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A COMPREHENSIVE ANALYSIS OF MICROSOFT CORPORATION'S FINANCIAL RATIOS

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has not been previously presented for grading.

The document length is 11856 words from the introduction to the end of the conclusion.

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TABLE OF CONTENTS

ABSTRACT

The study focuses on evaluating the financial performance of Microsoft Corporation using various financial ratios. These ratios provide a detailed view of the company's financial health and can be useful for investors to determine if it is a good investment. The analysis is based on Microsoft's annual financial reports from 2018 to 2022, which is the period ending June 30.

The financial ratios used in the study include liquidity ratios, which measure a company's ability to meet its short-term obligations, financial leverage ratios, which indicate the extent to which the company uses debt to finance its operations, profitability ratios, which show the company's ability to generate profit, and valuation ratios, which provide an estimate of the company's worth. In addition, the study also uses tailored ratios specific to tech companies to provide a more comprehensive analysis of Microsoft's financial performance. The ratios are also compared to industry average and Google to compare Microsoft’s performance to its competitors.

The results of the study show that Microsoft has exhibited strong financial performance over the years, with effective management of debt and healthy liquidity levels. The company's stock also shows less volatility compared to the average market, making it a safer investment option. Overall, the study suggests that Microsoft is a good investment for investors.

Keywords: Financial ratios, Microsoft corporation, financial performance, investment, Google

INTRODUCTION

Financial analysis is defined as the process of evaluating and interpreting financial information to make informed decisions about a company's financial health and performance. This process typically involves analyzing the company's financial statements, such as its balance sheet and income statement, to gain insights into its revenues, expenses, assets, liabilities, and cash flows. Financial analysis is typically performed by financial analysts, who use a variety of tools and techniques, such as financial ratios and trend analysis, to evaluate a company's financial performance and condition.

The goal of financial analysis is to provide investors, analysts, and other stakeholders with information that can be used to make informed decisions about the company, such as whether to invest in its stock or assess its potential risks and opportunities. Financial analysis is an essential tool for understanding a company's financial performance and its potential for growth and profitability.

This thesis focuses on the financial analysis of Microsoft Corporation. Microsoft Corporation which is the biggest company that provides computer software. Microsoft is the largest supplier of internet services, including search and cloud computing. Microsoft operates in more than 190 nations, with its main office in Redmond, Washington. Today’s work climate requires quick communication, mobile technologies, and data sharing. Microsoft offers technologies that help organizations operate productively and effectively, regardless of location. Microsoft is one of the four companies that control more than 67% of the world’s cloud infrastructure, along with Amazon, Google Cloud, and Alibaba Cloud.

In current economic downturn when everything is in a bear market, investors are looking for safer investments which are usually provided by bigger companies such as Microsoft that have a solid background and are not highly vulnerable by market downturns. For that financial analysis of Microsoft is important because it will allow investors, analysts, and other interested parties to assess

the financial health and performance of the company. This information can be used to make informed decisions about investing in Microsoft's stock, as well as to assess the company's overall financial condition. Additionally, financial analysis can provide insights into the company's strategic direction, competitive position, and potential risks and opportunities and to compare its performance to industry benchmarks or other companies.

The main objective of the thesis is to evaluate the financial performance of Microsoft Corporation based on annual financial reports from period 2018 to 2022 using various financial ratios and to find if it is a good prospective investment. The financial performance will be evaluated by methods of financial ratio analysis including liquidity ratios, financial leverage ratios, profitability ratios, valuation ratios and other more tailored ratios which are important for any tech company. The thesis focuses on two main parts, theoretical and empirical chapters. In theoretical chapter we focus on the conceptual framework of financial analysis. The empirical chapters will detail the calculated financial ratios and review every ratio thoroughly.

Quantitative research will be applied in the thesis, which is the method of collecting and analysing numerical data. The thesis will use secondary data sources that are the annual financial reports published by Microsoft Corporation from the period 2018 to 2022 (Year ended, June 30). In the beginning, the thesis will focus on the understanding of financial analysis and why it is important for any company. Then it will follow up with the advantages and disadvantages of financial analysis to give an overview of the method. The different financial ratios will be explained after that, which will include the significance of all the ratios that are used in the study and why they are important for analysis. A short introduction of Microsoft Corporation will be given following the ratios where we see the different types of products and services the company provides and get an overview of the company in different sectors they operate. Financial ratio analysis will be performed following that where we see all the calculated financial ratios and review the results on what those ratios indicate for the company. We will also compare the results with industry average ratios benchmarks and further compare Microsoft's ratios to one if its biggest competitors Google.

1. Theoretical basics of financial analysis

Financial analysis is the process of evaluating the financial health and performance of a company or organization. Financial analysis can also be described as the process by which exploration or derivation of a group of quantitative and qualitative indicators of economic activity around the project contributes to determining the significance of the properties of the activities of the operations and financial position to use these indicators in evaluating the performance of the companies to make decisions (Matar, 2010).

1.1. Conceptual framework of financial analysis

Calculating ratios from the data in the financial statements and comparing them to those of other companies or the company's prior performance is a typical way for assessing financial data. Multiple businesses within the same industry could have their ratios established and compared as part of a more comprehensive analysis. The financial analysis can be done internally and externally depending on the needs of an individual. Companies can perform an internal corporate analysis, which is usually performed by accounting departments that helps the management to improve their business decision based on the data (Ross et al, 2016). A financial analysis not only helps you identify your company's creditworthiness, profitability, and ability to generate income, but it will also provide you with a deeper understanding of its internal operations (Ross et al, 2016).

Financial statement analysis provides several benefits to firms. It allows internal and external stakeholders the ability to make informed investment decisions (Robinson et al, 2020). The analysis of financial statements provides lending institutions with an unbiased analysis of a company's financial health, which is valuable when making loan decisions. Moreover, since top executives and other top management depend on accounting to provide an accurate representation of the

consequences of their decisions, financial statement analysis also contributes to corporate governance (Ohio, 2020).

Another critical advantage of financial analysis is that it can facilitate comparison between two companies. It is impossible to compare two businesses based on their income statements and balance sheets. Investors frequently want to know where a company stands within its industry. It also helps determine whether the company is overvalued or undervalued relative to its competitors. In addition to comparing the company to its competitors, it compares divisions within the same company. Typically, management utilizes ratios when deciding which division to invest in and which division to close. Ratio analysis also helps in communicating the results to shareholders. When the management discloses their results, ratios are always used. They emphasize ratios such as EV/EBITDA, EPS, and PE. It is effectively conveyed to the investors (Hampton, 2011). When management discusses a number, it is effectively summed up and streamlined.

Accounting practices also vary between different industries, which can result in an inaccurate comparison (Healy & Wahlen, 1999). Ratio Analysis does not account for the effect of the company's accounting policies on the recognition of Income and Expenses. The resultant comparison between the companies based on Ratio Analysis will be skewed and will not reflect their accurate comparison (Faello, 2015). For example, companies using the straight-line depreciation method will report different net profits than if they were using the declining balance method. Another disadvantage of ratio analysis is that it is not standardized across all industries. Based on the standard Ratio Analysis, it is difficult to interpret businesses operating in various Industries. Moreover, the accuracy of ratio analysis is determined by the quality of the Financial Statements. Suppose a company manipulates or presents its financial statements to make them appear stronger than they are (Healy & Wahlen, 1999; McNichols, 2000).

Financial ratios serve a variety of purposes. These include the evaluation of a company's ability to pay its debts, the assessment of its business and managerial success, and even the legal regulation of a company's performance and unsurprisingly, they become norms and affect performance (Barnes, 1987). Traditional textbooks of financial analysis also emphasize the need for a company to use industry-wide averages as targets (Barnes, 1987), and there is evidence that companies do adjust their

financial ratios to meet these targets. Using numeric values extracted from financial statements, financial ratios are calculated to derive meaningful information about a company. Balance sheet, income statement, and cash flow statement numbers are used to perform quantitative analysis and evaluate a company's liquidity, leverage, growth, margins, profitability, rates of return, valuation, and other factors (CFI, 2021).

1.2. Liquidity ratios

A liquidity ratio measures whether a debtor will be able to meet their payment obligations with readily available cash or if they will need to raise additional capital to cover the amount (Saleem et al, 2011). This type of metric can also demonstrate how quickly the debtor's assets can be converted into cash to settle the debt. Creditors (and sometimes debtors) use liquidity ratios to determine whether a company can repay creditors with the total cash on hand. The greater a company's liquidity ratio, the more liquid their assets and the greater their ability to pay off short-term debts. It is quite crucial to maintain an adequate level of liquidity within the company (Eljelly, 2004). The liquidity management can be considered the company's backbone. Without maintaining a sufficient level of liquidity within the organization, managers cannot predict the future. If a company cannot generate a profit, it is sick (Madushanka, 2018). But if the company lacks liquidity, it will decline and eventually perish. Consequently, liquidity is a prerequisite for determining the company's survival (Niresh, 2012).

Similarly, to the importance of the quantity of liquid assets, the importance of quality cannot be overstated. This ratio considers only a company's current assets. To analyze a company's liquid strength, it is thus prudent to consider additional accounting metrics in addition to the liquidity ratio. Inventory is utilized to calculate a company's liquidity via the liquidity ratio. This can, however, result in a miscalculation due to overestimation. Higher inventory levels may also contribute to decreased sales. Consequently, inventory calculation may not reflect a company's true liquidity. This ratio may also be the result of creative accounting, as it only includes information from the balance sheet. To comprehend the financial position of a company, analysts must perform liquidity ratio analysis in addition to examining the balance sheet.

We will be using two different types of liquidity ratios, current and cash ratios, to analyze the liquidity of Microsoft and find if they are able to meet its liabilities. The current ratio is a liquidity ratio that measures a company's ability to pay its short-term or annual obligations (Nuryani et al, 2020). It explains to investors and analysts how a company can maximize its current assets to pay its current debt and other payables (Welc, 2022).

The higher the current ratio, the better for a creditor, especially a short-term creditor like a supplier. A high current ratio for the company shows liquidity, but it may also mean that cash and other short-term assets are being used inefficiently. A current ratio of less than 1 would indicate that net working capital (current assets fewer current liabilities), which is what we would anticipate observing absent any special circumstances, is negative. In a healthy company, at least for most business kinds, this would be unusual (Ross et al, 2016). According to (Wardana, 2015), based on his ratio calculation, a company with a low current ratio indicates that its current assets are insufficient to cover its short-term liabilities. In contrast, a company with a high current ratio is not necessarily deemed to be successful, as a high current ratio may result from ineffective cash and inventory management. Therefore, a standard ratio, such as the ratio standard of comparable business segments, is required to determine whether a company has a good level of liquidity.

In addition to the above-mentioned lack of specificity, a further disadvantage of using the current ratio is its lack of specificity. In contrast to many other liquidity ratios, it includes all a company's current assets, including those that are difficult to liquidate (Husna et al, 2019). To calculate the ratio, analysts compare the current assets and liabilities of a company (Ross et al, 2016).

$$Current\ ratio = \frac{current\ assets}{current\ liabilities} \tag{1}$$

The cash ratio measures the liquidity of a company. Short-term creditors are extremely interested in this ratio, per (Ross et al, 2016). The cash ratio is calculated by dividing cash and its equivalents by short-term obligations. The cash ratio is used to gauge how much cash is accessible (AFFANDI et al, 2019). This is important for the creditors so they know the company will be able to pay its debt. Cash ratios can sometimes project a different perspective than more traditional ratios, so it is essential to

analyze cash ratios for investigating of the financial statements of the company (Kirkham, 2012). Cash ratios is usually more or less than one, where one indication perfect metric that explains the company has exactly amount of cash and its equivalents compared to its liabilities.

Over time, it also helps investors gauge a company's ability to withstand cyclical downturns or price wars (Mills et al, 1998). Lenders will examine a company's financial statements to determine its health when it applies for a loan (SBA, 2021). There can also be some downsides to having too much cash reserves, as that could be utilized for making investments for higher returns. The cash ratio, which only considers cash and cash equivalents and excludes other assets like accounts receivable, is often a more cautious indicator of a company's capacity to satisfy its debts and commitments than other liquidity ratios.

$$Cash\ ratio = \frac{cash\ +\ cash\ equivalents}{current\ liabilities} \tag{2}$$

1.3. Financial leverage ratios

Long-term solvency ratios are used to measure a company's overall financial leverage as well as its capacity to meet obligations in the long run. Sometimes referred to as financial leverage ratios or simply leverage ratios (Ross et al, 2016). Normally companies will use a financing mix of debt and equity for their operations so its important to know how much of that is financed by debt to evaluate if the company is able to pay it. An excessive amount of debt might be risky for a company but, if a company's operations can generate a higher rate of return than the interest rate on its loans, the debt may help the company grow (Pandey, 2007).

