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Artificial Intelligence and Corporate Innovation: Corporate Restructuring and Financing Constraints

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Abstract

Can corporate mergers and acquisitions alleviate their own financing constraints? Previous studies on financing constraints mostly focused on the measurement of financing constraints and their effects on enterprise performance but did not deeply discuss the transmission mechanism of enterprise behavior to financing constraints. This paper uses the financial data of Chinese listed companies and the database of mergers and acquisitions to measure the financing constraints by investment cash flow sensitivity and SA index and analyzes the influence of mergers and acquisitions on financing constraints. The empirical results show that the acquisition behavior of listed companies can alleviate the financing constraints of enterprises, and this mechanism has a more obvious effect in the post-financial crisis period. Moreover, combined with the actual situation in China, the functions of enterprises with different acquisition methods and different equity attributes will be different. But on the whole, with the rise of financial instruments and Internet finance, it is also a good strategy for enterprises to use a variety of financial instruments to carry out mergers and acquisitions to ease financing constraints.

CCS Concepts

• Applied computing; • Enterprise computing; • Service-oriented architectures;

Keywords

mergers and acquisitions, Financing constraints, Merger and acquisition methods, Equity attributes

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1 INTRODUCTION

In the process of further deepening the reform of the economic system, optimizing the investment structure of enterprises and

improving the investment efficiency of enterprises are the main contents of changing the mode of economic development, and the financing constraint of enterprises plays a vital role in the investment decision of enterprises.[1] Therefore, exploring the changing mechanism of corporate financing constraints is an important topic for further reform. For the discussion of financing constraints, scholars at home and abroad have done a lot of research. The improvement of investment cash flow sensitivity means that enterprises are facing stronger financing constraints, and the increase of cash-cash flow sensitivity also indicates that the external financing of enterprises is more difficult. In addition, some scholars construct linear models of component index to measure the financing constraints of enterprises, at present, the SA index constructed according to the size and age indicators of enterprises is highly recognized.[2–4] Combined with the actual situation in China, financing constraints have a significant impact on the debt capacity and performance of enterprises. Besides, enterprises with different political connections face different financing constraints. Enterprises with more political resources and contacts, it is easier to obtain financing from various channels.[5, 6] However, in a few articles from the perspective of mergers and acquisitions, this paper explores its role on corporate financing constraints. The research on financing constraint measurement mainly focuses on two dimensions. One is to interpret it from the perspective of sensitivity. The main research includes the characterization of investment cash flow sensitivity to corporate financing constraints, the sensitivity between changes in cash holdings and cash flow. The response of degree to financing constraints.[1, 2] In addition, many domestic scholars also use financial indicators such as cash holdings, asset-liability ratio, and enterprise size in empirical research to evaluate the level of corporate financing constraints in combination with the actual situation in China.[6–9] However, in addition, domestic scholars are less involved in how corporate behavior and characteristics affect corporate financing constraints. In contrast, foreign scholars have studied the changes of financing constraints from a more microscopic perspective.[11] used the data of mergers and acquisitions of European listed companies from 2001 to 2008 to study the impact of mergers and acquisitions on corporate financing constraints, and compared the heterogeneity of this mechanism on acquiring companies and acquired companies, government-subsidized enterprises and non-government-subsidized enterprises, and found that overall, mergers and acquisitions can alleviate corporate financing constraints Specific to the impact of enterprise mergers and acquisitions on enterprise financing constraints. Considering the effect of mergers and acquisitions on enterprise performance mergers and acquisitions can quickly eliminate competitors, and

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have many advantages such as quick results and quick plundering of resources.[12] Therefore, many mergers and acquisitions mean a substantial improvement in the strength of enterprises. According to the principle of KZ index and SA index, large-scale and high-profit enterprises are bound to face lower financing constraints and a better investment environment.[13]

More importantly, many literatures focus on the influence of micro-level factors of enterprises, while ignoring the influence of macro-economic shocks on corporate financing constraints, which is very important for the impact of companies. Because, from the perspective of financing constraints, it not only depends on the individual characteristics of enterprises themselves, but also depends to a large extent on the supply-side factors of macro-financial markets and Lamont (2001) and leary(2009) and others consider macroeconomic and policy events, and use sample data of American micro-enterprises to conduct empirical research, which also confirms this assertion.[13] From a micro perspective, macroeconomic shocks will affect the financial vulnerability of enterprises, reduce the liquidity of enterprises and increase the bankruptcy rate of enterprises. Therefore, there is no doubt that the factors of the economic cycle will undoubtedly affect the financing constraints of enterprises. Specifically, in different economic cycles, the operation of enterprises, other market behaviors and financial factors, such as restructuring and mergers and acquisitions, will have an impact on their financing constraints. The role will change.

