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Economics

A STUDY ON FINANCIAL MODELING USING 3 STATEMENT MODEL AND DCF VALUATION: AN INSIGHT FOR NEW ENTREPRENEURS

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ABSTRACT Financial statements reflect the position of a company in respect of its wealth and profitability in its short-term and long-term existence. The company's result in terms of profitability is reflected in the Profit and Loss statement for a financial year. The Long term financial health of the company in terms of its wealth creation will be reflected in its Financial Position Statement, termed as a Balance sheet reflecting its assets and liability position throughout its existence. Various financial modelling techniques are used to predict the future of a company. The 3-statement model predicts the company's financial strength for the future regarding the Balance sheet, profit and Loss Account and Cash flow statement. The study aims to predict the financial statements for a future period of 5 years based on the company's past performance. The study was based on the financial performance of Siemens AG for the past five years, and it attempts to predict the future 5 years of the company under study.

INTRODUCTION TO FINANCIAL MODELING

A financial model numerically represents a company's past, present, and future business operations. This numerical report is expressed through the use of Accounting—the language of business. Finance, which may be broadly defined as the science of managing money and other assets, is based on accounting. As such, it is critical to realize the significant role of Accounting, the tallying of business transactions, in building financial models.

A financial model is a required component of nearly any business plan. Anyone interested in starting a new business, starting a new line of business within an existing company, assessing the operations of an existing or proposed business, and/or comparing the operations of two or more businesses, among other tasks, should know how to build, use, and modify a financial model.

Three Statement and DCF Model is used to forecast the financial statements to determine the financial position of a company as a whole in terms of Statement of Financial Position, Statement of Financial, Statement of Profit and Loss and other Comprehensive Income and Cash flow statements. All the calculation in the model is done using MS EXCEL, and there is a trend analysis of the company's performance.
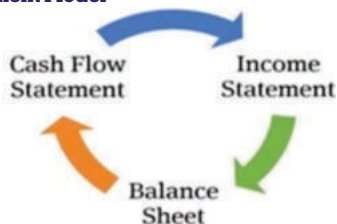
Three Statement Model

Figure 1: Representation of three statement model

2. Review of Literature

Chanappiya Choomjai (2020). Discounted Cash Flow Valuation of Haad Thip Public Company Limited, in this paper, they have applied the discounted cash flow valuation method (DCF method) to model the intrinsic Value of HaadThip Company by forecasting the expected cash flows and using net present value to discount those cash flows, considering the time value of money.

Carlos. J.O and Jada.M.Thompson (2020), Discounted Cash Flow Valuation of Conventional and Cage-Free Production

Investments, compare the profitability and risk of conventional and cage-free egg production in the United States. Evaluating cage-free production is particularly relevant given ongoing consumer-driven changes and new cage-free legislation.

Richard G. Barker (2014). Analysts and fund managers use the role of dividends in valuation models. Here the value of a share is given by the dividend discount model as a simple function of future dividends. However, the actual determination of the share price is rarely based upon the direct estimation of these future dividends.

Amiya Kumar Sahu (2014). Valuation: Hero MotoCorp Limited, by using the DCF model here, we will learn how to evaluate the performance of Hero MotoCorp Ltd by using DCF information and other information.

Paul Pignataro (2013). FINANCIAL MODELLING AND VALUATION - A Practical Guide to Investment Banking and Private Equity, the book sets out to give any investor the fundamental tools to help determine if a stock investment is a rational one; if a stock price is undervalued, overvalued, or appropriately valued. Investment banks, private equity firms, and Wall Street analysts use these fundamental tools.

Chandan Sengupta n.d.(2013). FINANCIAL MODELLING - Using Excel and VBA, here they have taught us how to learn and practice financial modelling the right way and provide us with a wide range of real-world financial models—over 75 of them—to imitate and use for practice so that you can be on your way to financial modelling's Carnegie Hall.

Pantelies Longinidis (2010). Integration of financial statement analysis in the optimal design of supply chain networks under demand uncertainty, In this article, they have told that the models that aim to optimize the design of supply chain networks have become mainstream in the supply chain literature.

Daniel Z. Meyer (2009). As a Qualitative Data Analysis Tool, Qualitative research examines the interconnections in rich, complex data sources. The statistical tools of quantitative methods separate pieces of data in a manner that defeats the purpose.

3. Research Methodology
3.1 Objectives of the Study
• To undertake the trend analysis of the company's

performance.
- To forecast the company's financial performance for future periods using Financial Modeling tools.
- To value the business based on the DCF technique.
- To provide financial insight for the new entrepreneurs.

