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Firm Valuation Through Discounted Cash Flows Method: An Empirical Example on an Automotive Company in Borsa Istanbul**

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Abstract: There has been a rapid increase in both the number of stock market investors and the number of public offerings in recent years with the Covid-19 pandemic in Borsa Istanbul (BIST) in Turkey. With these increases, the issue of choosing stocks for investors has become a very important issue. Investors need to estimate the true value of companies in order to make an accurate investment decision. The main purpose of this study is to make a firm valuation of an automotive sector company traded in Borsa Istanbul and to compare the stock value found with the current stock price. Free cash flow to the firm (FCFF), which is one of the discounted cash flow methods, was used for firm valuation. The findings of the study showed that the firm values of the automotive company calculated with the discounted cash flow method are applicable. The findings of the study showed that the firm values of the automotive company calculated by the discounted cash flows method are applicable.

Keywords: Firm Value, Discounted Cash Flow Method, FCFF, BIST, Automotive Sector

1. Introduction

Recently, financial markets in Turkey have attracted a lot of attention. Recent Initial Public Offerings (IPOs) and the increasing number of investors, according to the data of the Central Registry Agency (MKK), are indicators of this interest in Turkey. These developments in Turkish financial markets also increase the importance of financial literacy. In order to make more accurate investments, the real values of the companies should be known. For this reason, investors are expected to have knowledge about firm valuation.

Firm valuation is among the most decidedly discussed topics in finance. Accurate determination of firm value is very important when making investment decisions. Currently, many data belonging to companies can be easily accessed. The data obtained also facilitates the determination of the firm's value. Investors and analysts try to find company value by using firms' data. In this context, there are many firm valuation methods.

Among the firm valuation methods, one of the most commonly used methods is the discounted cash flows method. In this method, the present value of the firm's cash flows is taken into account. Because the inputs of this method are predictive, firm value may differ from person to person.

The method of discounted cash flows, like other methods, has advantages and disadvantages. Advantages: it has clear, consistent decision criteria for all projects, yields the same results when risk preferences are not taken into account, contains reasonable certainty, and is economically rational. In addition, this method also cares about the time value of money, takes into account risk factors and is widely accepted. The disadvantages can be listed as the uncertainty of the future results, the variability of the cash flows in the

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projection period, the existence of various sources of business risk, the variability of the firm's risk over time, the difficulty of evaluating all factors (Mun, 2002: 58-59).

The aim of this study is to try to calculate the real value of a firm with the discounted cash flow method, which is one of the firm valuation methods. Accordingly, the firm value of Ford Otosan Company, which is traded in the automotive sector of Borsa Istanbul (BIST), was determined by the discounted cash flow method and the findings were interpreted.

2. Literature Review

The importance of the firm valuation in the financial literature ensures that the subject remains constantly up to date. Some of the studies in the literature on firm valuation are as follows in chronological order.

Taner and Akkaya (2003) evaluated companies in different sectors using Net Asset Management, Discounted Cash Flow method and Ratio Analysis when determining firms' value. It has been concluded that the methods used do not have any superiority over each other, and more accurate results are achieved when various method**s** are used together. Ülgen and Teker (2005) used the method of discounted cash flow as a quantitative valuation technique on industrial companies traded on the ISE in Turkey. In this study, it is concluded that the use of EBITDA instead of net profit gives results closer to the market prices due to the discounted cash flow method to the firm.

Alkan and Demireli (2007), in their study on some firm valuation methods used in Turkey, concluded that the methods are based on different assumptions, but there are similarities between the methods. In addition, in this study, it is emphasized that which method will be used in valuation will vary according to the purpose of the valuation. Elmas et al. (2007) applied the methods of discounted cash flows in firm valuation to companies in the BIST Information Technology Sector. In the study, it was stated that the method of cash flows discounted by equity gives more accurate results than the method of cash flows discounted by firm.