The main contributions of this paper are as follows: Firstly, using the data of mergers and acquisitions of listed companies in China, this paper explores the influence of mergers and acquisitions on corporate financing constraints, and compares the heterogeneity of the influence of state-owned enterprises and non-state-owned enterprises, asset acquisition, equity acquisition and other acquisition methods. Secondly, considering the impact of financial crisis on the above transmission mechanism, this paper compares the samples before and after the financial crisis, and tests the heterogeneity of the constraint effects of mergers and acquisitions on financing in different economic cycles or macro-shocks.

2 Theoretical analysis and research hypothesis

A large number of empirical studies by scholars at home and abroad show that enterprises have a strong motivation to carry out mergers and acquisitions. According to Fazzari (1988)'s theory of using investment cash flow sensitivity to measure corporate financing constraints, companies with high profits and strong market power are usually more willing to pay dividends, which means that corporate financing constraints are lower. Combined with the situation in China, Allen (2005) also concluded from the legal and institutional perspective that enterprises with high market share and high income (usually state-owned enterprises) usually face lower financing constraints. Based on the above analysis, we put forward the following hypothesis:

- **Hypothesis 1:** The merger and reorganization behavior of enterprises can reduce the financing constraints of enterprises and improve their credit environment.

Therefore, under the loose credit policy, it can be inferred that the financing constraints faced by enterprises are obviously smaller than those in the period of economic downturn or severe financial

shocks. Therefore, at this stage, although the merger and reorganization of enterprises can obviously improve the market position and management level of enterprises, it will not have a significant impact on the financing constraints. According to the research of Stiglitz and Weiss (1981) on the credit market, such as the acquisition and expansion of enterprises during the financial crisis, such a kind of signal that can strongly reflect the excellent operating profitability of enterprises can effectively alleviate the information asymmetry between banks and enterprises. Therefore, it can be inferred that during the economic downturn, especially after the financial crisis, the mergers and acquisitions of enterprises can greatly reduce the financing constraints of enterprises. Thus, the following false is obtained.

- **Hypothesis 2:** In the period of economic prosperity, mergers and acquisitions have no significant impact on the financing constraints of enterprises. In the post-financial crisis period, mergers and acquisitions have obviously improved the financing constraints of enterprises.

3 Research design

To test the impact of corporate mergers and acquisitions on corporate financing constraints, that is, Hypothesis 1, the following equation 1) is estimated by referring to the econometric model of Isil Erel (2015) et al.:

$$\frac{Cash_I}{Ass} = a_0 + a_1After + a_2CF + a_3After \cdot CF + a_4Control + \sum Time + \sum Industry + \epsilon \quad (1)$$

In equation 1), the dependent variable Cash_I/Ass is the change of the company's cash holdings/total assets, which is used as a judgment index of the strength of financing constraints. The independent variable After is a dummy variable, which is set to 1 one year After the company completes the merger and reorganization, and set to 0 for the rest of the time; CF is the company's cash flow, and After CF is the interaction term between the two. In addition, the control variables include micro-enterprise indicators: Asset (the natural logarithm of the company's total assets), Asset2 (the square of the natural logarithm of the company's total assets), Lev (Asset-liability ratio), ROA (return on assets), Growth (the company's main business income Growth rate), Soe (whether it is a state-owned enterprise), macroeconomic variables: GDP_I (gross domestic product growth rate), Save/GDP (total deposits of financial institutions nationwide in the current year/GDP), Equity/GDP (total issued share capital of A shares in the current year/GDP). In order to mitigate the impact of annual factors and Industry factors, two dummy variables, Industry (Industry classification) and Time (Time change), have been added respectively.

