



A Survey of Research on the Effect of Tangible Assets on Capital Structure

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Abstract

This paper provides an overview of the literature that investigates on the influence of tangible assets or collateral on capital structure. Previous studies suggest a consistent conclusion that leverage ratio is positively affected by tangible assets. The trade-off theory can well explain the actual relationship, while the pecking order theory makes the opposite prediction. Other theories include the contract incompleteness theory states the relation from agency problem. This study intends to give a list of existing works and possibly offer new research ideas.

Keywords: *Capital structure; tangible assets; Collateral; Pecking-order theory; Trade-off theory; Leverage ratio*

1. Introduction

In a narrow sense, capital structure refers to the proportion of capital stock and debt of a company, while capital structure is the combination of the sources of production factors of an enterprise more broadly. The capital structure can not only reflect the financial relationship of a company's capital, but also among shareholders, creditors and managers. By choosing a reasonable capital structure continuously, companies can realize the optimization of capital and maximize the interests. Raising funds through debt is a financing method with controllable cost and stable income. However, liabilities need to be repaid regularly and paid interest, which will increase the cost of enterprises and expand the financing risk of enterprises. Equity and debt have their own benefits and adverse impact, so allocating rationally according to the actual situation is important to the capital structure of a company. Constructing an optimal capital structure of a company is the goal of building the equity debt ratio, and a suitable capital structure can promote the maximization of the benefits of the enterprise. Constantly pursuing the optimal capital structure, financing structure, and equity debt ratio, can largely help to produce the maximum income with the lowest capital cost.

Capital structure has become more and more valued by modern business. An unreasonable capital structure will bring huge hidden dangers to the operation of a

company. One of an crucial factor of ensuring income and going concern is maintaining a reasonable capital structure. Some financial theories explain the importance of capital structure, which determines company's financing management, financial plan, capital cost, cash flow and other financial solutions. A reasonable capital structure determines the stability of company operation. In the market, there is fierce competition among companies, a slight inefficiency operation will cause tremendous turbulence in the company. The cost of capital also affects the competitiveness of products. Overall, careful consideration of capital structure is crucial for every company.

In the past research, tangibility was one of the most important variables to be considered in capital structure. The tangibility of assets mainly refers to the mortgageability and pledgability, including cash, accounts receivable, inventory and fixed assets. Among the financing methods of a company, most loan comes from mortgage. And compared with intangible assets, tangible assets such as land, plant, machinery and equipment are of more advantage in asset evaluation, they have become the main collateral for financing.

In this article, tow criteria were considered to choose the publications that will be included in our survey subject. First and foremost, the studies must be choosing from prestigious publications. Second, the conclusions in the paper must be supplied so that the arguments offered in the paper may be explained and supported in a

reasonable and acceptable manner.

The remaining portion of the article is arranged in 4 parts. Part 2 discusses the main theories. Part 3 explains the articles' relations and findings. Part 4 presents the paper's results and discusses some potential study options.

2. Theory summary

2.1 *The pecking order theory*

Myers and Majluf (1984) [1] proposed their priority financing theory based on the concept of information transmission. Except for knowledge asymmetry, the assumption is that the financial market is complete. The capital of a company is generally divided into two categories: equity and debt. The cost of capital they contribute to the firm varies significantly. When the market average rate of return is fixed, a company's capital cost is determined by investors' risk-aversion criteria. Because the risk of equity investment is higher than that of debt, the expected return must be larger. Another consideration is that different from the payment of dividends which is after tax, the debt interest can be paid before tax and obtain tax reduction benefits. Furthermore, because of the comparatively high financing cost of equity financing, the cost of equity is substantially greater than the cost of debt. Therefore, considering the cost of capital, companies pursuing value maximization should give priority to debt when other factors are certain.

The main findings of this theory are: (i) firms prefer internal financing; (ii) the variance in the firm's net cash flow reflects the variation in external funding; and (iii) the company will first issue the most secure securities, when external finance is necessary. Finally, equity financing is the last option. Because the preference in order of financing method has an impact on firms deciding asset structure and capital structure decisions, many previous literatures considered this theory to conduct research.

2.2 *The trade-off theory*

The trade-off theory is a theory concerning a company's capital structure. The corporation is said to establish the balance of debt and equity by assessing the benefits and drawbacks of obligations. Tax savings or tax shelters are one of the advantages of debt. The cost of liabilities is the expense of being in financial difficulties. The marginal benefit of debt steadily diminishes as the debt ratio rises, while the marginal cost rises. To maximize the profits, the firm must weigh the benefits and costs of liabilities to determine the appropriate debt-equity ratio.

When the debt ratio is low, the tax shelter benefit of

debt increases the company's worth, according to the premise. If the debt ratio arrives a particular level, the tax benefits of debt are countered by the cost of financial distress. Based on the assumption of "maximization of corporate value", the static trade-off theory holds that enterprise cash holdings are the result of the trade-off between cash holding cost and cash holding income. The depreciation of tangible assets can provide similar role like tax shields, which contributes to the decision of the disposal or purchasing of tangible assets.

