governance variables (firm ownership and duality of CEO) impact on acquisition size. Both of these two variables are dummies. For variable *Nationalowned*, it takes value of 1 if the company is state owned enterprise, and 0 otherwise. For variable *Duality*, it takes value of 1 if the CEO and Chair are held by different individuals and 0 otherwise. The insignificant coefficient of owner variable indicates that whether the largest shareholder is state owned or not has no significant impact on expected acquisition size. The insignificance finding is not consistent with argument that State Owned Enterprises seem to acquire more because of the external driving forces exercised by Chinese government at different levels. The coefficient for variable CEO duality -0.335, significant at 1% level, indicate that controlling for all other factors, the company with CEO duality will have about 33.5% lower acquisition size compared to the same company except separation of CEO and chairman. It possibly suggests that CEO duality mechanism works in restricting over-acquisition. The last column has a sensitivity test to examine the relation of the identity and separation of duality with regard to expected acquisition size. We design an interaction term by multiplying owner and duality, identifying the effect of the state owned PLCs with departed CEO and Chair on acquisition size. No significant coefficient found for this interacted variable confirms our finding that acquisition decision is not related to national ownership.

Table 3: Regression analysis of expected acquisition size, first step

	Predicted sign	(1)	(2)	(3)	(4)
Q	+	0.106** <i>0.045</i>	0.116*** <i>0.045</i>	0.116*** <i>0.045</i>	0.116*** <i>0.045</i>
Leverage	+	0.693*** <i>0.255</i>	0.440* <i>0.254</i>	0.429* <i>0.254</i>	0.430* <i>0.254</i>
Incashh	+	0.201*** <i>0.035</i>	0.178*** <i>0.035</i>	0.172*** <i>0.035</i>	0.173*** <i>0.035</i>
Incapexp	+	0.256*** <i>0.03</i>	0.239*** <i>0.029</i>	0.236*** <i>0.03</i>	0.236*** <i>0.03</i>
dividend	+	0.333 <i>0.312</i>	0.44 <i>0.309</i>	0.443 <i>0.309</i>	0.443 <i>0.309</i>
lns	+	0 <i>0.005</i>	0.001 <i>0.005</i>	0 <i>0.005</i>	0 <i>0.005</i>
lnintas	-	-0.01 <i>0.007</i>	-0.011 <i>0.007</i>	-0.011* <i>0.007</i>	-0.011* <i>0.007</i>
magholding	-		-2.233*** <i>0.474</i>	-2.160*** <i>0.493</i>	-2.156*** <i>0.493</i>
IndDprop	-		0.631** <i>0.318</i>	0.656** <i>0.318</i>	0.657** <i>0.318</i>
Boardsize	+		0.069** <i>0.03</i>	0.071** <i>0.03</i>	0.071** <i>0.03</i>
Meetingtimes	+		0.059*** <i>0.012</i>	0.060*** <i>0.012</i>	0.060*** <i>0.012</i>
Nationalowned				0.055 <i>0.096</i>	-0.008 <i>0.279</i>
Duality	-			-0.335** <i>0.139</i>	-0.381 <i>0.234</i>
Nation*dual	-				0.07 <i>0.291</i>
Industry dummy		Yes	Yes	Yes	Yes
Year dummy		Yes	Yes	Yes	Yes
R-squared		0.154	0.176	0.178	0.177
N		1998	1998	1997	1997

Notes: The corresponding estimates of standard errors are reported below each coefficient. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

By deducting the expected acquisition size from the actual acquisition size, we find the difference which we term as discretionary acquisition size. Our expected acquisition is based on the fourth model. The further investigation focuses on the monitoring effect of different institutional investors including QFII, SSF, SF and SIF on the unexpected acquisition size of Chinese PLCs. We intend to identify whether any particular or in general, institutional investors will restrict or encourage the acquisition size.

Table 4 tests the monitoring of institutional investors by regressing different institution's holding percentage plus control variables on acquisition size again. The first column reports the results for all acquisitions; the second and third columns are based on over or under acquisition sample, defined by residual error more than 1 or not. QIFF, SSF, SF, and SIF represents the annual proportions of share holding respectively by these four institutional investors. Top5 indicates the annual proration of stock holding by largest 5 shareholders, irrespective of the nature of the institutions.

In general, firms with the residual error <1 are regarded as under-acquisition as well as residual error >1 is treated as over-acquisition. Table 4 shows the regression results based on the step 2 regressions for three samples: all firms, over-acquisition firms and under-acquisition firms. All control variables shows reasonable and consistent signs with the results in the first step regression. But, the effect of institutional ownership shows different results for these three groups. For all firms, there is no significant result from institutional ownership. However, for over-acquisition firms, if QFII and SIF have higher share proportions, the acquisition size would increase. At the same time, for under-acquisition firms, social security fund displays significantly negative effect on acquisition size, which is consist with what found in Qiu (2006). Hence, the insignificant effect of institutional ownership is due to a mix-up of different firms. Some unobserved characteristics of firms, which are captured by the residual acquisition errors are highly correlated with institutional ownership. Therefore, social security fund, as the only identified institutional investor, could effectively restrict the acquisition size hence be more conservative in investment, while QFII and SIF are more active in acquisition.

