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FUNDAMENTAL ANALYSIS AND DISCOUNTED FREE CASH FLOW VALUATION OF STOCKS AT MACEDONIAN STOCK EXCHANGE

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Abstract:
We examine the valuation performance of Discounted Free Cash Flow Model (DFCF) at the Macedonian Stock Exchange (MSE) in order to determine if this model offer significant level of accuracy and relevancy for stock values determination. We find that stock values calculated with DCF model are very close to average market prices which suggests that market prices oscillate near their fundamental values. We can conclude that DFCF models are useful tools for the companies' enterprise values calculation on long term. The analysis of our results derived from stock valuation with DFCF model as well as comparison with average market stock prices suggest that discounted cash flow model is relatively reliable valuation tool that have to be used for stocks analyses at MSE.

Keywords: valuation, securities, free cash flow, equity, stock-exchange.

Jel Classification: G1,G12

INTRODUCTION

Valuation of an asset can be determined on three ways. First, as the intrinsic value of the asset, based on its capacity to generate cash flows in the future. Second, as a relative value, by examining how the market is pricing similar or comparable assets. Finally, we can value assets with cash flows that are contingent on the occurrence of a specific event as options (Damodaran 2006).

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The basic idea of intrinsic valuation is that, the value of any asset is the present value of the expected future cash flows on the asset, and it is determined by the magnitude of the cash flows, the expected growth rate in these cash flows and the uncertainty associated with receiving these cash flows. There are two wide used models based on discounted cash flows (Dividend Discount Model-DDM as well as Discounted Cash Flow Model-DCF) in order to determine stock intrinsic value. In this paper we use discounted free cash flow techniques for stocks' valuation at Macedonian Stock Exchange (MSE). DCF valuation faces the choice: to make equity valuation (value just the equity claim in the buiness) or the firm valuation (value the entire business). We use Discounted Free Cash Flow to Firm model for company valuation in order to evaluate value of all investment opportunities of the firm compared with available cash flows that can be directed both to shareholders or creditors.

Relative valuation is based on using standardized market values as multiplies of some standard variable as earnings, book value and revenues and comparisons with valuation of similar assets/companies in order to determine if they have fair value or currently are underpriced or overpriced.

In their paper based on 104 analysts's reports (Demirakos, Strong, and Walker 2004) argued that analysts typically choose either a relative valuation models (P/E model) or an explicit multiperiod DCF valuation model as their dominant valuation model. However they found that none of the analysts use the price to cash flow as their dominant valuation model and some analysts who construct explicit multiperiod valuation models still adopt a comparative valuation model as their preferred model.

In accordance with the DCF method, the value of a company is a function of three major variables: the expected net cash flows, the expected growth of these cash flows, and the required rate of return. The net cash flows are the result of the company's income generating potential (or earning power) (Nenkov 2010). The future growth in earnings depends on the growth of this earning power. The required rate of return (or cost of capital) depends on the level of risk of the company's operations and its financial leverage. Finally, the value of the company can be expressed as a function of the earning power, the expected growth in earnings, and the level of risk (Damodaran 2006).

Kaplan and Ruback (1995) conclude that DCF valuations approximate around market prices reasonably well. There are also considerable numbers of papers that compare all three valuation models in order to determine their accuracy. In their paper Penman and Sougiannis (1998) contrasts dividend discount techniques, discounted cash flow analysis, and techniques based on accrual earnings when each is applied with finite-horizon forecasts. They provide evidence that valuation errors are lower using accrual earnings techniques rather than cash flow and dividend discounting techniques.

Market price is more closely related to long-term "expected earnings" (or "average earnings", or the "the earning power"), rather than to temporary deviations in current earnings, which are within the acceptable range. This fact outlines the close relationship between relative valuation and discounted cash flow valuation, since both are based on expected average earnings or cash flows in the long run (Nenkov 2010).

There is also growing uncertanity if DCF Models are suitable for emerging and transition economies. However, Pereiro (2006) in his paper finds that DCF techniques like NPV, IRR and payback are very popular among corporations and financial advisors.

The aim of this study is to investigate how precise and accurate is DCF valuation for stock market price predictions at Macedonian Stock Exchange (MSE). We analyse two companies listed at MSE: Granit SC Skopje and Vitaminka SC Prilep. We present whole process of comprehensive DFCF valuation for both companies. After completed valuation we compare stocks' intrinsic values with average stock market prices at MSE in order to see if market prices are near stock values.

