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Shareholder ratios and technical methods in evaluation of a publicly traded stock

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ABSTRACT

Laaksonen Roope: Shareholder ratios and technical methods in evaluation of a publicly traded stock
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The objective of this thesis was to determine the value and relative performance of a publicly traded stock based on calculations derived from financial data. The valuation analysis combined common shareholder ratios, which are based on the relationship between the trading price and different financial variables. The other evaluation method was technical analysis based on different statistical applications, such as moving average, standard deviation, and Beta coefficient. The main goal of the method combination was to give a comprehensive understanding of the valuation of a publicly traded stock.

The research used quantitative methods with publicly available financial data and stock price fluctuation history. AT&T Inc. was chosen as the case company, with data processed into shareholder ratios and technical indicators using Microsoft Excel. The comparative review with stocks Verizon Communications and T-Mobile US provided additional depth and corroborated the research reliability by setting the results in context. Results indicated that the case stock was undervalued compared to competitors and the market index with lower value of shareholder ratios and competitive dividend yield. Technical analysis revealed a price downtrend reversing in late 2023 and potential uptrend during 2024. Volatility analysis indicated moderate stability and beta value confirmed the case company as a low-risk stock investment in terms of a market risk.

In conclusion, the study demonstrated low valuation in AT&T despite its weaker market position. The findings highlight the value of combining fundamental and technical analysis for comprehensive stock evaluations and practical investment insights.

Keywords: Stock valuation, shareholder ratio, technical analysis, market index, financial metrics, stock market

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1 INTRODUCTION

Shareholder ratios and technical methods in evaluation of a publicly traded stock is a bachelor's thesis in which valuation and analysis of a stock is studied by implementing the methods of fundamental financial theory and applied statistical calculations. This involves utilizing financial ratios and comparative figures derived from publicly accessible data sources and the dataset of the stock price fluctuation history of an existing, listed case company. All data utilized in the present study is openly available online. It's crucial to note that the chosen case company is not affiliated with this thesis in any way beyond serving as a representative example of a publicly traded corporation.

The theoretical part of the thesis unfolds in two segments. Initially, common valuation metrics applied in the analysis of the relationship between a trading price and different financial factors of a share are being introduced. The second segment of the theory introduces financial analysis in terms of technical methods. The primary focus pivots from a review of the company's share trading price with more raw and statistical approach, exploring factors such as price fluctuation averages, volatility, and market correlations. The objective of this section is to introduce the key statistical metrics that are applicable in what is known as a technical analysis.

The research design, methods, and case company are introduced in the fifth chapter whereas evaluation applies the theoretical models through quantitative data calculations. Microsoft Excel is used to process the data, transforming it into visual and numerical formats for interpretation. This enables a comprehensive benchmark and analysis by presenting insights both graphically and numerically. The comparative review benchmarks the case company against the relevant competitors. The conclusion summarizes the evaluation and benchmark closing the entire study.

2 PURPOSE, OBJECTIVES & CONCEPTUAL FRAMEWORK

2.1 Purpose and objectives

The primary purpose of this thesis is to bring clarity to the complex world of stock valuation, uniquely integrating both relative pricing and a technical perspective in the analysis of publicly traded stocks. The focus of the analysis is on assessing the relationship between the share price and different shareholder ratios and how statistical ratios can be applied in interpreting the fluctuations of share prices. In other words, the purpose is to provide the reader a comprehensive understanding of the theoretical foundations of the most common quantitative financial models and their application in practise.

The thesis is to provide the reader with an in-depth understanding of the theory behind relevant fiscal and financial indicators and their application to basically any publicly traded company. By introducing the key figures used in valuation, such as price per earnings (P/E), earnings per share (EPS) and dividend yield (DV%), the primary objective is to create an accurate picture of reliable and common valuation methods: How do the trading price of the stock relate to different financial values of the company? How is the case company stock valued within these numbers compared to its primary competitors? The introduction aims to clarify the importance of valuation when making informed decisions about buying or selling shares in the stock market. Beyond the traditional valuation analysis, this study dives into the world of advanced technical methods as well. The objective with the technical methods is to introduce the effectiveness and usability of applied statistics in predicting stock movements, market correlations and basic risk modelling.

In summary, the thesis aims to deepen the understanding of and skills in stock market analysis. The purpose of the work is implemented by introducing stock valuation and analysis with methods and models that are widely used by, for example, institutional investors, bankers, corporate creditors, and professional traders. The target group for the work consists mainly of private investors and those interested in financial markets in general.

