

Criteria for Optimizing the Capital Structure When Increasing the Value of Joint Stock Companies

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Abstract: The capital structure of a joint stock company plays a critical role in determining its financial strength and overall value in the eyes of investors and stakeholders. This article examines various optimization criteria that can be used to maximize shareholder value through strategic capital structure decisions. Through a review of existing literature and empirical studies, this study aims to comprehensively explain the main factors influencing the formation of capital structure and their impact on company value.

Keywords: Leveraged beta, unleveraged beta, private equity valuation, debt valuation, weighted average equity valuation, company fundamental value, debt burden

Relevance of the topic: For many years, individuals and businesses have thought about how to make capital investments and use financial assets using savings mechanisms. The existence of transaction costs in the real economy shows the efficiency of financing capital through various securities. For example, government provision of tax-exempt subsidies has increased the availability of debt financing. Research shows that companies in different sectors or over different periods of time have to make financial decisions based on a single capital structure. However, the structure of assets on the balance sheet and the stability of expected future cash flows play a leading role in companies attracting borrowed funds. As a result, each company develops its optimal capital structure.

The main goal of capital formation is to provide a high level of profit to the owner of the enterprise, and if you look at it from the point of view of capital, then to determine the optimal cost of the funds involved.

The main criterion for the phased development of an enterprise is to minimize the cost of private and borrowed capital, which allows for a constant increase in the income of the enterprise. Reducing this assessment in the most alternative way increases the fundamental value of the enterprise and accelerates the processes of comprehensive assessment of the activities of firms

and their development prospects. That is, according to the theory, the more cash flow a company has now and in the future, the higher its value will be.

Literature review.

The term "capital" represents the long-term funds of an enterprise. In other words, equity is equal to the sum of total items on the left side of the balance sheet minus the total liabilities on the right side. According to Kulkarni, the capital structure is formed by financing the assets of the enterprise (Kulkarni, 1988). The capital structure was first put forward by Modigliani and Miller, and according to it, the market would operate more efficiently if there were no taxes in the country (Modigliani and Miller, 1958). Later, the theory of the hierarchy of capital structure began to emerge. Pecking order theory was first proposed by Donaldson, and according to it, it is appropriate for owners and managers to finance capital internally from retained earnings rather than from external sources of finance, regardless of the size of the firm (Donaldson, 1961). If retained earnings exceed investment needs, debt obligations can be easily avoided. Unlike the pecking order theory, the trade-off theory predicts the existence of an optimal capital structure due to the absence of a correlation coefficient between private and debt capital. According to Myers' theory, companies achieve an optimal capital structure by replacing equity with debt or vice versa, and as a result, company value reaches its highest point (Myers and Majluf, 1984). Fama and Miller continued their work by examining different utility functions between managers and shareholders (Fama and Miller, 1972). Fama and Miller expanded their research based on Modigliani and Miller's theory and formed agency theory. They proved that agency theory depends on agency costs. Signaling theory is based on the fact that the capital structure of firms serves as an informative signal to outside investors. According to the theory, firm insiders, that is, managers and owners of the enterprise, and not outsiders, have a clear understanding of the current state of the enterprise. Company managers prefer to use their own funds rather than borrowed funds because if the company goes bankrupt or becomes insolvent, the use of large amounts of debt will cause managers to leave their jobs. Conversely, outsiders believe that a firm's high level of debt indicates that the firm operates with a high level of trust (Ross, 1977).

Research methodology.

This part of our study presents a proposal to use a regression method to determine the level of weighted average cost of capital (WACC) required to increase the value of enterprises, as well as several models (Gordon growth model, CAPM model and discounted cash flow models).

Analysis and discussion of results.

When determining the fundamental value of enterprises using the discounted cash flow model, we obtain the following:

$$FV = \sum_{i=1}^T \frac{FCF_i}{(1 + WACC)^i} + \frac{TV}{(1 + WACC)^T}$$

Here:

FV – fundamental value of the enterprise;

FCF_i – free cash flow for the forecast period;

WACC – is the weighted average cost of capital;

TV – liquidation value of the enterprise;

T – end of the analyzed year.

The liquidation value (TV) of enterprises is estimated based on the Gordon growth model and is expressed as follows:

$$TV = \frac{FCF_T \times (1+g)}{WACC - g}$$

Here:

FCF_T – free cash flows of the enterprise in period T;

g – the growth rate of the company's cash flows.

