Czech University of Life Sciences Prague

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Bachelor Thesis

Approaches to Common Stock Valuation

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BACHELOR THESIS ASSIGNMENT

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Thesis title

Approaches to common stock valuation

Objectives of thesis

The primary objective of this thesis is to compare and contrast the two main categories of common stock valuation; absolute and relative valuation. The goal of the theoretical framework is to evaluate, compare and explain the different models under the absolute and relative valuations. The practical part aims to perform the valuations on a chosen publicly owned company based on the theories of the models to obtain a wide range of results and determine which method best suits the company's characteristics.

Methodology

In order to achieve the goals from the methodological point of view the research reviews the different models that yield contrasting results. Valuation models are applied in the practical section to a chosen publicly traded firm. The primary source of information regarding a chosen firm's performance for the practical part is based on its annual reports.

The proposed extent of the thesis

30-40

Keywords

Dividends, Stock, Intrinsic Value, Fundamental Analysis, Present Value, Future Value, Equity

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Recommended information sources

Baresa, S., Bogdan, S. and Ivanovic, Z. (2013), "Strategy of stock valuation by fundamental analysis",UTMS Journal of Economics,vol.4,no.1,pp.45-51,ISSN-18576982, http://hdl.handle.net/10419/105304

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Prague on 13. 03. 2023

Declaration

I declare that I have worked on my bachelor thesis titled "Approaches to Common stock valuation" by myself and I have used only the sources mentioned at the end of the thesis. As the thesis of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on 15/03/2023 _____

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Approaches to Common Stock Valuation

Abstract

This thesis has concentrated on the techniques used to determine the value of Microsoft Corporation shares. The Windows operating system, the Office suite of productivity apps, and the Xbox video gaming console are well-known Microsoft products. Looking into the future to evaluate and forecast 2026 is therefore fascinating.

The thesis bases their ideas on the study and theories of eminent economists and other finance professionals. In the theoretical section, both the models and processes utilized in the application section are discussed. Based on the balance sheet, income statement, and cash flow statement, the thesis has generated projections. There are other more factors to consider, such as the macroeconomic characteristics and operating environment of a given company. The Free Cash Flow to Firm model, the Free Cash Flow to Equity model, and other prevalent relative valuation methods were evaluated. All the remaining figures, including Net Working Capital, Net Debt, and Capital Expenditures, were either calculated or retrieved from the financial accounts.

Keywords: Discount Cash Flow, Firm Value, absolute valuation, relative stock valuation, equity valuation, Present value, intrinsic value.

Přístupy k oceňování kmenových akcií

Abstrakt

Tato práce se soustředila na techniky používané ke stanovení hodnoty akcií Microsoft Corporation. Operační systém Windows, sada kancelářských aplikací pro produktivitu a herní konzole Xbox jsou dobře známé produkty společnosti Microsoft. Pohled do budoucnosti za účelem vyhodnocení a předpovědi roku 2026 je proto fascinující.

Práce vychází ze studií a teorií významných ekonomů a dalších finančních odborníků. V teoretické části jsou diskutovány modely a procesy používané v aplikační části. Na základě rozvahy, výkazu zisku a ztráty a výkazu peněžních toků práce vygenerovala projekce. Je třeba zvážit další další faktory, jako jsou makroekonomické charakteristiky a provozní prostředí dané společnosti. Byly hodnoceny model Free Cash Flow to Firm, Free Cash Flow to Equity model a další převládající metody relativního oceňování. Všechny zbývající údaje, včetně čistého pracovního kapitálu, čistého dluhu a kapitálových výdajů, byly buď vypočteny nebo získány z finančních účtů.

Klíčová slova: Diskontní peněžní tok, Pevná hodnota, absolutní ocenění, relativní ocenění akcií, ocenění akcií, současná hodnota, vnitřní hodnota..

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1 Introduction

Price fluctuations are more detrimental to long-term investors than to short-term traders. Modifications to prices are crucial for evaluating a company's market position, future prospects, and competitive status. Price fluctuations affect investment decisions.

Investing entails fluctuating stock market prices. Numerous internal and external variables may impact business price (lower or higher). Predicting price movements requires an understanding of the pricing behaviour of the stock market. If behaviour tendencies are obvious and recurrent, investors can make better portfolio and business decisions. Equity assets may be sold, held, or traded by investors. Investors require credible market data. Changes in stock prices aid speculators in predicting market behaviour.

In the contemporary economy, financial theorists highlight that a stock is worth its current value plus its anticipated future earnings. Pricing in the stock market is difficult. Numerous economists with a background in finance have created valuation models to account for the fact that stock values may change due to numerous reasons. The market lacks dependability and predictability. The government, investors, stock managers, and brokers are interested in stock prices. Thus, it is essential to comprehend the value components of these assets. Due to inconsistent valuations, stock prices are highly volatile.

Consequently, privatization and the transfer of state-owned shares benefit the government, making this stock pricing mechanism essential. Investors desire bigger profits and additional benefits.
This study examined earnings per share, net profit margin, dividend age, beta rate, dividend growth rate, and promised benefits, as well as macroeconomic variables.

2 Objectives and Methodology

2.1 Objectives

The thesis's goal was to acquire knowledge about valuation theories typically applied to the forecasting of share values in the future. The theoretical section's aim is to elaborate on the

important performance indicators and forecasting methods employed by the valuation models. The thesis considered several comparable valuation approaches, including the Cash Flow to Firm mode, the Cash Flow to Equity mode, and others, while determining the company's fair market value.

2.2 Methodology

Microsoft Corp.'s three financial statements were the key analytical tools used in calculating the price per share projection. Using the Balance Sheet Statement, Income Statement, and Cash Flow Statements, the thesis estimated Cash Flow to Firm and Cash Flow to Equity. The CAPEX data was provided in the Balance Sheet statements, whereas the rest of the indicators were calculated using the theoretical portion. The market's annual growth rate was expected to be 3 % on average. The data was acquired entirely from the Yahoo financial sector and Morningstar. Each transaction was recorded in an Excel file, where all calculations were carried out. An Excel file with the necessary data was attached as part of the bachelor's thesis.

The work of (Damodaran, 2011) served as inspiration for this review, and (Damodaran, 2012) and Pingataro (2022) were relied upon for their calculations of the firm's intrinsic values based on the income statement, balance sheet, and cash flow statement. The thesis made use of the same strategy in the application part.

Please refer to the "Appendices" of the dissertation's Excel file submitted alongside the thesis for the calculations and data.

3 Literature Review

The theoretical portion of this article will provide a brief explanation of what a stock valuation is, how it is utilized, and why.

According to Damodaran (2011) To make educated judgments on the composition of a portfolio, the price to be paid or received in a takeover, and the allocation of capital and distribution of profits within a firm, it is necessary to comprehend an asset's worth and the factors that influence it.

Such models rely heavily on quantitative data for accurate pricing evaluation; nevertheless, the inputs leave ample leeway for subjective judgments. Damodaran (2011) argued that the ultimate value gained from models is influenced by our inherent biases. Indeed, in many valuations, the price is determined first, followed by the value methodology.

In finance, the value of a company is the sum of its intrinsic value and shareholder value. Fundamental value is determined by anticipated cash flows. Shareholder value is firm value minus debt. Book or market value determines a business's value. The performance of the stock market influences a company's value. Total Shareholder Return, which incorporates stock price appreciation and dividends, is the most used metric used to determine shareholder value. Investing at a faster rate than their cost of capital creates benefit for businesses. Companies with stronger returns and growth are valued by the market. (Kumar, R.,2015)

3.1 Fundamental Analysis

Fundamental analysis is a method of valuing stocks by attempting to calculate their inherent value. Fundamental analysts investigate everything from the overall economy and industry conditions to a company's financial situation and management.

In other words, fundamental analysis is the process of determining the value of a stock based on facts. The method estimates a company's fundamental worth and future growth potential by analysing sales, earnings, future growth, return on equity, profit margins, and other statistics. (Kumar &Mohapatra, 2015)

The 'Up and down' strategy is predicated on utilizing all available information, including macroeconomic data, while making an investment decision. In general, fundamental analysts examine current macroeconomic conditions first because their

investment decisions are heavily influenced by the stage of the business cycle and which industries are forecast to perform well in the anticipated economy. The analysts then attempt to identify the top companies in the industry. The stock selection approach is predicated on the notion that the selected company's stock must be superior to its peers in the industry and the industry. The disadvantage is well-documented in financial literature and well recognized and witnessed on Wall Street. This strategy employs sector exchange (changes in sector allocation based on economic developments) and investing style as investment techniques (the difference between value and stock growth).

