

Financing Constraints and the Sensitivity of Investment-cashflow

-- Based on the Perspective of Asset Tangibility

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Abstract

Investment-cash flow sensitivity research is one of the frontier issues in corporate finance. This paper constructs an investment cash flow sensitivity model to explore how the tangibility of assets affects the sensitivity of investment cash flow. Through theoretical analysis and formula derivation, it is found that when a company is subject to financing constraints, its investment-cashflow sensitivity increases with the increase in asset tangibility. When the company's assets are sufficiently tangible, the company's investment is no longer sensitive to cashflow. This paper provides a new research perspective for SMEs to ease financing constraints, and has important practical guiding significance for the investment and financing decisions of Chinese enterprises.

Keywords

asset tangibility ; financing constraints ; the sensitivity of Investment-cashflow.

1. Introduction

When the company is subject to financing constraints, investment decisions will be subject to high financing costs caused by information asymmetry. Due to the limited internal funds of the company, it is usually unable to meet all investment needs. The company needs to allocate and utilize internal cash flow reasonably and make reasonable investment decisions. Therefore, the company's investment is very sensitive to changes in internal cash flow. However, it is difficult and costly to obtain external funds, and the company's investment cannot be completed only by internal cash flow. It still needs to obtain funds for investment through external financing. Therefore, the degree of financing constraints on the company will also affect the control of internal cash flow during investment, so the company will consider the difficulty of obtaining external funds when making investment decisions, so there is a certain relationship between financing constraints and investment cash flow sensitivity. A large number of scholars have studied the relationship between them, but they have reached different conclusions. Some scholars, including Fazzari et al.(1988), believe that there is a positive relationship between them and support the theory of information asymmetry; However, many scholars hold the opposite view. Kaplan and Zingales (1997) empirically concluded that companies with lower financing constraints have higher sensitivity of investment-cashflow due to agency problems, which supports the free cash flow hypothesis. Other research results show that there is no single linear relationship between them. To sum up, there is no conclusion about the relationship between them in academic circles, so there is the feasibility and necessity of research.

Up to now, China's capital market is not perfect, and indirect financing will remain the main force of service entities for a long time to come. Bank credit is the most important financing channel for Chinese enterprises, and whether enterprises can successfully obtain loans from banks and other financial institutions has become the guarantee for their long-term development. Because the overall risk management ability of China's banking industry is relatively weak, when examining loan applications, it will strictly examine the solvency of

enterprises, the ownership and value of mortgage and pledge, and the feasibility of realizing mortgage and pledge rights. Therefore, having high mortgage and pledge of assets becomes the key for enterprises to successfully obtain bank credit. It is one of the most important topics for the survival and development of the company to discuss and make good use of its relationship with the sensitivity of investment cash flow.

Then, under the current economic background and capital market in China, can enterprises rely on high asset tangibility to ease financing constraints? will the level of asset materiality not only affect the debt financing cost of enterprises, but also affect the sensitivity of investment cash flow of enterprises? What kind of correlation results will be obtained by introducing asset tangibility into the study of the correlation between financing constraints and investment-cashflow sensitivity? This article will explore these issues.

2. Literature Review

Qian Xuesong (2008) analyzed the relationship between financing constraints, mortgage assets and investment. He derived the model shows that compared with R&D investment, extended physical investment can more effectively relax financing constraints through mortgage loans, thereby expanding the scale of enterprise investment. Wang Hongjian and Li Mangmang (2013) studied the relationship between asset tangibility and capital structure, they found that when a company faces financing constraints, the company lacks free funds, and at the same time, external financing has high agency costs, using physical assets as collateral for financing can greatly reduce financing constraints. Guo Hao (2014) empirically tested that the tangibility of assets can increase the sensitivity of non-state-owned enterprises' investment in Tobin's Q, ease financing constraints and improve investment efficiency.