The weighted average cost of capital influences the decision on how to finance operations based on the valuation of private and debt capital. Its value is expressed by the following formula:

$$WACC = r_e \times w_e + r_d \times w_d \times (1 - T)$$

Here:

r_e – price of private capital;

r_d – cost of borrowed capital;

w_e – share of private capital of the enterprise;

w_d – share of the enterprise's borrowed capital;

T – income tax rate.

In the financial literature, the leverage indicator, that is, the share of borrowed funds in the total volume of private capital, is taken as a factor influencing the capital structure. The method developed by Hamada is used to determine the value of private capital (Hamada, 1972):

$$r_e = r_f + \beta_l \times (r_m - r_f)$$

$$\beta_l = \beta_u \times \left(1 + \frac{d}{e} \times (1 - T)\right)$$

Here:

r_f – risk-free rate;

r_m – expected market rate;

r_e – expected return on private capital;

$(r_m - r_f)$ – risk premium;

β_l – beta version with leverage;

β_u – beta version without leverage;

$\frac{d}{e}$ – leverage, the ratio of debt capital to private capital;

T – income tax rate.

The first stage of calculating the value of an enterprise begins with determining the price of the private capital of the enterprise. We use the CAPM model to determine the cost of equity capital. Since the formula cannot determine the beta of leveraged companies, we can find the beta values of unleveraged companies. To determine the values without leverage, beta coefficients of enterprises operating in several sectors of the economy are taken, and the median of the coefficients is determined accordingly. In the table below we get information about unleveraged beta by sector.

Table 1. Sum of unleveraged betas in the industrial sector

Industrial sector name	Non-leveraged beta
Automobile	1.12
Cold drinks	1.17
Construction Materials	1.15
Chemical products	0.98
Coal	1.25
Construction supplies	1.03

Food processing	0.75
Mining and heavy industry	1.11
Oil and gas	1.09

Source: <https://www.stern.nyu.edu/~adamodar/pc/datasets/betas.xls>

Based on the data in the table above, the unleveraged beta coefficients of the enterprises are determined and the median is determined to be 1,11 ($\beta_u = 1.11$). In the analyzed period, "Tashkent Oil and Fat Plant" JSC formed 25% of its capital through borrowed funds. Based on this, the company's leveraged beta is determined by the Hamada equation as follows:

$$\beta_l = \beta_u \times (1 + (1 - T) \times \left(\frac{D}{E}\right)) = 1.11 \times (1 + (1 - 0.15) \times 0.25) = 1.35$$

At the next stage, the process of determining the value of the private capital of the enterprise is carried out.

Table 2. Ratio of market risk premium to risk-free rates by country, %

Countries	Total market risk premium	Risk-free rate	Country risk premium
Uzbekistan	10.46	5.46	NA
China	6.07	1.07	0.81
Indonesia	7.89	2.89	1.56
Japan	6.07	1.07	0.00
Korea	5.75	0.75	0.00
Pakistan	20.18	15.18	NA
Philippines	7.89	2.89	1.43
Singapore	5.00	0.00	NA
Taiwan	5.91	0.91	NA
Thailand	7.43	2.43	0.51

Source: <https://www.stern.nyu.edu/~adamodar/pc/datasets/ctrypremJuly23.xlsx>

Based on the information given in the table above, we determine the cost of direct investment for the analyzed company:

$$r_e = r_f + \beta_l \times (r_m - r_f) = 5.46 + 1.35 \times 10.46 = 19.58\%$$

The next stage of determining the weighted average cost of capital begins with determining the price of borrowed capital. To determine this, we determine the amount of interest expense on a company's income statement by dividing it by the amount of long-term and short-term debt on the company's balance sheet. It would be appropriate to express it like this (Khudaykulov, 2021):

$$r_d = \frac{\text{Interest expenses}}{\text{Long-term loans} + \text{Short-term loans}}$$

As a result, it is determined what percentage of the company's profit is the amount of borrowed funds.