This part is mainly used for sensitivity analysis. If the coefficient a_3 of the interaction term After CF is significantly negative, it means that the merger and reorganization of enterprises can reduce the amount of cash held by them, that is, it has a weakening effect on financing constraints.

To test the changes in the impact of corporate mergers and acquisitions on corporate financing constraints in different economic cycles, that is, when impacted by the financial crisis, that is, Hypothesis 2, we divide the samples into pre-financial crisis and

Table 1: List of study variables

Variable symbol	Variable definition
Inv/Ass	Net cash flow from investments/total assets
Cash _ I/Ass	Change in cash holdings/total assets
Cash/Ass	Cash holdings/total assets
SA	SA index, financing constraint measurement method: $-0.737 \text{ Size} + 0.043 \text{ Size}^2 - 0.04 \text{ Age}$
After	One year after the merger, acquisition and reorganization is set to 1, and the rest is set to 0
CF	Company cash flow
Asset	Natural logarithm of a company's total assets
Asset2	The square of the natural logarithm of the company's total assets
Lev	Asset-liability ratio, equal to total liabilities/total assets
ROA	Return on assets, equal to net profit/total assets
Growth	The company's main business income growth rate
Soe	Whether it is a state-owned enterprise, yes is 1
GDP _ I	GDP growth rate
Save/GDP	Total deposits/GDP of financial institutions nationwide in the current year
Equity/GDP	A shares Total issued share capital/GDP for the year
Industry	According to the industry classification recognized by the China Securities Regulatory Commission
Time	Annual Time Change

post-financial crisis, and then estimate the following equation 2):

$$\frac{\text{Cash}_I}{\text{Ass}} = b_0 + b_1 \text{after} + b_2 \text{CF} + b_3 \text{Control} + \sum \text{Time} + \sum \text{Industry} + \varepsilon \quad (2)$$

In equation 2), the dependent variable Cash/Ass is the companies Cash holdings/total assets, and the independent variable and control variable are the same as equation 1). Through the multi-dimensional regression analysis of whether it includes macro variables, before and after the economic crisis, whether it is a state-owned enterprise and different ways of restructuring, the influence of enterprise mergers and acquisitions on corporate financing constraints under various circumstances is obtained.

If the coefficient b_1 of After is significantly negative, then the same conclusion as equation 1) can be drawn. At the same time, by comparing the regression coefficients, we can know the heterogeneous changes of the impact of different factors and events such as macro variables, economic crisis, state-owned enterprises and mergers and acquisitions on corporate financing constraints.

4 Data and variables

4.1 Selected variables

In order to verify the three hypotheses mentioned above, refer to Isil Erel (2015) to select the company's current statements in the financial statements Changes in gold holdings/total assets (Cash _ I/Ass), company Cash holdings/total assets (Cash/Ass) dependent variables, independent variables include dummy variables After (set to 1 one year After the company completes mergers and acquisitions, the rest of the time is set to 0), company Cash flow (CF), and net investment Cash flow/total assets (Inv/Ass), and SA index (SA) are selected as surrogate variables of dependent variables for robustness test to ensure the objectivity and reliability of regression results.

The control variables are mainly to control the influence of various micro and macro factors on the dependent variables, and the

indicators of macroeconomic variables selected in different literatures are not exactly the same. This paper refers to the macro control variables adopted by Isil Erel and Wang Yizhong in related financing constraint research articles, so the relevant parameters at the enterprise level are introduced into the regression equation. Including total assets (Asset), Asset-liability ratio (Lev), return on assets (ROA), the company's main business Growth rate (Growth), and whether it is a state-owned enterprise (Soe). At the also necessary to consider the impact of macroeconomic conditions on dependent variables, Therefore, the GDP growth rate (GDP I), the total deposits/GDP (Save/GDP) of financial institutions across the country in the current year, the total issued share capital/GDP (Equity/GDP) of A shares in the current year, the Industry classification (Industry) and the Time variable (Time) are added as another macro control variable. See Table 1 for details of the variables.