Several ratios can be classified as leverage ratios, but debt, equity, assets, and interest expenses are the most vital. A leverage ratio could also be used to figure out how different changes in a company's operating expenses will affect its operating income (Hull, 1999). There are two kinds of operating costs: fixed costs and variable costs. The proportion of each varies from business to business and industry to industry. The consumer leverage ratio is used in economic analysis and by policymakers

to figure out how much debt consumers have compared to how much money they have available. We will look at the company using the debt-to-equity (D/E) ratio and the net debt-to-EBITDA (earnings before interest, taxes, depreciation, and amortization) ratio.

The debt-to-equity ratio is the ratio of a company's debt to its shareholders' equity. A company's financial leverage is measured by its debt-to-equity ratio, which can shed light on both the company's ability to pay off loans and its overall level of risk. Debt is problematic for businesses because interest payments must be made even if there is insufficient revenue to cover them. They noted that due to the significance of the risk-return relationship, many experts believe the debt-to-equity ratio to be an essential statistic for analyzing the performance of each company (Libby et al, 2009). Debt must be repaid or refinanced; it typically incurs interest expense that cannot be deferred and, in the event of a default, could diminish or destroy the value of equity. Consequently, a high D/E ratio is frequently associated with a high level of investment risk; it indicates that a company relies heavily on debt financing (Peterson et al, 1999). If the incremental profit increase exceeds the related increase in debt service costs, then shareholders should expect to benefit from debt-financed expansion (Heikal, 2014). However, the share price may decline if the additional cost of debt financing exceeds the additional income it generates. Depending on market conditions, the cost of debt and a company's ability to service it can vary. Consequently, borrowing that initially appeared prudent may prove unprofitable under different circumstances (Hull, 1999).

Investors can use different ratios to judge a company's short-term leverage and its ability to pay debts that are due in less than a year (Collin et al, 2001). It is also crucial to consider the company's industry when calculating the D/E ratio. For ideal analysis the ratios should only be compared within the same industry, as some industries use high debt to finance their operation than others. As a highly regulated industry that usually makes big investments with a stable return rate and a steady stream of income, utilities borrow a lot and don't have to pay much for it. High leverage ratios are an effective use of capital in sectors with slow growth and steady income. For similar reasons, companies in the consumer staples sector typically have high D/E ratios (CSI, 2022).

$$Debt\ to\ Equity\ = \frac{Total\ debt}{Total\ equity} \tag{3}$$

The net debt-to-EBITDA ratio is a financial ratio that measures a company's ability to pay off its debts using its earnings before interest, taxes, depreciation, and amortization (Pecha et al, 2015). Analysts prefer net debt to EBITDA and net debt to equity as benchmarks for debt management (Pecha et al, 2015). Generally, a low net debt to EBITDA ratio is desired, as it indicates that a company is not overburdened by debt and will be able to meet its financial obligations without difficulty. A high net debt to EBITDA ratio, on the other hand, means that a company has too much debt, which also means that its credit rating is bad, and investors will probably want higher bond yields to make up for the higher risk of lending money to the company (Samonas, 2015).

A high net debt-to-EBITDA ratio could also mean that a business is more indebted than it is profitable, which could increase its financial risk and make it more susceptible to market downturns or other difficulties. A firm's cash flow may be under strain, which will make it more challenging for the company to pay off its debts, if the net debt-to-EBITDA ratio is high. Moreover, high net debt-to-EBITDA ratio may also be an indication of impending financial trouble or insolvency. A corporation may not be able to meet its financial obligations and run the risk of default or bankruptcy if its earnings are insufficient to pay off its debt. This could have detrimental effects on the business's reputation and financial standing, as well as its owners, creditors, and stockholders.

$$Net\ Debt\ to\ EBITDA\ = \frac{Total\ Debt\ -\ Cash\ \&\ equivalents}{EBITDA}$$

where

$$EBITDA = Earnings\ before\ interest, taxes, depreciation\ and\ amortization \tag{4}$$

1.4. Profitability ratios

Profitability ratios are a class of financial ratios that measure a company's ability to generate profits and return on investment. These ratios are used to assess a company's financial performance and efficiency, and they can provide insights into the company's profitability and potential for growth. These ratios focus on evaluating on how efficient firms are in utilizing its assets and manage its operations (Ross et al, 2016). Profitability is a metric for detecting profit and a criterion for assessing the results of a company's activities over a specific period (Husain et al, 2020). Higher profitability

ratios are typically thought to be preferable from a financial standpoint. This is true because profitability ratios quantify an organization's capacity to produce profits and a return on investment, and a larger ratio denotes an organization's increased effectiveness and efficiency in generating such outcomes.

The gross profit margin is a profitability ratio that measures the percentage of revenue that a company retains after accounting for the cost of goods sold or simply put shows the rate of return on gross profit to net sales (Nariswari et al, 2020). According to (Brigham, E. F., & Houston, 2011), gross profit margin is the proportion of the sale remaining after the company has paid for its goods. Therefore, if a company has a high GPM (gross profit margin), it may be advantageous, as the lower the relative cost of selling goods, the higher the GPM. Normally a fluctuating gross profit margin is not good for a company and reflects poor management of its operations. This fluctuation can be justified if a company is investing to improver their supply chain that might give higher returns compared to the initial investment.

Gross profit margin is not always a good way to compare industries because cost structures and how profits are calculated vary from one to the next. This is due to the disregard of other facts like production costs increase from suppliers or reducing product price initially to grow the market share which can result false profit figures. So, a careful and precise evaluation of this ratio, can helps tech companies cut costs by calculating if their gross profit margin is too low, which indicates that they either must cut costs or increase their prices to maintain a stable percentage of profit.

$$Gross\ Profit\ Margin\ = \frac{Net\ Sales\ -\ COGS}{Net\ Sales} \tag{5}$$

where

COGS = cost of goods sold

The return on assets (ROA) is a profitability ratio that measures the percentage of profit that a company generates for each dollar of assets it holds. It measures the company's ability to generate profits that can guarantee the firm value (Husna et al, 2019). Return on assets (ROA) is one of the most well-known and valuable financial ratios (Jewell, 2011). Higher return on assets is a good sign for the company as it indicates that the company can generate higher profits for its equivalent assets

it holds. Analysts frequently use ROA to investigate the financial position, performance, and prospects of a company (Jewell, 2011). The ratios are highly dependent on its corresponding industry, as different industries generate different returns on its assets. It is ideal to compare the ratios within in the same industry to get precise results as the margins will be similar within the same sector.

The greater the ROA, the better, as it indicates that the business can earn more money with a smaller investment (Heikal, 2014). Simply put, a higher ROA indicates greater asset efficiency. As previously mentioned, the ratio is not useful when comparing different industries due to the nature of the sectors. Some industries may have different cost structures or operating models, which can affect the numerator of the ROA ratio and make it difficult to compare companies across different industries. ROA ratio may also be affected by changes in the level of competition, changes in the cost of capital, or changes in the level of economic activity, which can vary across different industries and situations. These factors can affect a company's ability to generate profits and return on investment, and they can make it difficult to compare companies across different industries using the ROA ratio.

$$Return\ on\ Assets\ = \frac{Net\ Income}{Total\ Assets} \tag{6}$$

The return on equity (ROE) is a financial ratio that measures the percentage of profit that a company generates for each dollar of shareholder equity. The return on equity is considered a measure of a company's profitability and profitability generation efficiency. The greater the ROE, the more effectively a company's management generates income and growth from equity financing (Heikal, 2014). Return on equity considers only the equity portion of an investment. It relates the earnings remaining for equity investors after deducting debt service costs to the equity invested in the asset (Damodaran, 2007). ROE is a straightforward metric for assessing investment returns. By comparing a company's ROE to the industry average, the company's competitive advantage may be identified. ROE may also reveal how the company's management is utilizing equity-based financing for business expansion (Heikal, 2014). A sustainable and rising ROE over time may indicate that a company is adept at creating shareholder value because it knows how to reinvest its profits wisely to boost productivity and profits. A declining ROE, on the other hand, may indicate that management is making poor decisions regarding the reinvestment of capital in unproductive assets. A high ROI may not always be beneficial. A high ROE can signal a number of problems, such as inconsistent profits

or excessive debt. In addition, a negative ROE due to a company's net loss or negative shareholders' equity cannot be used to analyze or compare the company, nor can it be compared to companies with positive ROE (Heikal, 2014).

$$Return\ on\ Equity\ = \frac{Net\ Income}{Average\ Shareholders'\ Equity} \tag{7}$$

1.5. Valuation ratios

Valuation ratios are a type of financial ratio that are used to evaluate the relative value or worth of a company's stock or other assets. Valuation ratios contextualize this knowledge within the context of a company's share price, where they serve as valuable tools for assessing investment potential. Valuation ratios have a unique significance when compared to other statistics that can be used to predict stock prices (Campbell et al, 2011). Valuation ratios are important for forecasting because they give a long series of data and show how stock prices are linked to careful assessments of a company's fundamental value (Campbell et al, 2011). The most used valuation ratios are the enterprise multiple (EV/EBITDA), price-to-earnings (PE), and price-to-sales (P/S) ratio. Price-to-earnings ratio is one of the most used ratios to measure public companies. The PE ratio compares the price of a share to the shareholder profit per share. The direct comparison between cost and return provides the investor with an idea of the value of his or her investment. There are numerous variations of the PE ratio in which a company's adjusted earnings or diluted earnings are used to determine whether the cost and return are proportionate. It can be calculated for one year or multiple years.

The price to sales (P/S) ratio is a financial ratio that measures the valuation of a company's stock relative to its revenues. The P/S ratio is a crucial tool for investors and analysts in analysis and valuation. The ratio indicates the price per dollar of sales that investors are willing to pay. The P/S ratio is used to identify companies that are vulnerable to acquisition due to their low market valuation. The P/S ratio is calculated by dividing the sales of a company over a designated period (normally twelve months) by the total number of outstanding shares. Then, the market price of the stock is compared to its sales per share (Vruwink et al, 2007). Fisher's (1984) theory suggests that investors should only purchase stock in companies with low P/S ratios because each invested dollar will then

purchase more dollars of sales, resulting in a greater likelihood of higher stock portfolio returns. The P/S ratio may not be a perfect indicator of a stock's popularity with investors because it does not focus on a company's earnings, which is the most widely used metric for valuing companies in the modern financial press (Vruwink et al, 2007). It is believed that an investor seeking abnormally high returns over the long term would be best served by investing in highly profitable industries (Vruwink et al, 2007). Theoretically, if the P/S ratio could be adjusted for varying levels of profitability per dollar of sales, the resultant adjusted P/S ratio would be more consistent with modern investment strategy and more accurately reflect the popularity of a stock among investors (Vruwink et al, 2007).

$$Price - to - Sales\ (P/S)\ Ratio\ = \frac{Market\ Value\ per\ Share}{Sales\ per\ Share} \tag{8}$$

A price-to-earnings ratio, also known as a P/E ratio, is a financial ratio used to evaluate the value of a firm that measure its current share price relative to the company's earnings per share (Ghaeli, 2017). The ratio can be used to find the value of a company in the same sector to compare different companies. It can also be used to see how much company has improved their earnings as compared to its previous years. The ratio is very efficient and mostly preferred by investors and analysts to find the value of the company. By analysing this ratio, we can see if the company's stock is undervalued or overvalued or properly valued. The price-to-earnings ratio, like any other fundamental designed to inform investors as to whether a stock is worth buying, has a few limitations that are important to consider because investors are frequently led to believe that a single metric will provide complete insight into an investment decision, which is almost never the case (Ghaeli, 2017). A high P/E ratio typically indicates that investors predict more earnings growth over the next several years, whereas organizations with a low P/E ratio are expected to have lower growth whereas a low P/E suggests that a company is either now undervalued or performing remarkably well in comparison to its historical tendencies (Ghaeli, 2017).

