EVALUATION OF AUTOMOTIVE SECTOR COMPANIES WITH THE DISCOUNTED CASH FLOW METHOD

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Abstract. *The number of individual investors and Interest in the capital markets has recently increased rapidly in Turkey. Especially in the stock markets, investors should have basic and technical analysis information in order to make the right investment decisions. Among the fundamental analysis topics, company valuation methods have a very important place. In addition, although there are different company valuation methods, "Discounted Cash Flows Method", which is among these methods, is one of the most known and used methods. The purpose of this study is to evaluate the two important automotive sector shares traded in Borsa Istanbul (BIST) according to the Discounted Cash Flow Method and to calculate the real market price. In this study, in which the "Free Cash Flow to Firm" method, one of the Discounted Cash Flow Methods, is used, it is seen that the real firm values are lower than the current market values.*
Keywords: *Valuation, Firm Valuation, Discounted Cash Flows, Borsa İstanbul (BIST), Automotive Industry.*

JEL CLASIFICATION: D53, D81, G11, G13

1. Introduction

People have always wanted to grow their assets. One of the ways to grow these assets is to invest in the financial markets. Financial markets are places that contain many different markets and investment instruments and where people can easily invest. Some financial markets and investment instruments are fixed income and low risk, while others are variable return and high risk.

Investors who invest in financial markets generally want to earn high returns. However, high returns include high risks. In this case, investors want to reduce their risk level. One of the important ways to reduce risk is to have financial analysis knowledge. Thus, the investor will be able to invest in the future for a sufficient return at an appropriate risk level.

Although financial analysis is a very wide field, there are constantly preferred methods as analysis method. One of the most used analysis methods and evaluated within the scope of fundamental analysis is valuation. Value can be thought as a benefit provided by an asset or service. Valuation is the study performed to determine this value of the asset in the most accurate way. In financial markets, the price and value of the asset are generally not the same. For this reason, it is tried to be determined by valuation methods whether the prices of assets in the market are higher or lower than their real values.

The variables that most affect the value of an asset are the future cash flows, maturities and risks that the assets will provide. With valuation analysis, investors try to make better investment decisions by evaluating expected cash flows and risks in a certain term. Although there are many valuation methods, one of the most used methods is Discounted Cash Flows (DCF) method. This method calculates the price that an asset should be, taking into account the present values of the future cash flows of the asset. One of the most preferred risky investment instruments in financial markets is stocks. When investors invest in stocks, they want to know how stock prices will move in the future, whether they can make a profit, and whether the stock is less than its true value. One of the most used valuation methods in determining the value of stocks is the Discounted Cash Flow method (Carter & Demissew, 2008, p. 58-59); (Elmas, Yılmaz, & Yalçın, 2017, p. 1221-1222).

The future cash flows are difficult to predict and close attention should be paid to this issue. The cash flows that will occur should be discounted in line with the existing and potential risks and valuation should be done. It can be considered that correct valuation is made in previously determined cash flows such as rental income. However, even in this case there is a risk that the rent will not be paid. Therefore, if the appraiser acts carefully while determining future expectations and adopts multiple scenarios, the quality of the valuation will increase (French & Laura, 2005, p. 76-77).

In the light of this information, the main purpose of this study is to evaluate the companies of the automotive industry, Ford Automotive Industry Inc. (FROTO) and Tofaş Turkish Automobile Factory Inc. (TOASO), using the Discounted Cash Flow method, which is one of the most used valuation methods. The market values obtained as a result of the valuation were compared with the current market values and interpreted.

2. Literature

There are national and international academic studies in the literature especially on the discounted cash flow method. In addition, there are many studies conducted using different valuation methods. However, the number of studies in which several valuation methods are considered together is less. Some of these studies are as follows.

Hatipoğlu and Yener (2013) investigated the applicability of Discounted Cash Flow Methods in the Turkish energy sector. According to the study, the Free Cash Flow Method to Firm (FCFF) gave better results in the Turkish energy sector than the Free Cash flows to Equity method (FCFE). Bilir and Kulalı (2014) compared the Relative Valuation Method with the Discounted Cash Flow Method. Thus, he investigated which method can be chosen in which situations in terms of financial analysts. As a result, they determined that each method is an effective valuation method for their own purposes and that the methods are not superior to each other.