Table 3. Calculation of the debt burden and cost of debt of oil and fat production joint-stock company

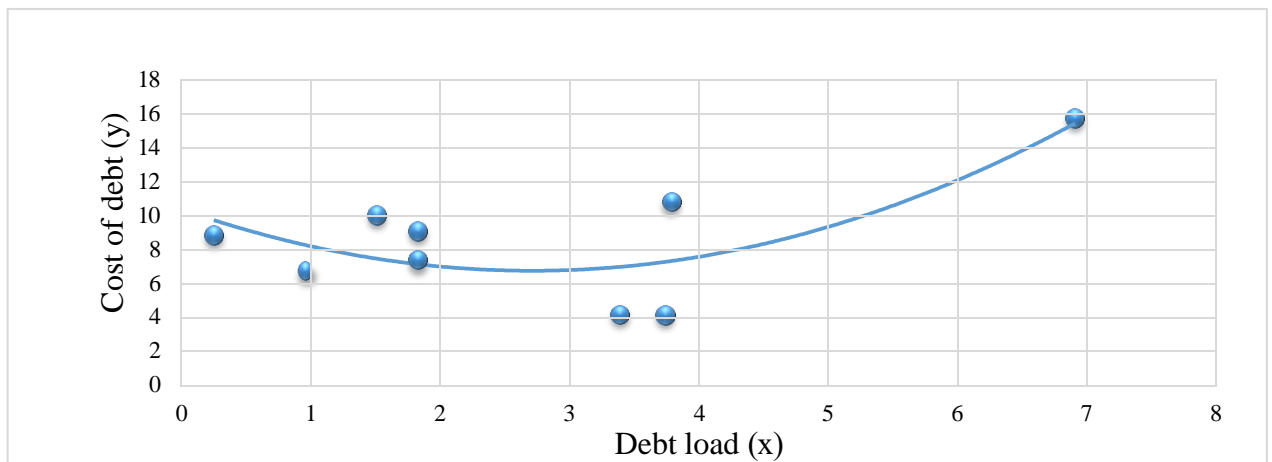
Name of enterprises	Debt load (x)	Cost of debt (y)
JSC "Andijan oil and fat"	6,91	15,77
JSC "Asaka oil"	3,74	4,17
JSC "Gulistan oil production"	1,82	9,02
JSC "Fergana oil and fat"	3,39	4,2
JSC "Yangiyul oil and fat"	0,25	8,86
JSC "Karshi oil production"	3,79	10,83
JSC "Yoggar Beruni"	1,51	10,05
JSC "Kokand oil and fat"	1,82	7,34
JSC "Tashkent Oil and Fat Plant"	0,97	6,69

Source: Compiled from financial statements.

The graph below shows the relationship between businesses' debt load and the cost of debt. Also, based on the graphical data, a quadratic regression equation was compiled and the coefficient of determination was checked.

Schedule 1

Graph of the dependence of the price of debt on the debt load



Source: Generated from data. $y = 0.49 \times x^2 - 2.6733 \times x + 10.395$

$$R^2 = 0.5804$$

From the graphical data above, it can be seen that the coefficient of determination among the 10 selected enterprises is 0.5804. It is clear from this that there is a significant degree of correlation between enterprises on the Chaddock scale.

We know that the amount of debt is directly related to the size of the debt burden, so the increasing side of the function we know is important to us. When we set the derivative of the above function $y=0.493 \times x^2 - 2.6733 \times x + 10.395$ to zero and then check that it increases in the interval, we get the following expression:

$$\frac{dy}{dx} = 2 \times 0.493 \times x - 2.6733 > 0$$

$$0.986x > 2.6799$$

$$x > 2.71$$

Thus, the function increases when $x > 2.71$. Therefore, the amount of debt capital of enterprises is equal to the same number when the value of the debt burden is less than 2.71, and as soon as it exceeds 2.71, the amount of debt also increases. Let's take the maximum debt load value to be 10.

Studying the level of enterprise value depending on the capital structure is a rather complex process, so we estimate the value of private and debt capital based on the leverage ratio, and find that their values remain unchanged at lower levels of debt. than 2.71, and also, we find that both capital prices increase as a result of exceeding 2.71. Creating an optimal capital structure is a never-ending process. Companies may consider increasing debt capital by 1% and increasing equity capital by 1%. Others may go a different route. In our study, we find out how the values of the companies we analyze change as a result of an additional increase in debt capital by 5%.

Conclusions and offers.

The higher the enterprise value sensitivity index, the higher the correlation between the fundamental value of enterprises and the capital structure, which indicates the need to optimize the capital structure. According to the results of the study, it was proven that the actual share of borrowed funds in the capital structure of the analyzed enterprises can be increased by an

additional 5% to the optimal level, and the fundamental value of enterprises can be increased to 1.0-1.5%.

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