$$Price - to - Earnings\ (P/E)\ Ratio\ = \frac{Market\ Value\ per\ Share}{Earnings\ per\ Share} \tag{9}$$

The enterprise multiple, also known as the EV/EBITDA ratio, is a financial ratio that compares a company's enterprise value which is an estimate of the market value of the company's operating assets

to its earnings before interest, taxes, depreciation, and amortization (EBITDA) (Ross et al, 2016). There is evidence that investors can benefit from the EV/EBITDA multiple. EV/EBITDA multiple, for instance, is a helpful quantitative metric that explains market values and predicts stock returns better than operational profit does (Mauboussin, 2018). This ratios like other valuation ratios should be in same sector as its industry, usually a lower number reflects that the company might be undervalued, and a higher number reflects an overvalued company. Enterprise multiples are useful for international comparisons because they disregard the distorting effects of national taxation policies (Walkshäusl et al, 2015). But this can also be problematic as two companies with the same ratio and capital structure might be paying taxes at dissimilar rates which will result in a different ratio (Mauboussin, 2018). Although EBITDA has the inherent risk of understating the capital intensity of the business (Mauboussin, 2018). As a result, EBITDA overestimates the amount of cash a company may distribute while maintaining proper operations. In addition to capital expenditures and depreciation, changes in working capital and acquisitions might also be crucial (Mauboussin, 2018).

$$Enterprise\ Multiple = \frac{Enterprise\ value\ (EV)}{EBITDA}$$

where

$$EBITDA = Earnings\ before\ interest, taxes, depreciation\ and\ amortization \tag{10}$$

1.6. Metrics for analyzing a tech company

The technology sector is an important and rapidly growing part of the global economy. Companies in this sector are responsible for developing and distributing cutting-edge products and services that drive technological innovation and progress. These companies are typically characterized by their focus on research and development, as well as their commitment to staying ahead of the curve in the fast-paced tech industry. One of the key challenges faced by technology companies is the need to fund their research and development efforts. Many of these companies are unprofitable and may not generate revenue, which means that they must rely on other sources of funding to support their operations. This can include venture capital investments, debt issuance, and acquisitions. When analyzing a technology company, it is important to consider a range of financial ratios that are relevant

to the unique characteristics of the sector. These ratios can provide valuable insights into a company's financial health and performance and can help investors to make informed decisions about whether to invest in a particular tech company. Consequently, key financial ratios are utilized when analysing a technology company.

A beta coefficient, or beta for short, indicates the amount of systematic risk an asset has in comparison to the average asset (Ross et al, 2016). The beta of a typical asset compared to itself is 1. Therefore, an asset with a beta of 0.50 has half the systematic risk of the typical asset, whereas an asset with a beta of 2.0 has twice as much (Ross et al, 2016). Important to note is that the expected return and, thus, the risk premium of an asset are solely determined by its systematic risk. Because assets with larger betas are more susceptible to systematic risk, their projected returns will be higher (Ross et al, 2016). One thing to stress on is not all betas are equivalent and different providers estimate betas using somewhat distinct methodologies, and sometimes there are substantial discrepancies, so its ideal to look over different sources to get the overall picture.

A low beta indicates that a stock is less volatile than the overall market. This means that the stock's price is less sensitive to market movements, and it is less likely to experience large price swings. A stock with a low beta may be considered less risky than a stock with a high beta, as it is less likely to be affected by market volatility, but this also reduces its change of getting higher returns as compared to high beta stocks (Ross et al, 2016). On the other hand, stock with a high beta is more volatile than the market as a whole. This indicates that the stock's price is more susceptible to market fluctuations and is more likely to undergo major price fluctuations. A stock with a high beta may be deemed riskier than one with a low beta since it is more susceptible to market volatility, but this will also increase its change for high returns (Ross et al, 2016).

$$Beta\ Coefficient\ (\beta)\ = \frac{Covariance(R_e\ , R_m)}{Variance\ (R_m)} \tag{11}$$

where

$R_e\ =\ the\ return\ on\ an\ individual\ stock$

$R_m\ =\ the\ return\ on\ the\ overall\ market$

$Covariance\ =\ how\ chnage\ in\ a\ stock's\ return\ are\ related\ to\ chnages\ in\ \ market's\ returns$

$Variance = \ how\ far\ \ market's\ data\ points\ spread\ out\ from\ their\ average\ value$ yearly

The net income is the gross earnings minus mandatory deductions and withholdings, such as state and federal income tax and social security contributions. In other words, it is the profit that a company generates after subtracting the cost of goods sold, operating expenses, taxes, and other expenses from its total revenue. Interest on a debt is also a deduction that should be made when calculating net earnings. Profit attributable to shareholders is an essential element of business management, so net earnings are crucial (Cornell, 2020). It is crucial for a company to grow, and net income growth can tell them how much they have grown with respect to the previous years. Businesses must earn a greater profit each year than they did the year before. Net income growth is frequently viewed as an indication of a company's operational efficiency and investment desirability. Investors can evaluate a company's financial health and performance based on its net income growth. By comparing net income growth to other financial measures, such as revenue growth, expenses, and debt levels, investors can gain a better understanding of the company's financial status and make more informed decisions about whether to purchase, hold, or sell the shares.

Research and development (R&D) expense refers to the costs incurred by a business when developing new goods, processes, or technologies. On its tax return, a business may deduct R&D costs as a common type of operating expense. The expense can range from mild cost to several billions for research intensive industries which are an essential component of a company's research and development department. Research and development (R&D) expenditures are frequently substantial in the technology and pharmaceutical industries. These industries are distinguished by their emphasis on innovation and the development of new goods, processes, and technologies, which might necessitate substantial R&D expenditures. The growth of tech companies usually depends on the innovation of products and services by investing largely in R&D (Lantza & Sahutb, 2005). Identifying that the relationship between R&D expenditures and firm performance is essential for managers whose goal is to maximize the present value of stockholders' value is significant (Tubbs, 2007). R&D is crucial to the growth and maintenance of a company's competitive position, but this can also lead to negative growth in the short-term period depending on the particular sector (Bouaziz, 2016). Research and development are vital to the tech industry because it helps organizations to innovate, distinguish themselves from competitors, and position themselves for long-term growth. Investors in tech businesses should evaluate a company's financial health and future performance prospects

considering its R&D spending. Normally R&D is tied to the revenue of the company, and they will decide on what percentage of the revenue will be allocated for research and development for a particular period.

Revenue per employee is a financial metric that is used to evaluate the productivity and efficiency of a company's workforce. By dividing a company's total revenue by the number of employees it has, this metric provides insight into the amount of revenue generated by each employee and can be used to identify potential areas for improvement in terms of employee productivity and efficiency. The technology industry has an average earnings per employee of $87,532, according to the research from Tipalti (Web Desk, 2020). This is the second-highest earnings per employee among all industries, with only the financial sector having higher earnings per employee at $116,228 (Web Desk, 2020). The technology industry had annual profits of $252,836 million and a total of 2,888,490 employees, which contributed to its high average earnings per employee (Web Desk, 2020). This shows that the technology industry can generate significant amounts of revenue with a relatively small workforce, compared to other industries.

Revenue per employee is also useful for comparing the performance of different companies within the same industry or sector. By comparing the revenue per employee of two companies with similar products and business methods, investors and analysts can gain insight into which company is more efficient and profitable. A company with a higher revenue per employee may be viewed as more successful and attractive to investors, as it is able to generate more income with a smaller workforce. In addition to providing insight into a company's productivity and efficiency, revenue per employee can also be used to evaluate the overall financial health and performance of a company.

2. Microsoft Corporation: A closer look at financial ratio analysis

Microsoft is an American multinational computer technology company that dates to April 4, 1975. Microsoft, founded by Bill Gates, a Harvard College dropout, and his childhood friend Paul Allen, is now one of the world's largest software companiest is also one of the world's most valuable companies. Microsoft is the world's largest provider of computer software. It is also an industry leader in cloud computing services, video games, computer and gaming hardware, search, and other online services (Patrizio, 2022). Microsoft generates revenue through the creation, licensing, and support of a vast array of software products and services, the design and sale of hardware, and the delivery of targeted online advertising to a global customer base (Microsoft Annual Report, 2022). Their products consist of operating systems for personal computers (PCs), servers, phones, and other intelligent devices; server applications for distributed computing environments; productivity applications; business solution applications; desktop and server management tools; software development tools; video games; and online advertising (Patrizio, 2022). Additionally, the company designs and sells hardware, such as the Xbox 360 gaming and entertainment console (Patrizio, 2022).

In addition, they provide cloud-based solutions that deliver software, services, and content to customers via the Internet using shared computing resources located in centralized data centers (Patrizio, 2022). Most of the cloud revenue comes from usage fees and advertising. Microsoft's largest revenue source is its Azure cloud service, which is also the fastest-growing segment of its business model. During the 2021 fiscal year, Microsoft Azure services generated nearly $60 billion for the company. Azure offers a variety of cloud services, including capabilities for computing, analytics, storage, networking, management, machine learning, and big data (Patrizio, 2022). The fact that Azure shares the same operating environment as on-premises Windows Server is a major selling point (Patrizio, 2022). Therefore, customers can frequently migrate their on-premises applications to Azure without modification (Patrizio, 2022). Microsoft has also worked to ensure that the cloud versions of

many of its key on-premises applications, such as SQL Server, have the same functionality as their on-premises counterparts (Patrizio, 2022).

Microsoft, like most large corporations, conducts multiple acquisitions each year. Here are some notable acquisitions (Patrizio, 2022). Microsoft paid eBay $8.5 billion in 2011 for skype. In 2013, Microsoft acquired Nokia for $7.2 billion. Microsoft was competing against Apple and Android in the smart phone market at the time, and Nokia was the largest supporter of the Windows Phone operating system (Patrizio, 2022). Windows Phone failed to gain popularity, lost developers, and was ultimately discontinued. In December 2016, Microsoft paid $26 billion for the professional social networking website LinkedIn. Recently, the company announced plans to integrate LinkedIn with its MS teams. Microsoft announced in April 2021 that it would spend $16 billion to acquire Nuance Communications, the leading developer of the Dragon NaturallySpeaking speech recognition software (Patrizio, 2022). On January 18, 2022, Microsoft sought to strengthen its position in the gaming industry by acquiring Activision-Blizzard, the creator of the Call of Duty and Diablo franchises, for $68.7 billion. It is Microsoft's largest acquisition to date, elevating the company to the third largest gaming company by revenue.Microsoft Corporation's (MSFT) principal competitors include some of the industry's most renowned technology companies. Among others, the list contains well-known companies such as Apple (AAPL), Google (GOOG), SAP SE (SAP), and IBM (IBM). Microsoft faces intense competition in several key areas of the technology industry since it is a diversified company that offers a variety of products and services. Google is a formidable competitor to Microsoft in the enterprise solutions vertical, where both companies compete. Like Office 365, Google has its G Suite platform, which includes Gmail, Docs, and Drive. In addition, it offers business solutions such as Cloud Platform, which includes Google Big Query, Data Studio, etc., in addition to an enterprise-level cloud infrastructure.

Google is also aggressively promoting the adoption of Chromebooks, which could pose a long-term threat to Microsoft's Windows platform. Google's search engine is the market leader with a 92.5% market share, while Bing's is second with a mere 2.45% (WCS, 2022). Google Cloud Platform assists developers in the development, testing, and deployment of applications on its scalable infrastructure. This segment generates $8.9 billion in annual revenue and ranks third with 19% market share, behind Microsoft and Amazon Web Services (1st) (WCS, 2022). Google has also developed G Suite

productivity tools consisting of apps such as Gmail, Docs, Drive, and calendar that facilitate collaboration and machine intelligence to simplify people's work (WCS, 2022). However, Microsoft has a competitive advantage over Google in the enterprise market, as Google has yet to effectively penetrate this sector. Microsoft generated $168 billion in revenue in fiscal year 2021, an increase of 18 percent year-over-year. Their operating income increased by 32% to reach $70 billion. And they continue to establish new profitable franchises. LinkedIn's annual revenue and that of their security division both surpassed $10 billion for the first time.