Bal (2009) tried to compare different cash flow methods in investment decisions. Accordingly, it has been revealed that each method gives different results when making investment decisions. Janiszewski (2011) presented theoretical and practical information about the valuation using the discounted cash flow method. In this study, which reveals that the method determines the true value of the company in the best way, it is emphasized that the projection period is very sensitive to assumptions. In addition, it was stated that since different assumptions in the discounted cash flow method lead to different results in the firm's value, it would be more accurate to determine the company value as a range according to different scenarios.

Aydın (2012) examined the studies on the discounted cash flow method, the relative valuation method and the economic value-added methods, which are among the firm valuation methods. In this study, it was stated that since the parameters used by the examined methods are different, the results of the valuation may also differ, and therefore, the valuation studies do not include a definite value and estimation. Begovic et al. (2013) analyzed the issue of firm valuation using discounted cash flow methods. In the study, two discounted cash flow methods, the discounted cash flow method to the firm and the cash discounted to equity method, are examined comparatively. Accordingly, the similarities and differences, advantages and disadvantages of these two approaches are presented. As a result, it has been concluded that free cash flows discounted to equity give more accurate results in determining firm value.

Bilir and Kulali (2014) compared discounted cash flows with relative valuation methods. In the study, it was stated that both methods can be used effectively in valuation studies and that different methods can be selected according to the purpose of the appraiser. Çetiner et al. (2018) made a firm valuation of an exchange-traded electricity firm using the method of discounted cash flows. In this study, it was emphasized that the company value obtained is based on the foresight and assumptions of the appraiser, so the

data to be used in the discounted cash flows method should be carefully selected. Ünvan (2019) carried out an application on Turkish Airlines using company valuation approaches. In this study, it is recommended to choose the method to be used in order to make a healthy evaluation and to compare the results obtained with different methods in the application process.

3. Method of Discounted Cash Flows

One of the most used methods in company valuation is the discounted cash flow method. The most important issue in this method is the cash flows that the company will generate in the future. In valuation with discounted cash flows, to determine the value of an asset, it is to determine the present value of the asset by discounting the future cash flows of this asset (Damodaran, 2005).

According to the method of discounted cash flows, company assets increase the value of the company by providing a cash increase. For this reason, in order to determine the company value, it is estimated by taking into account the time value of the cash flows that the company will receive during its activities and the investment risk. The inputs used with discounted cash flows, the growth rate of cash flows and the discount rate, which is a measure of risk, are of great importance. In this method, the value of the asset is based on the assumption that all the cash that the asset will produce is equal to its present value (Bilir & Kulali, 2014). There are two different methods for discounted cash flows.

3.1. Free Cash Flows to Equity (FCFE)

When calculating cash flows to equity, only cash flows belonging to equity holders are taken into account. Lenders are not considered in this method. The discount rate used in the method of Free Cash Flows to Equity (FCFE) is the cost of equity. Free cash flows to equity that are thought to be obtained from the company's value are discounted to the present value with the cost of equity. If the firm is publicly traded, this value is divided by the issued capital (Ercan & Ban, 2005: 341-342).

3.2. Free Cash Flows to the Firm (FCFF)

In the method of free cash flows to the firm, free cash flows belonging to all resource owners are taken into account. Here, the WACC (Weighted Average Cost of Capital) is used as a reduction ratio. The present value of the liabilities is subtracted from the discounted cash flows to the firm. If the company is open to the public, the value of one company's shares is calculated by dividing it by the number of shares (Ercan & Ban, 2005: 348).

4. Important Concepts Used in Valuation

4.1. Ongoing Value

Firm value in the discounted cash flow method is expressed as the present value of the cash flows that the firm will generate in the future. Since the future cash flows cannot be predicted exactly, the projection period is divided into two periods as predictable and unpredictable periods. The predictable period is generally considered to be 5-10 years. Keeping the predictable period long may cause the valuation results to diverge from their true value. The growth rate for the firm in the predictable period can be taken as the average of the growth rate of previous years. It is assumed that the growth rate after the predictable period shows a constant growth like the country's growth rate. In the discounted cash flow method, although the life of the firm is considered limited, it should not be forgotten that it will provide cash flow in an unlimited time. This generated cash flow significantly affects the value of the company. For this reason, the company's valuation requires an estimate of the cash flows of the period after the forecast period. The long duration makes it difficult to predict. So the ongoing value, which is a representative value, can be used instead of estimating

this unpredictable period in detail as a year. Thus, with the discounted cash flow method, the value of the firm is considered as the sum of the present value of the cash flows for the predictable period and the present value of the continuing value (Önal et al., 2005).