4.2 Correlation coefficient

By calculating the correlation coefficient between each variable, it can be seen that the correlation coefficient between the dependent variable Cash _ I/Ass and the surrogate variable Inv/Ass is lower than -0.0082, so there is no multicollinearity, so the robustness test results have practical significance. Similarly, another set of dependent variables Cash/Ass also has a small correlation coefficient with the surrogate variable SA, which is -0.0294, which is very consistent with the surrogate variable condition. At the same time, the correlation coefficients between the independent variable CF and the dependent variable and its surrogate variables are also small values, and there is no multicollinearity. But can further reflect the authenticity and reliability of the subsequent regression results, especially the dummy variables After and cross terms have a more objective explanation of the regression results of the above dependent variables.

Table 2: Sensitivity analysis of the impact of mergers and acquisitions on corporate financing constraints

Variable	Includes macro variables		Excludes macro variables	
	Inv/AssCash	I/Ass	Inv/AssCash	I/Ass
After	0.0148 [6.09]	-0.0345 [-2.65]	0.0156 [6.19]	-0.0322 [-2.68]
After CF	-0.120 [-9.23]	-0.0392 [-3.01]	-0.127 [-9.50]	-0.0425 [-1.88]
CF	0.00107 [1.4]	-0.00463 [-3.85]	0.000965 [0.98]	-0.00470 [-3.46]
Asset	-0.0652 [-2.84]	-0.0425 [-1.17]	-0.0737 [-4.15]	-0.0242 [-0.73]
Asset2	0.00128 [2.41]	0.000938 [1.16]	0.00153 [3.68]	0.000516 [0.72]
Lev	0.0325 [4.44]	0.00461 [0.13]	0.0275 [3.75]	0.0191 [0.59]
ROA	-0.101 [-3.64]	0.064 [0.98]	-0.100 [-3.64]	0.0793 [1.31]
Growth	0.00107 [2.11]	0.000747 [3.77]	0.00125 [2.73]	0.000747 [0.0]
Soe	0.0152 [4.68]	0.00152 [0.2]	0.0128 [3.54]	0.00424 [0.53]
GDP_I	-0.0227 [-0.41]	0.495 [2.76]		
Save/GDP	0.0145 [0.71]	0.0244 [0.4]		
Equity/GDP	0.536 [1.68]	0.181 [0.35]		
Industry and Year Effect	Yes	Yes	Yes	Yes
Cluster By Firm and Year	Yes	Yes	Yes	Yes
Adjusted R2	0.138	0.023	0.123	0.008

Note: [] is the value of regression coefficient t, and represent the significance levels of 5%, 1% and 0.1%, respectively. The following tables are the same.

4.3 Research data

The sample interval is 14 years from 2006 to 2019, in which all the remaining listed company stocks of Chinas A-share sits, and financial companies are excluded as the research sample. To better understand the influence of independent variables on dependent variables and make the sample size large enough to reduce errors, we use annual report data for research. The research data mainly comes from CSMAR Guotaian database and its reorganization and merger database. Before the regression operation, the corresponding data of various index parameters were bilaterally tailed at the level of 99%.

5 Empirical results

5.1 The impact of corporate mergers and acquisitions on corporate financing constraints

First, estimate equation 1), that is, the impact of enterprise mergers and acquisitions on corporate financing constraints. See Tables 3 and 4 for specific results. Table 3 is mainly used as the sensitivity analysis of this

hypothesis test. By mainly observing the correlation coefficient of cross terms to dependent variables, we can preliminarily understand the influence of enterprise mergers and acquisitions on corporate financing constraints. Table 4 shows the results obtained by directly regressing independent variables by changing dependent variables. The synthesis of the regression results of the two tables can fully and fully show the influence degree of enterprise mergers and acquisitions on corporate financing constraints.

In the regression results in Table 2, the cross terms are negative and significant for the regression results of the dependent variables. Comparing the regression coefficients with macro variables and without macro variables, it can be found that the numerical differences are not large and significant but replacing the dependent variable with the surrogate variable still does not affect the conclusion. Therefore, restructuring and mergers and acquisitions have obviously had a negative impact on financing constraints, that is, the company can significantly reduce financing constraints after restructuring and mergers and acquisitions, thus obtaining more financing.

