

Study of Capital Structure of Listed Companies under the Influence of Policy Support—An Empirical Study Based on Money Supply Policy

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Abstract. In order to explore the impact of money supply on the capital structure of listed companies with different levels of financing constraints, we take Chinese A-share listed companies from 2007 to 2011 as the research samples, and test the impact of money supply on the capital structure of listed companies based on the perspective of financing constraint. The results show that money supply has a significant positive impact on the capital structure of listed companies. At the same time, the influence of money supply on the capital structure of listed companies with different levels of financing constraints is different: the influence of money supply on the capital structure of listed companies with higher degree of financing constraint is significantly stronger than that of listed companies with lower degree of financing constraint. Macroeconomic environment and policies provide directions for the optimization of capital structure of companies.

Keywords: Money supply; capital structure; gearing ratio; financing constraints.

1. Introduction

During the world economic crisis in 2008, the Chinese government launched a four trillion yuan economic stimulus program in order to fight the crisis and maintain economic growth. The government hoped that by increasing the money supply, lowering interest rates and reserve requirement ratios, and encouraging banks to increase credit, it would be able to achieve a reversal of the economic trend and development. For a long time, due to the split between micro perspective of accounting and finance field and macroeconomic policy research, there are very few researchers and research contents on what kind of impact this series of monetary policy adjustments will bring to the financial management of companies, which makes us lack of quantitative understanding of the transmission mechanism from macroeconomic instruments to the specific financial behavior of enterprises.

The monetary stimulus in 2008 provides a good opportunity to study the relationship between economic policies and the capital structure of listed companies. Therefore, based on the perspective of financing constraints, this paper focuses on the following two questions: (1) the impact of money supply on the capital structure of listed companies; (2) the differential impact of money supply on the capital structure of listed companies with different levels of financing constraints. This study not only enriches the research on capital structure theory, but also allows us to better understand how macroeconomic policies act on microeconomic agents and the transmission mechanism of macroeconomic policies and the optimization of capital structure of companies.

2. Literature Review

2.1. Micro Factors and Corporate Capital Structure

Since the MM Theory was developed [1], scholars have studied internal factors such as firms' own characteristics and corporate governance from different perspectives. Titman and Wessels used factor analysis to study the factors affecting the capital structure of U.S. firms. They found the negative relationship between gearing and profitability, while non-debt tax shield, variability of earnings, asset security value, and growth are not significantly related to gearing [2]. Allen and Mizuno studied the

determinants of capital structure of Japanese firms and found that profitability and industry effects are the most important factors affecting capital structure. They found that profitability and industry effect are the two main factors affecting capital structure, while non-debt tax shield and dividend payout ratio are negatively but not significantly related to capital structure [3]. Akhtar examines the determinants of capital structure of Australian firms in a sample of multinational and state-owned firms, and finds that for any type of firm, firm size, profitability and growth have a significant effect on gearing [3]. Pao conducted an empirical study on the determinants of capital structure of high-tech firms in Taiwan using panel data and found that business risk is the most important factor in determining the capital structure of firms, showing that business risk is positively correlated with capital structure [4].

2.2. Macroeconomic Factors and Corporate Capital Structure

In recent years, researchers have begun to pay attention to the impact of the external macro-environment on the capital structure, Korajczyk & Levy study the impact of macro-economy on the capital structure of the enterprise and found that enterprises without financing constraints in favor of equity financing in the period of economic expansion, while in the period of economic contraction in favor of debt financing. The opposite is true for firms with financing constraints. So the macroeconomy is a major factor affecting the capital structure of the enterprise [5]. Hackbarth et al. found that capital supply shocks, whether from the credit market or from the capital market, are important factors affecting firms' capital structure [6]. Kashyap found that tight monetary policy changes the external financing behavior of firms, and the amount of bank loans received by firms decreases significantly [7]. Leary found that the impact of macroeconomic conditions on capital structure has significant characteristics, the target leverage of the sample without financing constraints shows counter-cyclical changes, while the constrained sample shows cyclical changes [8]. There is little empirical data examining the impact of national money supply on firms' capital structure and whether there are differences in the impact of money supply on firms' capital structure for firms with different levels of financing constraints.