We are unaware of any scholarly comparisons between the up-and-down technique and the down-and-up technique in terms of fundamental analysis. Attempts to accurately predict the economy have historically been fraught with difficulty and failed to generate a satisfactory return on investment. Investors commonly commit the error of focusing on individual companies as opposed to shares. Investing in a reputable firm does not guarantee financial success. Always compare the market price to the stock's true value while selecting stocks. Investors must assess if the stock's value is lower or higher based on a fundamental review of the company. Invest in the stock if its price is well above its intrinsic value.

3.2   Approaches to Valuation

In practice, analysts employ several models ranging in complexity from simple to complex. Typically, these models are founded on a range of assumptions; yet, they have certain traits and can be grouped into larger classifications. This category has multiple advantages: it makes it easier to understand how various models fit into the larger context, why they give different results, and whether they include fundamental logical flaws.

According to (Damodaran, 2012) in the evaluation of an asset, one can follow one of three fundamental approaches. First, the discounted cash flow (DCF) method uses the present value (PV) of an asset to estimate its future cash flows. The second approach for evaluating the value of an asset entails comparing its current market price to the

prices of similar assets in the past, as indicated by earnings, cash flows, book value, or sales. The contingent claim valuation approach examines the value of assets by applying models created for pricing choices to their specific characteristics. Options may be based on marketable financial assets, such as warrants, or on real-world assets, making them non-tradable (projects, patents, and oil reserves are examples).

Actual alternatives, in contrast, are ones that exist. The result can vary based on the chosen approach. This book aims to assist readers in selecting the ideal model for a given task by analysing the factors that lead to the disparity in value between different model types.

3.2.1 Discounted Cash Flow

Although discounted cash flow valuation is only one of three valuation methods, and most valuations performed in practice are relative valuations, it serves as the foundation upon which the other two methods are founded. For correct relative valuation, a solid understanding of the fundamentals of discounted cash flow valuation is required. When applying option pricing models to value assets, a discounted cash flow analysis is typically the starting point. (Damodaran,2012)

$$\mathbf{DCF} = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_n}{(1+r)^n}$$

$$\mathbf{FV} = \mathbf{DCF}\ (1+r)^n$$

Equation 1 Discounted Cash Flow

Where:

DCF – Discounted Cash Flow.

CF – Cash flow

n – asset's life span

r – discounted rate with the involvement of estimated cash flow risk

Given that the discount rate is a function that takes the riskiness of an expected cashflow into account, the riskier the asset, the higher the risk rate and the more difficult it is to manage. Depending on the asset, cash flows could seem very different (Pinto, J., E., Henry, E., Robinson, T., R. & Stowe, J. D., 2010).

3.2.2   Free Cash Flow (FCF)

According to (Pinto, J., E., Henry, E., Robinson, T., R. & Stowe, J. D., 2010) Using the discounted cash flow (DCF) technique, the intrinsic value of a security is the total of its discounted, anticipated future cash flows. The dividend discount model is an alternative to discounted cash flow models (DCF) (DDM). This dissertation broadens the application of discounted cash flow analysis to the valuation of companies and equity securities by valuing the free cash flow to the company (FCFF) and the free cash flow to equity (FCFE) (FCFE). For shareholders, the two most important measures are free cash flows and dividends. However, FCFF and FCFE information is less available than dividend information. Financial analysts must have a comprehensive understanding of free cash flows and the ability to assess and apply relevant financial data to provide reliable estimates. Creating accurate estimates of future free cash flows is a difficult and rewarding endeavour. In this endeavour, the analyst's understanding of the company's financial statements, operations, funding, and industry may "pay dividends." In fact, many analysts consider free cash flow models to be more efficient than discounted cash flow models (DDMs). Cash flow from operations is an economically sound metric for valuing a company. When one or more of the following requirements are met, analysts prefer to use free cash flow as the return (FCFF or FCFE):

☐   Dividends are not an option for the company's stockholders.

☐   The corporation pays dividends, but it does so in a way that goes against the company's capacity.

☐   Free cash flow is an indicator of a company's profitability over a given period.

☐   movement can be anticipated.

☐   In exchange for capital, shareholders are given voting rights and financial returns.

The potential profit from influencing dividends is substantial for investors.

3.2.2.1 Present Value Of FCFF

$$\text{Firm Value} = \sum_{t=1}^{\infty} \frac{\text{FCFF}_t}{(1+\text{WACC})^t}$$

Equation 2 Present value of FCFF

Where:

FCFF – Free Cash Flow to Firm

WACC – Weighted Average Cost of Capital

The total worth of the firm's capital can be calculated by discounting its Free Cash Flow from Operations (FCFF) at its Weighted Average Cost of Capital (WACC). The value of equity is the value of the firm minus the market value of its debt:(2) Equity value = Firm value − Market value of debt

Dividing the total value of equity by the number of outstanding shares gives the value per share. (Pinto, J., E., Henry, E., Robinson, T., R. & Stowe, J. D., 2010).

3.2.2.2 Present value of FCFE

$$\text{Equity Value} = \sum_{t=1}^{\infty} \frac{\text{FCFE}_t}{(1+\text{r})^t}$$

Equation 3 Present value of FCFE

Where:

FCFE – Free Cash Flow to Equity

r – equity rate of return.

Given that FCFE reflects the cash flow available to equity holders after all other claims have been satisfied, discounting FCFE by r (the required rate of return on equity) produces the firm's equity value. Divide the total value of equity by the number of outstanding

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shares to get the value per share (Pinto, J., E., Henry, E., Robinson, T., R. & Stowe, J. D., 2010).

3.2.2.3 Single stage FCFFt

FCFFt = FCFFt-1 (1 + g)
Equation 4 Single stage FCFF

The Gordon (constant- or stable-growth) model is a subset of the dividend discount model (DDM) that implies continuous dividend growth over time. When steady expansion of free cash flow is assumed, a simpler FCFF or FCFE model emerges (Pinto, J., E., Henry, E., Robinson, T., R. & Stowe, J. D., 2010).

$$\textbf{Firm Value} = \frac{FCFF_1}{WACC - g} = \frac{FCFF_0\ (1+g)}{WACC - g}$$

Equation 5 Firm Value

When calculating the value of a company, the same factors are applied

FCFF – free cash flow to firm,

WACC – weighted average cost of capital.

g – growth rate,

FCFFt= FCFE1-1 *(1+g) if the equity value is to be determined directly at a constant g. At some point in the future, a two-stage model's performance could be assessed using a technique quite similar to this one.

$$\textbf{Equity Value} = \frac{FCFE1}{r-g} = \frac{FCFE0(1+g)}{r-g}$$

Equation 6 Equity Value

3.2.3   Calculation of FCFF

From Net income

FCFF is the cash flow available to the company's capital suppliers following payment of all operational expenses (including taxes) and operating investments. The company's capital providers are bondholders and common shareholders (plus, occasionally, holders of

preferred stock, which we ignore until later). Considering that a noncash charge is a charge or expense that does not entail the expenditure of cash, the term for FCFF can be written as follows: (Pinto, J., E., Henry, E., Robinson, T., R. & Stowe, J. D., 2010).

$$FCFF = NI + NCC + Int\,(1 - T) - FCInv - WCInv$$
Equation 7 FCFF based on net income

NI = Net Income

NCC – Net Non-Cash Charge

Int – Interest Expenses

T – Tax rate

FCInv – Fixed Capital Investment WCInv – Working capital Investment.

From the Statement of Cash Flows

To estimate FCFF using CFO as a starting point, we must account for the treatment of interest paid. As per US GAAP, if the after-tax interest expenditure was subtracted from net income and CFO, the after-tax interest expense must be added back to arrive at FCFF. (Pinto, J. E., E. Henry, T. R. Robinson, and J. D. Stowe, 2010). Consequently, FCFF can be approximated as follows:

$$FCFF = CFO + Int\,(1 - T) - FCInv$$
Equation 8 FCFF based on cash flows

Where:

CFO – Cash Flow from Operations.