2.1. Liquidity ratios analysis

The greater a company's liquidity ratio, the more liquid their assets and the greater their ability to pay off short-term debts. It is quite crucial to maintain an adequate level of liquidity within the company (Eljelly, 2004). Figure 1 shows two liquidity ratios, current and cash ratio to shows the liquidity of Microsoft from period 2018 to 2022.

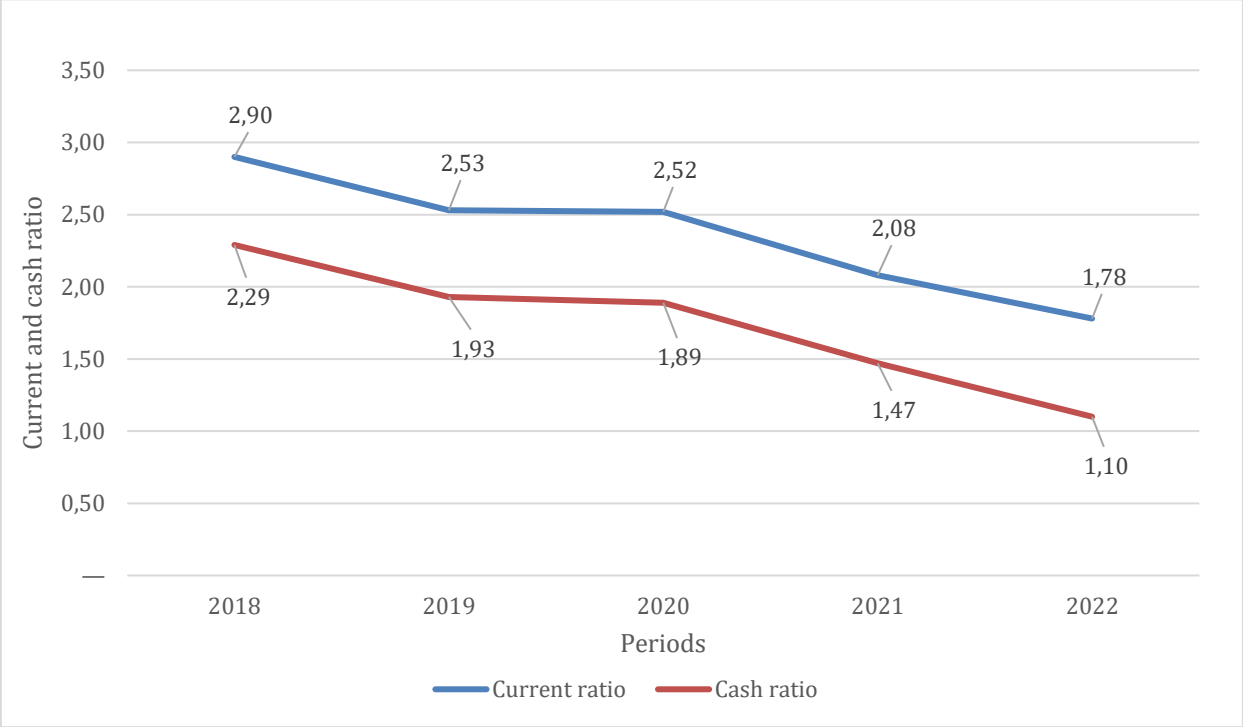

Figure 1. Liquidity Ratios of Microsoft Corporation

Source: Appendix 3

When we analyse the current ratio for Microsoft from the period 2018 to 2022, we can see a declining trend. There has been a decline of 38,62% from the year 2018 to 2022. Normally, a current ratio slightly higher than the industry average is considered a good sign that the company is utilizing its assets properly. As if the company has a current ratio of 2 that means that the company can pay twice that of their current liabilities. This is considered a good ratio as it tells the investors that the company has enough assets to their current liabilities.

The average industry current ratio for tech companies is 1.6 and currently Microsoft sits at 1.78 which is higher than the industry average, so this is a good sign for the investors as the company is utilizing its assets properly. If we compare the ratio to Google, which is Microsoft's biggest competitor, then their current ratios for the year 2022is 2.81 which is 36% more than Microsoft's ratio. We can also see that since 2018, Google also had a decline of 32,28% in their current ratio from 4.15 to 2.81 and if we look at the overall industry average there has been a decline of 19,5% from 2018 to 2022. This shows that the overall industry average indicates the utilization of their assets. And Microsoft has been doing a good job in coming closer to the industry average as if the company has too high of current ratio than the industry average then the company is not utilizing its current assets and short-term financing.

Cash ratio is the most common indicator of a company's liquidity. This metric demonstrates the company's ability to pay all its current liabilities without selling or liquidating other assets if it is forced to do so immediately. A good cash ratio is closer to 1 as this indicates that the company can pay all its current liabilities without liquidating its assets. This is a very essential ratio for a tech company as most tech companies only has cash and not other assets like inventory to pay their current liabilities. Microsoft has been maintaining its current ratio of more than 1 from 2018 to 2022. But we can see that the ratio has been declining over the years since 2018. This can be explained by their increasing current liabilities form $58.48B in 2018 to $95.08B in 2022 which is an 62,5% increase since 2018. This can be explained by their acquisitions of LinkedIn valued at $26,2B which was financed primarily through the issuance of new indebtedness.

The current ratio benchmark for tech companies on average is 1.15 over the period 2018 to 2022 and for current period the benchmark is 0.98, so in comparison Microsoft has been doing well to have

enough cash on hand to pay its current liabilities. If we compare the ratio to Google then they have a higher cash ratio then Microsoft, on average the company has a ratio of 2,5 over the period 2018 to 2021 which is quite higher than the industry average. This indicates that Google normally have more than two times cash available to pay their current liabilities. This is normal for a company like Google as, most tech companies are always looking for acquisitions to expand their business and find opportunities to increase their revenue growth.

2.2. Financial leverage ratios analysis

Financial leverage ratio is a metric that measures the extent to which a company is using debt to finance its operations. Ideally the debt-to-equity ratio should be between 0.4 to 0.6 depending on the industry. Investors prefer to invest in companies with a lower debt to equity ratio as it indicates that the equity of company's shareholder is bigger, and they don't require to finance their operation with outside capital.

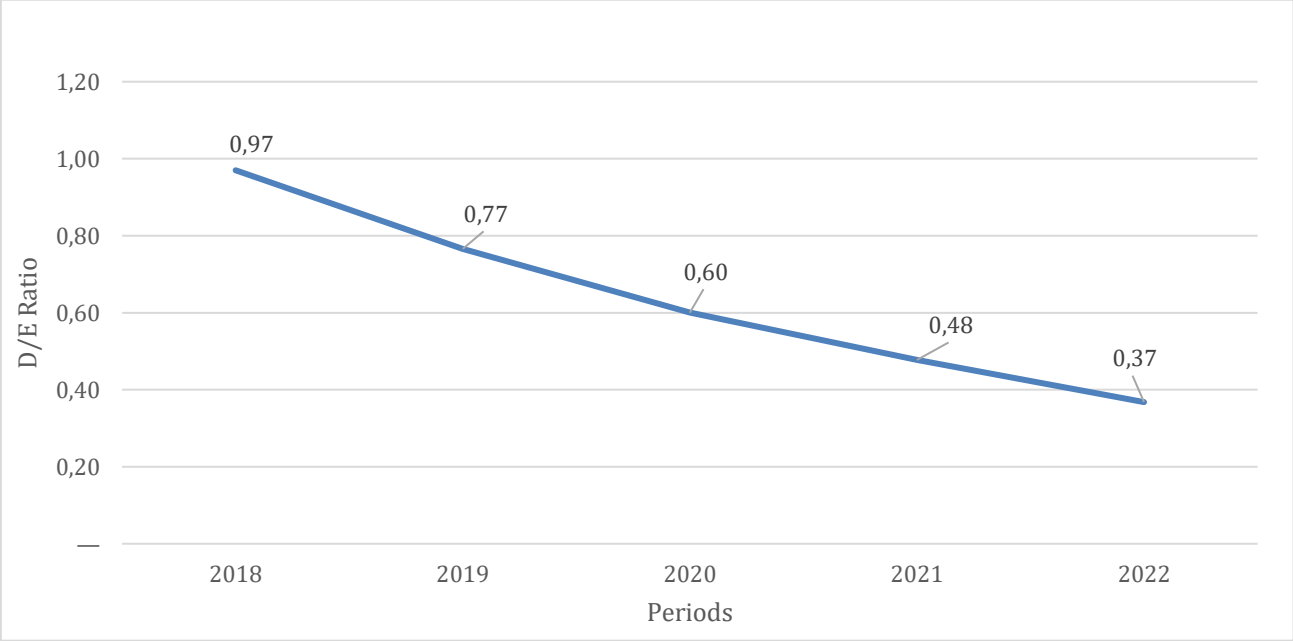

Figure 2. Debt to equity ratio of Microsoft corporation

Source: Appendix 3

The debt-to-equity ratio of Microsoft has been declining from 2018 to 2022. Since 2018 the ratio has declined nearly 61,2%, starting from 0,97 to 0,37 in 2022. We can see that in 2018 most of the operations were financed with debt by shareholders in comparison to 2022, where the debt financing has declined to 0.37. If we compare this to the tech industry average ratio over the 2018 to 2022 period, the ratios have been 0.8, which is very high in comparison to Microsoft. This indicates that Microsoft has been doing well in financing its operation with its own equity rather than with debt. Google's average ratio, on the other hand, has been very stable over the years, with an average of 0.35 from the period 2018 to 2,022, which indicates that the company finances most of their operation with shareholders' equity.

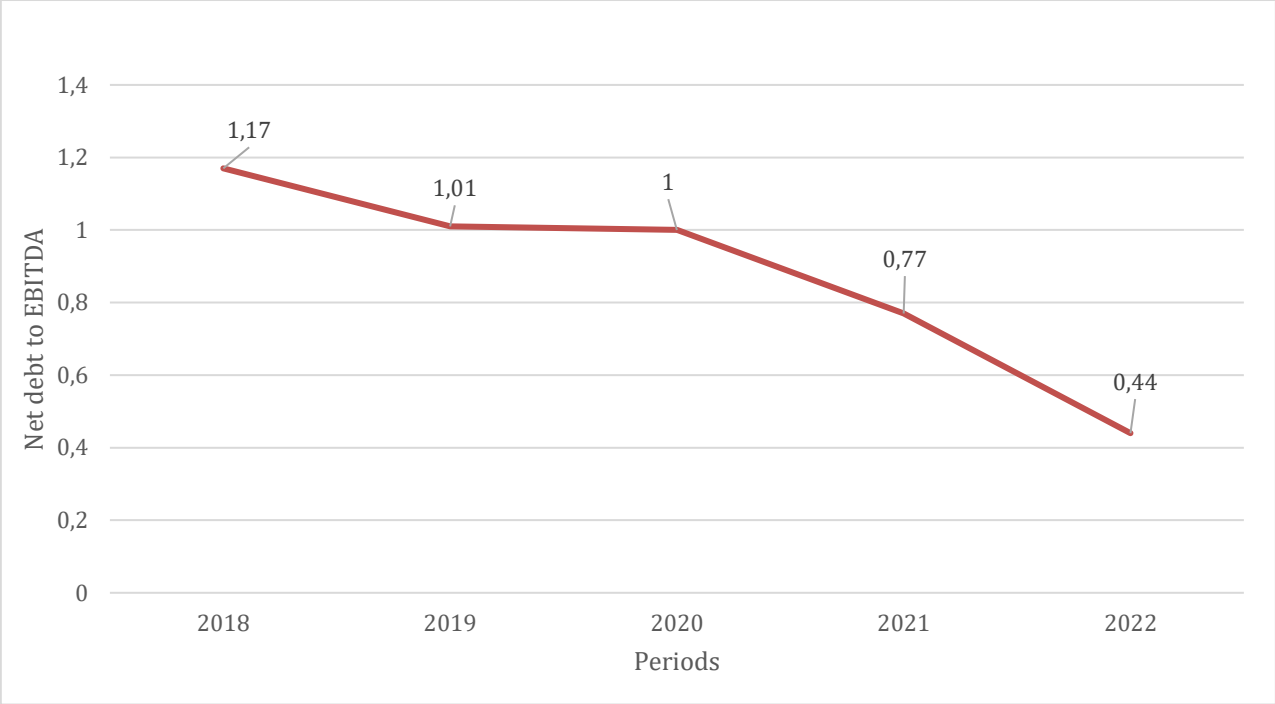

Figure 3. Net debt to EBITDA ratio of Microsoft corporation

Source: Appendix 3

Figure 3 also indicates a decaling net debt to EBITDA ratio from the period 2018 to 2022. Ideally this also behaves like debt-to-equity ratio and a lower ratio is always preferred by an investor. Based on the company's liquid assets and EBITDA, a higher net debt-to-EBITDA ratio suggests that the company may have trouble meeting its financial obligations. Microsoft has managed to decrease their

net debt to EBITDA ratio by 62,39% from 2018 to 2022 which is good indicator of their finances. If we compare that to Google, the ratio is high, their net debt to EBITDA ratio on average is 0.25. This is again due to their low debt financing of operations.

