Three Industry Characteristics Affecting Capital Structure: Review of Literature

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Abstract: This paper summarizes the literature that studies the impact of industry characteristics on capital structure, and focuses on three factors, namely, growth opportunities, tangibility and firm size. We find that most literature supports the following conclusions: growth opportunities are negatively correlated with leverage, tangible assets are positively correlated with leverage, and enterprise size is positively correlated with debt level. At the same time, we find some limitations in previous studies. For example, scholars generally use linear regression as research method, and focus more on developed countries rather than on developing countries. According to these current situations, we give several suggestions for future research directions.

Keywords: growth opportunities, tangibility, firm size

1. Introduction

In 2008, a sudden financial crisis brought a lot of different sizes of companies into dilemma, there was also a lot of bankruptcy, but most businesses failed because of more than just the financial crisis. It's more because there are problems with the capital structure of enterprises. We find that with the development of capital structure theory, various studies on the impact of industry characteristics on capital structure emerge endlessly. When we read the literature on the impact of industry characteristics on capital structure, we find that three factors are more critical: growth opportunity, tangibility, and firm size literature research about capital structure.

First, all the research is based on three theories: Modigliani and Miller theory, the Pecking order theory, and the Trade off theory. So we focused on reading the relevant literature and wanted to find out what was behind their production impact. The theoretical study of capital structure developed from the beginning of the 20th century to the present has mainly formed MM theory, pecking order theory, and trade off theory. Each industry is faced with a different external environment and its situation. For example, some countries adopt different industrial policies for different industries. Also, each industry has its unique industrial form and also forms different degrees of competition, product markets, asset characteristics and business risks. Most of the articles on capital structure focus on the leverage ratio, In this paper, we hope to focus on the impact of industry differences on capital structure. So, combine the research on the capital structure, from growth opportunity, tangibility, and firm size of their impact on capital structure.

In some research papers on capital structure, a majority of scholars have conducted some research on the relationship between industry characteristics and capital structure, but mainly proved that there are industry differences in capital structure. This difference is stable, but the influence of industry characteristics on capital structure is not discussed deeply. With the deepening of capital structure research, it is necessary to explore the influence of industry characteristics on capital structure to promote the research of capital structure and explore the influencing factors of capital structure. For enterprise managers, since there are industrial differences in capital structure, and the differences are stable, then enterprise managers should pay more attention to the capital structure of their main competitors and the average level of the industry to compare the similarities and differences between white body and them; Find out the reason for the difference, and then optimize their capital structure. Therefore, it is of great significance to study the influence of industry characteristics on enterprise capital structure to promote the optimization of capital structure and enhance enterprise value.

This thesis is mainly divided into four sections. Section I is an introduction and it explains the background, significance and purpose of the research. Section II summarizes relevant literature on the impact of growth opportunities, tangibility and scale on capital structure. Section III is the evaluation of the literature we read, and section VI is the prospects for future research. The research method of this paper is literature research, the way of literature research means conducting research by collecting and analyzing documents according to a certain purpose. The development history of capital structure and relevant literature at home and abroad are reviewed and sorted out. The research content is selected for in-depth discussion according to the insufficient demonstration problems in the previous research process. Therefore, the literature research method is the basis of paper writing.

2. Literature Review on Three Factors Affecting Capital Structure

2.1. Growth Opportunity

2.1.1. The Most Important Paper

In this part, we mainly study the impact of growth opportunities on capital structure, and According to the paper titled *Growth Opportunities and the Choice of Leverage*, *Debt Maturity, and Covenants* written by Matthew T. Billett (2007), he focused on the impact of the concentration of corporate investment opportunities on growth opportunities on the portfolio selection of leverage, debt maturity and contract [1]. We can go through them one at a time. Debt is critical to a company's value, especially high-risk outstanding debt, and if the loss of the company's value as a result of these investment decisions is part of the cost of the debt, managers should take steps to maximize the value of the stock. For rational bondholders, they can use restrictive clauses in short-term debt contracts to avoid risks. They will anticipate conflicts and need higher debt financing costs. Therefore, for them, in order to reduce the conflict of future growth options, the best solution is to avoid risks by using less debt financing.

The second paper is from Nha, Loan and Nhung, on the determinants of capital structure selection of Vietnamese listed companies [2]. This paper adopts the way of empirical investigation and explains that in Vietnam, Companies raise capital in three ways: 1. Update the sample size. 2. Changes in financing decisions. 3. Take the attributes of the new company as the determinants of the capital structure. In this paper, a data analysis shows that Vietnamese companies prefer to use current debt instead of non-current debt. The average retained high-level debt of Vietnamese companies accounts for about 50% of the total capital, the minimum debt employment rate is 0.3%, and the maximum leverage ratio is 155.2%. In order to study the relationship among total debt, non-current debt and current debt as dependent variables, the author used panel regression method and obtained regression results. There is a relationship between these variables and the company's capital structure. For

example, companies with higher incomes are supposed to bear more debt to protect their income from income tax. The research shows that there is a statistically positive correlation between the company's growth opportunities and its choice between debt and equity. For those who use too much short-term debt, it will be considered to lead to an increase in the company's financial risk. However, there are differences in the capital structure of various industries. The author uses the inter industry dummy variable coefficient to confirm that the inter industry fixed effect is an important determinant of leverage. Therefore, firm-specific characteristics cannot completely exclude the explicit capital structure behavior of listed companies. As we said, this paper uses literature review and data analysis to discuss the change and impact of capital structure of Vietnamese companies, and the data analysis uses linear regression and other knowledge of statistics.