FUNDAMENTAL ANALYSIS AND DISCOUNTED FREE CASH FLOW VALUATION OF GRANIT–SKOPJE SC STOCKS AT MACEDONIA STOCK EXCHANGE

There are numerous factors that affect the stock price and they are almost impossible to predict. As one of the best ways to fight against many factors that make the uncertainty, arises fundamental analysis as one of the most widely used methods for estimating price movements of securities (Baresa, Bogdan, and Ivanovic 2013). In fact DCF analysis which is in focus of our research started with companies' fundamental analysis.

Granit SC, Skopje is construction company with main accitivity as projecting, construction and audit in construction industry with several branches in Germany, Russia, Albania, Bulgaria, Ukrain, Croatia and Monenegro.

By using DFCF model as well as fundamental analysis of audited financial statements and all public available information for the company, we evaluate Granit SC, Skopje stock (ISIN Code: GRNT). Fundamental analysis as a tool enable to derive basic assumptions in order to forecast company Free Cash Flow. In order to create Pro-Forma Income Statements and for fundamental analysis we use company's key data for period 2006–2010, as follows (MSE and authors calculations):

Table 1. Data from Granit SC, Skopje Financial Statements (in 000 denars)

	2010	2009	2008	2007	2006
Total Income	3.486.889	3.927.692	2.989.679	2.239.916	2.093.443
EBIT	243.598	198.295	190.473	30.857	82.469
EBT	296.915	336.924	400.508	348.138	267.076
Equity	3.291.195	3.074.020	2.857.524	2.376.777	2.143.208
Total Liabilities	2.754292	4.291.078	2.227.526	2.284.316	2.248.485
Total Asset	6.045.487	7.365.098	5.085.050	4.661.093	4.391.693
Market Capitalization 25.08.2010.	1.697.091	2.398.321	1.812.112	6.443.705	1.714.565
EBITDA	525.149	452.844	339.347	30.857	230.082
WC	448.009	790.004	482.198	350.962	205.048

By using fundamental analysis we derive basic ratios (liquidity, activity, leverage and profitability). We also make cross-sectional analysis using averages for similar companies and industry averages in the region of South-East Europe (SEE). Fundamental analysis results will be used for determination of basic assumptions for DCF Valuation Model development.

Table 2. Fundamental analysis of Granit SC, Skopje

	2010	2009	2008	2007	2006
ROS	6,98%	5,04%	6,37%	1,37%	3,93%
EPS	99	109,69	130,40	113,35	86,96
ROA	4,84%	4,57%	8,21%	7,69%	6,07%
ROE	8,90%	10,96%	15,04%	15,40%	13,37%
P/E	5,81	7,42	4,52	18,51	6,42
BV per Share	10.117,04	10.00,86	866,87	735,82	650,27
P/B	0,51	0,81	0,68	2,85	0,86
Dividend per Share	10	20	23,00	23,00	22,73
Dividend Yield	1,69%		3,89%	1,09%	4,07%
NetProfit Margin	8,29	8,57	13,66	15,54	12,75
Current Ratio	1,17	1,20	1,24	1,17	1,093
Quick Ratio	0,76	0,97	0,84	0,75	0,78
Inventory Turnover	1,04	2,68	1,55	0,99	2,65
Total Assets Turnover	1,14	1,39	1,09	0,97	1,05
Debt Ratio	45,55	58,26	45,77	99,75	51,19
Debt Equity Ratio	20,27	57,01	36,85	28,13	4,74
Total Assets/ Equity	6,48	7,94	5,46	2,45	4,71

Table 3. Cross-Sectional Analyses

	P/E	P/S	P/B	ROE
Granit	5,81	0,61	0,81	8,90
Putevi Uzice (Serbia)	6,08	-	0,85	13,92
Industry average SEE	8	1,85	1,02	-

Company fundamental analysis started with analysis of key derived data from financial statements (Balance Sheet and Income Statement) in absolute value, as well as their trend analyses (historical per year). This is a base to extract sales data, EBIT as well as Net Income for the company. Our goal is not only to analyze change in financial position of that company, but also to determine basic reasons for its growth or decrease in absolute value or as ratios - profit margins.

We proceed with analyses of company assets and assets sources (liabilities and equity) as well as their historical comparison. Beside previously mentioned key data we also determine company's EBITDA and NWC which are necessary for DCF Model. Calculation of ratios as well cross-sectional analyses (comparison with similar companies in SEE environment) will be used in order to determine if stock price is undervalued or overvalued.

We can see that Granit has 12% sales decrease in 2010 compared with 2009 when it has 30% sales incerase compared with 2008. It has kept same level of percentage in sales of 55% (COGS/Sales). EBIT has increase for 22 % in 2010, which is significantly higher than in 2009 when it increased for 4%, while Net Income has decreased for 12% in 2010, as well as 14% in 2009. Granit has increased its Net Income in 2008 for 15% compared with 2007, so it is evident that crises in 2009 has negative impact on company performance. Company has decrease of Net Profit Margin for 4% in 2010 and now it is 8,29%. Company has 40% growth of Assets and 90% growth of Liabilities. In 2010 company has reverse trend and decrease of asstes for 18%. Company liabilitiees has decreased in 2010 for 36%. We can also see that company use 30% from Net Income for dividend payments.