2.2 Conceptual framework

The conceptual framework (Chart 1) summarizes the concepts and procedures introduced in the thesis. The purpose of the conceptual framework is to simplify and illustrate both the structure of the work itself and the process that takes place in the study in chronological order.

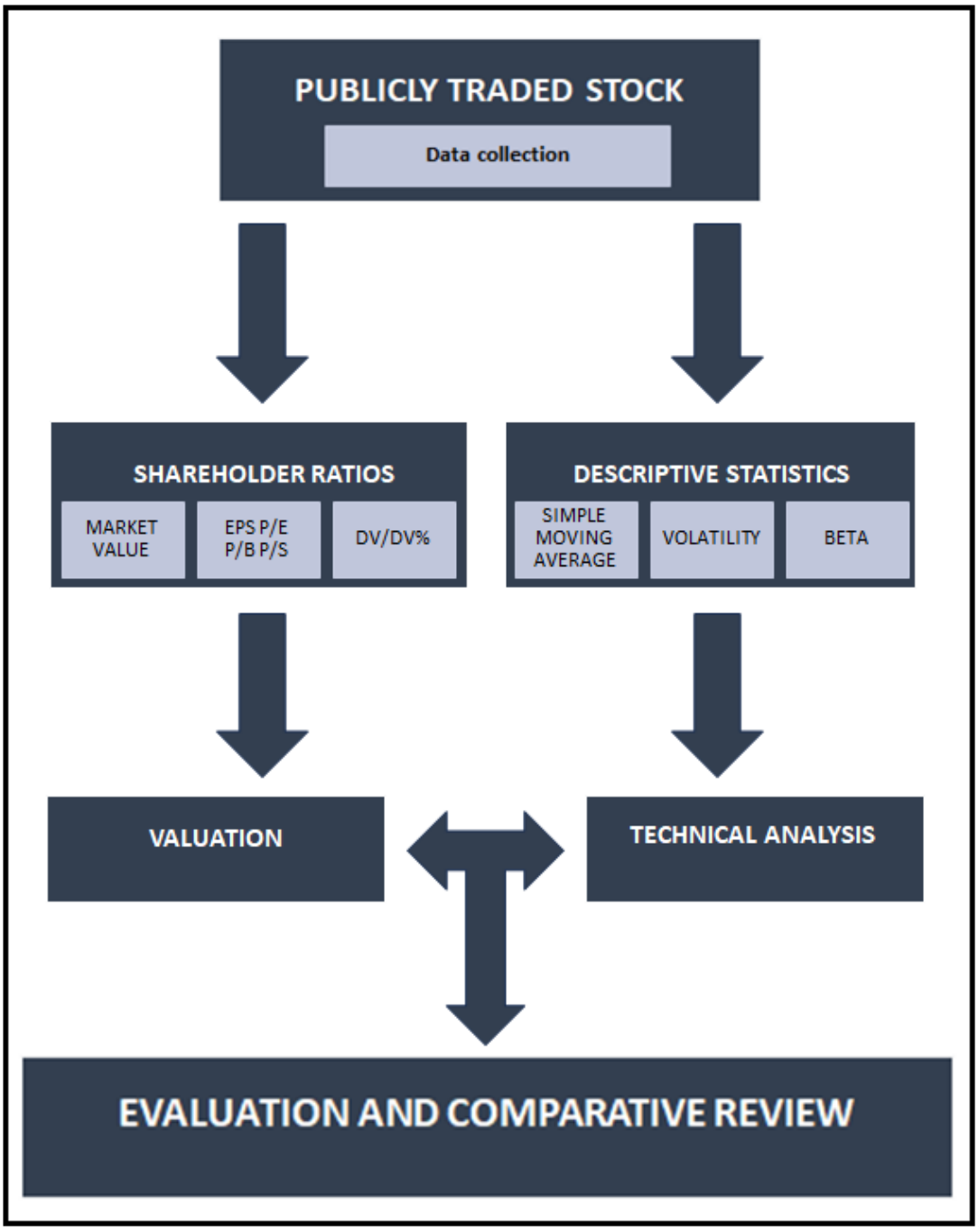


Chart 1. Conceptual framework

The conceptual framework outlines the procedural steps of the research, which begins by collecting publicly available financial information about a publicly traded stock. The information consists of key figures on the income statement, balance sheet and historical stock prices. The financial information forms the basis for the shareholder ratio figures and the calculations of statistical methods. Shareholder ratios, such as market value, earnings per share, price per earnings, price per book value, price per sales and indicators related to dividend are metrics used to calculate the relative value, profitability and potential profit distributions of the case-company. Simultaneously, descriptive statistical methods are used to analyse stock price fluctuation trends. Statistical metrics are based on measuring the moving average of the trading price, volatility and index correlation, which all are forms of a technical analysis. The case company's market position is comprehensively evaluated in the light of these methods in the Evaluation section. A benchmark between the case company and the main competitors is further explored in the comparative review under the same section. The purpose of the comparison is to study the relationship between the financial indicators of the case company to its most significant competitors and to market index so that the evaluation results would be in right context.

3 SHAREHOLDER RATIOS

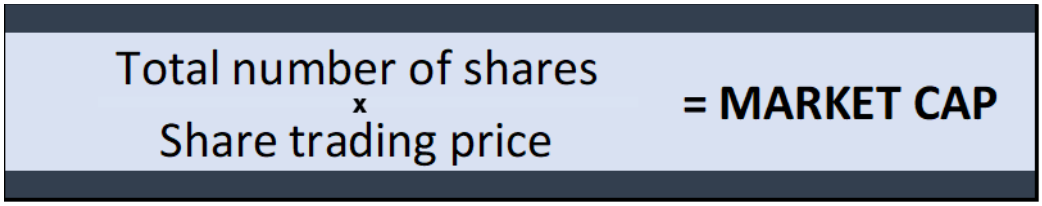
The opening section of the theoretical part in the thesis introduces the most common metrics used for assessing the relative pricing, size and return of a publicly traded stock. The valuation metrics introduced in chapters 3.1 - 3.7 are also known as the *shareholder ratios*. These ratios are used to study how current or historical trading price of a company share relates to different variables, such as figures on financial statement and other financial data, what relative returns can be expected for the investment and in what type of risk frame. The following shareholder ratios are all calculated from an income statement, balance sheet or other finance-based corporate data.