2.1.2. Theoretical Hypothesis

These two papers have been used in many aspects of statistical theory and hypothesis. First, they explained the endogenous choice of leverage, maturity and contracts. Using the leverage ratio of simultaneous equation, that is, the ratio of current debt to contract index as an endogenous variable, we find that leverage ratio is negatively correlated with market book ratio, while current debt is positively correlated with market trend and interacts with contract index; In the contract index formula, it is calculated that the contract index is related to the leverage ratio and negatively related to the current debt ratio. At the same time, it is with the endogenous variable, he also use the tools of exogenous variables most moment constraints, namely generalized method of moment (GMM) to simultaneous equations, through the estimated GMM and two-stage least squares (2 SLS) compare whether heteroscedasticity regression error, therefore, GMM ensure the standard error of estimate difference variance and autocorrelation are consistent. However, this calculation method does not report the estimated R^2 in the whole calculation process, and there is no widely accepted measurement method.

2.1.3. Summary of Results

In general, growth opportunities will have an impact on capital structure. To be more specific, financial leverage, tax theory and debt status will have an impact on growth opportunities, thus affecting the interests of shareholders.

First of all, from the perspective of corporate tax, progressive tax in the corporate tax structure means the increase of payable tax changes, which will increase the expected tax liability of enterprises. Therefore, enterprises with high growth opportunities and high cash flow variability will diminish the debt during the progressive tax period, indicating that there is a negative correlation between their growth opportunities and their debt ratio.

Secondly, the financial leverage of enterprises will also affect growth opportunities. According to the study of capital structure by Rajan and Zingales, through cross-sectional time series analysis of the relationship between growth opportunities and capital structure, it is found that the level of enterprise leverage is positively correlated with scale and capital ratio, and negatively correlated with the level of growth opportunities [3].

2.2. Tangibility

2.2.1. The Most Important Paper

Of all the papers that study the impact of many factors on capital structure, the most important one for this literature review should be *What Do We Know about Capital Structure? Some Evidence from International Data* [3]. The main purpose of this paper is to find out whether the factors that affect

the capital structure of American companies also affect the capital structure of other countries [3]. By investigating panel data of G7 countries, the paper finds that, except for the relatively low leverage levels in Britain and Germany, the leverage levels of enterprises in G7 countries are quite similar, while the factors that affect leverage levels in the United States have the same impact in other countries. However, this seminal paper has two limitations:(1)The theory behind the observed correlation remains to be discovered, and (2)The impact of institutional differences needs further study. The importance of this paper lies in that it not only points out the influencing factors of capital structure that should be paid attention to in subsequent empirical papers, but also explains the measurement methods of related variables.

2.2.2. Theoretical Hypothesis

Trade off theory points out that when a company is in financial distress, tangible assets can be quickly realized, thereby reducing the cost of financial distress. Therefore, the more tangible assets a company has, the stronger its willingness to borrow. However, the pecking order theory shows that due to the information asymmetry between stakeholders, if a company issues securities, it will prefer internal financing instead of external financing, as well as debt equity swap. Therefore, companies with more tangible assets do not necessarily have more debt.

2.2.3. Summary of Results

Most empirical studies have observed a positive relationship between leverage and tangible assets (for example, Rajan and Zingales, 1995; Huang, 2006; Wiwattanakantang, 1999). According to these papers, compared with intangible assets, tangible assets can be more easily realized, which means that these assets can support more debt [3,4,5].

However, Serghiescu and Văidean say that tangible assets and leverage are negatively correlated, strengthening the conclusions of former studies which demonstrate that the impact of asset tangibility on leverage is opposite in developing and developed countries [6]. According to Acaravci, tangibility and leverage are negatively correlated in Turkey [7]. So, the conclusions of both papers support the pecking order theory.

In addition, some studies find asset structure has nothing to do with capital structure because of the statistical insignificance of estimated coefficients [8,9].

2.3. Firm Size

2.3.1. Important Papers

The most significant and popular one ought to from Myers and Majluf, which confirmed that companies facing greater information asymmetry can mitigate mispricing by issuing bonds [10]. Based on the study from J. Chae, the author, by comparing different regressions, found that larger firms would have less information symmetry than small firms, and presented that firm size holds a negative relationship with asymmetric information, and thus affects firms' decisions to change their capital structures [11].