Most studies regard macro factors as stable external conditions in the decision-making of corporate financing constraints, either focusing on how to control macro disturbances, or focusing on giving explanations for the differences in capital structure from micro subjects. For example, Su Dongwei and Zeng Haihua analyzed China's capital structure through macro factors and found that China's capital structure has an inverse effect on economic cycles [9]. Zhao Dongqing et al. examined the impact of macro-control on the capital structure of real estate listed companies and found that the debt ratio of real estate listed companies increased significantly after macro-control [10]. However, little literature has examined empirical data on the impact of national money supply on firms' capital structure and whether there are differences in the impact of money supply on firms with different degrees of financing constraints.

2.3. Research Hypothesis

Based on the perspective of financing constraints, this paper examines the impact of money supply on corporate capital structure. Considering the availability of data, we choose listed companies as the research sample. The OLS regression method is first used to test the relationship between money supply and corporate capital structure for the overall sample, and then to test whether there is any difference in the impact of money supply on corporate capital structure for companies with different degrees of financing constraints.

The classical MM theory implies that the firm's capital supply is perfectly elastic, i.e., the firm's financing decision is made with the objective of maximizing the firm's value without considering the constraints on the amount of money in the market. In fact, the financing of a firm depends not only on its own financing demand, but also on the supply side of the market [11]. The amount of money supply is an important factor in the supply side of the capital market.

The amount of money supply is exactly the important factor of the supply side of the capital market, when the money supply increases, the real interest rate is lower, it is easier for enterprises to obtain bank loans, and the cost of financing is also lower. Conversely, it is more expensive and difficult for enterprises to obtain loans. When the financing environment of a firm changes, the behavior of the firm's creditors and shareholders may change as well [12].

Accordingly, the following research hypothesis is proposed.

H1: Money supply has a significant positive effect on firms' capital structure.

The degree of financing constraints is a reflection of the degree of information asymmetry and the severity of principal-agent conflicts between firm operators and external investors. Korajczyk and Levy find that when the central bank's monetary policy is favorable, listed firms with low financing constraints have lower debt ratios, whereas firms with high financing constraints that are tightly financed have higher debt ratios and a stronger preference for debt financing. When money supply decreases, for firms with low financing constraints increase their debt so that managers' interests combine with those of external shareholders, leading to a leverage reversal for firms with low financing constraints [5].

In practice, there are differences in the impact of money supply on firms with different financing constraints due to changes in central bank monetary policy and the presence of credit rationing. Firms with high financing constraints face higher financing costs and their sensitivity to the money supply is higher. Firms with low financing constraints are less affected by changes in the financing environment because of their ability to use alternative debt financing (e.g., bond issues, external equity financing).

Accordingly, the following research hypothesis is proposed.

H2: Money supply has a significantly stronger effect on the capital structure of firms with higher levels of financing constraints.

3. Data and methodology

3.1. Data

This study adopts manufacturing A-share companies listed in Shenzhen and Shanghai as the research sample, and the time window is from 2007 to 2011 for. The sample data comes from the CSMAR database. In order to satisfy the needs of panel data analysis and to make the structure more convincing, we exclude companies with incomplete data, financial insurance companies and ST, PT companies. Money supply data is sourced from the website of the People's Bank of China.

3.2. Methodology

According to the above literature review, it can be seen that the capital structure of enterprises is influenced by money supply, profitability, company size, financing cost, growth, fixed assets and other factors. Therefore, we examine the correlation between money supply and corporate capital structure by using an OLS regression to estimate the following equation:

$$LEV_{it} = \alpha_0 + \alpha_1 M2_{it} + \alpha_2 Size_{it} + \alpha_3 FCOST_{it} + \alpha_4 GROW_{it} + \alpha_5 TANG_{it} + \alpha_6 PROF_{it} \quad (1)$$

where for company i and year t , the dependent variable in the model is gearing ratio, the independent variable is money supply ($M2$ is used as a proxy for money supply), and the control variables include profitability, company size, financing cost, growth, and tangible assets. The meaning of each variable is shown in Table 1.