Liquidity ratios analysis (current ratio – 1,17 as well as quick ratio – 0,96) shows that company may have soon problems with liquidity.

Leverage ratios show that company has used gearing until 2010 which means that it was risky (Debt/Equity – 57% in 2009). However Debt/Equity ratio in 2010 is 20,27% which suggest that company decreased leverage.

Profitability ratios P/S is 0,61% which is above the industry average and P/E is 5,81 (22% decreases compared with 2009 when it was 7,42) and it is below the construction industry averages. With Du Pont analysis we calculate ROE = 8,90 in 2010, which decreased compared with 2009, when ROE was 10,96 %, which means that return on capital decreased for 19% and the trend of its decrease continue (in 2009 it decreased for 4% compared with 2008) and is bellow the industry averge.

Considering the fact that company has continues increase of Net Income and is has relativelly stable ratios, as well as compared with cross-sectional analysis with the region of SEE we can see that stock price is undervalued.

Based on fundamental analysis we derived following assumpitions necessary for DCF valuation. First, we determined sales growth rate. Expected sales growth rate was forecatsed in interval from 5–10%, based on company management expectations, as well as calculation of expected rate of growth. We determine historical reinvestment rate as 93% as well as ROCE, that is 5,5%, which enables to determine expected growth rate as 5,11%. We make assumption in the model that sales growth rate will decrease every year for 1% until fifth year, when we use constant rate of growth of 5%, while in one simulation we forecast constant rate of growth of 3% forever.

Second, we determine basic model assumptions as follows:

- COGS/Sales = 55%;
- General, Administrative and Selling Expences/Sales = 27%;
- Cost of Debt = 9%, 10%, 11%;
- Cost of Equity (Table 5) = 16,5%;
- Cost of Capital = WACC =14,991, 15,135, 15,279% (Table 6);
- CAPEX/Sales = 8%;
- Depreciation = 9% (Table 4);
- ΔNWC/Sales= 60%;
- Tax Rate = 10%.

Table 4. Calculation of Fixed Assets and Depreciation

	2009	2010	2011	2012	2013	2014
Fixed Assets	3.032.234	3.339.080	3.673.543	4.034.762	4.421.267	4.830.962
Depreciation	281.551					
	0,09285266					

Table 5. Cost of Equity calculation (CAPM) for Granit SC – Skopje

R_{free}- T-Bonds	5,5
Beta (β)	1
R_m-Risk Premium	5
Country Risk Premium	6
R_e-Cost of Equity	16,5

Table 6. WACC Calculation for Granit SC – Skopje – %

E/E+D (equity financing)	0,83	0,83	0,83
Cost of equity	16,5	16,5	16,5
D/E+D (debt financing)	0,16	0,16	0,16
Cost of Debt	9	10	11
(1-T)	0,9	0,9	0,9
WACC	14,991	15,135	15,279

As previously mentioned we use Discounted Free Cash Flow to Firm model for company valuation in order to evaluate value of all investment opportunities of the firm compared with available cash flows that can be directed both to shareholders or creditors. For evaluation of Free Cash Flows to Firm we calculate NOPAT (EBIT (1-T)).

Based on assumpitions as well as calculated forecasts, we project Pro-forma Income Statment, for FCF evaluation with three different growth rates (10%, 7% and 5%). On next table we present Pro-Forma Income Statement with 10% growth rate:

Table 7. Pro-Forma Income Statement and FCF forecasting for Granit SC, 10% sales growth rate (forecasting 2011–2016 in 000 denars)