In addition to the conceptual presentation, the theoretical part has been extended with comparative reviews based on real market examples. In comparative reviews the valuation methods are benchmarked in reflection to real shares of companies operating in either same or different industries and with actual calculated data. The purpose of the benchmarking is to increase both the reader's understanding of the usability of the metrics introduced in shareholder ratio analysis and to increase the depth of the theoretical work.

3.1 Market capitalization

Market capitalization, often referred to as market value or market cap, is a fundamental metric, broadly used in evaluation of a company's overall size, potential performance, and risk profile at the stock market (The Investopedia Team. 2024, March 5).

According to the Investopedia Team (2024, March 5), the literal definition for market capitalization is the total dollar value of all the company's outstanding shares. Therefore, the mathematical formula for the indicator is formed by multiplying the number of outstanding shares by the price at which the company’s share is trading on the market at a chosen time. In other words: Market capitalization is a sum of the number of shares and the current price of one share.



Formula 1. Market capitalization

Data for the formula is derived from Investopedia (Investopedia, Market Capitalization, 2024)

Market cap is a universally valid and practical calculation for comparing different companies as the scale of operations is set as a factor influencing the investment decision. The reliability of the market value analysis between different stocks can be enhanced by choosing compared companies from the same

industry. The higher the market capitalization, often the greater the liquidity and the lower the risk concentration (Merrill Edge, 2024). Market cap is therefore a useful metric when the relationship between risk and return is assessed, because according to the general perception, a larger size class protects the investor from a dramatic decline in value, but at the same time reduces the possibility of excess returns as in a larger size, rapid growth in relation to valuation is not as likely as in a small or midcap classification (Merrill Edge).
According to the Investopedia Team (2024, March 5) article concerning market capitalization, companies can be divided by their market value at least into three different categories as follows:

