THE VALUATION OF THE COST OF CAPITAL THROUGH THE DCF MODEL

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Abstract

This article describes the scientific and theoretical aspects of using the discounted cash flow method in assessing the capital value of a joint stock company. Also, the discounted cash flows method was used to assess the capital value of JSC "Kokand Mechanical Plant". It also identifies existing problems in using the method of discounted cash flows in the assessment of the capital value of the joint-stock company and ways to overcome them.

Key words. Cost of equity, discount cash flow, terminal value, risk free rate, beta, debt, weight average cost of capital

Introduction

These days, in developed countries, the valuation standard approaches and methods are widely used to determine companies' capital value. Also, the principles of valuation standards in calculating the capital value and value of enterprises' property of different forms of ownership are carried out. In particular, companies' capital valuation was evaluated in developed countries based on three different approaches to income, comparative and cost methods, according to the international standard.

However, unfortunately, one of the most pressing issues today is improving the valuation system in our country. That still does not improve valuation activities, valuation approaches, methods do not comply with the principles of international valuation standards, and the introduction of a single valuation standard based on best international practices. Also, the widespread use of the net asset and liquidity value method in calculating the capital value of enterprises in our country only indicates that there are shortcomings in the valuation process.

Therefore, the lack of a single national standard meets the international valuation standard in valuing companies' capital value. In our country, capital is valued at an unreasonably inflated price [1]. Besides, the lack of improvement in valuation activities in our country and the lack of approaches and methods of valuation to international standards limit the use of capitalization, discounted cash flows, capital markets and multiplier coefficients in assessing the value of company

capital. Therefore, under the state program on implementing the strategy of actions in five priority areas of development of the Republic of Uzbekistan in 2017-2021 in the "Year of Science, Enlightenment and Digital Economic", the introduction of a single standard of assessment based on foreign experience"[2]. Therefore, we dedicate this article to using capitalization and discounted cash flows based on the income approach in determining the capital value of companies in our country.

Literature review

In the 1930s, Graham and Dodd's book Securities Analysis focused on asset valuation techniques. In their opinion, the company' investment value's determination emphasizes that the assessment of the company's capital value will be very close. In recent years, changes in financial markets have necessitated using the market value of securities in asset valuation. With this in mind, they showed an evaluation of a company's shares through its tangible assets' market value"[3]. John Berr Williams described using the discount cash flow method in valuing a company's capital in his book Investment Investment Theory and demonstrated the theory of discounted cash flows in valuing capital. According to the researcher, three models play an essential role in the discounted cash flows theory. In particular, the company's capital value assessment involves the use of dividend discount models, free cash flow discount models, and residual income models. Although the calculation of these models is different, in theory, determining the value of the expected cash flows from the company's capital will be the same"[4].

In Miller's and Modiglian's research, the discount dividend model's theory was improved by them. According to the authors, investors consider two types of cash flows when buying a company's securities. The first is the number of dividends payable by the company in the period in which it owns the shares. The second is the market value of those shares in the period in which the company held investors' shares until the dividend was declared. According to the authors, the company's securities' market value is determined by the expected dividend for the period. That held by the holders of those securities"[5].

Myron J. Gordon contributed to the development of the discount dividend model. He developed an authorship model during his research, and according to this model, the value of shares is determined based on ever-increasing dividends. According to Gordon’s theory, if a company’s dividend policy pays dividends to regular shareholders when it is stable, using the Gordon model allows the company to calculate the number of dividends for the coming year [6].

Stephen Penman’s research focuses on the discount dividend model, where the future market value of a stock is not determined based on dividends. He noted that today there are difficulties in applying this model, as the large number of securities traded and the high volatility of their market value do not allow the use of this model [7].

According to a study by Grullon and Michael, in the 1980s, large companies began to repurchase their shares in large quantities. As a result, the conversion of funds in companies into investors' funds did not allow the dividend model's application. After that, most researchers began to use the free discount cash flow model. However, due to changes in the conjuncture of financial markets, the company began to use relative valuation method in assessing the value of capital. In turn, the value of the capital was determined using multiplier coefficients [8].

In scientific research, Stowe et al. have argued that it is appropriate to use three relative valuation methods in estimating a company’s capital value. In particular, the method of estimating relative income: P / E (Price-earnings ratio) and PEG (price/earnings to growth ratio) coefficients, the method of estimating relative cash flows: P/EBIT, P/EBITDA, P/CFO, EV/EBITDA coefficients.Relative asset valuation method: P/B or B/M ratios [9].

According to Barker's research, professional investors and financial managers have noted the P / E multiplier ratio's widespread use in practice [10]. Besides, a study by renowned economists Demirakos, Strong, and Wokera concluded that 89% of companies perform capital valuations using the relative income valuation method [11].

In our opinion, when buying shares of companies that are not regularly traded in the stock market, investors pay attention to the number of dividends expected from the shares of these companies. However, when buying shares of companies in which securities are in constant circulation, investors buy the company taking into account the company's multiplier ratios, determined by financial managers. It can be seen that the capital value of enterprises is directly related to the method of estimating relative income.