Usually, technology companies tend to raise capital through equity financing rather than debt financing for a number of reasons. One reason is that equity financing allows a technology company to access capital without incurring additional debt. This can be particularly appealing to technology companies, which may be hesitant to increase their debt levels to maintain a strong financial position. In addition, as equity investors are often more ready to participate in a firm without the requirement for a defined payback schedule or interest payments, adopting equity financing can also give a technology company access to a wider pool of possible investors. This might be crucial for a technological business, which may be looking to acquire money from a variety of investors to support its development and growth.

2.3. Profitability ratios analysis

For the majority of profitability ratios, investors favour ratios that are higher because they suggest that a company can make more profit with the same amount of revenue. A corporation with a high profitability ratio is more efficient and productive than one with a low profitability ratio, as it can make more profit with less capital and resources.

For Microsoft's profitability ratios analysis, we will be using gross profit margin, return on equity (ROE), and return on assets (ROA) ratios. The gross profit margin for Microsoft have been quite linear from the period 2018 to 2022. Starting at 65.25% in 2018 to 68.40% in 2022 which is a 4.82% increase since 2018. It is good for a company to have a gross profit margin between 50% to 70%. This indicates that for every dollar of revenue generated $0.50-$0.70 is retained while remaining is attributed to the cost of goods sold. A higher gross profit margin is always preferred as that indicates that the company is successfully earning profit over and above its costs.

The industry average for gross profit margin on average is 69% and Microsoft is near this range over the years which is a good sign for the investors. Microsoft is doing quite well if we compare their

gross profit margin to Google. On average over the period 2018 to 2022, Google's gross profit margin is 55.97% which is lower than Microsoft's margin of 67.25% which indicates that Microsoft is efficiently managing its labour and suppliers in the production process than Google.

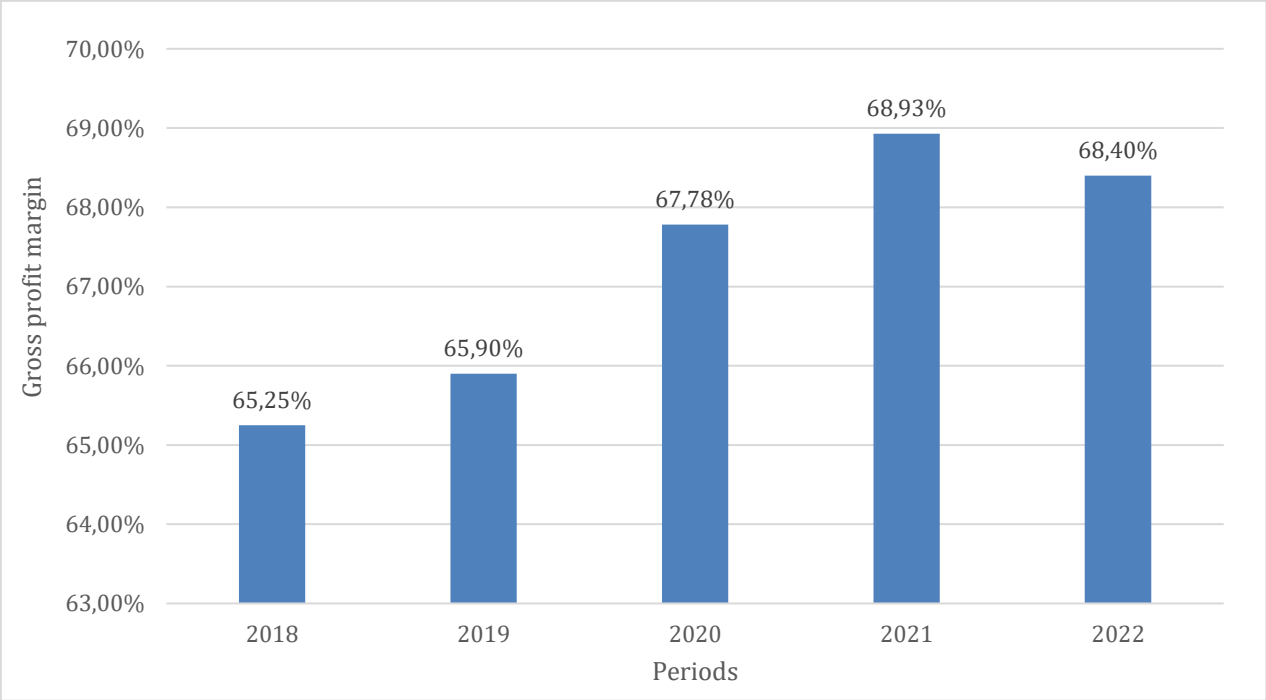

Figure 4. Gross profit margin of Microsoft Corporation

Source: Appendix 3

The return on equity on the other hand had a big jump from 20.03% in 2018 to 38.35% in 2019 and then has been stable with an average of 40.65% since 2019. This was due to their 16% increase in profit margin ratio from 15% in 2018 to 31% in 2019. Normally a good or bad ROE depends on the industry average or the main competitors of the company. A low ROE the company is earning less to its shareholders equity and a high ROE indicates that the companies is efficiently using their shareholder's equity to generate income. Microsoft's return on equity has been stable since 2019 which is a good indicator for the investors and shows them that the company is successfully able to generate profits with respect to their shareholders equity. The current return on equity for the period 2022 is 43.68% which indicates that the company can earn $43.68 on every $100 of its share capital. If we compare this to the tech sector's average return on equity of 36.35% than Microsoft has been

doing quite good, then the industry average. Microsoft is also doing quite well in comparison to Google's average return on equity ratio of 20,34% over the period 2018 to 2022. On average Microsoft ratio is 16.18% higher than Google's ratio.

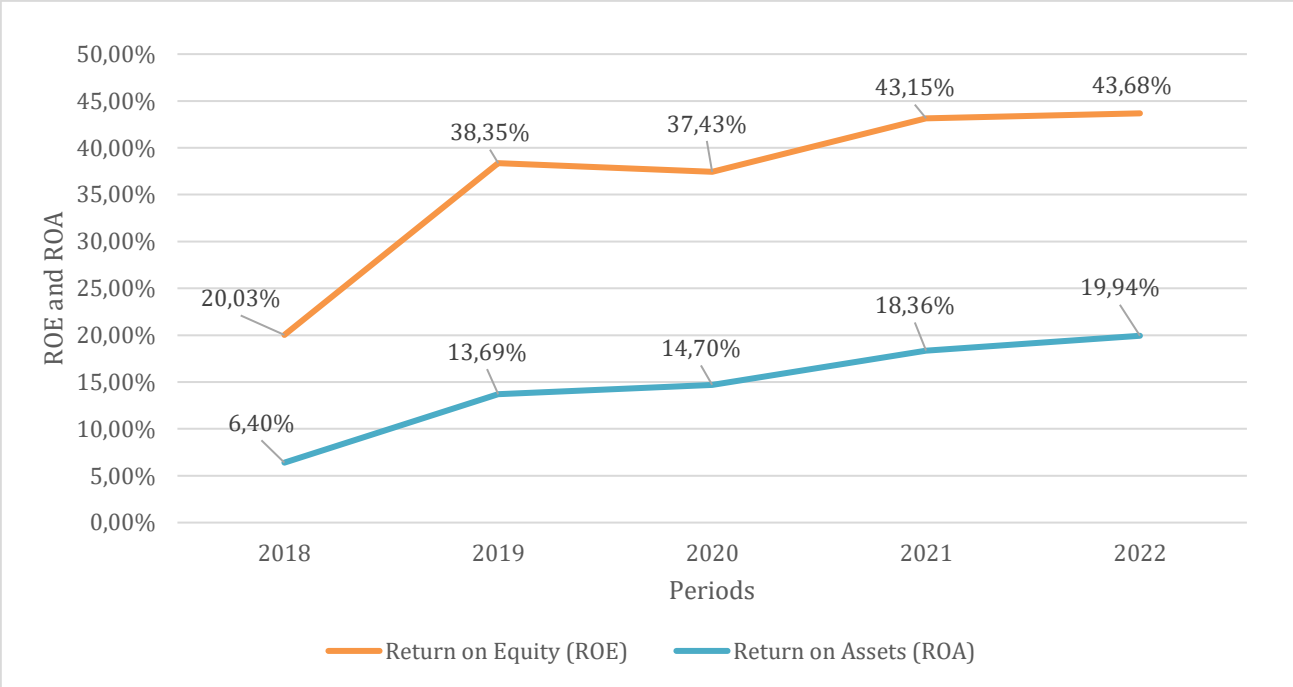

Figure 5. ROE and ROA of Microsoft Corporation

Source: Appendix 3

Like the return on equity, return on assets also had a huge jump from 6.40% in 2018 to 13.69% in 2019. This is nearly a 113.9% increase since 2018, the reason for this a significant increase in their net income which has increased from $16.571B in 2018 to $39.240B in 2018 which was an 136% increase in their net income. The return on equity since 2019 has been stable with an average of 16.67% from the period 2019 to 2022. A stable rise in return on assets indicates the company is an efficient job of increasing its profits per each investment dollar it spends. In comparison a falling or low ratio indicates that the company has over invested in their assets and have failed to produce revenue growth which can be a red flag for the investors. A higher ratio is always preferred by the investors, but this can be highly depended on the specific industry.

The average within the tech sector for return on equity on average is 12.96%. And Microsoft has been managing a stable ROA of 16.67% since 2019 which is higher than the industry average. This indicates that Microsoft can generate $0.17 for every $1 the company has in assets. On the other hand, Google's ROA on average is 16.5% over the period 2019 to 2022 which is similar to Microsoft's ratios which indicates that the companies is efficiently managing its assets to generate profits.

2.4. Valuation ratios analysis

Valuation ratios, also known as market value ratios, are measurements of the appropriateness of a company's share valuation and the potential return for an investor. A potential investor can determine whether the shares are overvalued, undervalued, or at a fair price by calculating their market value. We will look at different valuation ratios such as price to earnings (P/E) ratio, price to sales (P/S) ratio, and earnings before interest, taxes, depreciation, and amortization (EBITDA) ratio for Microsoft.

The P/E ratio of Microsoft declined by 42,28% from 2018 to 2019 which is due to their increase in earnings per share (EPS) from 2,16 in 2018 to 5,14 in 2019 which was a 137,96% increase form 2018. This indicates that the stock price was overvalued with respect the EPS in 2018 and the increase in EPS from 2018 to 2019 made the stock more valued for the share price. An increase in EPS indicates that the company is generating more profits that can be distributed to the shareholders. A higher EPS is a good indication of company's efficiency to its investors.

This can also result in more dividend payout as earnings increase. Since 2019, Microsoft can maintain a stable P/E ratio average of 31,34, with a decline in 2022 of 28,34 from previous year ratio of 35,14. This can be explained by the drop in their share price from $286,5 from 2021 to $276,41 in 2022. Even though the EPS has increased from 8,15 in 2021 to 9,75 in 2022.