From Earnings Before Interest and Tax

$$FCFF = EBIT\,(1 - T) + Dep - FCInv - WCInv$$
Equation 9 FCFF based on EBIT

Where:

EBIT – Earnings Before Interest and Tax

Dep – Depreciation

FCInv – Fixed Capital Investment WCInv – Working capital Investment**.**

Based on Earnings before Interest, Tax, Depreciation and Amortization

FCFF= EBITDA (1–T) + Dep(T) – FCInv – WCInv

Equation 10 FCFF based on EBITDA

3.2.4   Calculation of FCFE

From FCFF

FCFE is cash flow available only to equity investors, according to (Pinto, J., E., Henry, E., Robinson, T., R., and Stowe, J. D., 2010). To calculate FCFE, we must subtract the after-tax value of interest paid to debtholders from FCFF and add net borrowing (which is debt issued less debt repaid over the period for which one is calculating free cash flow). In Equations 7 and 8, we demonstrate the calculation of FCFF beginning with net income and cash flow from operations, respectively. As demonstrated by Equation 11, FCFE = FCFF Int (1 Tax rate) + Net borrowing. By removing after-tax interest expenditure and adding net borrowing to Equations 7 and 8, we have equations for calculating FCFE, beginning with net income and CFO, respectively:

FCFE = FCFF – Int (1 – Tax rate) – Net borrowing

Equation 11 FCFE from FCFF

Where:

FCFE – Free Cash flow to Equity

FCFF – Free Cash Flow to Firm

Int – Interest Expenses

T – Tax rate

From Cash flow Operations

FCFE = CFO – FCInv + Net borrowing

Equation 12 FCFE from CFO

Where:

FCFE – Free Cash flow to Equity

CFO – Cash Flow from Operations

FCInv – Fixed Capital Investment

From Net Income

FCFE = NI + NCC – FClnv – WClnv + Net borrowing

Equation 13 FCFE from Net income

Where:
NI – Net Income

NCC – Non – Cash Charges

FCFE – Free Cash Flow to Equity

FC*Inv* – Fixed Capital Investment

WC*Inv* – Working capital Investment.

3.2.5 Weighted aberage Cost of Capital (WACC)

The most up to date WACC should be calculated using the market value of equity along with the market value of loans and interests (where available). We would compute the expected return for a company with a mixed capital structure (debt and equity) by averaging the expected returns of equity investors and lenders, with the returns of equity investors weighted more heavily (Pignataro, 2022).

$$\text{WACC} = \frac{D}{D+E} * rd\ (1\text{-}T) + \frac{E}{D+E} * re$$

Equation 14 WACC

Where:
D – debt value
E – Equity Value
rd – Debt cost
T – Tax
re – Equity Cost.

Although estimating the cost of equity is a challenging task, it can be accomplished using the capital asset pricing model (CAPM).
The cost of debt is the interest rate, which is the rate at which lenders expect to be repaid. Current interest rates should be used wherever possible. Return on equity is the sum of all dividends and capital gains distributed to shareholders. To calculate the cost of equity, the projected rate of return of a company must be determined. Obtaining the anticipated rate of

return without using an asset-pricing model is impossible, particularly for a publicly traded company. Typically, models used to evaluate the value of an asset incorporate the asset's inherent risk. Diverse asset-pricing models translate variations in risk into variable levels of projected return (Pignataro, 2022).

$$rd = (Rf + rs) \times (1 - T)$$

Equation 15 Debt Cost

Where:

Rf – Risk Free,

rs – Spread default,

T – Tax.

3.2.6 The Capital Asset Pricing Model (CAPM)

In his book (Pignataro, 2022) explains Under the assumption that investors are risk averse and make investment decisions based on the mean return and variance of returns of the entire portfolio, the CAPM is a formula for the required return that should maintain equilibrium (the state in which supply equals demand). The key tenet of the strategy is that investors should evaluate an asset's risk based on its contribution to the portfolio's systematic risk (systematic risk is risk that cannot be shed by portfolio diversification).

$$r = R_f + B \ (ERP), \text{ where } ERP = R_m - R_f$$

Equation 16 CAPM

Where:

r – Expected return on equity

R_f – risk free rate of return,

B – coefficient beta,

ERP – Equity risk premium,

Rm – Return from market.

3.3 Profitability Analysis

Profitability analysis techniques and recommended metrics are discussed here. The three most common places to find these kinds of monetary dealings are the balance sheet, income statement, and cash flow statement. (Soros, G., 2003)

The thesis considers return on equity, net profit margin, and total asset turnover to do research on Microsoft Corp.

To calculate a company's Return on Equity, take its net income and divide it by the total amount of money its shareholders have invested in the company. The formula for determining this proportion is as follows:

$$ROE = \frac{Net\ income}{Shareholders'\ equity}$$

Equation 17ROE

ROA measures the return on an organization's total assets. It quantifies the financial return a corporation receives from its investments in its assets. A higher rate indicates smarter and more productive resource utilization on the part of management. A percentage ratio computation is also included below:

$$ROA = \frac{Net\ income}{Total\ assets}$$

Equation 18 ROA

Net profit margin represents the amount of money remaining after all expenses have been paid (such taxes and interest). The formula for calculating it in %age form is as follows:

$$Net\ profit\ margin = \frac{Net\ income}{Revenue}$$

Equation 19 net profit margin

3.4 Relative Valuation

A price is allocated to an asset based on its similarity to other marketable assets in relative valuation.

Comparative valuation seeks to assign a monetary value to an asset by comparing it to the market value of other assets. Consequently, relative value comprises two components. When pricing assets compared to one another, prices must be normalized, typically by multiplying them by a third-party variable. This factor may indicate earnings, book value, or revenues for publicly listed equities, but it is uniform across all assets. Identifying comparable assets is the second phase, which is difficult because no two assets are identical. (Damodaran, 2011).

3.4.1   Standard Values and Multiples

According to (Damodaran, 2011), the price per share of a corporation is decided by both the firm's equity value and the number of outstanding shares when comparing publicly traded equities across firms. Consequently, a stock split that doubles the number of shares will approximately halve the share price. To compare the market prices of comparable businesses, we must first scale and normalize the statistics. In general, values can be normalized in accordance with the profits created by businesses, the book value or replacement cost of the businesses themselves, the revenues generated by businesses, or sector-specific indicators.

3.4.2   Earnings Multiples

A multiple of an asset's revenue is one of the simplest ways to conceptualize its worth. It is usual practice when purchasing a stock to compare the purchase price to the company's earnings per share (EPS). This price-earnings ratio can be calculated using current earnings per share to produce a current P/E, earnings over the previous four quarters to produce a trailing P/E, or predicted earnings per share in the following year to produce a future P/E. (Damodaran, 2011)

$$\text{PEG ratio} = \frac{\text{Price-earnings multiple}}{\text{Expected growth rate}}$$

$$\text{Price-earnings multiple} = \frac{\text{Market price per share}}{\text{Earnings per share}}$$

$$\text{Ent.pr. to EBITDA} = \frac{\text{Market value of equity - Market value of debt - Cash}}{\text{EBITDA}}$$

Equation 20 Earning Multiples

3.4.3 Book Value or Replacement Value Multiples

Accounting to (Damodaran, 2011)   standards specify the purchase price of assets and the accounting modifications that may be made to that price in order to produce an estimated book value (such as depreciation). Price-to-book value ratios are frequently used by investors as proxies for a stock's fair value; nevertheless, this ratio will vary dramatically from industry to industry due to varying growth projections and asset quality. This ratio is used to determine the value of a company by dividing its market value (or enterprise value) by its book value (or capital) (rather than just the equity).

$$\text{Price-to-book ratio} = \frac{\text{Price per share}}{\text{Book value of equity per share}}$$

$$\text{Price-to-book ratio} = \frac{\text{Market value of equity}}{\text{Book value of equity}}$$

Equation 21 Price to book ratio

3.4.4 Revenue Multiples

Both profit and book value are computed in accordance with accepted accounting standards. Another way that is significantly less prone to manipulation by selective accounting is the ratio of a company's market value to its revenue. The price-to-sales (PS) ratio gauges shareholder profitability by comparing the market value of a company's equity to its revenues. To evaluate the value of a corporation, this ratio can be recast as the

enterprise value-to-sales (VS) ratio, with the market value of the company's operating assets substituting for sales. (Damodaran, 2011)

$$\text{Price-to-sales ratio} = \frac{\text{Market value of equity}}{\text{Revenues}}$$

Equation 22 Price to sales Ratio

4 Practical Part

This section of the thesis introduces Microsoft, the main aspects of its business, and the items it offers, and it makes a Future Stock Price forecast for the next five years. The thesis has done the math using the Statement of Financial Position, the Statement of Income and Expenditures, and the Statement of Cash Flows.

Microsoft Corporation is a multinational technology business that develops, licenses, and distributes personal computers, consumer devices, and computer software. Bill Gates and Paul Allen started Microsoft in 1975 in Redmond, Washington.

Microsoft's Windows operating system and Microsoft Office suite, which includes Word, Excel, and PowerPoint, are its most well-known products. Additionally, the corporation manufactures hardware such as the Xbox game console, Surface tablets, and many accessories.

In recent years, Microsoft has moved into cloud computing with its Azure platform and made significant investments in artificial intelligence and machine learning technology. As of early 2023, Microsoft is one of the world's largest technological businesses, with a market capitalization of over $2 trillion.