Altan and Karahan (2016) examined which of the firm valuation methods (Free Cash Flows to Firm (FCFF), Free Cash Flows to Equity (FCFE) and Economic Value Added (EVA) method) would yield better results in which sector. Five companies from each sector were determined and the firm values of the sectors were tried to found with these three methods. It has been found that the Economic Value Added Method is the most appropriate method in the energy, technology and transportation sectors, whereas the Free Cash Flows to the Firm Method in the food sector in determining the market values.

Elmas et al. (2017), using the discounted cash flow method, evaluated two companies in the BIST informatics industry. For this, cash flow to firm and cash flow to equity methods are used. As a result, it has been determined that the Free Cash Flows to Equity (FCFE) method is more consistent than the Free Cash Flows to Firm (FCFF) method.

After Masun (2017) introduced valuation methods, he made an application in the hotel and tourism sector. According to this study, the valuation methods gave very realistic results. In addition, these methods can be applied to operating in Turkey has been emphasized many tourism companies.

Çetiner et al. (2018) explained the discounted cash flow methods and made a valuation of a firm from the energy sector using the Free Cash Flow Method to Firm (FCFF). They stated that the way to reach correct results in the valuations made with reduced cash flows is to make accurate estimates.

3. Firm Valuation with Discounted Cash Flow Method

The value of an asset is tried to be estimated by expected cash flows. The value of an asset varies depending on the amount of cash flows it will generate in the future and its predictability. In the discounted cash flow method, high discount rate is used when determining the value of risky assets, and low discount rate is used when determining the value of safe assets (Damodaran, 2005, p. 696).

Net cash flows used in the discounted cash flow method is a different concept from the amount of profit. The difference between the company's cash inflows and cash outflows in a given period represents the net cash flow (Karapınar & Zaif, 2012).

The Free Cash Flows are found by deducting investment expenditures from the cash amount of the firm's activities. According to scope, cash flows from operating activities are divided into two categories: Free Cash Flows to Equity and Free Cash Flows to Firm (Karapınar & Zaif, 2012, p. 239).

3.1. Free Cash Flows to Firm (FCFF)

The Free Cash Flows to Firm (FCFF) takes into account cash flows to both equity and liabilities. In this respect, Free Cash Flows to Firm are one of the more comprehensive and the more used methods.

In this method, free cash flows must first be calculated. Free cash flows can be calculated as follows (Gündoğdu, 2017, p. 492-493):

Free Cash Flows = EBIT + Depreciation Expenses – FAI – CWC

Here;

EBIT: Earnings Before Interest and Tax

FAI: Fixed Asset Investments

CWC: Change of Working Capital

Later, in this method, the Weighted Average Cost of Capital (WACC) method is used as the discount rate of cash flows. Accordingly, the share value can be calculated using the formula below.

$$Share\ Value = \sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1+WACC)^t}$$

Here;

$FCFF_t$: Free Cash Flow to Firm in year t

WACC: Weighted Average Cost of Capital

The weighted average cost of capital formula is as follows (Karapınar & Zaif, 2012):

$$WACC = i_d\ (1-t)\ w_d + \ i_s\ w_s$$

Here,

WACC: Weighted Average Cost of Capital

i_d = Borrowing Cost Ratio

i_s = Equity Cost

w_d= Weight of Liabilities in Total Resources

w_s=Weight of Equity in Total Resources

t = Tax rate

3.2. Free Cash Flow to Equity (FCFE)

In the Free Cash Flow to Equity (FCFE) method, only cash flows to equity are taken into account. In this method, the amount left to the capital owners after the liabilities are deducted is taken into the valuation. Here, the equity cost ratio is taken into account in discounting cash flows (Damodaran, 2005, p. 701).

$$Share\ Value = \sum_{t=1}^{t=\infty} \frac{FCFE_t}{(1+k_e)^t}$$

Here;

$FCFE_t$: Free Cash Flow to Equity in year t

k_e: Equity cost

4. Methodology of the Study

In this study, two automotive firms traded in BIST30, Ford Automotive Industry Inc. (FROTO) and Tofaş Turkish Automobile Factory Inc. (TOASO), are evaluated according to the discounted cash flow method. In this study, fixed growth models are used and it is assumed that the cash flows to be created by the firms in the future will increase continuously after the forecast periods.