Granit SC Skopje /04.08.2011	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sales % growth	2.239.916	2.881.446 13%	3.927.692 14%	3.48.6889	3.835.577 10%	4.180.779 9%	4.515.242 8%	4.831.309 7%	5.121.187 6%	5.377.247 5%
COGS % margin	840.533 62,4%	1.224.754 57,5%	.383.088 40%	1.092.748 31%	1.956.144 51%	2.132.197 51%	2.302.773 51%	2.463.967 51%	2.611.805 51%	2.742.396 51%
Gross Profit % margin	1.399.383 62%	1.656.689 57%	1.574.604 40%	2.394.141 68%	1.879.433 49%	2.048.582 49%	2.212.468 49%	2.367.341 49%	2.509.382 49%	2.634.851 49%
Gen,Sell,Adm. Ex% from sales	529.638 23%	592.103 20%	824.557 20%	669.200 20%	1.035.606 27%	1.128.810 27%	1.219.115 27%	1.304.453 27%	1.382.720 27%	1.451.856 27%
Depreciation % of fixed assets	184.556 8%	230.978 8,8%	254.549 9%	281.551 9%	(310.042) 9%	(341.098) 9%	(374.638) 9%	(410.526) 9%	(448.567) 9%	(488.511) 9%
EBIT % margin	30.857 1%	108.369 3%	198.295 5%	243.598 6,9%	533.784 13,9%	578.673 13,8	618.714 13,7%	652.361 13,5%	678.093 13.2%	694.483 12,9%
Tax %	41206	37547	11626		53.378 10%	57.867 10%	61.871 10%	65.236 10%	67.809 10%	69.448 10%
NOPAT					480.406,18	520.806	556.843	587.125	610.284	625.035
Depr.+ NOPAT					790.448,67	861.904	931.481	997.651	1.058.851	1.113.546
CAPEX % of sales			313.605 8%	(-)	(306.846) 8%	(334.462) 8%	(361.219) 8%	(386.505) 8%	(409.695) 8%	(430.180) 8%
ΔNWC % of change of sales	99%	29%	20%	(-)	(209.213) 60%	(207.121) 60%	(200.677) 60%	(189.640) 60%	(173.927) 60%	(153.635) 60%
Free Cash Flow					274.389	320.321	369.585	421.507	475.230	529.731
Long term rate of growth - g										5%
WACC										14,991%
Vn-terminal value										5.567.182
Discount rate (1+wacc)					1,149	1,322	1,520	1,748	2,0105	2,311
DFCF of Vn										2407977
DFCF					238.617	242.246	243.065	241.073	236.365	229.124
Vo										3.838.470

After determination of discounted value of FCF (V_0) we add the value of debt and subtract the amount of money and money equivalents and get Enterprise Value (EV) which divided by the total amount of stocks outstanding gives stock intrinsic value as follows:

Table 8. Enterprise Value calculation for Granit SC for 10% growth rate (in denars)

Discounted value of FCF (V_o)	3.838.470
Money and money equivalents	(120.478)
Debt	189.048
Enterprise Value (EV)	3.907.040
Stocks outstanding	2.946.340
Value of stock	1.326

In first scenario for Granit SC Pro-forma Income Statement we have forecasted high sales growth rate of 10% and its decrease every year for 1% until 5% when it stays constant forever. In second scenario we create Pro-forma Income Statement with 7% sales growth rate and 3% constant growth rate (g), while third scenario is with 5% constant rate of growth (g) forever presented as follows:

Table 9. Pro-Forma Income Statement and FCF forecasting for Granit SC, 5% sales growth rate (forecasting 2011–2016 in 000 denars)

GRNT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sales % growth	2.239.916	2.881.446 13%	3.927.692 14%	3.486.889	3.661.233 5%	3.844.295 5%	4.036.510 5%	4.238.335 5%	4.450.252 5%	4.672.570 5%
COGS % margin	840.533 62,4%	1.224.754 57,5%	2.383.088 40%	1.092.748 31%	1.867.229 51%	1.960.591 51%	2.058.620 51%	2.161.551) 51%	2.269.629 51%	2.383.110 51%
Gross Profit % margin	1.399.383 62%	1.656.689 57%	1574604 40%	2394141 68%	1794004 49%	1883705 49%	1977890 49%	2076784 49%	2180624 49%	2289655 49%
Gen,Sell,Adm.Exp % from sales	(529.638) 23%	(592.103) 20%	(824.557) 20%	(669.200) 20%	(988.533) 27%	1.037.960 27%	1.089.858 27%	1.144.351) 27%	1.201.568 27%	1.261.646 27%
Depreciation % of fixed assets	184.556 8%	230.978 8,8%	254.549 9%	281.551 9%	(308.747) 9%	(337.303) 9%	(367.287) 9%	(398.771 9%)	(431.828) 9%	(466.538) 9%
EBIT % margin	30.857 1%	108.369 3%	198.295 5%	243.598 6,9%	496.723 13,5%	508.441 13,2%	520.744 12,9%	533.662 12,6%	547.227 12,3	561.469 12%
Tax %					49.672 10%	50.844 10%	52.074 10%	53.366 10%	54.723 10%	56146 10%
NOPAT					447.051,5	457.597,1	468.670	480.296,5	492.504,4	505.322,6
Depr.+ NOPAT					755.799	794.900,8	835.957,7	879.067,5	924.332,8	971.861,3
CAPEX % of sales			313605 8%	(-)	(292.899) 8%	(307.544) 8%	(322.921) 8%	(339.067) 8%	(356.0200 8%	(373.821) 8%
ΔNWC % of change of sales	99%	29%	20%	(-)	(104.606) 60%	(109.837) 60%	(115.328) 60%	(121.095) 60%	(127.150) 60%	(133.507) 60%
Free Cash Flow					358.294	377.520	397.708	418.905	441.163	464.533
Long term rate of growth - g										5%
WACC										15,279%
Vn- terminal value										4.745.201
Discount rate (1+wacc)					1,152	1,328	1,531	1,766	2,035	2,346
DFCF of Vn										2.021.871
DFCF					310.805,6	284.079,4	259.605,5	237.200,2	216.694,4	197.931,5
Vo										3.528.187