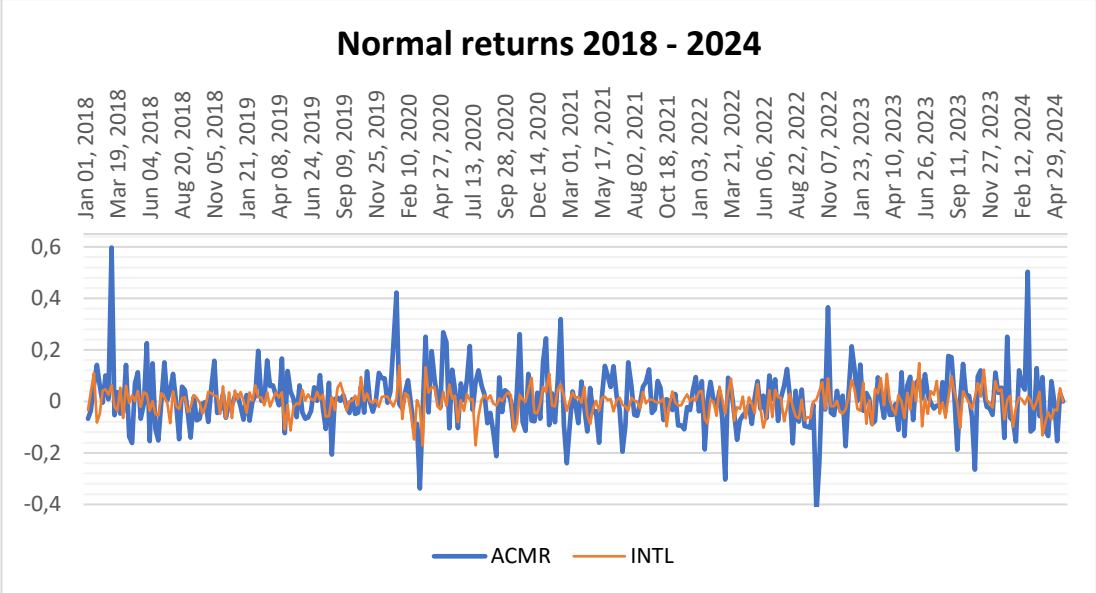
- Small cap with value < $2 billion
- Mid cap with value range of $2 billion - $10 billion
- Large cap with value > $10 billion

In order to understand the application of the metric market cap on a deeper level, a comparative review can be formed. Two example stocks are selected for the comparison: ACM Research (ACMR) with a market value of $1,75 billion (05/2024) and Intel Corporation (INTC) with a market value of $180 billion (05/2024). To reinforce the relevance of the comparison, stocks compared are selected from the same industry, in this case: IT-components and chips.

According to the previously presented value scale, INTC is classified as a company with a large market value, while ACMR represents a segment with a small market value. INTC is an internationally recognized market factor in the manufacturing of information technology components. Theoretically, INTC's large market capitalization reflects a strong market position, a large customer base, and stable revenues. The Large Cap rating suggests that INTC is a lower-risk investment with the potential to generate stable and yet moderate returns for the shareholder. However, ACMR, which has a market value of approximately 1% of INTC, may grow earnings relative to the size of the business more efficiently than INTC, as small cap companies often do. The Small Cap classification indicates the potential for growth and higher returns compared to Large

Cap companies, but it also involves a greater risk, as the company's ability to generate profit can turn in the opposite direction as easy.

In a deeper comparison, the normal returns from adjusted closing prices of both companies are listed from the period 2018-2024, so that a more comprehensive understanding of market values impact on returns can be formed. The adjusted closing prices are listed in chronological order in Microsoft Excel and turned into normal return data set with the function (=LN) resulting the comparative diagram of returns.



Graph 1. ACMR (blue) and INTC (orange) normal returns 2018-2024.

Data for the graph is derived from Yahoo Finance (Yahoo Finance, ACMR & INTL, 2018-2024).

The diagram above illustrates how the logarithmic return distribution of the small cap company has a larger range than the large cap one. The large cap however is more likely to offer more stable returns. In the comparison of return distributions, the emphasis is not actually on which scale of market value is the best possible, but more on how the market value can possibly have an influence on the distribution of the returns.

As a summary, it can be stated that companies with a higher market value tends to offer security and stable growth, while SME’s offer the opportunity for higher returns with greater risk. Therefore, the comparison of the market value

gives valuable information about both the current state of the company and what kind of expectations the investor should set regarding risk and return.