Table 1 Income statement analysis, own Processing Excel

Period	12/31/2021	12/31/2020	12/31/2019
Total Revenue	168,088.00	143,015.00	125,843.00
Growth Y-o-Y	18%	14%	
Operating Revenue	168,088.00	143,015.00	125,843.00
Cost of Revenue	52,232.00	46,078.00	42,910.00
Gross Profit	115,856.00	96,937.00	82,933.00
Gross Margin	0.69	0.68	0.66
Operating Expense	45,940.00	43,978.00	39,974.00
Selling General and Administrative	25,224.00	24,709.00	23,098.00
Research & Development	20,716.00	19,269.00	16,876.00
Operating Income	69,916.00	52,959.00	42,959.00
Operating Margin	0.42	0.37	0.34
Net Non Operating Interest Income Expense	0.20	0.89	1,385.00
Interest Income	2,131.00	2,680.00	2,762.00
Interest Expense	2,346.00	2,591.00	2,686.00
Other Income Expense	1,401.00	-12.00	653.00
Other Non Operating Income Expenses	60.00	-87.00	422.00
Pretax Income	71,102.00	53,036.00	43,688.00
Tax Provision	9,831.00	8,755.00	4,448.00
Net Income Common Stockholders	61,271.00	44,281.00	39,240.00
Net Income	61,271.00	44,281.00	39,240.00
Growth Y-o-Y	38.37%	12.85%	N/A
Net Minority Interest	61,271.00	44,281.00	39,240.00

Revenue growth or decline is shown in Table -1 for comparisons between fiscal years. In total, sales will rise by 14% between 2019 and 2020, and by another 18% in 2021 However, based on annual variation, its Net Income is as follows: See, Table – 2. The relative rise in Net income between 2019 and 2020 is 12.85 %, which is less than between 2020 and 2021. In contrast, the Net Income has climbed by 38.7 % which is higher in relative terms along the years.

Table 2 Net income growth, own Processing Excel

Period	12/31/2021	12/31/2020	12/31/2019
Net Income	61,271.00	44,281.00	39,240.00
Growth Y-o-Y	38.37 %	12.85 %	N/A

4.1 Profitability analysis of Microsoft corp. for the period of 2014 to 2021

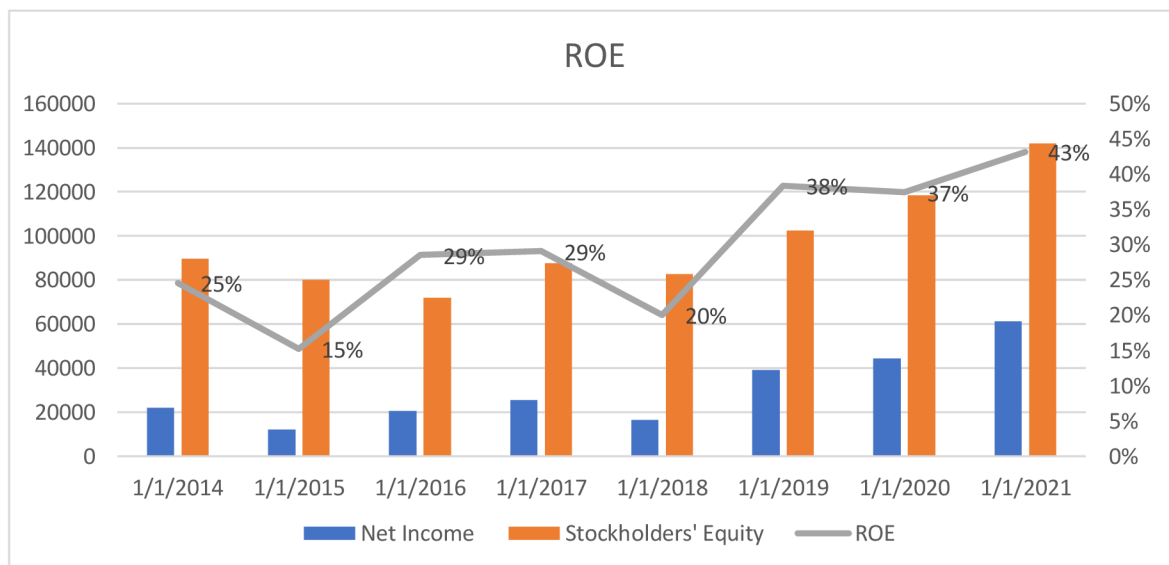The balance sheet was used to determine Microsoft Corp.'s profitability, as shown in the thesis.

Figure 1 ROE analysis of Microsoft Corp., own calculations Excel

Period	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	12/31/2021
Net Income	22074	12193	20539	25489	16571	39240	44281	61271
Stockholders' Equity	89,784	80,083	71,997	87,711	82,718	102330	118304	141988
ROE	25%	15%	29%	29%	20%	38%	37%	43%

Table 3 ROE calculations

The preceding table displays the ratio from 2014 to 2021; in Table -3, the ROE indication was between 15% and 20% before to Covid-19; for most businesses, a Return on Equity between 10% and 30% is desired to offer dividends to owners while also having cash for the company's future growth. When using ROE as the sole indicator of a firm's efficiency, investors should exercise considerable caution, as ROE might be high if a company is overly leveraged. As indicated in Table 2, Net Income increased by 38.4 percent in the final year of 2021. The calculation was based on financial sheet data from Microsoft Corporation from 2014 to 2021. Despite the pandemic, Microsoft Corporation had a higher return on equity than the average investor's forecast of 15%. Microsoft Corporation is a financially sound and stable company, as seen by its Return on Equity.

Figure 2 ROA analysis of Microsoft Corp., Own Processing Excel

Period	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	12/31/2021
Net Income	22074	12193	20539	25489	16571	39240	44281	61271
Total Assets	172,384	174,472	193,468	250,312	258,848	286556	301311	333779
ROA	13%	7%	11%	10%	6%	14%	15%	18%

Table 4 ROA calculations

Figure 2 depicts the Return on Assets as well as the productivity and efficiency with which Microsoft Corp.'s management uses its own assets to generate profits based on those investments. The figure depicts the COVID-19 causes in 2019 and 2020, when the incidence rate was quite stable and high. Following the epidemic, though, Microsoft manufacturing restarted, and by the end of 2021, 17.9 percent of ROA had been accounted

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for. This means that Microsoft earns around 17.9 cents for every dollar of assets it owns. It is crucial to note that because Microsoft is a large, diverse company with multiple business sectors, the ROA for each segment may differ.

It should be noted that ROA can vary greatly among industries and should be compared to companies in the same industry to obtain more insightful statistics. Furthermore, ROA is just one of several financial measures used by investors and analysts to evaluate a company's financial performance. Microsoft's ROA has also varied year to year, with some years yielding higher returns than others. However, the company's ROA has been consistently good in recent years, with a significant improvement in 2021 compared to previous years. This illustrates that Microsoft has successfully used its assets to generate money.