Another paper *Firm Size and Capital Structure from* A. Kurshev found out a relationship between corporate scale and capital structure [12]. The main purpose of this paper is to provide a theoretical basis for the relationship between corporate scale and capital structure. The results show that this has four effects on the relationship: smaller companies issue more debt on the condition of refinancing, but they wait longer before another restructuring; Between refinancing, at the level of a single enterprise, the relationship between enterprise size and leverage is negative; The existence of non leverage companies has a positive impact on the scale leverage relationship, and it is found that the

existence of fixed costs may also lead to zero leverage becoming the optimal policy. However, the model gives uncertain data consistent with the relationship, which is due to the lack of further research in this field. Therefore, more cross section and time series predictions should be added.

2.3.2. Theoretical Hypothesis

The trade off theory suggests that the company scale is positively correlated with the leverage. Since the asset portfolio of large companies is more diversified, they face less risk and have stronger borrowing capacity, and they suffer less from financial distress costs. As a result, larger firms have larger benefit of having leverage. Meanwhile, the pecking order theory suggests that, due to asymmetric information, smaller companies have lower credit ratings, so that they cannot be trusted by borrowers; therefore, external capital like debt appears to be costly. In comparison, the larger companies have high credit ratings and are willing to provide more information to borrowers and external investors. As a result, they are less troubled by the problem of information asymmetry. Hence, debt appear to be less than that of smaller firms.

2.3.3. Summary of Results

The major of papers agree with the trade off theory that big firms tend to use more debt than small ones. For instance, an empirical study by N. Eriotis investigates the influence of characteristics of Greek firms to capital structure [13]. The writer presents the firm size in the measurement of sales figure of the firm, overall, the results indicate that there is a positive correlation between the firm scale and the total leverage ratio, which is consistent with the conclusion drew from the trade-off theory's viewpoint. Except for the research paper focusing on Greece firms, papers investigating in other countries' firms also show the consistent result, for instance, research of Malaysian, Turkish, and Spanish firms [14,15,16].

However, other research papers investigate relevance between firm size with non-current and current debt separately. The conclusions indicate that the firm scale has an unclear, and sometimes negative correlation to the firm's short term leverage, while positive relationship with long-term debt [17]. A possible explanation is that smaller companies prefer to employ current leverage rather than non-current debt, with larger firms benefit more from long-term debt. Another paper from F. Mouamer explains the phenomenon differently: issuing more long-term debt would make big terms easier to take economies of scale and gain bargaining power, while smaller firms have less borrowing capacity relative to bigger firms [18].

3. Evaluation

Firstly, the least square method is commonly used to establish multiple linear regression models in the papers in this field. Second, most papers use the ratio of fixed assets to total assets to measure the ratio of total debt to total assets to measure leverage. However, some papers go further in the measurement of variables. Titman and Wessels classified debt into non-current debt, current debt and convertible debt, and divided them by the book value and market value of equity to obtain six measures of leverage [8]. Rajan and Zingales used debt as the denominator of leverage, and in turn introduced total assets, net assets and capital as the numerator to get a more precise measure of leverage [3]. Third, the papers have various definitions for firm size, which may lead to different results. Rajan and Zingales used the logarithm of annual sales [3], Fama and French used the logarithm of total book assets as the representative of corporate scale [19], and A. Kurshev used the logarithm of the quasi market value of the company's assets as the representative [12].

4.   Prospects for Future Research

First of all, the existing literature basically uses multiple linear regression for analysis. However, based on this method, the choice of factors and expressions is only subjective judgment. Due to diversified related factors and some unmeasurable factors, regression analysis is only applicable to some cases. Therefore, future research should use different methods to obtain more accurate indicator variables.

Secondly, although the research on developing countries has gradually become more and more in the past few years, the research on capital structure of developed countries still accounts for the majority. It is also worth noting that some studies on developing countries have reached the same conclusions as those on developed countries, while others have reached completely opposite conclusions. This phenomenon means that there is no definitive answer as to whether the pecking order theory or the trade off theory has more power. Accordingly, researchers are supposed to pay more attention to developing countries and explore the reasons behind the differences in research conclusions.

Third, originally the literature basically takes tangibility as the driver of collateral value. However, according to Norden and Van Kampen, recent research emphasizes that asset redeployability matters [20]. Consequently, future research should not only focus on non-current tangible assets such as real estate, plants and equipment, but also on assets such as inventories and accounts receivable, which are closely related to short-term leverage.

5.   Conclusion

Overall, the paper summarizes literatures presenting three main essential factors that affect firms' capital structure basing on the Modigliani and Miller theory, the Pecking order theory and the Trade off theory. Our results indicate that growth opportunities are negatively correlated with leverage, while tangible assets and enterprise size are both positively correlated with leverage and debt level to an extent. What has also been mentioned are the most representative papers looking into relationship between firm characteristics with their capital structure choices, which provide evidence for the internal correlation of factors and the extent they affect capital structure. However, the existing research is mainly carried out through linear progression, which is recognized as subjective and not applicable to special cases. The investigation into correlation among factors and capital structure, in the meantime, is carried out in a majority of developed countries, while papers investigating into firms in developing countries draw different results, which leaves various conclusions for the topic. Henceforth, more methods except for the existing regression can be used, and a more broadened range of investigation into firms in different types of countries can be employed.

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