3.2 Data for Study

In this study, secondary data is used for data analysis. The information analyzed through the secondary data is very qualitative. Therefore the information of Siemens AG is considered, and 4 years' data is taken for analysis. Historical data has been collected from 2016 to 2019, and the forecasting has been done for 5 years, i.e. 2020 to 2024. The trends in the movement of various parameters over the years are studied, and certain inferences are made.

3.3 Limitations of the Study
- The study is based on assumptions to predict the future.
- The outcome of the result is based on the terminal value assumed to calculate the present value of a business.

4. Data Analysis and Interpretation
Analysis 4.1 Calculation of Income Statement

The table below shows historical data and a forecasted value of the Income Statement.

Table 4.1 Calculation from Revenue to Net Income in Income Statement

INCOME STATEMENT	2016A	2017A	2018A	2019A	2020E	2021E	2022E	2023E	2024E
Fiscal year end date	9-30-16	9-30-17	9-30-18	9-30-19	9-30-20	9-30-21	9-30-22	9-30-23	9-30-24
(€ mm except per share)									
Sales/Turnover / Revenue	79,644	82,863	83,044	86,849	1,00,297	1,21,326	1,60,901	2,12,361	2,95,569
Cost of Sales (enter as -ve)	-55,826	-57,820	-58,181	-60,922	-70,208	-84,928	-112,630	-1,48,652	2,06,898
Gross Profit	23,818	25,043	24,863	25,927	30,089	36,398	48,270	63,708	5,02,467
Research and development (enter as -ve)	-4,732	-5,164	-5,558	-5,670	-6,368	-7,826	-10,467	-13,715	-19,037
Selling, general and administrative (enter as -ve)	-11,669	-12,360	-12,941	-13,345	-15,174	-18,501	-24,669	-32,425	-45,058
Other operating Income	328	647	500	442	-404	-524	-649	-846	1,209
Other operating Expenses (enter as -ve)	-427	-595	-678	-466	-280	-354	-463	-578	-4,734
Income from Investments	134	43	-3	199	-7	-8	-11	-19	-22
Operating Profit (EITB)	7,452	7,614	6,183	7,087	7,856	9,186	12,012	16,126	23,646
Interest income	1,314	1,490	1,481	1,634	1,816	2,200	2,930	3,835	5,911
Interest expenses (enter as -ve)	-989	-1,051	-1,089	-1,129	-1,294	-1,572	-2,078	-2,738	-2,956
Other financial income/ (expenses)	-373	135	1,475	-74	552	785	587	1,013	1,389
Pretax Profit	7,404	8,188	8,050	7,518	8,930	10,598	13,450	18,235	27,990
Taxes (enter expenses as -ve)	-2,008	-2,148	-2,054	-1,872	-2006	-2427	-3218	-4247	-5911
Net income from continued operation	5,396	6,040	5,996	5,646	6,924	8,172	10,232	13,988	22,078
-attribute to non controlling interests	-134	-133	-313	-474	-314	-423	-637	-851	-1078
- attribute to share holders	5,450	5,960	5,807	5,175	6,723	7,848	9,735	13,289	21,262
Income for Discontinued Operation, net of taxes	188	53	124	3	114	100	140	152	262
Net income	5,584	6,093	6,120	5,649	7,037	8,272	10,372	14,140	22,340

The formula used for the particular financial activities are:
- Gross Profit = (Sales + Cost of sales)
- EBIT = Total sum of (R&D, Selling general and administrative, other operating Income, other operating expenses and Income from investments) in that particular year.
- Pretax Profit = Sum of (Interest income + Interest expenses + other financial income/(expenses))
- Net Income = (Net Income from continued operation + Income from discontinued operation, net of taxes)
- Interpretation
- To analyze the income statement; there are two types of analyses they are:
- Vertical analysis
- Horizontal analysis

For this study, vertical analysis has been used, and the information that has been projected is that a company's gross profit will be 30% throughout the projected years and in the previous years. EBIT in the income statement has increased yearly, meaning fewer expenses on mortgages, payrolls, property taxes, etc., indicating a company's profitability. At the end of the income statement, Net Income values have increased yearly, indicating a good sign for a company's profitability. Over time, companies with consistent and increasing net Income are looked at very favorably by stockholders. Therefore, Siemens is looked at very favorably by stockholders.

Analysis 4.2 Calculation of Balance Sheet

Let us understand the Balance sheet items influencing the company's performance.