Table 10. Pro-Forma Income Statement and FCF forecasting for Granit SC, 7% sales growth rate (forecasting 2011–2016 in 000 denars)

GRNT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sales	2.239.916	2.881.446	3.927.692	3.486.889	3.730.971	3.954.830	4.152.571	4.318.674	4.448.234	4.581.681
% growth		13%	14%		7%	6%	5%	4%	3%	3%
COGS	840.533	1.224.754	2.383.088	1.092.748	1.902.795	2.01.6963	2.117.811	2.202.524	2.268.599	2.336.657
% margin	62,4%	57,5%	40%	31%	51%	51%	51%	51%	51%	51%
Gross Profit	1.399.383	1.656.689	1.574.604	2.394.141	1.828.176	1.937.866	2.034.760	2.116.150	2.179.635	2.245.024
% margin	62%	57%	40%	68%	49%	49%	49%	49%	49%	49%
Gen,Sell,Adm.Exp	529.638	592.103	824.557	669.200	1.007.362	1.067.804	1.121.194	1.166.042	1.201.023	1.237.054
% from sales	23%	20%	20%	20%	27%	27%	27%	27%	27%	27%
Depreciation	184.556	230.978	254.549	281.551	(309.265)	(338.642)	(369.488)	(401.569)	(434.611)	(468.645)
% of fixed assets	8%	8,8%	9%	9%	9%	9%	9%	9%	9%	9%
EBIT	30.857	108.369	198.295	243.598	511.548	531.419	544.076	548.539	544.000	539.324,7
% margin	1%	3%	5%	6,9%	13,7%	13,4%	13,1%	12,7%	12,2%	11,7%
Tax					51.154	53.142	54.408	54.854	54.400	53932,47
%					10%	10%	10%	10%	10%	10%
NOPAT					460.393,4	478.277,8	489.669	493.685,3	489.600,1	485.392,3
Depr.+ NOPAT					769.658,8	816.920,5	859.157,9	895.254,3	924.211,5	954.037,4
CAPEX			313.605	(-)	(298.478)	(316.386)	(332.206)	(345.494)	(355.859)	(366.534)
% of sales			8%		8%	8%	8%	8%	8%	8%
ΔNWC	99%	29%	20%	(-)	(146.449)	(134.315)	(118.644)	(99.661)	(77.736)	(80.068)
% of change of sales					60%	60%	60%	60%	60%	60%
Free Cash Flow					324.732	366.219	408.307	450.099	490.617	507.435
Long term rate of growth - g										3%
WACC										15,135%
Vn- terminal value										4.307.027
Discount rate (1+wacc)					1,15135	1,3256	1,5262	1,7572	2,0231	2,3294
DFCF of Vn										1848985
DFCF					282.044,4	276.265,3	267.525,5	256.140,5	242.496,5	2.17.839,2
Vo										3.391.296

Table 11. Stock Value calculation for GRNT for 5% growth rate (in denars)

Discounted value of FCF (V_o)	3.528.187
Money and money equivalents	(120.478)
Debt	189.048
Enterprise Value (EV)	3.596.757
Stocks outstanding	2.946.340
Value of stock	1.220

Table 12. Stock Value calculation for GRNT for 7% growth rate (in denars)

Discounted value of FCF (V_o)	3.391.296
Money and money equivalents	(120.478)
Debt	189.048
Enterprise Value (EV)	3.459.866
Stocks outstanding	2.946.340
Value of stock	1.174

As discount rate we use WACC, and make simulation with three different costs of debt (9,11 and 12%), and got three different discount rate. We are calculating intrinsic values for three different scenarios with three different discount rates. For each scenario we determine Granit stock intrinsic values.