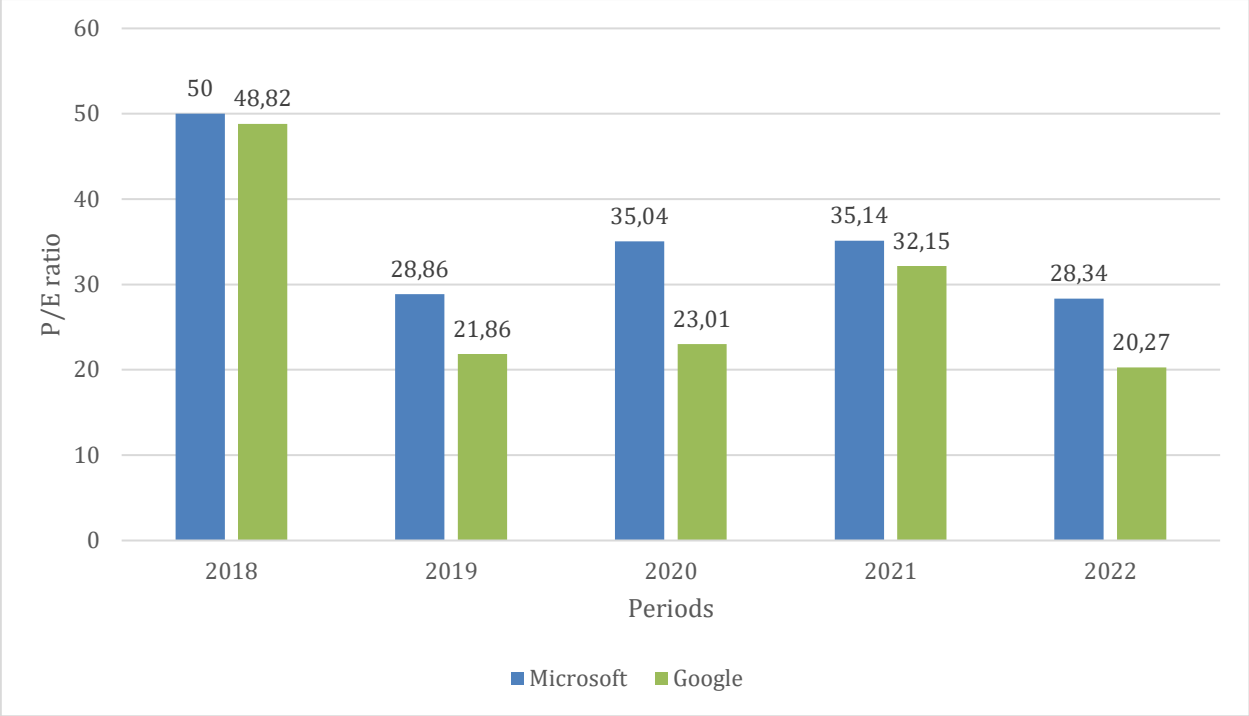

Figure 6. P/E ratios of Microsoft Corporation and Google

Source: Appendix 3

Microsoft stock price fell from their all-time highest price of $339,89 on November 19,2021 to $276,41 on June 30,2022. The tech industry benchmark on the other hand averages about 26,9 in terms of P/E ratio. Since 2019, Microsoft had an average of 31,34 which is higher than the industry average but is still a good ratio that indicates a strong earnings per share growth with respect to their stock price. If we look at Google's average P/E ration, then its 24,3 which is quite lower than the Microsoft ratio. This indicates that the investors are paying less per dollar for company's earnings per share. Although the P/E ratio currently sits at 20,27 in 2022 but their stock price has declined form $149,84 on November 18, 2021, to $108,96 which is a 27,28 percent decline from 2021. This is due to current uncertainties in the markets from the COVID pandemic and signs of recession. Both companies are still good if we look at the overall tech industry and there are no sings of red flags.

Additionally, the price to sales ratio (P/S) has been increasing steadily as seen the Figure 7. There is a slight decline from 12,81 in 2021 to 10,40 in 2022. This can be explained by their decline in stock

price from $286,5 in 2021 to $276,41 in 2022 same as the decline in case of P/E ratio. But overall, the ratio has been stable over the period 2018 to 2022 with an average ratio of 9,9. If we compare that to the industry average which is 8,15 then its slightly higher. A low P/S ratio indicates that the stock might be undervalued and implies that the company is generating more revenue for every dollar invested in the company. And a higher P/S ratio indicates that the stock might be overvalued, and the markets is willing to pay higher prices for each dollar of sales.

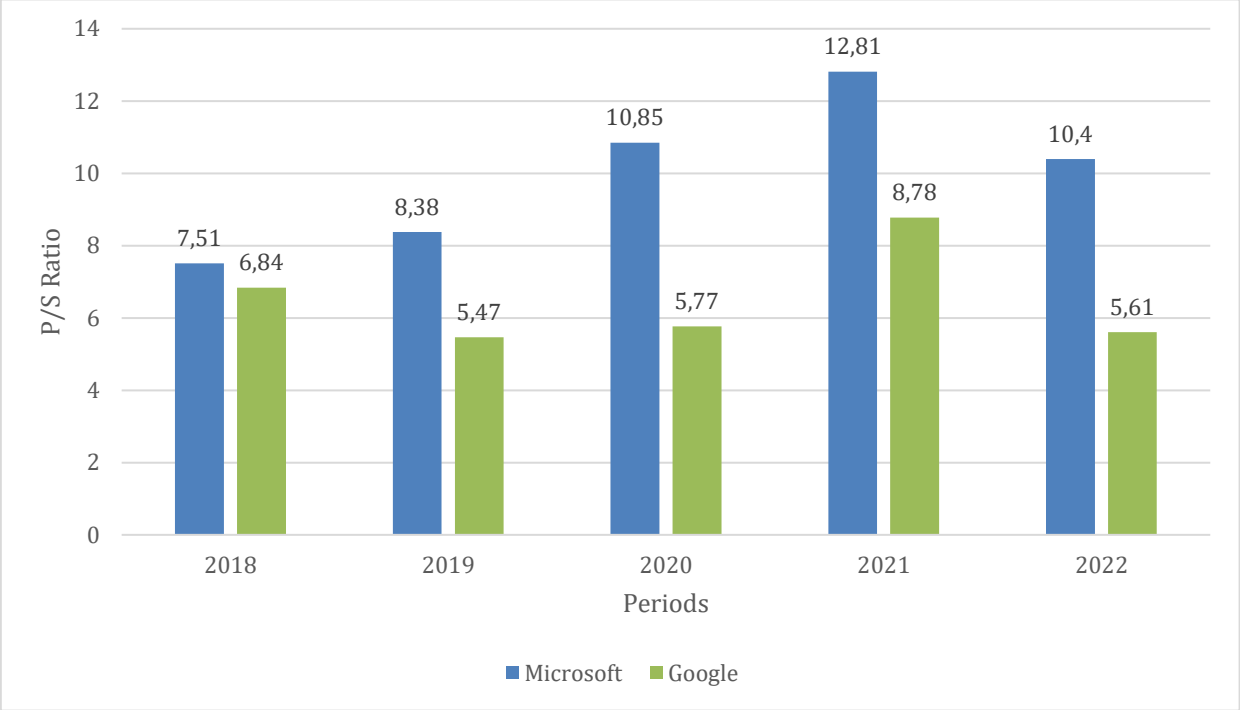

Figure 7. P/S ratios of Microsoft Corporation and Google

Source: Appendix 3

The P/S ration should only be compared in terms of industry average and within the same sector to get a proper analysis. It won't make sense when comparing two companies in different sectors as the ratio varies across industry. Google's on the other hand has a low P/S ratio in comparison to industry average and Microsoft. Their average ratio for the period 2018 to 2022 is 6,5% which is 34% lower than Microsoft's ratio. This is due to their higher sales per share percentage with respect to their stock price. Google stock is undervalued, and the company is generating more in revenue with respect to its stock price.

The enterprise multiple (EV/EBITDA) of Microsoft has been growing since 2018 to 2021, from 15,67% to 24,59%. From 2021 to 2022 there has been a decline of 4,42% from 24,59% in 2021 to 20,17% in 2022. The decline of 4,42% can be explained by their decline in stock price in 2022 and a reduction in their cash and cash equivalents from $130,34B in 2021 to $104,74B in 2022.

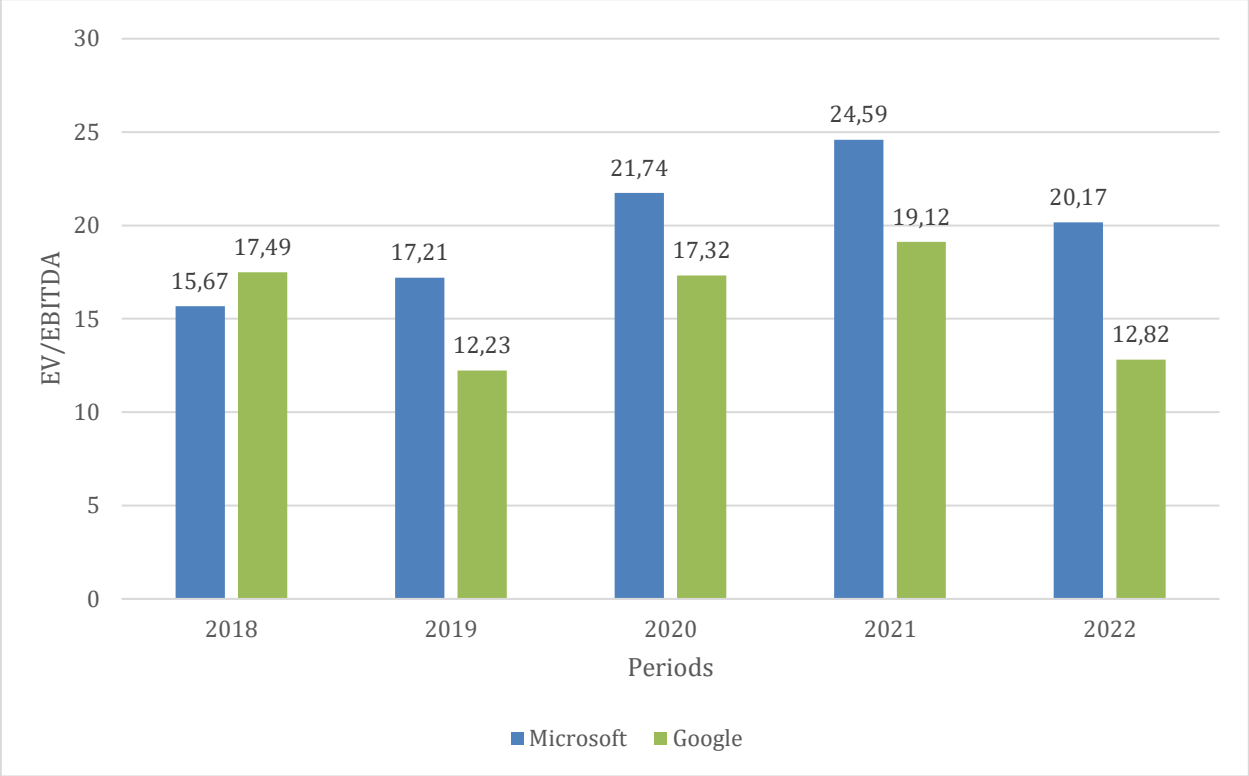

Figure 8. Enterprise multiple (EV/EBITDA) of Microsoft corporation and Google

Source: Appendix 3

This is normal when looking at the whole economic downturn in the tech sector such as high inflation, increasing interest rates and supply chain issues. Microsoft has been maintaining an average enterprise multiple of 19,87 over the period 2018 to 2022. When comparing to industry average of 17,58 the company is doing good. When comparing Microsoft's enterprise multiple to Google, then the ratio is lower than Microsoft. Google's average ratio for the period 2018 to 2022 is 15,76% which is lower by 4,11% from Microsoft. This indicates that their stock is little undervalued and can grow in comping years with increased revenue and growth. Normally investors want a higher enterprise multiple since

it indicates that the company has low debt levels and substantial cash reserves. Enterprise multiples enable investors to effectively assess the earnings yields of companies with varying debt levels and tax rates.

2.5. Tailored metric ratios analysis

There are many different ratios and metrics which are used by investors to analyse a company in different sectors and industries. Sometimes these ratios can be specifically tailored to the sector that can help the investor in comparing companies that operate in the same industry to find the better investment. One of these metrics is Beta (β).