For these calculations, five-year (2015-2019) balance sheets and income statements of two companies were taken into account. Then, firms' cash flows were tried to be estimated for the next five years (2020-2024).

5. Findings

In the study, five-year (2015-2019) data belonging to Ford Automotive Industry Inc. (FROTO) were used first and some items required to generate estimated cash flows were calculated. Then, cash flows for the next five-year period (2020-2025) were calculated in the light of the first five-year data. These calculations are shown in Table 1 and Table 2.

In Table 1, average values have been created in order to generate cash flows for the next 5 years by using 2015-2019 data. At the same time, free cash flows were tried to be formed with the help of Table 1.

Table 2 is created with the help of the averages calculated as a percentage of sales in Table 1. Thanks to the estimated figures, free cash flows of the next 5 years were calculated first and then these values were discounted to today. In addition, terminal values were calculated with the assumption of growth at a certain rate after 5 years.

Table 1: First five-year (2015-2019) financial statement data of FROTO (Turkish Liras, TL)

	2014	**2015**	**2016**	**2017**	**2018**	**2019**
Sales Revenues	11.924.836.507	16.746.396.740	18.289.107.000	25.341.290.000	33.292.030.000	39.209.019.000
Cost of Sales (-)	-10.794.249.532	-14.886.511.502	-16.203.045.000	-22.704.095.000	-29.833.459.000	-35.193.802.000
Gross Profit/Loss	1.130.586.975	1.859.885.238	2.086.062.000	2.637.195.000	3.458.571.000	4.015.217.000
Operating Expenses	603.984.991	879.242.587	1.057.148.000	1.110.975.000	1.187.929.000	1.441.578.000
Net Operating Profit/Loss	526.601.984	980.642.651	1.028.914.000	1.526.220.000	2.270.642.000	2.573.639.000
EBIT	390.412.250	865.828.239	970.171.000	1.481.161.000	1.761.112.000	1.950.173.000
Tax (-)	-204.443.861	23.917.565	14.863.000	-8.822.000	77.916.000	-9.311.000
Depreciation (+)	304.730.151	405.107.370	456.387.000	473.624.000	569.203.000	775.988.000
Capital expenditures (-)	858.000.000	466.000.000	602.446.308	939.000.000	1.200.000.000	844.900.000
Change of working capital (-)	404.072.700	106.380.966	-22.859.327	-82.383.000	-780.844.000	-83.805.000
Free Cash Flow	-226.296.704	789.451.490	890.851.019	1.152.049.000	2.342.773.000	2.597.843.000

Table 2: FROTO's estimated cash flows for a five-year period (2020-2024) (TL)

	2020	**2021**	**2022**	**2023**	**2024**	Terminal Value
Sales Revenues	49.979.910.952	63.709.614.839	81.210.929.466	103.519.933.079	131.957.319.234	
Cost of Sales (-)	-44.729.604.460	-57.017.025.798	-72.679.856.440	-92.645.336.341	-118.095.422.392	
Gross Profit/Loss	5.250.306.491	6.692.589.042	8.531.073.026	10.874.596.739	13.861.896.841	
Operating Expenses	2.309.437.218	2.943.849.896	3.752.538.558	4.783.377.595	6.097.392.700	
Net Operating Profit/Loss	2.940.869.274	3.748.739.146	4.778.534.467	6.091.219.144	7.764.504.141	
EBIT	2.485.541.345	3.168.330.610	4.038.685.124	5.148.129.895	6.562.344.080	
Tax (-)	-497.108.269	-633.666.122	-807.737.025	-1.029.625.979	-1.312.468.816	
Depreciation (+)	1.085.206.661	1.383.317.759	1.763.321.301	2.247.713.507	2.865.170.408	
Capital expenditures (-)	1.893.948.346	2.414.224.382	3.077.422.560	3.922.804.228	5.000.416.002	
Change of working capital (-)	84.506.337	107.720.604	137.311.933	175.032.132	223.114.237	
Free Cash Flow to Firm	2.544.729.521	3.243.778.041	4.134.858.300	5.270.722.270	6.718.613.125	32.314.738.363
Discounted Cash Flow	2.049.585.780	2.104.263.258	2.160.399.385	2.218.033.074	2.277.204.276	26.027.060.124