3.2 Earnings per share

Earnings per share or EPS is the most important financial metric in the process of earning -based valuation as it measures the ability to produce returns for the shareholders. In other words: EPS indicates the absolute amount a company generates actual cash for a singular outstanding share (Schmidt, 2024). When calculating EPS, net profit refers to the company's total earnings after all expenses have been deducted, while outstanding shares represent the total number of shares currently held by all shareholders. The relationship between the distribution of the accumulated profit and one share is determined by dividing the net profit (with preferred dividends subtracted) by the number of outstanding shares (Schmidt, 2024). Another method for calculating earnings per share is to replace the absolute number of outstanding shares with the weighted average. The weighted average is sometimes applied in the formula as the absolute share amount can vary significantly due to events such as share issuance or buybacks. These calculations provide a clearer picture of a company's profitability and its ability to generate returns for investors (Murphy, 2022, March 17).

$$\frac{\text{Net income - preferred dividends}}{\text{Total number of shares}} = \text{EPS}$$

Formula 2. Earnings per share.
Data for the formula is derived from Investopedia (Investopedia, EPS, 2024)

The significance of the EPS ratio lies in its versatile applications. Earnings per share can be used to evaluate various aspects, such as a company's profitability, changes in profitability over time, and the comparative performance of rival companies in terms of their EPS ratios. When comparing the data calculated from competitors' financial figures, a fair share of attention should be paid

to random deviations in cost and income structures that may distort the result of the comparison. It is neither recommended to compare the earnings per share ratio of companies operating in different industries, because depending on the industry, the financial structures can be very different from each other (Mannion, 2023, November 14).

A comparative review can be created for a deeper examination of earnings per share. Two example stocks are selected for the comparison: McDonald's Corporation (MCD) with an EPS of $11,46 and The Wendy's Company (WEN) with an EPS of $0,96 both during 05/2024. To ensure the relevance of the comparison, both example stocks are operating in the same industry: the fast-food business.

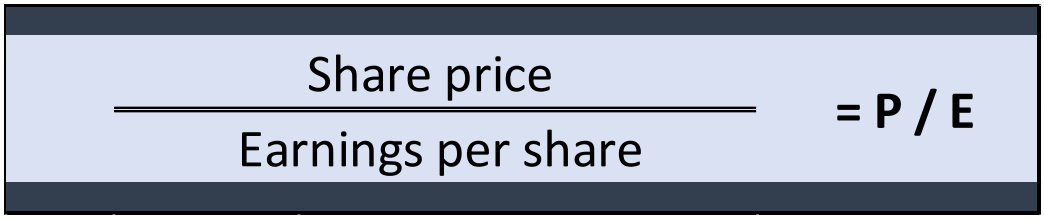
MCD with higher EPS of $11,46 indicates significant profitability. Higher profitability potentially attracts investors looking for stable earnings and strong dividend prospects. Higher EPS reflects McDonald's good financial status and reliability in performance, but also its position as a leader in the global fast-food industry. Conversely, WND with an EPS of $0,96, may indicate a different phase in the business lifecycle or just poorer market performance. While the lower EPS presents a higher risk profile due to potential earnings volatility, it also signifies possible growth opportunities. For investors willing to accept higher risks, Wendy's may offer a lot higher future growth prospects.

In summary, EPS is an important metric for evaluating a company's absolute profitability by a singular share. In this comparison McDonald's higher EPS points towards financial strength and stability, making it a potentially safer investment for those seeking reliable returns. However, both companies being compared generate a positive return per share, indicating that both are profitable businesses.

3.3 Price per earnings

In a comprehensive valuation of a share, it's essential to find an answer to the question of whether the market has priced the share at the lower or upper end in relation to its earnings (Graham, 1973). Contrary to the misconception that

many at a stock market might have, the actual value of a stock is not solely determined by its trading value. A widely used ratio known as price per earnings, abbreviated P/E, has been developed to determine what the general market is willing to pay for the companies past or future earnings (Murphy, 2024, June 21.) In the calculation formula, P represents the share's current price and E represents the yield per share, in other words: the earnings per share (Lianos, 2023, September 25), as discussed in the previous chapter. The indicator price per earnings is therefore calculated by dividing the share price by its EPS ratio. The P/E ratio simply expresses how many times the share trading price is in relation to the company's earnings per share (Lianos).



Formula 3. Price per earnings.
Data for the formula is derived from Investopedia (Investopedia, P/E, 2024)

In the study of value investing, the interpretation of the price per earnings figure uses a valuation scale to which the P/E figure of the valuated stock is compared (Graham, 1973). In the model, which aims to choose a reasonably priced share, the price of the selected share should not be more than fifteen times the average of its return per share for the past three years. Simplified, according to this model, the stock would have an indication of undervaluation when price per earnings falls below 15 (Graham, 1973).