Table 13. Assumptions and Scenarios for GRNT

Assumptions for GRNT			
$\beta = 0{,}59$,R_{free} =5,5 ,Rm (risk premium)= 5			
Cost of Debt	9%	10%	11%
WACC	14,99%	15,14%	15,28%
Scenarios		Price	
I– 10% growth rate, g=5%	1.326	1.306	1.287
II– 7% growth rate, g=3%	1.188	1.174	1.160
III– 5% growth rate, g=5%	1.255	1.237	1.220

In accordance with DFCF Model, and with assumptions that we made as well as average 7% sales growth rate in next five years we got stock price of 1.174 denars. Compared with several key ratios, GRNT stocks is undervalued (August 2011, GRNT-price 600 denars).

FUNDAMENTAL ANALYSIS AND DISCOUNTED FREE CASH FLOW VALUATION OF VITAMINKA–PRILEP SC STOCKS AT MACEDONIA STOCK EXCHANGE

By using DFCF model as well as fundamental analysis of company's audited financial statements and all public available information for that company we evaluate Vitaminka-Prilep SC (ISIN Code: VITA). Vitaminka is food industry and has all characteristics of a mature company. Fundamental analysis enables to derive basic assumptions in order to forecast company Free Cash Flow. In order to create Pro-Forma Income Statements and for fundamental analysis we use company's key data for period 2006–2010, as follows (MSE and authors calculations):

Table 44. Data from Vitaminka–Prilep SC, Financial Statements (in 000 denars)

Year	2010	2009	2008	2007	2006
Total Income	1.223.783	1.147.522	1.152.579	1.051.045	936.938
EBIT	53.466	64.250	58.561	49.650	39.728
EBT	42.466	47.686	33.601	32.349	28.788
Equity	448.771	528.344	458.672	455.896	456.903
Total Liabilities	553.593	583.765	648.092	696.182	410.504
Total Asset	1.077.496	1.106.064	1.106.764	1.152.078	867.407
Market Capitalization	379512,5	606.450	619.497	1.436.005	153.862
Net Income	130.606	80.888	131.737	102.394	85.280
Working Capital	39639	87353	12081	5523	85258

Using data from financial statements, we proceed with fundamental analysis and derive basic ratios (liquidity, activity, leverage and profitability), as well as make cross-sectional analysis using averages for similar companies and industry averages in the

region of South-East Europe (SEE). Fundamental analysis results will be used for determination of basic assumptions for DCF Valuation Model development.

Table 15. Fundamental analysis of Vitaminka SC, Prilep

	2010	2009	2008	2007	2006
EBIT/Income (ROS)	3,84%	5,95%	5,08%	4,72%	4,24%
EPS	455,02	589,73	414,93	399,47	355,50
ROA	3,19%	4,31%	2,97%	3,13%	3,32%
ROE	7,03%	9,02%	7,34%	7,17%	6,46%
P/E	10.42	12,71	18,44	44,39	5,34
BV per Share	6.473,27	6.534,05	5.646,88	5.569,35	5.501,12
P/B	0,73	1,14	1,35	3,18	0,35
Dividend per Share	159	158	195,00	187,00	183,00
Dividend Yield	3,27%		2,54%	1,05%	9,63%
Net Profit Margin	3,32%	4.15%	2,91%	3,07%	3,07%
Current Ratio	1,09	1,236331	1,026711	1,011578	1,228541
Quick Ratio	0,70	0,85	0,46	0,51	0,86
Inventory Turnover	4,44	4,39	3,11	3,18	2,29
Total Assets Turnover	1,98	1,76	1,79	1,56	2,29
Debt Ratio	51,37	52,77	58,55	60,42	47,32
Debt Equity Ratio	83,11	88,13	86,51	90,79	22,66
Total Assets/ Equity	4,33	4,55	4,89	4,77	5,24

Table 16. Cross-Sectional Analysis

	P/E	P/S	P/B	ROE
Vitaminka	10,42	0,52	1,14	7,03
Swislion	13,41	-	0,69	5,13
Industry Average (SEE)	12,44	2,83	1,66	2,17

Vitaminka SC, Prilep has 6% sales increase in 2010 compared with 2009 and 2008 when it has almost same 10% sales incerase compared with 2007. EBIT is lower in 2010 for 17%, which is reverse trend compared with 2009 when it was 10% higher compared with previous year, while Net Income decrease for 11%. Vitaminka Net Income in 2009 has 42% increase. Company has decrease of Net Profit Margin on 3,32% in 2010 and this is 11% decrease compared with previous year. In 2009 Net profit Margin has 2% increase compared with 2008. Company has 5% decrease of of Liabilities as well as 15% decrease of equity. Vitaminka did not make dividend payments in 2010 and 2009.

Liquidity ratios analyzes (current ratio – 1,09 as well as quick ratio – 0,70) shows that company may have soon problems with liquidity.