Table 3: FROTO Share Value and Other Data (TL)

Calculation of WACC		Valuation Result	
Returns on a Risk Free Investment Rate	13,15	Total Cash Flows	10.809.485.773
Expected Market Return	6	Residual Value	26.027.060.124
Market Risk Premium	19,15	Cash and Cash Equivalents	3.202.952.000
Beta Rate	0,72	Financial Debts	2.589.213.000
Tax Rate	0,2	Equity Value	37.450.284.897
Financial Debts	2.589.213.000	Paid-in capital	350.910.000
Equity	4.664.921.000	Share Value	106,7
Equity + Debt	7.254.134.000		
Equity	0,643		
Debt	0,357		
Cost of Equity	26,938		
Cost of Debt	19,15		
WACC	0,242		
Terminal Grow Rate	0,20		

After calculating the discounted cash flows, the market value and share price of the company are shown in Table 3. Some data are needed to calculate these values. These data are given in Table 3. According to Table 3, the share price of FROTO company should be 106.70 TL. Considering that the current share price is around 70TL-80TL in the market, it can be said that it is valued cheaply according to the discounted cash flow method.

After these calculations, the market price of the second company, Tofaş Turkish Automobile Factory Inc. (TOASO), was calculated. In the study, five-year (2015-2019) data belonging to TOASO were used and some items required to generate estimated cash flows were calculated. Then, cash flows for the next five-year period (2020-2025) were calculated in the light of the first five-year data. These calculations are shown in Table 4 and Table 5.

In Table 4, average values have been created in order to generate cash flows for the next 5 years by using 2015-2019 data. At the same time, free cash flows were tried to be formed with the help of Table 4.

Table 5 is created with the help of the averages calculated as a percentage of sales in Table 4. Thanks to the estimated figures, free cash flows of the next 5 years were calculated first and then these values were discounted to today. In addition, terminal values were calculated with the assumption of growth at a certain rate after 5 years.

Table 4: First five-year (2015-2019) financial statement data of TOASO (TL)

	2014	2015	2016	2017	2018	2019
Sales Revenues	7.440.009.000	9.920.723.000	14.235.951.000	17.467.806.000	18.603.331.000	18.896.914.000
Cost of Sales (-)	-6.516.211.000	-8.780.540.000	-12.888.429.000	-15.551.677.000	-16.190.143.000	-16.510.459.000
Gross Profit/Loss	983.302.000	1.216.523.000	1.447.741.000	2.026.205.000	2.516.146.000	2.498.611.000
Operating Expenses	449.633.000	507.514.000	603.845.000	721.429.000	758.622.000	779.102.000
Net Operating Profit/Loss	533.669.000	709.009.000	843.896.000	1.304.776.000	1.757.524.000	1.719.509.000
EBIT	472.253.000	617.987.000	797.936.000	1.229.472.000	1.290.894.000	1.456.555.000
Tax (-)	-101.985.000	-212.814.000	-172.292.000	-53.346.000	-39.529.000	-25.084.000
Depreciation (+)	298.609.000	359.521.000	522.631.000	696.679.000	775.054.000	760.248.000
Capital expenditures (-)	858.000.000	466.000.000	602.446.308	939.000.000	1.200.000.000	710.220.000
Change in working capital (-)	404.072.700	106.380.966	-22.859.327	-82.383.000	-780.844.000	-83.805.000
Free Cash Flow	-327.809.700	708.963.034	959.232.019	1.198.184.000	2.152.951.000	1.878.426.000

Table 5: TOASO's estimated cash flows for a five-year period (2020-2024) (TL)