Table 3: The impact of mergers and acquisitions on the related indexes and indicators of corporate financing constraints

Variable	Includes macro variables		Excludes macro variables	
	Cash/Ass	SA	Cash/Ass	SA
After	-0.0263 [-3.38]	-0.0673 [-5.27]	-0.0257 [-3.12]	-0.0801 [-7.41]
CF	-0.00461 [-2.86]	-0.0514 [-19.15]	-0.00514 [-2.21]	-0.0511 [-16.49]
Asset	-0.0602 [-1.83]	-1.572 [-4.54]	-0.0714 [-2.91]	-1.586 [-4.35]
Asset2	0.00137 [1.86]	0.0628 [7.74]	0.00164 [3.09]	0.0626 [7.35]
Lev	-0.0561 [-2.15]	-0.329 [-6.09]	-0.0396 [-1.43]	-0.292 [-5.92]
ROA	0.0794 [1.7]	0.114 [1.39]	0.122 [3.17]	0.108 [1.12]
Growth	0.000410 [2.95]	-0.00502 [-1.68]	0.00056 [.]	-0.00729 [-2.71]
Soe	-0.0128 [-2.12]	-0.0825 [-4.03]	-0.00985 [-1.20]	-0.0630 [-3.01]
GDP_I	0.302 [2.19]	-0.0178 [-0.08]		
Save/GDP	0.0499 [1.04]	-0.276 [-2.51]		
Equity/GDP	0.969 [2.08]	-3.927 [-4.32]		
Industry and Year Effect	Yes	Yes	Yes	Yes
Cluster By Firm and Year	Yes	Yes	Yes	Yes
Adjusted R2	0.084	0.973	0.045	0.97

Note: [] is the value of regression coefficient t, and represent the significance levels of 5%, 1% and 0.1%, respectively.

Compared with Table 2, the dependent variable and surrogate variable are replaced in Table 3, and the cross term is also removed, and the dummy variable After is directly regressed to Cash/Ass and SA. The regression results are still in line with the preliminary conclusion in sensitivity analysis, and more intuitively show that the company can significantly reduce financing constraints and obtain more external financing after restructuring and mergers and acquisitions. After removing macro variables. The regression coefficients of all have increased, which also shows that the improvement of macroeconomic environment has a positive impact on the weakening of corporate financing constraints.

The above conclusions are also more in line with the realistic law. If the company carries out reorganization and mergers and acquisitions, its capital structure and main business scope will be optimized to a certain extent, which will naturally be more competitive in the future development, and its financing constraints will naturally be correspondingly reduced, making it easier to obtain external investment.

Table 4 separately lists the regression results as robustness test to test endogenous problems. Drawing on the method of Wintoki et al. (2012), we use the generalized moment estimation (GMM) method to test the benchmark regression equation. Generalized

moment estimation is mainly suitable for dynamic panel estimation, which can alleviate the endogenous problems caused by the interaction between dependent variables and independent variables and missing variables in the model. Here, macro variables lagging by one period are used: GDP growth rate (GDP_I), total deposits/GDP (Save/GDP) of national financial institutions in the current year, and total issued share capital/GDP (Equity/GDP) of A shares in the current year as instrumental variables. Since the number of instrumental variables and endogenous variables is the same, there is no over-identification problem, and it is used in stata xtivreg2, estimated using the two-stage least squares method (2SLS). The empirical results show that it is basically consistent with the predicted conclusion, and the regression coefficients of each variable have not changed significantly, and all of them have passed the test of weak instrumental variables and insufficient identification. Therefore, the conclusion obtained from the above regression: corporate restructuring and mergers and acquisitions have an obvious positive impact on the alleviation of corporate financing constraints, which is realistic and convincing enough.