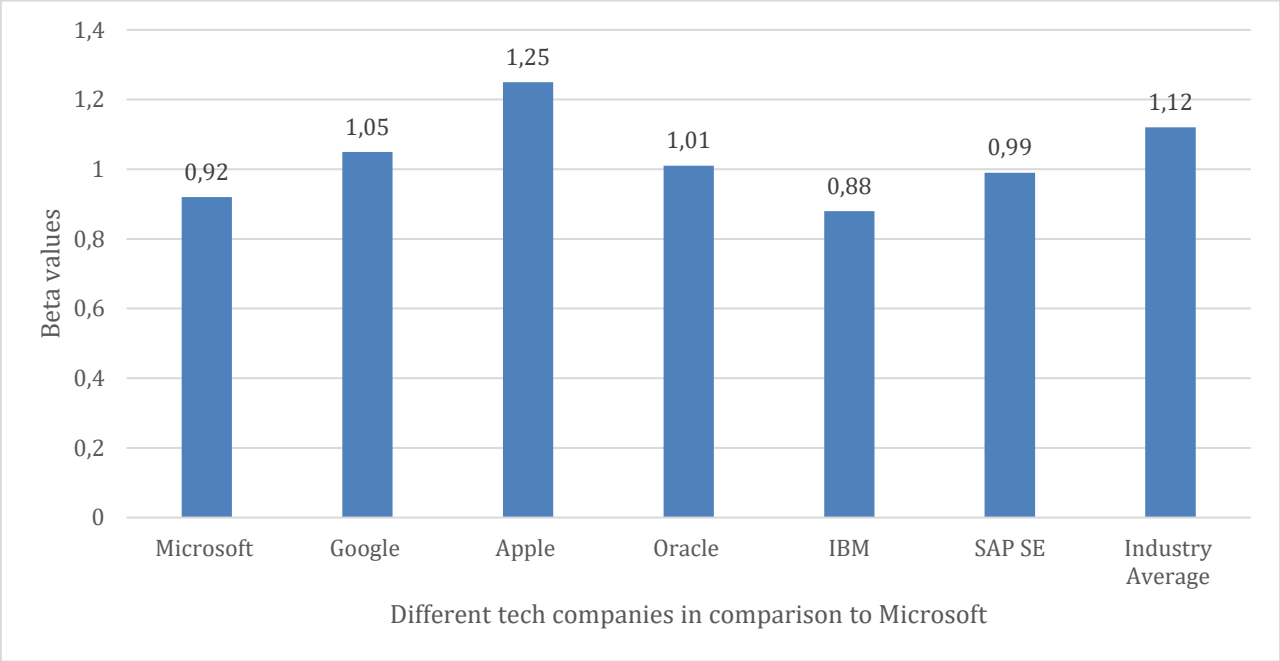

Figure 9. Beta (5 Year) values of different tech companies.

Source: Appendix 3

Beta is a measure that is used to indicate the volatility of a company's stock price to the market. A beta of a stock measures the volatility of an individual stock relative to the market's systematic risk. For instance, average asset has a beta of 1.0 relative to itself so in comparison a beta of 0.50 will have half the systematic risk (Ross et al, 2016). In comparison a beta of 2.0 will carry double the risk of an

average asset (Ross et al, 2016). Beta which is greater than 1,0 indicates that the stock is more volatile than the broader market and a beta which is less than 1,0 suggests a stick that has lower volatility. A beta lower than 1,0 is considered a better option as this is less volatile than the market and will be a less risky for the investors. Normally tech companies' industry is slightly more volatile than the overall market. The industry average is 1,12 which indicates higher volatility and risk than Microsoft's beta. Microsoft's beta (5Year) is 0,92 which is lower than 1,0 and means the stock price will be less volatile than the market downturns. Normally the ideal beta should be near 1,0, which will give more stability for the investors. Google's beta in comparison to Microsoft is higher than 1,0 and is 1,05 (5Year) which indicates marginally more volatility with respect to the market. High beta stocks are preferred in a bull market when all the prices are going up which makes them a good investment as they will have higher returns than the overall market but in the current bear market lower beta stock are more preferred by the investors which are less volatile and reduces their risk.

Another important metric to look for while analysing tech companies is their net income growth over the years. Net income growth shows how rapidly the company can grow year over year. From the year 2018 to 2019, we can see a huge net income growth of 136,8%. Since then, the company has grown their net income by 12,84% from 2019 to 2020 and further growth of 38,36% from 2020 to 2021. From 2021 to 2022, there was a decline in net income growth to 18,72% from 2021 which is result of the economic downturns and unstable market conditions.

Research and development (R&D) expenses is another metric which refers to the costs incurred by a business when developing new goods, processes, or technologies. Normally companies indicate a percentage of their revenues every year to R&D, Microsoft R&D expense have been increasing since 2018 from $14,73B to $24,51B in year 2022. Microsoft has been maintaining a stable 13% increase in R&D expense growth over the period 2018 to 2022 and normally allocates around $19,22B on average over the years. Investing in R&D is very important for tech companies like Microsoft and Google as they market is quite competitive, and you always must keep developing better technology and services than your competitor. By investing in R&D companies try to develop innovative products and services either by creating new technologies or use the existing technology to create new cutting-edge products and services.

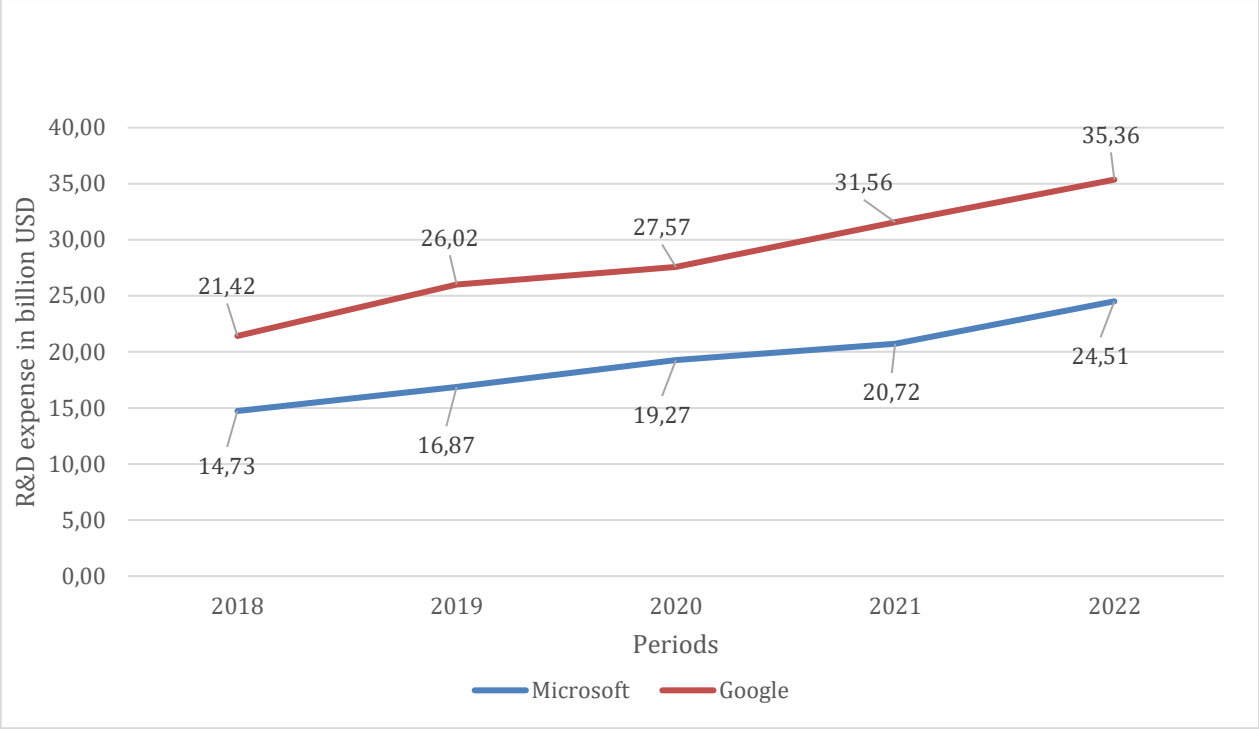

Figure 10. Research and Development expense (R&D) of Microsoft and Google

Source: Appendix 3

Normally companies invest 10% to 20% of their revenue to R&D expense, but this highly depends on the industry, on average the tech companies' industry average is around 11%. If we compare Microsoft's R&D expense to Google, then their expense is much higher than that of Microsoft. On average Google has spent over $28,39B from the period 2018 to 2022. They also have an increasing R&D expense growth of 13,57% over the years. The main reason behind their R&D spending is their Cloud and AI business, where they have been heavily investing over the years. Google is just behind Microsoft in terms of market share in cloud business at 11% and plans to grow this in the coming years. Their high spending can also be explained by their phone market line-up, where Microsoft failed with their windows phone. But Microsoft is highly investing in their surface laptops line-up which are growing year over year and their successful game controller, the Xbox which is the biggest competitor to Google's Chromebook.

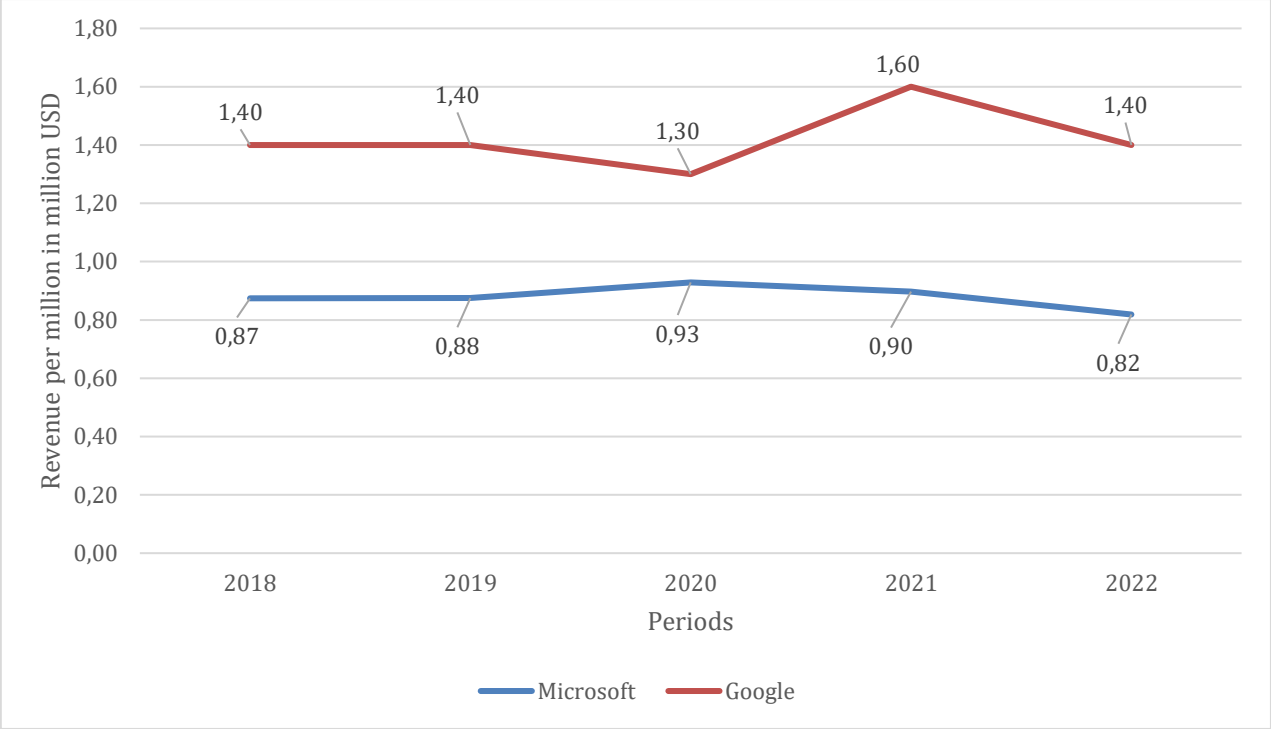

Figure 11. Revenue per employee of Microsoft and Google

Source: Appendix 3

Revenue per employee is another useful analytical metric which evaluates the amount of revenue generated by an organization per employee. A company with a high revenue per employee may be viewed as more efficient and lucrative than one with a low revenue per employee since it generates more income with a smaller workforce. Microsoft revenue per employee started to increase from $0,87M in 2018 to $0,93M in 2020 and then it declined to $0,82M in 2022. This in comparison to average revenue of $150K is quite higher than industry average. Google in comparison is much better in terms of revenue per employee, the company has been generating revenue per employee of $1,42 million over the period 2018 to 2022 which is much higher than that of Microsoft. This indicates that Google's workforce can generate more profit with respect to their numbers than Microsoft.