Research method

The study uses the method of assessing the capital value of companies in developed countries. According to it, the method of determining the value of capital through free cash flows is used. Also, in determining the company's free cash flows, capital expenditures, depreciation costs, and working capital changes are taken into account. The valuation of a company’s capital is determined using valuing financial

assets at a discount rate. The following indicators were calculated and analyzed in the assessment of the company's capital value:

$$\textbf{The capital value of the company} = \sum_{t=1}^{t=n} \frac{\textbf{Free cash flows from capital}_t}{(1 + K_e)^t}$$

Where,

Free cash flow from capital = expected crop cash flow from capital in period t;

Ke = capital value

Expected free cash flow from capital = Net profit + depreciation-change in working capital-cost of capital + interest expense (tax rate 1).

The research object was the joint stock companies of the developed countries of the world, based on the data of which, using the methods of grouping, comparative analysis, sample tracking analysis, the capital value of the joint stock company and the weighted average value of capital were determined.

The data were analyzed using the official website of the foreign economist Damodaran and JSC "Kokand Mechanical Plant" data to determine the free cash flows, leverage and unleveraged beta coefficient, and capital value of the joint-stock company.

Analysis and results

These days, there are 597 joint-stock companies in Uzbekistan. The shares of Kokand Mechanical Plant JSC were sold in the form of SPO. According to the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated May 10, 2017 No 268 "On the organization of public offering of shares on the stock exchange", the first SPO in the stock market of the country was held by JSC "Kokand Mechanical Plant". Our study used the discounted cash flow method to estimate the value of a corporation’s capital. Revenues from the sale of products of Kokand Mechanical Plant are shown in the following figure (Figure 1)

Figure 1

Revenues from the sale of products of JSC "Kokand Mechanical Plant”

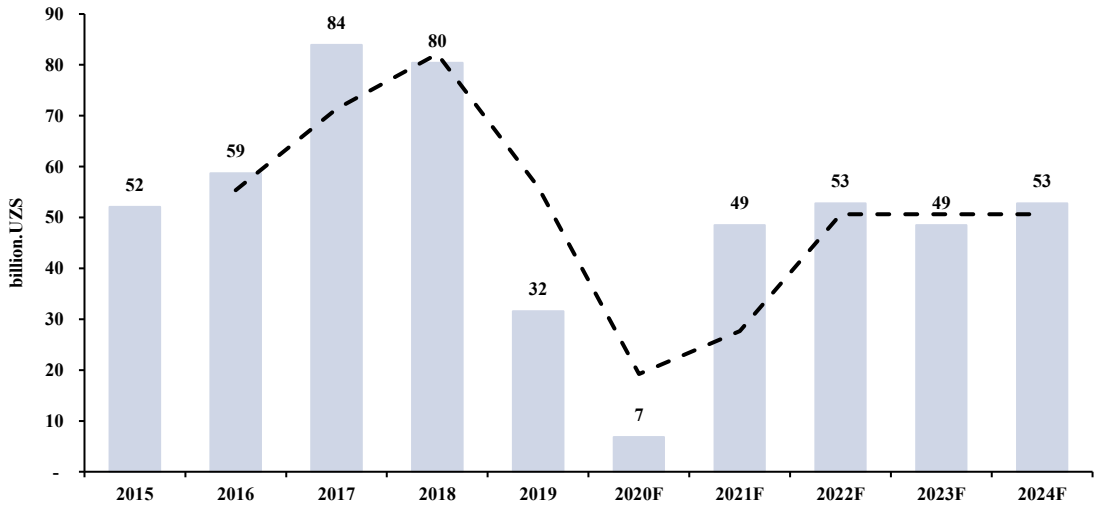

Figure 1 shows that as a result, the revenue of JSC "Quartz" will reach 7 billion UZS by 2020 and 53 billion by 2024. Growth rates will smoothly increase from 6.4% in 2021 to 9.6% in 2022 and 14.1% by 2024. EBIT margin for the last three fell from 21% to 6%. According to our estimates that based on the company's expected plans to expand production by 2024. It will reach 6 %, which will lead to a reduction in the NOPLAT margin from 30% in 2019 to 7% in 2024. However, NOPLAT margin will grow slowly over the forecast period (table 1).

Table 1

DISCOUNT CASH FLOW MODEL OF JSC "Kokand Mechanical Plant”