Table 1. Variable Meanning

Variable Name	Notation	Define
gearing ratio	LEV	debt/asset
money supply	M ₂	Ln(broad money supply)
company size	Size	Ln(asset)
financing cost	FCOST	finance costs/(liabilities+accounts payable)
growth	GROW	revenue growth rate
tangible assets	TANG	fixed assets/ assets
profitability	PROF	net profit/ assets

4. Result

To test hypothesis 1 and without considering the financing constraints of money supply on the capital structure of enterprises, the results of OLS regression by applying model 1 are shown in Table 2.

The empirical results of the full sample group in Table 2 indicate that money supply has a positive and significant effect on the gearing ratio of listed companies, with a regression coefficient of 0.085 and significant at the 1% significance level. When assuming that macroeconomic policies are heterogeneous except for the broad money supply, the gearing ratio increases by 0.085 for every 1 unit increase in money supply, i.e., the gearing ratio is significantly and positively related to the broad money supply. Therefore, hypothesis 1 is valid. In addition, the regression coefficients of the five control variables in the above regression equations are all significant at 1% and 5% levels, which also shows that the linear relationship with the dependent variable of gearing is significant.

Table 2. The Results of OLS Regression

	(1) Full sample	(2) Low financing constraints	(3) High financing constraints
M ₂	0.085*** (0.000)	0.048* (0.063)	0.085*** (0.000)
Size	-0.175*** (0.000)	0.204*** (0.000)	-0.175*** (0.000)
FCOST	0.132*** (0.000)	-0.015** (0.013)	0.260*** (0.000)
GROW	0.101*** (0.007)	0.081** (0.016)	0.260*** (0.000)
TANG	-0.534** (0.012)	0.015* (0.262)	2.594*** (0.000)
PROF	0.331*** (0.001)	-0.032** (0.020)	-0.262** (0.047)
Obs	3950	1330	1295
R ²	0.892	0.856	0.892

Note: Numbers in brackets are p-values. *, **, *** denote statistical significance at the 0.1, 0.05, and 0.01 levels, respectively.

In order to test whether there is a difference in the impact of money supply on corporate capital structure for firms with different degrees of financing constraints, the degree of financing constraints faced by each company is grouped using the SA index: companies below the 33% quartile are in the low financing constraints group and companies above the 66% quartile are in the high financing constraints group. The regression results are shown in columns 2 and 3 of Table 2. It can be seen that the coefficient of money supply in the high financing constraint group is 0.085 and is significant at the 1% level, while the regression coefficient of money supply in the low financing constraint group is 0.048 and insignificant at the 1% level. This indicates that money supply has different effects on

the capital structure of firms under different financing constraints, and the money supply is strongly positively correlated with the gearing ratio in the high financing constraint group. In the high financing constraint group, money supply and gearing ratio are strongly positively correlated, and the influence of money supply on capital structure is significantly stronger than that of low financing constraint group. Therefore, hypothesis 2 is valid.

5. Summary

Choosing 2007-2011 as the time window, and using the annual panel data of manufacturing listed companies, the relationship between money supply and corporate capital structure is verified from the perspective of financing constraints using OLS estimation method, and the empirical results show that: (1) money supply and enterprise capital structure are significantly and positively related when financing constraints are not considered; (2) using SA index as proxies for financing constraints, the sample is divided into high and low financing constraints groups. The study finds that the influence of money supply on capital structure of companies with different financing constraints varies, and the money supply of companies with higher financing constraints is significantly stronger than that of firms with low financing constraints.

To summarize, the macroeconomic environment and policies provide directions for the optimization of capital structure of companies. The macroeconomic environment has a global impact on the securities market and the financing of listed companies, so companies must consider the changes in the macroeconomic policies in order to realize the gradual optimization of their capital structure. Macroeconomic policies will have an important impact on the decision and optimization of the capital structure of listed companies. The management of listed companies should dynamically and reasonably adjust the capital structure of listed companies based on the changes of macroeconomic factors, realize the consistency between the capital structure of the company and the changes of macroeconomic policies.

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