Table 4: Regression analysis on acquisition size, second step

Variables	All-acquisition	Over-acquisition	Under-acquisition
Q	0.118***	0.171***	0.158***
	<i>0.045</i>	<i>0.034</i>	<i>0.053</i>
Leverage	0.453*	0.471**	0.741**
	<i>0.255</i>	<i>0.183</i>	<i>0.313</i>
Incashh	0.161***	0.132***	0.153***
	<i>0.036</i>	<i>0.023</i>	<i>0.054</i>
Incapexp	0.222***	0.244***	0.265***
	<i>0.03</i>	<i>0.02</i>	<i>0.043</i>
dividend	0.367	0.782***	0.318
	<i>0.314</i>	<i>0.247</i>	<i>0.353</i>
lns	0.001	-0.005	0.007
	<i>0.005</i>	<i>0.003</i>	<i>0.006</i>
lnintas	-0.012*	-0.018***	-0.014*
	<i>0.007</i>	<i>0.005</i>	<i>0.008</i>
Magholding	-2.130***	-2.058***	-3.487***
	<i>0.493</i>	<i>0.321</i>	<i>0.695</i>
IndDprop	0.608*	0.476**	0.979**
	<i>0.318</i>	<i>0.219</i>	<i>0.417</i>
Boardsize	0.067**	0.076***	0.092**
	<i>0.03</i>	<i>0.021</i>	<i>0.038</i>
Meetingtimes	0.058***	0.048***	0.056***
	<i>0.012</i>	<i>0.009</i>	<i>0.014</i>
Nationalowned	0.001	0.086	0.004
	<i>0.279</i>	<i>0.21</i>	<i>0.326</i>
Duality	-0.374	-0.469***	-0.481*
	<i>0.234</i>	<i>0.174</i>	<i>0.276</i>
Nationaldual	0.048	0.154	-0.169
	<i>0.291</i>	<i>0.217</i>	<i>0.343</i>
QFII	0.015	0.021**	-0.006
	<i>0.012</i>	<i>0.009</i>	<i>0.016</i>
SSF	-0.114	0.056	-0.266**
	<i>0.1</i>	<i>0.073</i>	<i>0.122</i>
SF	0	-0.014	0
	<i>0.025</i>	<i>0.019</i>	<i>0.028</i>
SIF	0.016	0.017*	-0.003
	<i>0.013</i>	<i>0.009</i>	<i>0.016</i>
top5	0.007	-0.001	0.009
	<i>0.009</i>	<i>0.006</i>	<i>0.011</i>
Industry dummy	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes
R-squared	0.179	0.525	0.22
N	1997	1042	955

Notes: The corresponding estimates of standard errors are reported below each coefficient. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

IV. Conclusions

The extant literatures mention little about the determinants of the firm's acquisition size, especially for Chinese firms. With recent available data of acquisition firm-years in Chinese stock market, we estimate the expected acquisition size. Our evidence indicates that after controlling for industry fixed effect and year dynamics, on average the firms' acquisition size is significantly positively associated with the firm size, Tobin' q, leverage ratio, cash holding level, internal capital expenditure. Acquisition size is found to be positively related to some governance characteristics of firms such as management holding, board size, independency of board, activity of board, and negatively related to the leadership structure of board, i.e. the duality of chairman and CEO. However, other factors such as annual dividend, management holding, intangible asset, ownership concentration and the identity of ownership (whether the firm is state owned or not) seems unrelated to the acquisition size. Furthermore, we also find that social security fund, as only institutional investors, could restrict over-acquisition, while QFII and SIF are more active in acquisition.

Appendix: Variable Statistics Description

Variable	Obvs	Mean	SD	Min	Max
lnAS	2117	17.87	2.02	0.00	24.48
Q	2117	1.74	1.02	-0.03	4.59
Leverage	2097	0.50	0.18	0.00	1.90
lnCash	2097	19.48	1.43	-8.52	24.55
lnCapExp	2000	18.37	1.87	8.71	26.13
CashDiv	2100	0.09	0.14	0.00	3.00
lnSales	2097	17.34	9.66	-8.52	27.67
lnIntangible	2095	15.97	6.67	-9.21	23.88
Magtholding	2098	0.03	0.09	0.00	0.78
Inddprop	2098	0.56	0.15	0.00	1.00
BoardSize	2098	6.31	1.64	2.00	17.00
Meetingtimes	2098	9.43	3.80	1.00	36.00
Owner	2096	0.65	0.48	0.00	1.00
Duality	2098	0.90	0.30	0.00	1.00
Nation*Duality	2096	0.58	0.49	0.00	1.00
QFII	2117	0.96	4.85	0.00	45.64
SSF	2117	0.14	0.45	0.00	6.26
SF	2117	0.29	1.77	0.00	58.37
SIF	2117	2.43	4.05	0.00	29.08
top5	2117	6.50	7.81	0.00	58.74

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