2.6. Discussion

When we look at Microsoft's liquidity over, they years the ratio has been declining, but still maintaining the standard industry average. The reason for the decline is their more efficient use of their assets for generating more revenue over the years. Their revenue has grown significantly with their decline in liquidity ratio over the years. Microsoft has been a better job than Google in maintaining their liquidity closer to industry average. The ratios indicate that Microsoft has sufficient liquid assets to cover its short-term obligations. This means that the company has the financial flexibility to meet its financial commitments and avoid potential liquidity problems.

Microsoft is also able to decrease their financial leverage ratios over the years which is a good sign for the investors as it tells us that the company can finance their operations without taking on unnecessary debt. The company is also doing better than the industry average in keeping their ratio lower. This indicates that Microsoft has a moderate level of debt relative to its equity and a strong ability to pay its interest expenses. This suggests that the company has a balanced capital structure and is not overly reliant on debt financing.

The profitability ratios analysis indicates that Microsoft has been able to maintain a stable ratio over the years and is operating at ideal level when compared to the industry average and competitors. Although in recent years the growth has been less relative to earlier periods and can be improved further. This indicates that Microsoft has a high level of profitability. This means that the company is able to generate a significant amount of profit from its operations, which can be used for various purposes, such as reinvesting in the business, paying dividends to shareholders, or repurchasing its own shares.

Valuation ratios of Microsoft has improved over the years with their increase in earnings per share since 2018. The ratio has been closer to the industry average and have been stable over the years.
Microsoft's beta coefficient has been lower than 1,0 over the 5-year benchmark which is lower than the industry average. This is necessarily not a bad thing as this makes it less volatile to the market downturns and makes the investment less risky.

Microsoft’s net income has also grown significantly over the years due to their increasing cloud business. Their growth has been better then the industry in recent years which is a good indication for the investors. Their market cap has also doubled since 2018, making them the third largest company by market cap in the world. They are also investing highly in their R&D over the years which is significant in the tech sector as the industry is highly competitive. Microsoft is also doing better in terms of their employee productivity with a very high revenue per employee which indicates better utilization of their workforce and a strong indication of their work.

CONCLUSION

This thesis analysed the financial performance of Microsoft Corporation by reviewing their annual financial reports from the period 2018 to 2022. The main objective of the thesis is to assess the financial performance of Microsoft Corporation and to find if it is a good investment for the investors. This was done by reviewing different financial ratios that measures multiple aspects of the company finances. The results were then reviewed and compared to the standard average benchmarks in tech sector. Microsoft's financial ratios were also compared to one of their big competitors, Google to do an industry comparison of two companies that have similar business operations.

The thorough analysis of Microsoft's financial data reveals that the company has a strong financial performance. Over the years, the company has consistently shown growing revenue and has managed its debt effectively. Additionally, Microsoft has maintained healthy liquidity levels, indicating that the company has the financial flexibility to meet its short-term obligations and avoid potential liquidity problems. Moreover, the company's financial data suggests that it is managed efficiently, with a focus on maximizing profitability and minimizing risk. This, combined with the company's strong growth potential, makes it a good long-term investment for investors who are looking to invest in less volatile stocks and minimize their risk. Overall, the financial analysis of Microsoft indicates that the company is well-positioned for future growth and offers a promising investment opportunity.

The research also has certain limitations, for the analysis of Microsoft based on the financial ratio analysis. Financial analysis lacks depth and is not really an in-depth analysis of a company. Instead, financial analysis often involves the use of various financial ratios and metrics to evaluate a company's financial performance. While these ratios and metrics can provide useful information, they do not always provide a complete picture of a company's financial health. In addition, financial analysis often relies on historical data and does not take into account future events that may affect a company's financial performance. As a result, financial analysis is often limited in its ability to accurately assess

a company's financial performance and future prospects. In order to conduct a decent and accurate performance review, we must use appropriate ratios and financial indicators. The accuracy of the analysis depends on the quality and reliability of the data used. Financial ratios are typically determined using data from a company's annual report. However, this data can sometimes be manipulated by the company's management to reflect strong performance than there actually is. As a result, the financial ratios and other indicators derived from this data may not provide an accurate picture of the company's financial performance. It is important to carefully evaluate the data used in financial analysis to ensure that it is accurate and not subject to manipulation. To truly understand a company's financial position, a deeper and more comprehensive analysis is needed.

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APPENDICES

Appendix 1. Income Statement of Microsoft Corporation 2018-2022

(In millions $, except per share amounts)

Year Ended June 30,	**2022**	**2021**	**2020**	**2019**	**2018**
Revenue					
Product	72,732	71,074	68,041	66,069	64,497
Service and other	125,538	97,14	74,974	59,774	45,863
Total revenue	**198,270**	**168,088**	**143,015**	**125,843**	**110,360**
Cost of revenue					
Product	19,064	18,219	16,017	16,273	15,420
Service and other	43,586	34,013	30,061	26,637	22,933
Total cost of revenue	**62,650**	**52,232**	**46,078**	**42,910**	**38,353**
Gross Margin	135,620	115,856	96,937	82,933	72,007
Research and Development	24,512	20,716	19,269	16,876	14,726
Sales and marketing	21,825	20,117	19,598	18,213	17,469

General and administrative	5,900	5,107	5,111	4,885	4,754
Operating income	83,383	69,916	52,959	42,959	35,058
Other income, net	333	1,186	77	729	1,416
Income before income taxes	83,716	71,102	53,036	43,688	36,474
Provision for income taxes	10,978	9,831	8,755	4,448	19,903
Net income	**72,738**	**61,271**	**44,281**	**39,240**	**16,571**
Earnings per share:					
Basic	9.70	8.12	5.82	5.11	2.15
Diluted	9.65	8.05	5.76	5.06	2.13
Weighted average shares outstanding:					
Basic	7,496	7,547	7,610	7,673	7,700
Diluted	7,540	7,608	7,683	7,753	7,794

(Source: Microsoft Annual Reports)

Appendix 2. Balance Sheet of Microsoft Corporation 2018-2022

(In millions $)

June 30,	**2022**	**2021**	**2020**	**2019**	**2018**
Assets					
Current assets:					
Cash and cash equivalents	13,931	14,224	13,576	11,356	11,946
Short-term investments	90,826	116,110	122,951	122,463	121,822
Total cash, cash equivalents, and short-term investments	104,757	130,334	136,527	133,819	133,768
Accounts receivable	44,261	38,043	32,011	29,524	26,481
Inventories	3,742	2,636	1,895	2,063	2,662
Other current assets	16,924	13,393	11,482	10,146	6,751
Total current assets	**169,684**	**184,406**	**181,915**	**175,552**	**169,662**
Property and equipment,	74,398	59,715	44,151	36,477	29,460
Operating lease right-of-use assets	13,148	11,088	8,753	7,379	6,686
Equity investments	6,891	5,984	2,965	2,649	1,862
Goodwill	67,524	49,711	43,351	42,026	35,683
Intangible assets, net	11,298	7,800	7,038	7,750	8,053
Other long-term assets	21,897	15,075	13,138	14,723	7,442
Total assets	**364,840**	**333,779**	**301,311**	**286,556**	**258,848**
Liabilities and stockholders' equity					
Current liabilities:					
Accounts payable	19,000	15,163	12,530	9,382	8,617

Appendix 2 continued

June 30,	2022	2021	2020	2019	2018
Current portion of long-term debt	2,749	8,072	3,749	5,516	3,998
Accrued compensation	10,661	10,057	7,874	6,830	6,103
Short-term income taxes	4,067	2,174	2,130	5,665	2,121
Short-term unearned revenue	45,538	41,525	36,000	32,676	28,905
Other current liabilities	13,067	11,666	10,027	9,351	8,744
Total current liabilities	**95,082**	**88,657**	**72,310**	**69,420**	**58,488**
Long-term debt	47,032	50,074	59,578	66,662	72,242
Long-term income taxes	26,069	27,190	29,432	29,612	30,265
Long-term unearned revenue	2,870	2,616	3,180	4,530	3,815
Deferred income taxes	230	198	204	233	541
Operating lease liabilities	11,489	9,629	7,671	6,188	5,568
Other long-term liabilities	15,526	13,427	10,632	7,581	5,211
Total liabilities	**198,298**	**191,791**	**183,007**	**184,226**	**176,130**
Commitments and contingencies					
Stockholders' equity:					
Common stock and paid-in capital – shares authorized 24,000	86,939	83,111	80,552	78,520	71,223
Retained earnings	84,281	57,055	34,566	24,150	13,682
Accumulated other comprehensive income	(4,678)	1,822	3,186	(340)	(2,187)
Total stockholders' equity	**166,542**	**141,988**	**118,304**	**102,330**	**82,718**
Total liabilities and stockholders' equity	**364,840**	**333,779**	**301,311**	**286,556**	**258,848**

(Source: Microsoft Annual Reports)

Appendix 3. Financial Ratios of Microsoft Corporation

	June 30,2022	June 30,2021	June 30,2020	June 30,2019	June 30,2018
Current Ratio	1.78	2.08	2.52	2.53	2.9
Cash Ratio	1.10	1.47	1.89	1.93	2.29

(Source: Based on authors calculations from Microsoft annual reports)

	June 30,2018	June 30,2019	June 30,2020	June 30,2021	June 30,2022
Debt to Equity	0,97	0,77	0,60	0,48	0,37
Net Debt to EBITDA	1,17	1,01	1,00	0,77	0,44

(Source: Based on authors calculations from Microsoft annual reports)

	June 30,2018	June 30,2019	June 30,2020	June 30,2021	June 30,2022
Gross Profit Margin	65,25 %	65,90 %	67,78 %	68,93 %	68,40 %
Return on Equity (ROE)	20,03 %	38,35 %	37,43 %	43,15 %	43,68 %
Return on Assets (ROA)	6,40 %	13,69 %	14,70 %	18,36 %	19,94 %

(Source: Based on authors calculations from Microsoft annual reports)

Price to Earnings (P/E) Ratios					
	2018	2019	2020	2021	2022
Microsoft	50	28,86	35,04	35,14	28,34
Google	48,82	21,86	23,01	32,15	20,27

(Source: Based on authors calculations from Microsoft annual reports and Alphabet reports)

Appendix 3 continued

Price to Sales (P/S) Ratios					
	2018	2019	2020	2021	2022
Microsoft	7,51	8,38	10,85	12,81	10,4
Google	6,84	5,47	5,77	8,78	5,61

(Source: Based on authors calculations from Microsoft annual reports and Alphabet reports)

Enterprise Value to EBITDA (EV/EBITDA)					
	2018	2019	2020	2021	2022
Microsoft	15,67	17,21	21,74	24,59	20,17
Google	17,49	12,23	17,32	19,12	12,82

(Source: Based on authors calculations from Microsoft annual reports and Alphabet reports)

Companies	Microsoft	Google	Apple	Oracle	IBM	SAP SE	Industry Average
Beta(β) (5 Year) Benchmarks	0,92	1,05	1,25	1,01	0,88	0,99	1,12

(Source: Based on authors calculations from Microsoft annual reports)

Appendix 3 continued

Microsoft and Google R&D Expense (in billion$)					
	2018	2019	2020	2021	2022
Microsoft	14,73	16,87	19,27	20,72	24,51
Google	21,42	26,02	27,57	31,56	35,36

(Source: Based on authors calculations from Microsoft annual reports)

Revenue Per Employee of Microsoft and Google (in million $)					
	2018	2019	2020	2021	2022
Microsoft	0,87	0,88	0,93	0,90	0,82
Google	1,40	1,40	1,30	1,60	1,40

(Source: Based on authors calculations from Microsoft annual reports)

Net income of Microsoft and Google					
	2018	2019	2020	2021	2022
Microsoft	16,57	39,24	44,28	61,27	72,74
Google	30,73	34,34	40,26	76,03	66,99

(Source: Based on authors calculations from Microsoft annual reports)

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