Table 4: Panel two-stage least squares estimation

Variable	Inv/Ass	SA	Cash/Ass	Cash_I/Ass
GDP_I	0.215 [3.9]	-1.410 [-16.47]	0.213 [3.1]	-0.00118 [-0.01]
Save/GDP	0.0408 [2.74]	-0.243 [-9.36]	-0.136 [-5.34]	0.0351 [1.37]
Equity/GDP	0.332 [1.72]	-8.253 [-14.33]	3.212 [11.42]	2.038 [5.76]
After CF	-0.0535 [-4.40]			-0.0445 [-0.98]
After	0.00803 [4.99]	-0.0288 [-8.36]	-0.0262 [-8.90]	-0.0540 [-7.45]
Asset ²	0.00249 [3.65]	0.0387 [11.66]	0.00232 [2.44]	0.00175 [1.46]
Asset	-0.110 [-3.65]	-0.610 [-4.09]	-0.0973 [-2.37]	-0.0926 [-1.74]
CF	0.00208 [8.67]	-0.0510 [-15.74]	-0.00458 [-3.54]	-0.00598 [-3.50]
Lev	0.0143 [1.79]	0.0143 [0.47]	-0.0780 [-4.97]	-0.0418 [-1.77]
ROA	-0.103 [-4.46]	0.218 [2.86]	0.0282 [0.88]	0.0679 [1.68]
Growth	0.000307 [0.65]	0.00223 [1.68]	0.000133 [0.2]	0.000328 [0.49]
Soe	0 [0]	0 [0]	0 [0]	0 [0]
Industry and Year Effect	Yes	Yes	Yes	Yes
Cluster By Firm and Year	Yes	Yes	Yes	Yes
Adjusted R2	-0.207	0.948	-0.178	-0.196
Insufficient identification test (p-value)	0.000	0.000	0.000	0.000
Weak instrumenta l variable test (p-value)	0.000	0.000	0.000	0.000

Note: [] is the value of regression coefficient t, and represents the significance levels of 5%, 1% and 0.1%, respectively.

5.2 Impact before and after the economic crisis

In different economic cycles, the influence of corporate mergers and acquisitions on their financing constraints is also different. In the period of economic depression, the degree of market activity is relatively low, and the overall risk appetite is low. Both institutions and individuals are more willing to choose steady and value-added investment channels. However, the merger and acquisition of enterprises is a measure to further expand the market and improve the scale efficiency of enterprises, which has long-term strategic significance. Therefore, it is often easier for investors to invest their funds in such mergers and acquisitions with good development prospects at this stage, so as to avoid the inflation risk brought by the economic downturn to the currency, and to obtain relatively stable and objective returns by investing in a company with long-term strategic planning.

Therefore, according to the 2008 financial crisis, we divide the sample into two stages: pre-economic crisis and post-economic crisis and test the influence of enterprise mergers and acquisitions on

financing constraints in these two stages respectively. The regression results shown in Table 5 well verify the inference of Hypothesis 2. Before the financial crisis, the cross-term regression coefficients of sensitivity indicators (investment cash flow sensitivity and cash-cash flow sensitivity) were not significant, but After the financial crisis, the cross-term coefficients were significantly negative, while the absolute values of the regression coefficients of After term of SA index and cash holding index were also significantly improved, indicating that After the financial crisis, the mitigation effect of M&A on financing constraints was significantly enhanced, which further proved the viewpoint of Hypothesis 2.

At the same time, we can see that whether it is classified according to the merger and reorganization model or the economic crisis, the event of merger and reorganization of enterprises has an impact on net investment cash flow/total assets (Inv/Ass). Both are significantly positive, so mergers and acquisitions have a positive promotion effect on investment, and also illustrate the reduction of financing constraints from the side.

Table 5: The impact of corporate heterogeneity (before and after the economic crisis)