Leverage ratios show that company use gearing and it makes her risky (Debt/Equity – 83,7%).

Profitability ratios P/S is 0,58% and P/e is 10,42 which is bellow the industry average.

With Du Pont analysis we calculate ROE = 7,3in 2010, which is 21% decrease compared with 2009, when ROE was 9,2% and was 2% higher than in 2008. Vitaminka ROE is bellow the industry averge.

Considering the fact that company has continues increase of Net Income and is has relativelly stable ratios, as well as compared with cross-sectional analysis with the region of SEE we can see that stock price is overvalued.

Based on fundamental analysis we derived following assumpitions necessary for DCF valuation. First, we determined sales growth rate. Expected sales growth rate was forecatsed in interval from 3–8%, having in mind that company beside 2007 has deinvestments. In accordance with Vitaminka historical recordes as well as expected rate of return calculation we determine expected rate of growth.

With analysis of historical reinvestment rate as 36% as well as ROCE, that is 8,07%, which enables to determine expected growth rate as 3%. We make assumption in the model that sales growth rate will decrease every year for 1% until fifth year, when we use constant rate of growth of 3% forever.

Second, we determined basic model assumptions as:

- COGS/Sales = 55%;
- General, Administrative and Selling Expences/Sales = 27%;
- Cost of Debt = 10%,
- Cost of Equity (Table 17) = 11,99%;
- Cost of Capital = WACC =10,547; 10,835; 11,1595% (Table 18);
- CAPEX/Sales = 10%;
- Depreciation = 9%;
- ΔNWC/Sales= 7%;
- Tax Rate = 10%.

Table 17. Cost of Equity calculation (CAPM) for Vitaminka SC – Prilep

R_{free}- T-Bonds	5,5
Beta (β)	0,59
R_m-Risk Premium	5
Country Risk Premium	6
R_e-Cost of Equity	11,99

Table 18. WACC Calculation for Vitaminka SC-Prilep

	%	%	%
	0,65	0,65	0,65
E/E+D (equity financing)	11,99	11,99	11,99
Cost of equity	0,34	0,34	0,34
D/E+D (debt financing)	9	10	11
Cost of Debt	0,9	0,9	0,9
(1-T)	10,55	10,85	11,16

We use Discounted Free Cash Flow to Firm model for company valuation in order to evaluate value of all investment opportunities of the firm compared with available cash flows that can be directed both to shareholders or creditors.

Based on assumpitions as well as calculated forecasts, we project Pro-forma Income Statment, for FCF evaluation with three different growth rates (8%, 5% and 3%). In our paper we present only Pro-Forma Income Statement with 8% growth rate:

Table 19.5 Pro-Forma Income Statement and FCF forecasting for Vitaminka SC, 8% sales growth rate (forecasting 2011–2016 in 000 denars)

VITA/ 04.08.2011	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sales	1.051.045	1.152.579	1.147.522	1.223.783	1.321.686	1.414.204	1.499.056	1.574.009	1.636.969	1.686.078
% growth		8,8%	-0,44%		8%	7%	6%	5%	4%	3%
COGS	754.063	788.971	615.947	723.114	(793.011)	(848.522)	(899.433)	(944.405)	(982.181)	(1.011.647)
% margin	71%	68%	53%	59%	60%	60%	60%	60%	60%	60%
Gross Profit	49.650	363.608	531.575	500.669	528.674	565.681	599.622	629.603	654.787	674.431
% margin	28%	31%	46%	40%	40%	40%	40%	40%	40%	40%
Gen,Sell,Adm.Exp	225.086	234.858	325.465	178.657	(356.855)	(381.835)	(404.745)	(424.982)	(441.981)	(455.241)
% from sales	21%	20%	28%	14%	27%	27%	27%	27%	27%	27%
Depreciation	52.744	67.782	70.343	77.140	(85.625)	(95.044)	(105.499)	(117.104)	(129.985)	(144.283)
% of fixed assets	7%	11,3%	10,8%	12,5%	11%	11%	11%	11%	11%	11%
EBIT	49.650	58.561	64.250	53.466	86.193	88.802	89.378	87.517	82.820	74.906
% margin	4,7%	5%	5,6%	4,3%	6,5%	6,2%	5,9%	5,5%	5%	4,4%
Tax					(8.619)	(8.880)	(8.938)	(8.752)	(8.282)	(7490)
%					10%	10%	10%	10%	10%	10%
NOPAT					77.574,36	79.922,05	80.440,38	78765,46	74.538,52	67.415,73
Depr.+ NOPAT					163.199,8	174.966,2	185.939,4	195.869,4	204.523,9	211.699,5
CAPEX	(-)	(-)	(-)	(-)	(132.169)	(141.420)	(149.906)	(157.401)	(163.697)	(168.608)
% of sales					10%	10%	10%	10%	10%	10%
ΔNWC	(-)	6%	(-)	(-)	(6853,185)	(6476,26)	(5939,655)	(5246,695)	(4407,224)	(3437,635)
% of change of sales					7%	7%	7%	7%	7%	7%
Free Cash Flow					24.178	27.070	30.094	33.222	36.420	39.654
Long term rate of growth - g										3%
WACC										10,547%
Vn- terminal value										541.191,1
Discount rate (1+wacc)					1,105	1,222	1,350	1,493	1,650	1,825
DFCF of Vn										296530,2
DFCF					21.871,25	22.150,74	22.276,24	22.245,18	22.059,85	21.727,31
Vo										428.860