4.2. Discount Rate

The most sensitive and most difficult variable to determine the discounted cash flow methods is the discount rate. Because the discount rate contains many variables and is determined subjectively, it should be very careful about potential abuses. In the method of free cash flows to equity, the cost of capital is used as a discount rate. In the method of Free Cash Flows to the Firm (FCFE), Weighted Average Capital Cost (WACC) is used as a discount rate (Bilir & Kulali, 2014).

4.3. Weighted Average Cost of Capital

Since cash flows to all capital holders are taken into account in the model of FCFF, the discount rate is calculated according to the ratio of the weights used in these resources. The costs of different resources, the cost of equity and the cost of debt, are calculated individually. When the weighted average capital cost account is evaluated as three stages, the ratio of all the elements that make up the resources in the first stage is calculated. In the second stage, the individual costs of these resources are calculated. Finally, the ratios of resources in total resources are multiplied by their costs (Aydin, 2012).

4.4. Net Working Capital

Working capital refers to the capital required by the enterprise during its production activities. The sum of existing assets is considered Gross Working Capital. The portion of current assets exceeding short-term liabilities is called Net Working Capital (NWC) (Elmas et al., 2017). Cash and securities accounts are not included in the current assets when calculating Net working capital. This is because cash and securities are not used for core activities. Interest bearing financial liabilities are also not included in short-term resources. Because they carry an interest burden, they are already evaluated in the operating profit account after tax (Üreten & Ercan, 2000: 86-87). Net working capital (NWC) can be calculated as follows (Elmas et al., 2017):

NWC = (Current Assets - Cash) – (Short Term Foreign Resources - Financial Liabilities)

5. Application

5.1. Data Set and Study Limitations

In this study, the company valuation of Ford Otosan (Turkey's export leader, Turkey's 2nd largest industrial enterprise, the highest employment in the Turkish automotive industry and Europe's largest commercial vehicle manufacturer) was made using the discounted cash flow method. For this purpose, the financial statements of the company for the years 2014-2020 were used. For company data, the Public Disclosure Platform (www.kap.org.tr) and the investor relations section of the company's website (www.fordotosan.com.tr) were used.

5.2. Concepts Used in the Study and Their Meanings

In the study, firstly, the free cash flows of the projection period were calculated, then the WACC was calculated to determine the discount rate, and finally the company value was calculated by discounted the free cash flows of the projection period to their present value with the determined discount rate. Some of the concepts discussed for analysis and their meanings are as follows.

Risk-Free Interest Rate: Changes in the rate of 30-year Eurobonds issued by the Ministry of Treasury and Finance of Turkey were monitored. The risk-free interest rate was accepted as 7.04%.

Risk-Free Rate of Return: Changes in the 10-year TL bond rate in Turkey were followed. The Risk-Free Rate of Return was accepted as 18.60%.

Market risk premium: Risk premiums in public offerings in Borsa Istanbul in the last 3 years are in the range of 5.0%-6.5%. In this study, the risk premium is considered as 6.5%.

Expected Market Return: The sum of the risk-free rate of return and the market risk premium were taken.

Beta Coefficient: It expresses the deviation rate between the stocks with each other or with the index. If the beta value is one, it is considered that there is a parallelism between the stock and the index (Çetiner et al., 2018). In this study, the Beta Coefficient, which is generally accepted in valuation calculations, is considered as one.

5.3. Findings of the Study

In this study, future cash flows of Ford Otosan company were evaluated by considering the current financial statements and annual reports, and the value of the company was tried to be determined by using these cash flows. The resulting cash flows have been estimated using the FCFF method, which is one of the Discounted Cash Flow Methods.