Table 4.2 Balance sheet from Cash and equivalent to total asset

BALANCE SHEET	2016A	2017A	2018A	2019A	2020E	2021E	2022E	2023E	2024E
Fiscal year end date	9-30-16	9-30-17	9-30-	9-30-19	9-30-20	9-30-21	9-30-22	9-30-23	9-30-24
(€ mm except per share)									
Cash and equivalents	10,604	8,375	11,066	12,391	28,005	44,431	77,490	1,19,206	1,83,867
Available for sales securities	1,293	1,242	1,286	NA	NA	NA	NA	NA	NA
Accounts receivables	16,287	16,754	17,918	18,894	19,884	24,104	31,843	41,580	58,421
Inventory	18,160	13,885	13,885	14,806	17,403	19,647	25,849	34,176	48,550
Deferred tax assets	3,431	2,283	2,341	3,174	3,174	3,174	3,174	3,174	3,174
Other current assets	8,004	17,911	19,312	22,938	22,938	22,938	22,938	22,938	22,938

Property, plant and equipment and intangible Assets	17,899	21,903	21,512	21,983	43,515	45,759	51,961	60,288	74,662
Goodwill	24,159	27,906	28,344	30,160	30,160	30,160	30,160	30,160	30,160
Investments using Equity method	3,011	2,727	2,579	2,244	2,591	3,135	4,157	5,487	7,637
Current Income Tax assets	790	1,098	1,010	1,103	1,103	1,103	1,103	1,103	1,103
Assets classified as held for disposal	190	1,484	94	238	238	238	238	238	238
Other assets	21,889	20,543	19,568	22,317	22,317	22,317	22,317	22,317	22,317
Total assets	1,25,717	1,36,111	1,38,915	1,50,248	1,91,329	2,17,006	2,71,230	3,40,666	4,53,066

Interpretation

In the above table, the Cash and equivalent have increased, meaning higher liquidity. A company with higher liquidity is considered healthier and poses less risk. The income statement mentions that the company will also receive a lower interest rate. Available for sales securities values are not given in 2019, because of which the projected year is also not considered in the values. Deferred taxes represent taxes that must be paid at a future date. Paying in advance to create deferred tax assets can aid a business looking to decrease its tax liability in a future period. Considering the above explanation in the calculation, the deferred tax has been taken as a constant value. The amount the company has to pay in the future is considered constant. The total asset has been increased from 8% to 41%, which signifies that the company is growing.

Table 4.3 Calculation of Cash Flow Statement

CASH FLOW STATEMENT									
Fiscal year		2016A	2017A	2018A		2019A			
2020E	2021E	2022E	2023E	2024E					
Fiscal year end date	9-30-16	9-30-17	9-30-18	9-30-19	9-30-20	9-30-21	9-30-22	9-30-23	9-30-24
(€ mm except per share)									
Net income					7037	8272	10372	14140	22340
Deprreciation and amortization					3641	4135	5040	5953	7931
(income) / Loss realted to investing activites					-713	-798	-915	-696	-781
Working Capital									
Accounts receivable					990	4,220	7,739	9,738	16,841
inventory					2,597	2,244	6,202	8,326	14,374
Accounts payable					-83	2,845	4,599	5,659	9,666
Other asset					0	0	0	0	0
Cash from operating activities - CFO					13,469	20,918	33,037	43,120	70,371
Additions to intangible assets and property, plant and equipment					-2,939	-3,632	-4,852	-6,341	-8,812
Cash from investing activites - CFI					-2,939	-3,632	-4,852	-6,341	-8,812
Purchase of treasury shares					0	0	0	0	0
Issuances of long term debit					5,366	5,382	4,988	5,552	5,322

Repayment of long term debit (including current maturities of long term debt)			0	0	0	0	0
Change in short term debt and other financing activities			-6034	0	0	0	0
Dividends paid to shareholders of Siemens AG			-3551	-4170	-5296	-7286	-11363
Other liablties			330	330	330	330	330
Cash from Financing activities - CFF			2,145	1,542	22	-1,404	-5,711
Changes in cash and cash equivalents			15,614	22,460	33,059	41,716	64,661
Cash and cash equivalents at beginning of period			12,391	28,005	44,431	77,490	1,19,206
Cash and cash equivalent at end of period			28,005	44,431	77,490	1,19,206	1,83,867

Interpretation

In the above table, there is Cash from operating activity (CFO) which explains the sources and uses of Cash from ongoing regular business activities in a given period. When Cash from operating activity increases, it indicates that the core business activities of Siemens AG are thriving. It provides an additional indicator of the profitability potential of a company. Cash from investing activity (CFI) in the above table is in negative cash flow, which indicates that the Siemens AG company spent an amount on the purchase of fixed assets or investment instruments, such as stocks and bonds. Negative cash flow from investing activities might be due to significant amounts of Cash invested in the company's long-term health, such as research and development. Cash from financing activity (CFF) shows the net Cash flows used to fund the company.