In general, Microsoft's ROA is viewed as extremely strong, demonstrating the company's ability to generate significant profits from its assets.
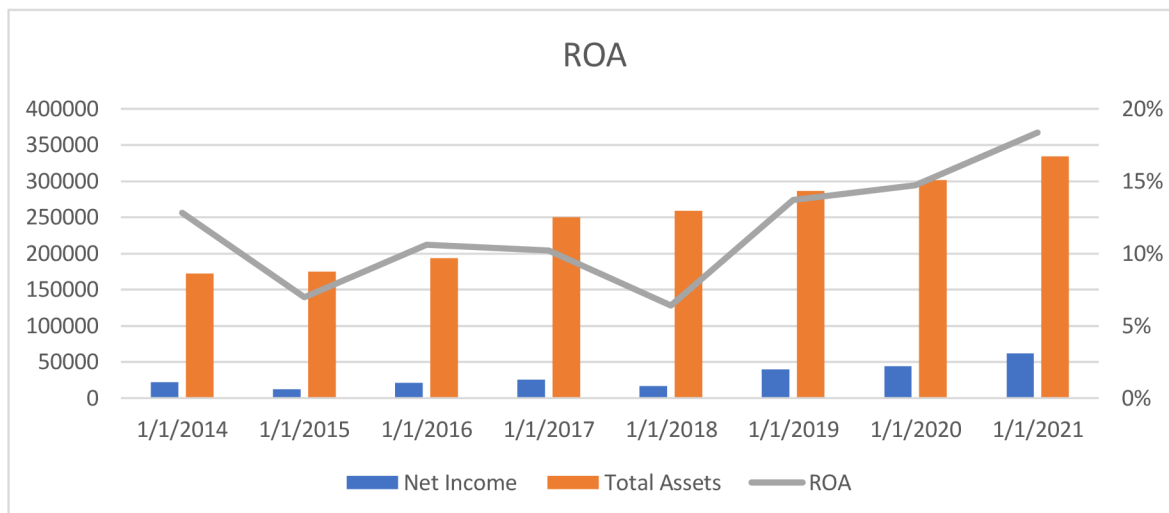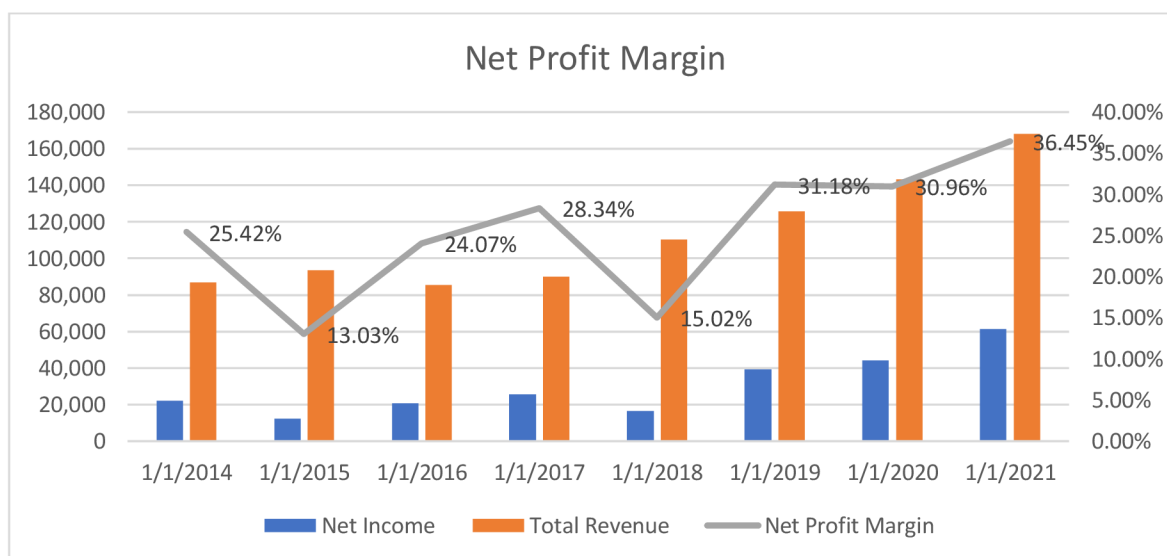

Figure 3 Net Profit Margin Analysis of Microsoft Corp., own Processing Excel

Period	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	12/31/2021
Net Income	22,074	12,193	20,539	25,489	16,571	39240	44281	61271
Total Revenue	86830	93580	85320	89950	110360	125843	143015	168088
Net Profit Margin	25.42%	13.03%	24.07%	28.34%	15.02%	31.18%	30.96%	36.45%

Table 5 Net profit margin calculations

Microsoft's net profit margin is expected to be 36.45 percent in 2021. This means that the corporation retained around 36.45 cents on every dollar of revenue. Please keep in mind that this number may have changed since then due to factors such as the company's financial performance or market conditions.

Microsoft's net profit margin has varied year to year, with higher margins in some years. The company's net profit margin has been continuously excellent throughout the past few years, with a notable increase in 2021 relative to previous years.

4.2 Absolute Valuation

The value of this company is based on the assumption that it will stay operating and profitable in the market for the foreseeable future. Taking this into account, these folks will purchase and use Microsoft products. As a result, the thesis chose to produce a five-year estimate based on financial statements from the past three years (balance sheet, income statement, and cash flow statement).

4.2.1 The DCF valuation

 The Discounted Cash Flow Model is the most commonly used type of valuation in this section. The following indicators will be used: the Firm's Free Cash Flow and the Equity's Free Cash Flow. The income statement will incorporate the following measures, such as capital expenditures and operating cash flow: The Income Statement and Depreciation and Amortization entries are used to compute Operating Cash Flow, whereas the Balance Sheet is used to calculate NWC. NWC indicators have been calculated for the years 2019-2021. The thesis uses 2018's Current Assets and Current Liabilities to calculate the NWC for 2019. The following tabular data will be displayed in US dollars.

Change in NWC			
Current Assets 2019	175,552.0	Current Liabilities 2019	69,420.00
Current Assets 2018	169,662.0	Current Liabilities 2018	58,488.00
Δ Current Assets	**5,890.00**	**Δ Current Liabilities**	10,932.00
Δ NWC	**-5,042.00**		

Table 6 Change in NWC 2019, Own calculation Excel

Change in NWC			
Current Assets 2020	181,915.00	Current Liabilities 2020	72,310.00
Current Assets 2019	175,552.00	Current Liabilities 2019	69,420.00
Δ Current Assets	**6,363.00**	**Δ Current Liabilities**	2,890.00
Δ Change in NWC	**3,473.00**		

Table 7 Change in NWC 2020, own calculation Excel

Change in NWC			
Current Assets 2021	184,406.00	Current Liabilities 2021	88,657.00
Current Assets 2020	181,915.00	Current Liabilities 2020	72,310.00
Δ Current Assets	**2,491.00**	**Change in Current Liabilities**	16,347.00
Δ NWC	**-13,856.00**		

Table 8 Change in NWC 2021, Own calculation Excel

Change in Net Debt is an essential component for projecting Free Cash Flow to Equity since it reveals a company's ability to meet both long- and short-term financial commitments. However, the whole debt information was included in the thesis' later computations. Because the thesis only spans three years, the negative Change in Net Debt in 2020 and 2021 will have only a minor impact on the estimates for the following years.

Change in Net Debt			
Cash 2019	11,356.00	Cash 2018	11,946.00
Short Term Debt 2019	5,516.00	Short Term Debt 2018	3,998.00
Long Term Debt 2019	78,366.00	Long Term Debt 2018	72,242.00
Current Year Net Debt	72,526.00	Prior Year Net Debt	64,294.00
Δ Net Debt	**8,232.00**		

Table 9 Change in net Debt 2019, own calculation Excel

Change in Net Debt			
Cash 2020	13,576.00	Cash 2019	11,356.00
Short Term Debt 2020	70,998.00	Short Term Debt 2019	78,366.00
Long Term Debt 2020		Long Term Debt 2019	
Current Year Net Debt	57,422.00	Prior Year Net Debt	67,010.00
Δ Net Debt	**-9,588.00**		

Table 10 Change in net Debt 2020, own calculation Excel

Change in Net Debt			
Cash 2021	14,224.00	Cash 2020	13,576.00
Short Term Debt 2021	8,072.00	Short Term Debt 2020	3,749.00
Long Term Debt 2021	50,074.00	Long Term Debt 2020	59,578.00
Current Year Net Debt	43,922.00	Prior Year Net Debt	49,751.00
Δ Net Debt	**-5,829.00**		

Table 11 Change in Net Debt 2021, own calculations Excel

Appendices to the thesis also include a calculation and presentation of the ratio of annual change in Net Debt to Total Revenue.

Period	12/31/2021	12/31/2020	12/31/2019
Net Income Common Stockholders	61271	44281	39240
Depreciation & amortization	11,686	12,796	11,682
Δ NWC	-13,856.00	3473	-5,042.00
Operating Cash Flow	86813	53604	55964
CAPEX	-20,622	-15,441	-13,925
FCFF	**107435**	**69045**	**69889**

Table 12 FCFF, own calculations Excel

The FCFF was calculated using the Total Revenue to CAPEX ratio, according to the thesis. The next step was to compute Free Cash Flow to Equity, which had previously been calculated in the previous step, as indicated in Table - 13: FCFE = FCFF + Change in Net Debt.

Period	12/31/2021	12/31/2020	12/31/2019
Net Income Common Stockholders	61271	44281	39240
FCFF	107435	69045	69889
Δ Net Debt	-5,829.00	-9588	8,232.00
FCFE	**101606**	**59457**	**78121**

Table 13 FCFE, Own processing Excel

Period	2019	2020	2021
Revenue Growth forecast	n/a	13.65%	17.53%
COGS as a % of Revenue	34.10%	32.22%	31.07%
S&GA as a % of Revenue	18.35%	17.28%	15.01%
Interest Income as a % of revenue	2.19%	1.87%	1.27%
Interest Expense as a % of revenue	2.13%	1.81%	1.40%
Normalized EBITDA	65.05%	56.65%	73.26%
Other Expense or Income	0.52%	-0.01%	0.83%
Effective Tax Rate	10.18%	16.51%	13.83%
Minority Interest as a % of Revenue	31.18%	30.96%	36.45%

D&A as a % of Revenue	9.28%	8.95%	6.95%
Δ NWC as a % of Revenue	-4.01%	8.95%	-8.24%
Capex as a % of Revenue	-11.07%	-10.80%	-12.27%
Δ Net Debt as a % of Revenue	5.76%	-6.70%	-3.47%

Table 14 Ratios of Total revenue

All the ratios of the major factors utilized to make the projections are shown in Table 14. In the absence of data prior to 2019, the revenue growth between 2019 and 2018 is detected as n/a. Similarly, the following table is based on projected Total Revenue; for more details, see the Appendices.