The concept of relativity, as applied to financial valuation, can be introduced in a practical example to gain deeper understanding of the metric. In the following benchmark, the same stocks are being analysed as in previous chapter, leveraging authentic data to simulate a real-world context: McDonald’s Corporation (MCD) and The Wendy’s Company (WND). Price per earnings ratio for MCD is 22,62 and 17,61 for WND, both at 05/2024.
The MCD P/E ratio of 23,09 indicates that its pricing in relation to EPS ratio is less attractive than in WND’s case. Wendy’s lower P/E ratio of 17,76 indicates

more attractive pricing, especially for an investor with value approach. Although the previous paragraph states that McDonald's share is more attractive from the point of view of its earnings per share, it should be noted that the general market values these high earnings more than with the Wendy's stock. The P/E ratios of comparable stocks emphasize different characteristics. While McD's higher P/E ratio reflects its position as a financially stronger entity with solid earnings expectations, Wendy's lower P/E ratio reveals a potentially undervalued stock with room for growth.

As a summary, P/E ratio is an important metric when evaluating the market's valuation in relation to the company's earnings. Based on McD's higher P/E ratio, its purchase price carries a premium for the future. The stock is therefore reliable from the market's point of view, although overpriced according to previously introduced valuation scale. WND's lower P/E ratio, on the other hand, indicates better growth potential for the future, but also lower confidence from the market on average.

3.4 Price per book value

Price per book value, or P/B ratio, is a financial metric used in a balance sheet-based valuation, where the ratio of the price determined by the market to the company's capital value is compared. According to the Corporate Finance Institute’s article, the book value itself refers to the value that would remain if the company were to liquidate all its assets and repay all its liabilities (CFI Team, 2016a). In order to solve the relation between a share price and a book (or asset) value of a company that the share represents, the values are being divided. In the P/B calculation formula, P represents the price at which the share trades at a chosen time and B the so-called equity value per share, which is calculated by dividing the company's equity by the total number of outstanding shares (Maveric, 2022, March 29).

$$\frac{\text{Share price}}{\text{(Equity / Total number of shares)}} = \text{P / B}$$

Formula 4. Price per book value.
Data for the formula is derived from Investopedia (Investopedia, P/B, 2024).

The informational value of the indicator P/B is based on relative pricing information, exactly like with the P/E. On a practical level, price to book value serves as a useful tool when the pricing level of a share at the time of purchase is being solved: When the price is 1:1 with the book value per share, the P/B ratio is naturally 1 (McClure, 2024, May 29). In terms of value investing, price per book value of 1 – 1,5 means a reasonably priced share, as the share can be trading in line with its book value. To make the interpretation of underpricing and overpricing easier, Graham introduced in his book on value investing, Intelligent Investor, that the price to book ratio should not exceed 1,5 when determining a moderate price level (Graham, 1973).

In the comparative review of the price per book value, the shares are compared are usually operating in the same industry for the analysis to be relevant. However, in this analysis the shares are chosen from different industries. In the interpretation of balance-based pricing, more industry-specific factors must be considered, as different business and fiscal structures occurs between different industries. The compared shares are chosen from different industries, so that these differences can be highlighted better. The comparable stocks in the following analysis are Wells Fargo (WFC), one of the largest banks in the Us and PepsiCo (PEP), which is one of the world's largest consumer goods corporations. Price per book value for WFC is 1,32 and for PEP 13,11 in 05/2024.

WFC with P/B of 1,32 indicates lucrative pricing in relation to its book value, as suggested. Although a low P/B value indicates underpricing in relation to the assets, it should be noted that P/B values in bank stocks are on average lower than other industries. In the case of banks and financial institutions, a low P/B value is typically because there are often large amounts bonds and

other investments on the balance sheets due to the nature of their business. Due to these factors, the P/B value is scaled differently in case of a bank stocks.