Variable	Pre-economic crisis				After the economic crisis			
	Inv/Ass	Cash_I/Ass	SA	Cash/Ass	Inv/Ass	Cash_I/Ass	SA	Cash/Ass
After CF	-0.0462 [-1.19]	-0.0323 [-0.84]			-0.134 [-8.62]	-0.0452 [-2.87]		
After	0.0136 [2.3]	-0.00089 [-0.87]	-0.0357 [-5.98]	-0.00322 [-1.20]	0.0138 [3.98]	-0.0578 [-3.99]	-0.0794 [-4.39]	-0.0414 [-6.06]
CF	-0.0621 [-2.11]	0.0174 [0.74]	0.0855 [0.43]	0.00603 [0.87]	0.00148 [3.83]	-0.00514 [-4.43]	-0.0515 [-27.76]	-0.00475 [-2.50]
Asset	0.0187 [0.42]	0.0210 [2.1]	-0.999 [-3.63]	-0.0219 [-2.08]	-0.0780 [-3.74]	-0.0607 [-1.20]	-1.772 [-4.57]	-0.0928 [-2.28]
Asset ²	-0.00065 [-0.62]	-0.000491 [-2.20]	0.0494 [7.51]	0.000533 [2.11]	0.00155 [3.22]	0.00136 [1.24]	0.0676 [7.51]	0.00212 [2.34]
Lev	0.00962 [0.91]	0.000652 [0.33]	-0.172 [-4.66]	-0.00399 [-1.38]	0.0376 [4.85]	0.013 [0.24]	-0.388 [-7.07]	-0.0732 [-2.16]
ROA	-0.153 [-3.70]	0.0232 [0.65]	0.0903 [0.63]	0.0263 [0.92]	-0.0523 [-2.02]	0.0845 [0.72]	0.12 [0.96]	0.132 [1.84]
Growth	0.00175 [2.46]	-0.00051 [-1.26]	0.000859 [1.09]	-0.0000188 [-0.06]	0.000452 [0.7]	0.00132 [.]	-0.00677 [-1.49]	0.000813 [.]
Soe	0.00741 [2.39]	-0.00181 [-1.05]	-0.0177 [-1.68]	-0.00272 [-1.43]	0.0184 [4.64]	0.00321 [0.29]	-0.116 [-5.34]	-0.0123 [-1.80]
GDP_I	0.0506 [0.78]	0.121 [1.84]	-0.587 [-3.67]	0.126 [2.45]	-0.181 [-5.21]	0.568 [1.71]	-0.769 [-2.33]	0.419 [1.95]
Save/GDP	0.0765 [2.43]	-0.0837 [-2.16]	-0.307 [-4.17]	-0.0733 [-2.22]	0.00649 [0.39]	0.00041 0	-0.440 [-6.19]	-0.0215 [-0.41]
Equity/GDP	0.829 [2.4]	0.0617 [0.2]	-2.804 [-3.43]	0.0686 [0.3]	1.408 [3.2]	3.693 [1.04]	12.45 [4.41]	1.898 [0.82]
Industry and Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster By Firm and Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of samples	5449	5248	5453	5453	9406	9042	9406	9406

Note: [] is the value of regression coefficient t, and represent the significance levels of 5%, 1% and 0.1%, respectively.

6 Concluding comments

A large amount of empirical evidence shows that corporate mergers and acquisitions can improve the market power and operational capabilities of enterprises, and according to corporate financial According to the classical theory of financing, these characteristics of enterprises are closely related to their financing constraints. Using the financial data of Chinese listed companies and the data of mergers and acquisitions, this paper explores the mechanism of mergers and acquisitions on corporate financing constraints in China, an emerging market. The empirical results show that mergers and acquisitions can significantly alleviate the financing constraints of listed companies. Moreover, in different economic cycles, the performance of this effect is heterogeneous. Before the financial crisis, when Chinas economy took off, mergers and acquisitions had no significant impact on the financing constraints of enterprises. However, in the post-financial crisis period, with the slowdown of Chinas economic growth and the relative sluggish real economy, mergers and acquisitions played a strong signal

role, which could significantly alleviate the financing constraints of enterprises. Combined with Chinas specific national conditions, the role of this mechanism is also significantly heterogeneous. This paper also makes some explorations in this aspect. For example, different nd acquisitions and enterprises with different ownership attributes have significantly different effects on their financing constraints.

According to the above empirical results, the following enlightenments are obtained: First, mergers and acquisitions can indeed effectively alleviate the financing constraints of enterprises, especially in the post-financial crisis, it can send a strong positive signal to financial institutions and other investors and achieve the effect of improving the financing environment. Therefore, current enterprises can use more emerging financial instruments to carry out mergers and acquisitions, to achieve the purpose of improving financing difficulties, small scale and low profits, which is consistent with Dubin conclusion that the smaller the enterprise, the

more inclined it is to expand mergers and acquisitions. In addition, it can be seen from the empirical results that mergers and acquisitions have eased the financing constraints of state-owned enterprises more obviously. On the one hand, state-owned enterprises are already facing smaller financing constraints; on the other hand, it also shows that the state's fiscal and credit policies are too inclined to state-owned enterprises, which leads to most private enterprises facing higher financing constraints and difficult to improve. Therefore, more support policies for private enterprises should be introduced to promote the vitality of economic operation.

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