16% and 14% of total revenue were projected for 2022 and 2023, respectively. The thesis then predicted an average for the previous three years up until the next year, based on their calculations for 2021, 2022, and 2023.

Forecast	2022 (F)	2023 (F)	2024 (F)	2025 (F)	2026 (F)
Revenue Growth forecast	16.00%	14.00%	15.00%	15.00%	16.00
CoGS as a % of Revenue	32.46%	31.92%	31.82%	32.07%	31.94
S&GA as a % of Revenue	12.00%	12.00%	12.00%	12.00%	12.00
Interest Income as a % of revenue	1.78%	1.78%	1.78%	1.78%	1.78
Interest Expense as a % of revenue	1.78%	1.78%	1.78%	1.78%	1.78
Normalized EBITDA	64.99%	64.96%	67.74%	65.90%	66.20
Other Expense or Income	0.85%	0.85%	0.85%	0.85%	0.85
Effective Tax Rate	12.00%	12.00%	12.00%	12.00%	12.00
Minority Interest as a % of Revenue	32.87%	33.43%	33.43%	33.43%	33.43
D&A as a % of Revenue	8.39%	8.39%	8.39%	8.39%	8.39
Change in NWC as a % of Revenue	-8.24%	-8.24%	-8.24%	-8.24%	-8.24
Capex as a % of Revenue	-11.38%	-11.38%	-11.38%	-11.38%	-11.38
Change in net Debt as a % of Revenue	-3.49%	-2.70%	-2.10%	-1.88%	-3.49

Table 15 Forecast based on total revenue , Own processing Excel

Period	12/31/2022	12/31/2023	12/31/2024	12/31/2025	12/31/
Net Income Common Stockholders	n/a	n/a	n/a	n/a	n
Depreciation & amortization	15845	17905	20170	22721	
Change in NWC	-15554	-17576	-19799	-22304	
Operating Cash Flow	125060	142341	160558	180277	
CAPEX	-21475	-24267	-27337	-30795	
FCFF	146536	166608	187895	211072	
Change in Net Debt	-6588	-5759	-5046	-5086	
FCFE	139948	160849	182849	205986	

Table 16 Forecast based on total revenue, own calculations Excel

The relative number was determined by multiplying the percentage ratio of an indicator for the projected year by the total revenue anticipated for the projected year (for further information, see the Appendices). Due to its insignificance, the Income Common Stockholder has not been computed for the forecasted years. Once r and g were determined, the average growth rate was used (3 percent).

CAPM		
Risk - Free Rate	3.975%	Microsoft's risk-free rate from google
Beta	0.9	Yahoo Financials
Market Return	10.20%	average, based on S&P 500
r	9.6%	

Table 17 CAPM Calculations, Own processing Excel

The Terminal Value for the year 2026 was also to be calculated in the thesis, using the data provided in Table - 16. (227,722).

This formula was used to estimate the Terminal Value for the year 2026:

Thus the terminal value (TV) = 227,722 * (1 + 3%) / (9,6% - 3%) = 3,553,843.333

The sum of the values is 3,781,565.333 calculated which was calculated from (227,722 + 3,553,843.333).

Using the NPV method, the thesis calculated the expected equity value by extracting the terminal value stream and the rate of return of 9.6 percent from Table - 17.

Equity Value	2,439,845.29	Projected equity value for 2026.
Share Outstanding	7,496.00	Available Stocks
Price Per Share	325.49	intrinsic value
Current Price	252.40	value for now
Buy / Sell	Buy	Buy at this point.
Upside	29%	growth for the period of 5 years

Table 18 Forecasting, own calculations Excel

The thesis forecasts that the price per share will increase gradually until 2026, at which point it is recommended to purchase shares at the present price of $252.40 and holding them until then. For the foreseeable future, a growth of 29 percent is anticipated.

Inflation, which was not accounted for as a factor that can depreciate the stock's final price, could occur at this time, but this is merely the thesis's prediction. The company's sales could decline for a variety of reasons, including Linux's possible market share gains. It is essential to keep an eye on the market, the company's ambitions, and the present level of electronic innovation, as the answer to this issue may change significantly based on a variety of circumstances.

These two models, FCF and DDM, serve as the basis for the principal evaluation. Nevertheless, projecting future cash flows is an essential component of any model. However, when free cash flow or dividends are excessively volatile, the models fail to predict the price per ratio effectively. In a fortunate turn of events for its shareholders, Microsoft Corp. has not faced a negative cash flow over the past decade and has therefore been able to routinely deliver dividends to its owners.

It is more likely that Microsoft Corp. stock price estimates that consider both external and internal factors will be accurate. In the lead-up to corporate presentations and again following the launch of a new product, there is a brief increase in stock price activity.

4.3   Relative Valuation

Here, the relative valuation methodologies described in the literature review, such as the P/E, P/B, and P/S multiples, are applied to certain equities data collected by Aswath Damodaran.

The profit multiplier is the most important ratio to consider. The stock price is set as of December 31, 2021, and the EPS is calculated using financial data from 2021. A summary of the P/E ratio is shown below:
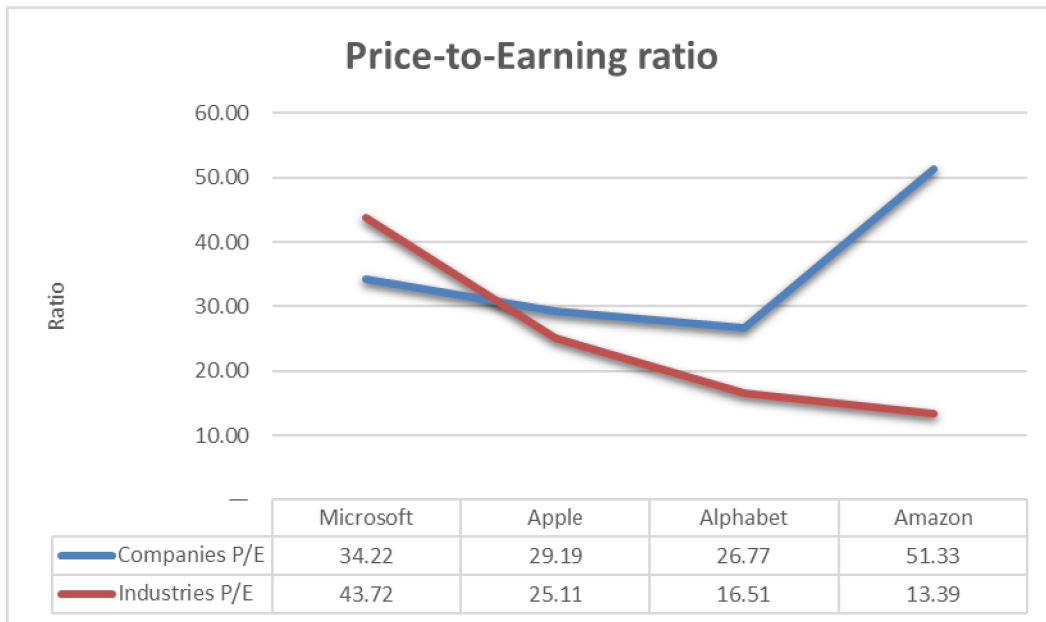
Figure 4 P/E Ratio, own calculations Excel

The P/E ratio reveals what the market is ready to pay for a stock based on its current or future earnings. A high price-to-earnings ratio, such as Amazon.com Inc.'s (51.33), suggests that investors place a high value on the company's potential for profit growth. Still, It should be noted to sell Amazon stock because the company's P/E is much higher than the industry average. Microsoft Corp.'s P/E ratio is above 30, although it is lower than the industry's P/E ratio, therefore investors should consider selling their shares. Alphabetet had the lowest valuation, implying that an investor would have to pay 26.77 USD for each dollar of the company's earnings to participate. Since the ratio is higher than the industry average, it is possible to liquidate the stock in the event of possession. The P/E ratio of Apples is more than that of industry, thus the company's stock is also available to investors.