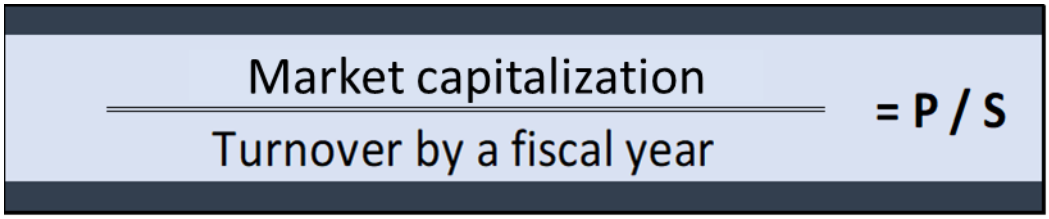
PepsiCo's high P/B -value reflects a situation in which company's market value isn't anywhere near close to its book value. In other words, the investor is to pay approximately eleven times what the company's assets are worth. In fact, price per book value for PEP is not only high compared to WFC but to general market as well, as the P/B value of S&P 500 index ranges between 2,8 and 4,1.

In summary, price per book value is an important metric for evaluating company's market value to its assets. In the comparison presented, P/B ratio of PepsiCo points towards significant overpricing to company's assets, making it potentially a less lucrative option for those seeking an affordable stock investment than WFC.

3.5 Price per sales

Besides of the interpretation concentrated on balance sheet, the assessment of share valuation can be alternatively done through an income-oriented perspective, specifically gauging relation of the trading price with the overall sales performance. In essence, the price per sales ratio, or P/S, provides insights into the market's valuation of a share concerning the annual turnover generated by the business (McClure, 2022, May 19).

The price to sales ratio can be calculated in two different ways: the formula can be formed by dividing either the company market value by its turnover by a fiscal year or share trading price by the turnover per share (McClure).



Formula 5. Price per sales.

Data for the formula is derived from Investopedia (Investopedia, P/S, 2024).

Like other the ratios that are based on share price, the price per sale ratio indicates whether the share is relatively undervalued or overvalued. A share with a P/S ratio between one and two generally has an attractive valuation, as the received turnover would be roughly the same as the share price. If the result of the calculation is less than one, the share is significantly underpriced to quantum of sales. However, according to the article of Corporate Finance Institute, it is important to take into account the industry-specific differences between nature and volume of sales and the fact that the key figure does not actually relate to the absolute level of sales. Nevertheless, the price per sales ratio is not an effective method for analyzing whether the company generates sales or will be able to do so in the future (CFI Team, 2016b).

For a deeper examination of price per sales ratio, two example stocks are selected for the comparative review: Pfizer (PFE) with P/S 2,84 (05/2024) and Johnson&Johnson (JNJ) with P/S 4,41 (05/2024). To ensure the relevance of the comparison, the chosen companies are operating in the same industry: pharmaceutical products.

PFE P/S ratio indicates a slightly elevated valuation in relation to the company's sales for the financial year, as it implies that the market capitalization is 2,84 times the total sales revenue. However, the PFE share does not reach the higher end of the valuation spectrum, as the reference value in the S&P500 index is only one value point lower and in the reference stock JNJ, the world's largest pharmaceutical company, almost twice as high. The premium in PFE trading price over the actual sales, as indicated by this comparison, does not appear exclusively high. The price per sales ratio of JNJ appears less appealing, as it exceeds the threshold for reasonable valuation.

To quantify the difference in valuation between PFE and JNJ, their P/S ratios can be compared directly. The ratio difference of 4,41−2,84 = 1,57 indicates that JNJ is valued at approximately 55% higher in terms of sales than PFE. Despite the possible overvaluation, market could see a greater stability or growth prospects for JNJ’s share as well.

In summary, companies with lower P/S ratio offers the potential for upside gains as they could be undervalued relative to their revenue, while those with higher P/S ratios poses a higher risk due to the potential for inflated market

expectations. Therefore, comparing P/S ratios provides valuable insights into the relative valuation and especially for an investor that has focus on sales. However, it’s important to underline that the price per sales ratio is only one component of financial valuation process and isn’t applicable in analyzing absolute sales quantities. According to this comparison however, PFE looks more potential stock for an investment looking for momentum in sales as the relative price is lower and the revenue quantities, according to MacroTrends statistics, have been somewhat stable during 2009-2023 (MacroTrends, 2009-2023)

3.6 Dividend yield

Dividend, i.e. the amount of cash distributed to shareholder from the profit made by a company, is one of the key components in evaluating the future returns of a stock and its current trading value relation to the distributed cash (Sim & Sigel, 2007, p. 337). Evaluating the future return of an investment in terms of dividends and their relation to the current share price is especially important for an investment which is placed for passive cash flow and stability from the general market volatility. The dividend not only indicates absolute and relative cash returns. From the dividend payment information, conclusions can also be made about the company's income stability, solvency, and profitability (Sim & Siegel, 2007, p. 339).