After determination of discounted value of FCF (V_0) we add the value of debt and subtract the amount of money and money equivalents and get Enterprise Value which divided with total amount of stocks outstanding gives us stock intrinsic value:

Table 20. Enterprise Value calculation for Vitaminka SC for 8% growth rate (in denars)

Discounted value of FCF (V_o)	428.860
Money and money equivalents	(30.021)
Debt	132.130
Enterprise Value (EV)	530.969
Stocks outstanding	78.250
Value of stock	6.785

Table 21. Enterprise Value calculation for Vitaminka SC for 6% growth rate (in denars)

Discounted value of FCF (V_o)	414.482
Money and money equivalents	(30.021)
Debt	132.130
Enterprise Value (EV)	516.590
Stocks outstanding	78.250
Value of stock	6.601

Table 22. Enterprise Value calculation for Vitaminka SC for 3% growth rate (in denars)

Discounted value of FCF (V_o)	404.727
Money and money equivalents	(30.021)
Debt	132.130
Enterprise Value (EV)	506.836
Stocks outstanding	78.250
Value of stock	6.477

Vitaminka SC stocks valuation with DFCF model also has three scenarios. First, with 8% sales growth rate and its decrease every year for 1% untill 3%, when stays constant forever. Second scenario is with 6% growth rate and 3% constant growth rate while third is with 3% constant growth rate. We make same calculation of discount rate WACC with three costs of debt (9,10 and 11%), and get three different discount rates. For every scenario we determine VITA stock prices as follows:

Table 23. Assumptions and Scenarios for VITA

Assumptions for VITA $\beta = 0,59$,R_{free} =5,5 ,R_m (Risk Premium)= 5			
Costs of Debt	9%	10%	11%
WACC	10,55%	10,85%	11,15%
Scenarios		Price	
I- 8% growth rate, g=3%	6.785	6.591	6.354
II- 6% growth rate, g=3%	6.601	6.388	6.191
III- 3% growth rate, g=3%	6.477	6.271	6.080

In accordance with DFCF Model, and with assumptions that we make as well as average sales growth rate of 6% in next five years we got stock price of 6.388 denars. Compared with several key ratios, VITA stocks is undervalued (August 2011, VITA– price 4.995 denars).

CONCLUSION

Valuation is crucial for investment decsion making process. Investors and analysts can use different models and tools in order to determine stock intrinsic value. However, some capital markets as well as some industry sectors have different characteristics that raise question what model to be used? In this paper we check reliability and accuracy of DCF Model using discounted free casf flow to firm method. We find that stock values calculated with DCF model are very close to average market prices which suggest that market prices oscillate near stock values, which follows to conclusion that DCF models are reliable tools for calculation of companies' enterprise values on long term. Analystis by using this model can get long-term picture for real stock value as well as enterprise value, which is solid base for investment decision-making and picking stocks that promises higher yields in the future.

However, the use of DCF model is most complex and ask from analysts to have deeper knowledge and experience in stock valuation. This method offer relatively safe forecasting for stocks' intrinsic value, as it can be seen from our results. Having in mind that construction of this model is based on relatively large number of unknowns

variables which asked large number of assumptions as well as forecasts to be made, we suggest that stock valuation has to be made as simulation with different assumptions (as it was done in our research). However, business practice esspecially for M&A shows that all complex valuations as well as due-dilligence always finished with DCF valuation. We suggest that DCF model is accurate tool that has to be used at MSE, together with relative valuation. Furthermore, due to the fact that dividends politics are very difficult for forecasting and not stable as well as because market does not offer relevant information for use of P/E and other relative multiplies, fundamental analysis and DFCF valuation has to be taken into account. DDM and relative valuation models has certain limitations at MSE.

The analysis of our results derived from stock valuation with DCF model as well as comparison with securities average stock market prices, suggest that DCF model is useful for analysts and investors at MSE for stocks picking.

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