Price-to-Book ratio is another multiplier that can be calculated by dividing the market price of the stock by its book value (the difference between its assets and liabilities). The following figure illustrates the results of the calculations:

	Microsoft	Apple	Alphabet	Amazon
Companies P/B	15.58	18.81	7.62	12.24
Industries P/B	8.39	9.83	5.21	6.16
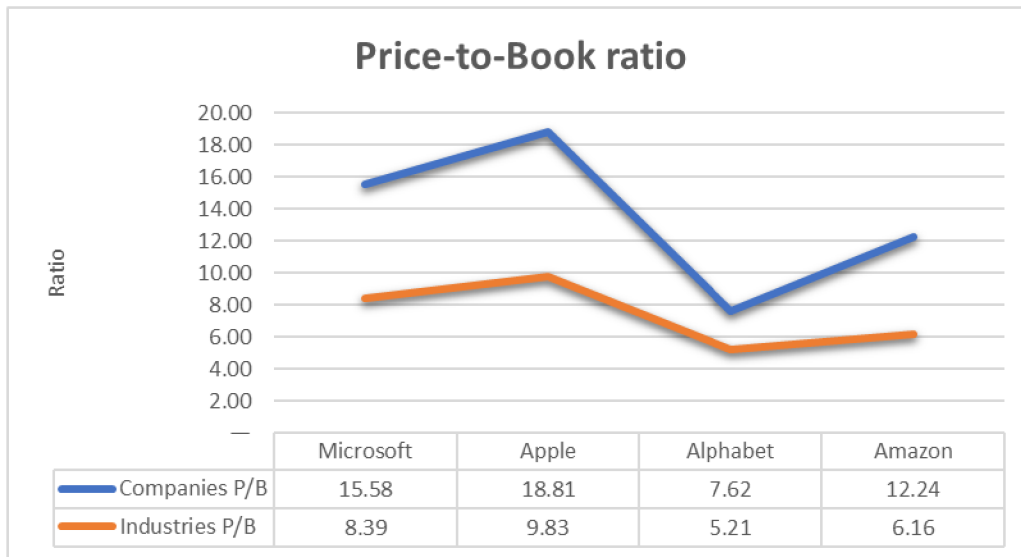
Figure 5 P/B ratio, own calculation Excel

Based on these numbers, Apple, Microsoft, and Amazon had significantly higher P/B ratios compared to the industry benchmark. This could suggest that investors were willing to pay a premium for these companies' stocks due to their strong growth prospects and financial performance.

On the other hand, Alphabet had a much closer P/B ratio compared to the industry benchmark, indicating that they were relatively undervalued by the market. This could be due to several factors, such as concerns about regulation or slower growth prospects.

It's worth noting that P/B ratios are just one metric used to evaluate a company's valuation and should be considered in conjunction with other factors such as earnings, revenue, and cash flow.
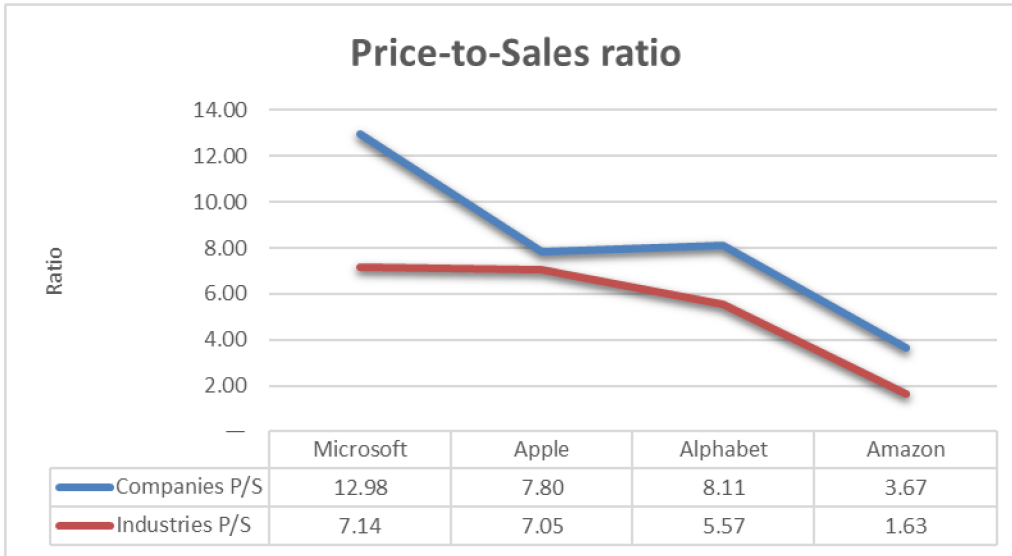
Figure 6 P/S ratio, own calculations Excel

Price-to-Sales reflects the relationship between the market price of a stock and the sales generated per share. Microsoft's P/S multiplier is much higher than sector averages. In addition, the value is the highest among other companies, so it is advised to sell or avoid purchasing this stock. Apple, Alphabet, and Amazon are trading above the average P/S ratio for the industry. It's crucial to note, however, that a company's P/S ratio might fluctuate based on several factors, such as market circumstances and revenue fluctuations.

5 Conclusion

The focus of this bachelor's thesis was on the application of specific absolute valuation approaches to Microsoft Corporation and a few other corporations for the Relative valuation. As a result, it was determined that Free Cash Flow to Firm and Equity models will be employed as absolute valuation methodologies, while multiples will be used for relative valuation.

In the final stage of the top-down approach, profitability analysis was performed by implementing ROE, ROA, and Net Profit Margin. It was determined that Microsoft's ROE for the fiscal year 2021 was approximately 43 percent, which is considered high and indicates that Microsoft is generating high returns on its shareholders' investments. Microsoft's ROA for fiscal year 2021 was approximately 18 percent, which is regarded high and demonstrates that the company is effectively generating profits from its assets. Microsoft's net profit margin for the fiscal year 2021 was approximately 36.45 percent, indicating that the corporation is making substantial profits and effectively controlling expenses.

In the initial section of the valuation process, absolute approaches are applied utilizing Discounted Cash Flow models. For the estimation of intrinsic value based on Free Cash Flow to Firm and Equity methods, significant input factors were determined. Initially, a two-stage growth model with a 5-year prediction horizon (from 2022 to 2026) was adopted. The discount rate was determined to be 9.6 percent, based on a levered beta of 0.9. Beta is a measure of a stock's volatility relative to the market and the average industry beta of internationally comparable companies, with a limit between 0.8 and 2.0, which is a reasonable range for a steady corporation.

Due to loan repayments, the equity value of a company is typically lower than the Firm's worth. In FCFF valuation, the selected company's value was determined. Microsoft Corp. shares have an intrinsic value of 325.49 USD, which is 29 percent greater than their market price. Therefore, it is recommended to buy or hold this stock.

In addition, Microsoft's P/E ratio is lower than the industry average, which may signal that the market has lesser growth expectations for the firm compared to its competitors. Alternately, it may indicate that the company is undervalued by the market, providing investors with a potential buying opportunity. Alphabet had the lowest P/B ratio among the selected companies, which made it appear preferable. It is vital to note that a company's ratios might fluctuate based on a range of circumstances, such as market conditions and financial developments. Before making any investment decisions, investors should conduct extensive study and analysis of a company's financial and industry performance, rather than relying exclusively on a single valuation metric such as the P/E, P/B, or P/S ratio.

Finally, because each organization can do an in-depth investigation, the chosen subject has a lot of development potential. Because of the volume limits imposed by thesis requirements, this work does not fully exploit the top-down approach to basic analysis. It does, however, represent a substantial step toward a comprehensive stock valuation technique. It would be fascinating to compare the thesis's conclusions with those of such a rigorous and in-depth investigation of selected equities.