The financial activity includes debt, equity and dividends. In the above table, the financial activity section shows a low and negative amount, which means that the Siemens AG company will be paying their debt in time, and investors may not worry about the ability of the company to pay back the debt. From the explanation and calculation, the Cash and equivalent predicted for projected years is good, indicating the company's better performance.

Analysis 4.4. Calculation of the DCF Model
Table 4.4.1 Calculation of Equity

Unlevered FCF		15,877	20,924	21,047	21,428	22,817	24,995	3,45,822
NPV Cash Flow				19,133	17,709	17,142	17,072	2,14,728
Firm Value (NPV)	2,85,785							
NPV Value of the Firm	2,86,785							
Plus: Cash	1,83,867							
Less: Debt	57,024							
Equity Value	₹ 4,12,628							

Interpretation

In the above table, the NPV (Net Present Value) is positive in all the years, which means the cash inflow for the company is good. Investors do not need to worry about their investments because there is no negative value in the Net Present Value. Therefore, the company's equity is positive, indicating that investors can invest their amount in Siemens AG for future projects, ensuring they return their investments in time. If we reconsider the Discount rate assumptions, the profitability of the investors might increase, because of which a sensitivity calculation is done.

Table 4.4.2 Calculation of Sensitivity Analysis

4,12,628		Discount Rate				
		8%	9%	10%	11%	12%
	7	3,72,075	3,62,706	3,53,808	3,45,355	3,37,318
	8	3,93,566	3,83,228	3,73,415	3,64,094	3,55,236
	9	4,15,056	4,03,751	3,93,021	3,82,833	3,73,153
Exit Multiple	10	4,36,547	4,24,273	4,12,628	4,01,572	3,91,070
	11	4,58,037	4,44,796	4,32,234	4,20,311	4,08,988
	12	4,79,527	4,65,318	4,51,841	4,39,050	4,26,905
	13	5,01,018	4,85,841	4,71,447	4,57,789	4,44,822

Interpretation

Sensitivity analysis is a financial model that determines how target variables are affected based on changes in other variables known as input variables. This model is also referred to as what-if or simulation analysis. It is a way to predict the outcome of a decision given a specific range of variables.

5. Findings, Suggestions & Conclusion

Findings

- In the study, the revenue growth is assumed as 100%, and based on that, the gross profit is calculated.
- Gross profit is considered as 30% throughout the year. That is in the historical year as well as in the projected year.
- The Net Income of the company is increasing year by year, which is a good sign for the profitability of the company.
- The company's EPS found an increase in value and reached around 80, which is a good sign for growth.
- It is found that the segment revenues have equally contributed to the overall revenue values, which play a significant role in the company's performance.
- In trend analysis, sales and net profit go hand in hand. As sales increase, the net profit also increases.
- It is found that the company is creditworthy.
- It is also found that the company has an effective business strategy by seeing the equity value.
- In DCF Model, it is found that there is a positive cash flow in all the years. In the exit year, the unleveraged cash flow and NPV are positive.
- In sensitive analysis, it is found that the WACC and Exit Multiple should be selected according to the Value of the NPV.

Suggestions

- To improve the overall revenue growth, the company has to concentrate on the wind power and renewable segment as it contributes less than other segments.
- If the company has to increase its EPS, the company has to expand their margin rates by lowering costs. They can also utilize share buybacks; this means that they lower the number of shares that can be bought without making any alterations to profits. This, in turn, raises the EPS.
- If they restructure the liabilities, the liabilities can also be reduced. The restructuring of liabilities can be done by agreeing to longer or scheduled payment terms with suppliers or replacing existing loans with guaranteed loans or consolidated loans or by shareholder funds.
- In DCF, it is found that there is a positive NPV in all the years. Those values can be improved by increasing the discount rate; the more profoundly the cash flows are discounted, the lower the NPV. The lower the discount rate, the less discounting, the better the project or the business.

CONCLUSION

The study shows that in the segment revenue growth, energy management has stopped contributing to the company's total revenue. Wind power and renewable energy contribute less than the other segments. The company has maintained an assets liability match, which gives creditworthiness to the company. The company pays back their debt and long-term loan within the given time. As per the study's outcome, Siemens AG's financial performance in future years will be better, and investors can invest in this company with no worry as the NPV values are positive, indicating a return to the investors in proper time.

6. REFERENCES

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