Projections created for the coming years have been tried to be estimated, especially considering the average size of the sales revenues of Ford Otomotiv company. The cost of sales item for future years was estimated as a percentage of sales. This percentage was the average of the cost of sales between 2014 and 2020. The projections and valuation results of Ford Automotive company established for the years 2021-2025 are shown in Table 1.

Table 1. Projections and Valuation Results of Ford Otomotiv (TL)

	31.12.2021	31.12.2022	31.12.2023	31.12.2024	31.12.2025
Sales Revenues	62.924.834.742	80.069.204.649	101.884.694.007	129.643.986.329	164.966.517.839
Cost of sales (-)	-56.134.407.164	-71.428.671.263	-90.889.978.824	-115.653.673.861	-147.164.433.864
Gross profit	6.790.427.578	8.640.533.386	10.994.715.183	13.990.312.468	17.802.083.974
Operating expenses	-2.823.002.955	-3.592.152.483	-4.570.862.895	-5.816.230.715	-7.400.908.867
Operating Profit	3.967.424.622	5.048.380.903	6.423.852.288	8.174.081.753	10.401.175.107
Tax (-)	-79.348.492	-100.967.618	-128.477.046	-163.481.635	-208.023.502
Depreciation (+)	1.337.710.110	1.702.179.830	2.165.952.215	2.756.083.061	3.506.999.733
Capital Expenditures (-)	-2.570.474.839	-3.270.821.079	-4.161.982.204	-5.295.947.239	-6.738.870.035
Change in NWC (-)	-316.340.894	-402.530.478	-512.203.097	-651.756.890	-829.333.220
Free Cash Flow to the Firm	2.338.970.506	2.976.241.557	3.787.142.157	4.818.979.050	6.131.948.083
Discounted Cash Flow	1.966.252.196	2.103.280.167	2.249.857.607	2.406.650.018	2.574.369.281

Valuation Results	
Total Cash Flows	11.300.409.268
Residual Value	52.267.302.265
Cash Equivalents	8.124.073.000
Financial Debts	8.080.874.000
Equity Value	63.610.910.533
Paid-in capital	350.910.000

Share Value	**181,3**
Performance of the Stock in the First Four Months of 2021	122,1 - 242

In the firm valuation study conducted using the discounted cash flow method, Ford Otosan company value was determined. As a result of the calculation, the value of the stock was found to be TL 181.3. This value is among the prices the company saw in the first four months of 2021. Accordingly, it can be said that the price of the company in Borsa Istanbul is close to the value of the company, therefore the company is not priced abnormally. In addition, the free cash flow to the firm method, which is one of the discounted cash flow methods, is suitable for this company.

6. Conclusions

Determining the company value is extremely important especially for those who will invest in the stock market. In addition, the company value should be determined in cases such as company acquisition, takeover and merger. The essence of valuation is that the company price is as close to the required value as possible. Firm valuation methods are used by investors and analysts to determine company value.

The Covid 19 pandemic has affected all sectors in the world, including the automotive sector. Immediately after the pandemic, the prices of automotive companies in BIST decreased very rapidly. However, a decrease in the company price does not mean that the company is below its real value. In this case, valuations should be made in order to understand whether all the shares whose prices have decreased are really cheaper.

In this study, the firm value of Ford Otosan, which is among the most valuable companies operating in the BIST Automotive sector, was determined by the discounted cash flow method. The results of the analysis used in the study showed that Ford Otosan's share value was TL 181.3. When the 181.3 TL share value of Ford Automotive company is compared with the stock market prices in the first four months of 2021, it can be said that the stock prices of the company are very close to the company's value, therefore, according to this result, investors will be able to invest in Ford Automotive company as the prices decrease. Accordingly, it can be stated that the FCFF method is successful in determining the value of Ford Automotive company.

According to the results of the study, it can be said that the discounted cash flow method is an effective method in determining the value of the company. However, considering that the assumptions in the estimation period are subjective and therefore the valuation will be able to handle different data, it can be said that the firm values found will differ from each other. Therefore, it should be taken into account that the firm values determined in this study may be misleading. In addition, it is recommended to determine the value of the firm with different methods and to make an investment decision by comparing the results.

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