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7 List of, tables and abbreviations

7.1 List of tables

7.1.1 Table 1 Income statement Analysis

Period	12/31/2021	12/31/2020	12/31/2019
Total Revenue	168,088.00	143,015.00	125,843.00
Growth Y-o-Y	18%	14%	
Operating Revenue	168,088.00	143,015.00	125,843.00
Cost of Revenue	52,232.00	46,078.00	42,910.00
Gross Profit	115,856.00	96,937.00	82,933.00
Gross Margin	0.69	0.68	0.66
Operating Expense	45,940.00	43,978.00	39,974.00
Selling General and Administrative	25,224.00	24,709.00	23,098.00
Research & Development	20,716.00	19,269.00	16,876.00
Operating Income	69,916.00	52,959.00	42,959.00
Operating Margin	0.42	0.37	0.34
Net Non Operating Interest Income Expense	0.20	0.89	1,385.00
Interest Income	2,131.00	2,680.00	2,762.00
Interest Expense	2,346.00	2,591.00	2,686.00
Other Income Expense	1,401.00	-12.00	653.00
Other Non Operating Income Expenses	60.00	-87.00	422.00
Pretax Income	71,102.00	53,036.00	43,688.00
Tax Provision	9,831.00	8,755.00	4,448.00
Net Income Common Stockholders	61,271.00	44,281.00	39,240.00
Net Income	61,271.00	44,281.00	39,240.00
Growth Y-o-Y	38.37%	12.85%	N/A
Net Minority Interest	61,271.00	44,281.00	39,240.00

7.1.2 Table 2 Net income growth

Period	12/31/2021	12/31/2020	12/31/2019
Net Income	61,271.00	44,281.00	39,240.00
Growth Y-o-Y	38.37 %	12.85 %	N/A

7.1.3 Table 3 ROE calculations

Period	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	12/31/2021
Net Income	22074	12193	20539	25489	16571	39240	44281	61271
Stockholders' Equity	89,784	80,083	71,997	87,711	82,718	102330	118304	141988
ROE	25%	15%	29%	29%	20%	38%	37%	43%

7.1.4 Table 4 ROA calculations

Period	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	12/31/2021
Net Income	22074	12193	20539	25489	16571	39240	44281	61271
Total Assets	172,384	174,472	193,468	250,312	258,848	286556	301311	333779
ROA	13%	7%	11%	10%	6%	14%	15%	18%

7.1.5 Table 5 Net profit Margins calculations

Period	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	12/31/2021
Net Income	22,074	12,193	20,539	25,489	16,571	39240	44281	61271
Total Revenue	86830	93580	85320	89950	110360	125843	143015	168088
Net Profit Margin	25.42%	13.03%	24.07%	28.34%	15.02%	31.18%	30.96%	36.45%

7.1.6 Table 6 Change in NWC 2019

Change in NWC			
Current Assets 2019	175,552.0	Current Liabilities 2019	69,420.00
Current Assets 2018	169,662.0	Current Liabilities 2018	58,488.00
Δ Current Assets	5,890.00	Δ Current Liabilities	10,932.00
Δ NWC	-5,042.00		

7.1.7 Table 7 Change in NWC 2020

Change in NWC			
Current Assets 2020	181,915.00	Current Liabilities 2020	72,310.00
Current Assets 2019	175,552.00	Current Liabilities 2019	69,420.00
Δ Current Assets	6,363.00	Δ Current Liabilities	2,890.00
Δ Change in NWC	3,473.00		

7.1.8 Table 8 Change in NWC 2021

Change in NWC			
Current Assets 2021	184,406.00	Current Liabilities 2021	88,657.00
Current Assets 2020	181,915.00	Current Liabilities 2020	72,310.00
Δ Current Assets	2,491.00	Change in Current Liabilities	16,347.00
Δ NWC	-13,856.00		

7.1.9   Table 9 Change in Net Debt 2019

Change in Net Debt			
Cash 2019	11,356.00	Cash 2018	11,946.00
Short Term Debt 2019	5,516.00	Short Term Debt 2018	3,998.00
Long Term Debt 2019	78,366.00	Long Term Debt 2018	72,242.00
Current Year Net Debt	72,526.00	Prior Year Net Debt	64,294.00
Δ Net Debt	**8,232.00**		

7.1.10   Table 10 Change in Net Debt 2020

Change in Net Debt			
Cash 2020	13,576.00	Cash 2019	11,356.00
Short Term Debt 2020	70,998.00	Short Term Debt 2019	78,366.00
Long Term Debt 2020		Long Term Debt 2019	
Current Year Net Debt	57,422.00	Prior Year Net Debt	67,010.00
Δ Net Debt	**-9,588.00**		

7.1.11   Table 11 Change in Net Debt 2021

Change in Net Debt			
Cash 2021	14,224.00	Cash 2020	13,576.00
Short Term Debt 2021	8,072.00	Short Term Debt 2020	3,749.00
Long Term Debt 2021	50,074.00	Long Term Debt 2020	59,578.00
Current Year Net Debt	43,922.00	Prior Year Net Debt	49,751.00
Δ Net Debt	**-5,829.00**		

7.1.12 Table 12 FCFF

Period	12/31/2021	12/31/2020	12/31/2019
Net Income Common Stockholders	61271	44281	39240
Depreciation & amortization	11,686	12,796	11,682
Δ NWC	-13,856.00	3473	-5,042.00
Operating Cash Flow	86813	53604	55964
CAPEX	-20,622	-15,441	-13,925
FCFF	**107435**	**69045**	**69889**

7.1.13 Table 13 FCFE

Period	12/31/2021	12/31/2020	12/31/2019
Net Income Common Stockholders	61271	44281	39240
FCFF	107435	69045	69889
Δ Net Debt	-5,829.00	-9588	8,232.00
FCFE	**101606**	**59457**	**78121**

7.1.14 Table 14 Forecast Assumptions

Period	2019	2020	2021
Revenue Growth forecast	n/a	13.65%	17.53%
COGS as a % of Revenue	34.10%	32.22%	31.07%
S&GA as a % of Revenue	18.35%	17.28%	15.01%
Interest Income as a % of revenue	2.19%	1.87%	1.27%
Interest Expense as a % of revenue	2.13%	1.81%	1.40%
Normalized EBITDA	65.05%	56.65%	73.26%
Other Expense or Income	0.52%	-0.01%	0.83%
Effective Tax Rate	10.18%	16.51%	13.83%
Minority Interest as a % of Revenue	31.18%	30.96%	36.45%
D&A as a % of Revenue	9.28%	8.95%	6.95%

Δ NWC as a % of Revenue	-4.01%	8.95%	-8.24%
Capex as a % of Revenue	-11.07%	-10.80%	-12.27%
Δ Net Debt as a % of Revenue	5.76%	-6.70%	-3.47%

7.1.15 Table 15 Forecast Estimation

Forecast	2022 (F)	2023 (F)	2024 (F)	2025 (F)	2026 (F)
Revenue Growth forecast	16.00%	14.00%	15.00%	15.00%	16.00
CoGS as a % of Revenue	32.46%	31.92%	31.82%	32.07%	31.94
S&GA as a % of Revenue	12.00%	12.00%	12.00%	12.00%	12.00
Interest Income as a % of revenue	1.78%	1.78%	1.78%	1.78%	1.78
Interest Expense as a % of revenue	1.78%	1.78%	1.78%	1.78%	1.78
Normalized EBITDA	64.99%	64.96%	67.74%	65.90%	66.20
Other Expense or Income	0.85%	0.85%	0.85%	0.85%	0.85
Effective Tax Rate	12.00%	12.00%	12.00%	12.00%	12.00
Minority Interest as a % of Revenue	32.87%	33.43%	33.43%	33.43%	33.43
D&A as a % of Revenue	8.39%	8.39%	8.39%	8.39%	8.39
Change in NWC as a % of Revenue	-8.24%	-8.24%	-8.24%	-8.24%	-8.24
Capex as a % of Revenue	-11.38%	-11.38%	-11.38%	-11.38%	-11.38
Change in net Debt as a % of Revenue	-3.49%	-2.70%	-2.10%	-1.88%	-3.49

7.1.16 Table 16 Forecast Estimation

Period	12/31/2022	12/31/2023	12/31/2024	12/31/2025	12/31/
Net Income Common Stockholders	n/a	n/a	n/a	n/a	n
Depreciation & amortization	15845	17905	20170	22721	
Change in NWC	-15554	-17576	-19799	-22304	
Operating Cash Flow	125060	142341	160558	180277	
CAPEX	-21475	-24267	-27337	-30795	
FCFF	146536	166608	187895	211072	
Change in Net Debt	-6588	-5759	-5046	-5086	
FCFE	139948	160849	182849	205986	

7.1.17 Table 17 Discount rate from Yahoo Finance

CAPM		
Risk – Free Rate	3.975 %	Microsoft's risk-free rate from google
Beta	0.9	Yahoo Financials
Market Return	10.20%	average, based on S&P 500
r	9.6%	

7.1.18 Table 18 Equity Value Calculation

Equity Value	2,439,845.29	Projected equity value for 2026.
Share Outstanding	7,496.00	Available Stocks
Price Per Share	325.49	intrinsic value
Current Price	252.40	value for now
Buy / Sell	Buy	Buy at this point.
Upside	29%	growth for the period of 5 years

7.2 List of abbreviations

Growth Y-o-Y	Growth year over year
ROE	Return on Equity
ROA	Return on Assets
Δ NWC	Change in Net working Capital
FCFF	Free Cash flow to Firm
FCFE	Free Cash flow to Equity
CAPEX	Capital Expenditures
COGS	Cost of Goods sold
SG&A	Selling, General and Administrative
D&A	Depreciation and Amortization
R	Discount Rate

G	Growth rate
P/E	Price to Earnings
P/B	Price to Book
P/S	Price to Sales