2.3 *Other theories*

According to Hart and Moore (1994) [2], the cost of defining all special abilities is too great due to people's limited reasoning, inadequate knowledge, and transaction uncertainty. It is difficult to create a full contract, therefore a partial contract is unavoidable. People are typically regarded to be unable of adequately preparing for the far future owing to its complexity and unpredictability. Titman's (1984) [3] stakeholder co-investment theory investigates an agency connection between a corporation and its consumers who incur expenses if the firm liquidates. The firm would bear the expenses of liquidation in the form of decreased product prices. As a result, enterprises that create one-of-a-kind items should pick a lower leverage ratio. Faulkender and Petersen's (2003) [4] central theory revolve around supply-side determinants of capital structure, which implicates that all types of enterprises, their capital structures decisions are restricted by the capital markets. By increasing the costs of debt capital, the firm can lower expected leverage by contracting.

3. Empirical literature summary

This survey starts from what Frank and Goyal (2009) [5] published about the determinants of capital structure, their work serves as a connecting link between past achievements and latter surveys. They discussed a series of relating theories and proved the influence of a set of six robust variables. The Frank and Goyal (2009) [5] provided an overview of factors that have large scale impact on capital structure decisions from 1950 to 2003. over decades, the main theories have no distinguish results, so people advocate differently. Through detailed analysis of theories applied in past research in different circumstances, this paper significantly makes this survey deeper in understanding determinants of capital structure. When considering the definition of leverage, severe arguments existed on book leverage and market leverage. The main difference is that book-based leverage is backward looking, while market-based leverage concentrates on things will happen. It adopts market-based leverage with reporting of other definitions, and a ratio of total debt to market value of assets (Judge and Korzhnitskaya, 2021) [6]. The general implication is that firms that have more tangible assets

tend to have higher leverage, further results show that tangibility and firm size are more important in explaining leverage for low market-to-book firms than they are for high market-to-book firms (Frank and Goyal, 2009) [5]. The nature of assets also reveals correlation between tangible assets and capital structure. Since tangible assets are easier for estimating value than intangible assets, this will largely decrease the distress cost. So, the minor distress cost and less agency problems about debt lead to a positive relation between tangibility and leverage. This is opposite with what suggested by the pecking order theory, and the actual choices are adverse affected by tangibility.

Adrian and Viswanathan (2013) [7] propose a dynamic agency-based company financing model based on the requirement to collateralize commitments to pay with physical assets. The user cost of capital definition adds the additional cost generated by a lack of internal funds to the preceding one. Tangible assets there include assets purchased and leased, and intangible assets only can be acquired by purchasing. Results with large variance exactly show that higher tangibility firms have higher leverage. The factor of leased capital has an influence on tangibility and capital structure which cannot be ignored. The hypothesis of collateral determines the capital structure is proved by all the results.

Antonios and et.al (2008) [8] proposed the same hypotheses that the leverage ratio is positively affected by the tangibility of assets, which is developed from the traditional concept of tangible assets hold more value when liquidation. Additional factors include the size of firm, firm profitability, growth opportunities, share price performance and market conditions are introduced and tested in this paper. A method of dynamic system-GMM is applied to panel data. Results indicate that the effect of non-debt tax shields came from depreciation allows firm to borrow more. From exploring the effect of tangible assets in two types of countries, it has been found that bank-oriented economies is more affected than capital market oriented economies. Similarly, Steve and et.al (2020) [9] tested same thing with different definitions of tangible and intangible assets. They take the fair value of tangible assets and exclude the goodwill from intangible assets, for obviously that only identifiable assets can serve as collateral. And results show that identifiable assets and tangible assets have similar relation with leverage, which means when a firm lack of tangible assets to achieve preferred leverage, identifiable intangible assets can take part of the role.

Campello and Giambona(2012)[10]emphasis the redeployability of tangible assets, which is a innovative aspect to test the relationship of tangible assets and leverage. The classification in this study is detailed, the main focus is on the redeployability—leverage relationship. Previous research assumes that less-firm

specific assets which are more recognizable should have higher debt capacity (Shleifer and Vishny (1992)) [11]. The evidence shows successfully that land and buildings, which are thought to be the least firm-specific fixed assets, can explain the most account of capital structure. But machinery and equipment can only slightly determine the leverage ratio. Further characterization applied on the firms over the possibility of facing credit frictions. And the redeployability—leverage relationship is prominent in these two types. As the result, the sensitivity of leverage to land and building increased by tightening the lending standard. This result is especially applicable to companies that are at risk for credit incompleteness.

Rampini and Viswanathan (2010) [12] investigated that higher tangible capital leads to borrowing more debt. Tangible assets are generally treated as collateral, and the collateralizability of a company implies that it can increase leverage through having more debt ex ante, while decrease net value ex post. Besides, when the expected price of capital increase, and the firms' ability to collateralize claims increased at the same time, firms exhausted debt capacity is obliged to reduce investment to a larger degree. Therefore, the capital structure of firms that with higher productivity and lower net worth tends to be more instable.