	2020	2021	2022	2023	2024	Terminal Value
Sales Revenues	22.964.318.340	27.907.197.800	33.913.991.155	41.213.697.064	50.084.604.255	
Cost of Sales (-)	-20.287.241.565	-24.653.902.406	-29.960.450.853	-36.409.189.934	-44.245.966.729	
Gross Profit/Loss	2.677.076.775	3.253.295.394	3.953.540.302	4.804.507.130	5.838.637.526	
Operating Expenses	1.061.398.210	1.289.855.391	1.567.486.088	1.904.874.495	2.314.882.965	
Net Operating Profit/Loss	1.615.678.564	1.963.440.003	2.386.054.213	2.899.632.635	3.523.754.561	
EBIT	1.407.238.351	1.710.134.759	2.078.227.112	2.525.548.297	3.069.151.666	
Tax (-)	-281.447.670	-342.026.952	-415.645.422	-505.109.659	-613.830.333	
Depreciation (+)	898.915.503	1.092.399.625	1.327.529.604	1.613.269.364	1.960.512.242	
Capital expenditures (-)	1.379.612.070	1.676.562.150	2.037.428.276	2.475.967.850	3.008.899.438	
Change in working capital (-)	47090899,23	57226825,55	69544426,11	84513288,26	102704074,1	
Free Cash Flow	1.369.338.768	1.664.077.605	2.022.256.537	2.457.530.519	2.986.493.624	12.958.194.925
Discounted Cash Flow	1.098.904.622	1.071.696.390	1.045.161.818	1.019.284.227	994.047.349	10.399.048.519

Table 6: TOASO Share Value and Other Data (TL)

Calculation of WACC		Valuation Result	
Returns on a Risk Free Investment Rate	13,15	Total Cash Flows	5.229.094.406
Expected Market Return	6	Residual Value	10.399.048.519
Market Risk Premium	19,15	Cash and Cash Equivalents	2.825.487.000
Beta Rate	0,72	Financial Debts	1.846.507.000
Tax Rate	0,2	Equity Value	16.607.122.925
Financial Debts	1.846.507.000	Paid-in capital	500.000.000
Equity	4.329.209.000	Share Value	33,2
Equity + Debt	6.175.716.000		
Equity %	0,701		
Debt %	0,299		
Cost of Equity	26,938		
Cost of Debt	19,15		
WACC	0,246		
Terminal Grow Rate	0,20		

After calculating the discounted cash flows, the market value and share price of the company are shown in Table 6. Some data are needed to calculate these values. These data are given in Table 6. According to Table 6, the share price of TOASO company should be 33.20 TL. Considering that the current share price is around 20TL-25TL in the market, it can be said that it is valued cheaply according to the discounted cash flow method.

CONCLUSION

Investors who invest in the stock market always take a certain amount of risk for return. Therefore, investors try to invest in the cheaper stocks to reduce their risk. It is possible to determine whether a stock is cheap or not with some analysis. We can basically divide these analyzes as fundamental and technical analysis. Technical analysis is based on graphic analysis and fundamental analysis is based on financial statement analysis.

There are many valuation methods available in fundamental analysis. One of the most used valuation methods is the Discounted Cash Flow Method. This method focuses on cash flows to the company in the coming years. The method, which takes into account the time value of money and market risk, provides important data to investors in terms of deciding whether the company is expensive or cheap compared to the current market value by reducing the value of future cash flows to today.

The purpose of this study is to evaluate the two important automotive sector shares (FROTO and TOASO) traded in Borsa Istanbul (BIST) according to the Discounted Cash Flow Method and to calculate the real market price. For this, 5-year (2015-2019) financial statements of the two companies were analyzed. Then, according to the averages of the values between 2015 and 2019, the next 5-year (2020-2024) values were determined.

The findings obtained showed that the real firm values of companies are lower than their current market values. More clearly, FROTO's post-valuation price was found to be 106.70 TL. Considering that the current share price is around 70TL-80TL in the market, it can be said that it is valued cheaply according to the discounted cash flow method. In addition, the price of TOASO after the valuation

was found as 33.20 TL. Considering that the current share price is around 20TL-25TL in the market, it can be said that it is valued cheaply according to the discounted cash flow method.

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