Forecast period model, billion UZS	**2020F**	**2021F**	**2022F**	**2023F**	**2024F**	**mature**
revenue growth rate,%	*3,2%*	*6,4%*	*9,6%*	*12,8%*	*14,1%*	*5,4%*
(+)Revenue	**6,8**	**48,5**	**52,8**	**48,5**	**52,8**	**55,6**
(x) Operating margin	3,7%	7,4%	11,1%	14,8%	16,3%	7%
(=) EBIT	**0,25**	**3,59**	**5,87**	**7,19**	**8,60**	**3,9**
Tax rate	12%	12%	12%	12%	12%	12%
(−)Tax on EBIT	0,0	0,4	0,7	0,9	1,0	0,5
(=) NOPLAT	**0,2**	**3,2**	**5,2**	**6,3**	**7,6**	**3,4**
(−)net reinvestment	-55	9	14	26	26,5	0,5
CapEx	2,1	2,7	3,4	4,2	5,2	0
(+) changes in WC	-52,9	10,5	14,7	26,3	25,9	0
(−) DD&A	4,2	4,0	3,8	4,2	4,6	0
(=) FCFF	**55**	**(6)**	**(9)**	**(20)**	**(19)**	**3**
(x) discount factor	0,87x	0,73x	0,60x	0,50x	0,42x	0,50x
PV FCF	48	(4)	(6)	(10)	(8)	1
Terminal value						20
PV Terminal value						**8**

Implied model variables	**2020F**	**2021F**	**2022F**	**2023F**	**2024F**	**mature**
Revenue /capital, x	0,10x	0,49x	0,47x	0,45x	0,44x	
Invested capital, billion UZS	70	100	114	140	167	
Net reinvestment, %	-24600%	292%	278%	416%	351%	15%
ROIC, %	0%	3%	5%	5%	5%	5%
Margin NOPLAT, %	3%	7%	10%	13%	14%	6%
WACC calculation	**2020П**	**2021П**	**2022П**	**2023П**	**2024П**	
Risk free rate	15,0%	15,0%	15,0%	15,0%	15,0%	
levered beta	1,1	1,1	1,1	1,1	1,1	
risk premium	4,63%	4,63%	4,63%	4,63%	4,63%	
Equity cost	**20%**	**20%**	**20%**	**20%**	**20,09%**	
Debt rate, before taxes	17,2%	17,2%	17,2%	17,2%	17,2%	
Debt rate, after taxes	**15,1%**	**15,1%**	**15,1%**	**15,1%**	**17,2%**	
equity / company value	100%	100%	100%	100%	100%	
Debt / Company Value	0%	0%	0%	0%	0%	

Weighted average cost of capital	**20%**	**20%**	**20%**	**20%**	**20,0%**
Cumulative cost of capital	0,87x	0,73x	0,60x	0,50x	0,42x

Capital valuation, billion UZS	
(=) Cost in the forecast period	20
(+) Cost in the mature period	8,305
(=) EV	**28**
(−)Debt	0,0
(+) Cash	0,6
(=) cost of equity	**29**
Market capitalization	25
Target share price, UZS	**1 296**
Market price, UZS	900
Growth potential, %	44%

Multiplier	valuation DCF
P/BV, x	0,9x
P/E, x	-3,8x
BV, 2019	31
Net profit, 2019	-8

Table 1 shows that In 2019, the net loss amounted to 7.56 billion UZS as a result of a sharp decrease in revenue (from 80.37 billion UZS in 2018 to 31.58 billion UZS in 2019), which resulted in low gross profit that did not cover operating expenses (although they decreased in twice). The company's assets decreased by 6.6%, and equity by 27.8%. Forecast of future cash flows in 2020-2024 years was drawn up based on its new business plan. Thus, the company plans to get a net profit of 2.5 billion UZS, and by 2024 bring the net profit to 3.19 billion UZS. However, the company's business plan includes an EBIT margin of 45.5%, which we considered overly optimistic, and made our forecast for an EBIT margin of 20.5% by 2024 (average margin for 2015-2017) and movement margin to average in 2020-2023, which is much more a conservative forecast than the forecast of the company itself. The cost of equity capital is calculated based on the Central Bank of Uzbekistan refinancing rate of 14% per annum plus a risk premium on equity investments of 4.63 with a beta of 1.1x.

The final estimate is 29 billion UZS by DCF. Based on the above assumptions, the cost of JSC " Kokand Mechanical Plant " in the forecast period will amount to 20 billion UZS and 8,3 billion UZS in the terminal period. The value of operating

assets is 28 billion UZS, taking into account the net cashless debt of 0 billion UZS. We get an estimate of the equity capital of JSC "Kokand Mechanical Plant" at 29 billion UZS, which is equivalent to 1296 UZS per 1 common share. The analysis result given this target price, the fundamental upside potential towards the lower end of the range is 44%.

Conclusion and recommendations

It can be concluded from the analysis that joint-stock companies in our country almost do not use the method of discounted cash flows in estimating the value of capital.

The main reason for this is the underdevelopment of the stock market in our country. There are the following problems with the use of the discounted cash flow method in assessing the capital value of joint-stock companies:

Firstly, the market capitalization of joint-stock companies in our country is very low. That is because the state's share is high in many joint-stock companies, while private investors' share remains low.

Secondly, due to the country's high risks, the expected return on capital of joint-stock companies is high. That significantly limits the opportunities to attract investment through securities.

Thirdly, the investment attractiveness of stocks of joint-stock companies is almost low. The main reason for this is that the dividend policy is not being appropriately pursued. That is because joint-stock companies pay a dividend payment of 50% of the share's nominal value for the first two years. In subsequent years, they do not pay dividends due to directing the company's net profit to the capitalization of the charter capital.

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