Antonio, Dalida and Jae (2012) [13] explored a less known part of quantifying the influence of tangible assets on liquidity management over the well-developed research of Rampini and Viswanathan (2010) [12], that more tangible assets allow more borrowings. With the decrease in the ability of pledge, preventive demand for current assets increased apparently, which is a substantial explanation of long-term trend in US cash holdings. The empirical results show that asset tangibility has tremendous influence on firms' leverage, which implicates the rise in preventive savings and then shrinking debt capacity. The decrease in asset tangibility also largely minimizes the usage of debt capacity. Another result achieved in this paper is that limited mortgageability not only reduces the debt capacity of enterprises, but also causes more relaxation in their borrowing capacity. The leverage ratio can vary significantly on account of the change in the ratio of tangibility. All these facts consistent with what proved on capital structure and tangible assets.

4. Conclusion

In conclusion, from summarizing the past papers, tangible assets have an undeniable influence on corporate capital structure. Among multiple impact factors, tangibility of assets always seems to be one of a core factors to be considered. The influence may be described in two ways: liquidity and economic significance. Tangible assets are easier to value than intangible assets which contributes to lessening distress costs and then

agency problems. Furthermore, changes in lending standards have an impact on the relationship's sensitivity.

Abundant empirical papers have used different set of variables and explored how they explain leverage ratio. It should be noted that the capital structure decision is affected by the combination of internal and external conditions. Therefore, when considering the impact of tangibility, well defined background should be mentioned. Despite complex obstruction, a positive relation between assets tangibility and corporate capital structure can be defined both theoretically and experimentally. Another finding is that the empirical data span decades proves the degree of the impact of tangibility maybe worsening in the explanation of capital structure.

Dozens of relating theories have been confirmed by ample empirical data over decades, which lead to difficulty when deciding the most suitable to prove the positive relation between tangibility and leverage ratio. One of the most frequently mentioned theory about tangibility and leverage is the pecking order theory. It fails to properly explain the positive relationship, because tangible assets can be viewed as proxy of different economic forces. The pecking order theory makes the prediction through information asymmetry, for the characteristics of tangible assets, that issuing equity cost less thus leverage ratios become lower (Frank & Goyal, 2009) [5]. The trade-off theory puts emphasis on the collateralization of tangible assets, that firms with more tangible assets can increase leverage and investment. The contract incompleteness theory regards the value of tangible assets under the state of bankruptcy. It admits the ability of liquid tangible assets to facilitate corporate borrowing.

Collectively, these studies outline a positive impact of tangible assets on corporate capital structure. Through various experimental approaches and under diverse assumptions, the final results seem to be consistent. As mentioned, the ability of tangibility to explain leverage is influenced by time. And surveys in recent years become more prefer to investigate intangible assets. It is notably that new data should be applied to explore over this topic. Another recommendation is that detailed classification of tangible assets is adoptable, it may help to better understand how assets influence capital structure.

References

- [1] Myers, S.C. (1984) The capital structure puzzle. *Journal of Finance*, 39: 575-592.
- [2] Hart, O., Moore, J. (1994) A theory of Debt Based on the Inalienability of Human Capital. *Quarterly Journal of Economics*, 109: 841-879.
- [3] Titman, S. (1984) The effect of capital structure on a

firm's liquidation decision. *Journal of Financial Economics*, 13: 137 – 151.

- [4] Faulkender, M., Petersen, M. A. (2003). Does the source of capital affect capital structure?. NBER Working Papers.
- [5] Frank, M. Z., Goyal, V. K. (2009) Capital Structure Decisions: Which Factors Are Reliably Important?. *Financial Management (Wiley-Blackwell)*, 38(1): 1–37.
- [6] Judge, A., Korzhnitskaya, A. (2021) Do credit ratings determine capital structure?. *International Journal of the Economics of Business*, 2021(2): 1-30.
- [7] Rampini, A.A., Viswanathan, S. (2010) Collateral, risk management, and the distribution of debt capacity. *Journal of Finance*, 65: 2293–2322.
- [8] Antoniou, A., Guney, Y., Paudyal, K. (2008) The determinants of capital structure: capital market-oriented versus bank-oriented institutions. *Journal of Financial & Quantitative Analysis*, 43(1): 59-92.
- [9] Lim, S. C., Macias, A. J., Moeller, T. (2020) Intangible assets and capital structure. *Journal of Banking & Finance*, 118: p. N.PAG.
- [10] Campello, M., Giambona, E. (2013) Real Assets and Capital Structure. *Journal of Financial and Quantitative Analysis*, 48(5): 1333–1370.
- [11] Shleifer, A., and Vishny, R. (1992) Liquidation Values and Debt Capacity: A Market Equilibrium Approach. *Journal of Finance*, 47: 1343-1366.
- [12] Rampini, A. A., Viswanathan, S. (2013) Collateral and capital structure. *Journal of Financial Economics*, 109(2): 466–492.
- [13] Falato, A., Kadyrzhanova, D., Sim, J.W. (2013) Rising intangible capital, shrinking debt capacity, and the US corporate savings glut. *SSRN Electronic Journal* (2013).

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