3. The Model

3.1. Theory Analysis

The impact of asset tangibility on corporate investment and financing draws on the theoretical analysis of Almeida and Campello (2007), who believes that when a company faces financing constraints, asset tangibility helps the company gain more debt capacity, thereby bringing benefits to the company's investment decisions. In the case of information asymmetry in the capital market, the company faces financing constraints. When the company has insufficient internal funds and needs to finance through the capital market, it will face high external financing costs. The tangibility of the company's assets can affect the company's ability to mortgage loans. This ability is considered by the lender to be his external option in the game with the borrower. With this power, the borrower can dispose of these tangible assets when the lender defaults, so the borrower will not easily default. This reduces the cost of information between the lender and the borrower, and the lender is willing to lend to the borrower at low cost. In this way, the borrower's debt capacity increases. Therefore, the company's investment in tangible assets can alleviate the financing constraints faced by the company, obtain greater debt capacity, and enable the company to invest more funds and expand investment when the internal cash flow is sufficient.

3.2. The Model about the Relationship between Investment-cashflow Sensitivity, Asset Tangibility and Financial Constraints

we constructs a single-period mathematical model in which tangible assets are mortgaged and asset tangibility can reversely describe the strength of credit constraints, and the external financing premium is always constant. Suppose that the company decisions are made at time points 0 and 1, respectively. At time point 0, the company has a production technology $f(I)$, and

at time point 1, it invests in human capital to generate output from physical investment I. To this end, companies need B to startup project.

$$B = L + W$$

where L is the amount of external funds needed, and W is the internal funds that the enterprise can use to realize the project.

Assuming that the company wants to make an physical investment I, at time point 1 the company makes an external fund loan to the bank, and the creditor needs to bear company-specific transaction costs proportional to the value of the asset to liquidate these assets, so the asset can bring the mortgage value of λI . Firms with high λ are able to borrow more because they invest in assets whose value can be largely recaptured by external investors. The amount of external loans that the enterprise can obtain satisfies the following constraints:

$$L \leq \lambda I$$

Regardless of time value, under the constraints of internal and external funds, the value maximization decision made by the enterprise for the project is based on the following constraints:

$$\max_I f(I) - I$$

$$s. t. I \leq W + \lambda I$$

Assuming that the optimal investment decision level of the project that the company can make is I^B , when the above conditions can achieve I^B , the corporate credit is not restricted, otherwise, the company is subject to financing constraints:

$$\lambda < \lambda^*(W, I^B) = \max\left(1 - \frac{W}{I^B}, 0\right)$$

Once the company's external credit is limited, the company's optimal project investment decision is not determined by the company's investment value maximization, but by the company's financing constraint level:

$$I(W, \lambda) = \frac{W}{1 - \lambda}, \text{ when } \lambda < \lambda^*(W, I^B)$$

$$I(W, \lambda) = I^B, \text{ when } \lambda \geq \lambda^*(W, I^B)$$

the sensitivity of investment cashflow for the company can be defined as:

$$\frac{\partial I(W, \lambda)}{\partial W} = \frac{1}{1 - \lambda}, \text{ when } \lambda < \lambda^*(W, I^B)$$

$$\frac{\partial I(W, \lambda)}{\partial W} = 0, \text{ when } \lambda \geq \lambda^*(W, I^B)$$

It can be seen from the above formulas that there is a non-monotonic relationship between the sensitivity of the company's investment cashflow and the bank's requirements for the company's tangible asset ratio, which shows that the investment-cashflow sensitivity increases with the tangibility of investment when the firm is financially constrained.

4. Results and Discussion

When a company is subject to financing constraints, the sensitivity of its investment-cashflow increases with the increase in asset tangibility, and asset tangibility plays a "credit accelerator" role in it. Considering the impact of a positive cash flow shock on two companies with different asset tangibility levels, the cash flow shock increases by ΔW . Changes in internal cash flow have a direct impact on the investment of financing-constrained companies, which is the same for both companies. However, the endogenous changes in borrowing capacity also have an indirect impact. The tangibility of assets increases the company's cash flow for investment by $\tau\Delta W$, which means that the increase in borrowing capacity will be more important for companies with high asset tangibility τ . If the company's borrowing capacity is high enough, the company will become unconstrained and the sensitivity of investment-cashflow will drop to zero. This means that further changes in asset tangibility will not affect the sensitivity of investment-cashflow in financially unconstrained companies.

5. Conclusion

This article focuses on the dependence of investment-cashflow sensitivities on the assets tangibility. When companies are subject to financing constraints, the tangibility of assets reduces the information asymmetry and agency costs of external investors and internal enterprises, and improves the sensitivity of investment cash flow and reduces underinvestment, supports enterprises to borrow more. When the assets are sufficiently tangible, the enterprise will not be subject to financing constraints.

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