In financial terminology, the relation between the absolute dividend distributed and the share price of a company paying the dividend is known as the dividend yield. The metric dividend yield essentially represents the proportion of the dividend relative to the trading price of the stock. In other words, a measure that expresses the dividend payment as a percentage of the stock's current market price (Fernando, 2024, May 31). The formula for dividend yield is calculated by dividing the latest gross dividend amount per share by the current market price of the stock. This calculation results an estimate of the investment's relative return in dividends (Sim & Sigel, 2007, p. 31).

$$\frac{\text{(Total dividend / Shares outstanding)}}{\text{Share price}} = \text{DV \%}$$

Formula 6. Dividend yield.

Data for the formula is derived from Investopedia (Investopedia, Dividend yield, 2024).

Dividend payment information and policy is important not only for the relative dividend to be paid, but also for evaluating the return of the investment from the perspective of continuity. The key source of information in terms of the continuity and stability of payments is companies' public information on dividend payment history. From the payment history information, the investor can directly ensure whether the dividend has been paid in a linearly increasing amount or whether the dividend payment has been kept independent of the economic cycle and has not been disturbed (Fernando, 2024, May 31).

The concept of relativity and usability of dividend yield can be as well simulated in a comparative review. In the following comparison, two companies that distributes dividend in quarter basis are selected from different industries. Ford Motor Company (F) with dividend of $0,15 and Johnson&Johnson (JNJ) with $1,24, both during 05/2024.

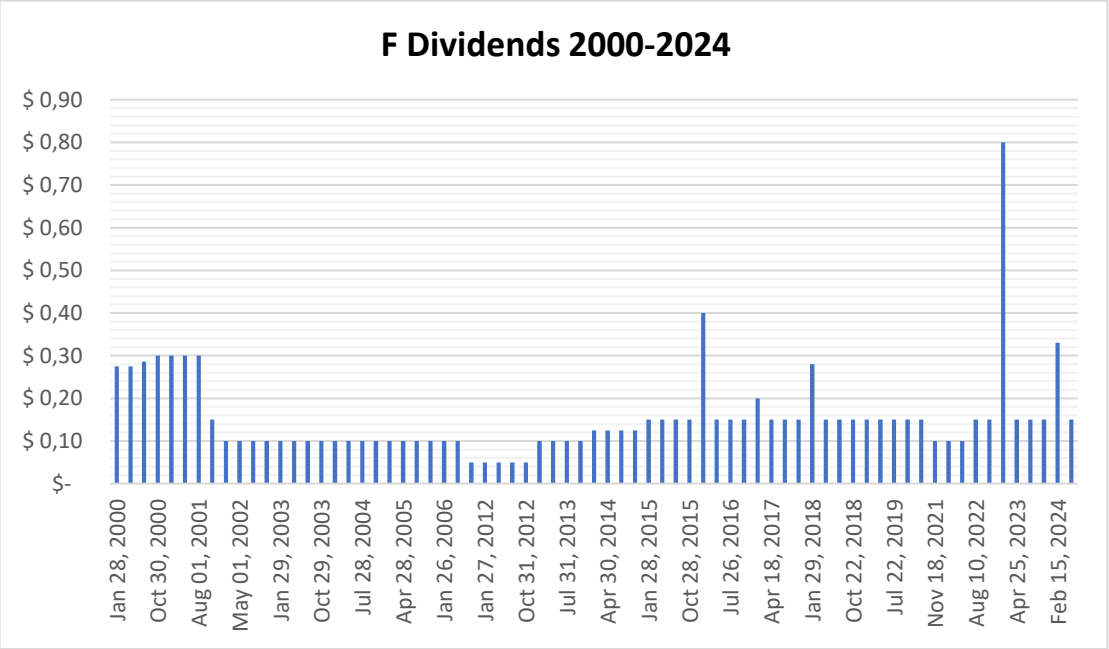
1) Share F trading at price $12,40 and distributes dividend of $0,15 each quarter:
   (4 x $0,15) / $12,40 = 4,83 % yield

2) Share JNJ trading at price $151,22 and distributes dividend of $1,24 each quarter:
   (4 x $1,24) / $151,22 = 3,28 % yield

According to the calculation above, the share F generates an annual return (expected) of 4,83 % in dividends alone. Although the annual dividend of JNJ is approximately eight times higher in absolute terms in 2024, the valuation is

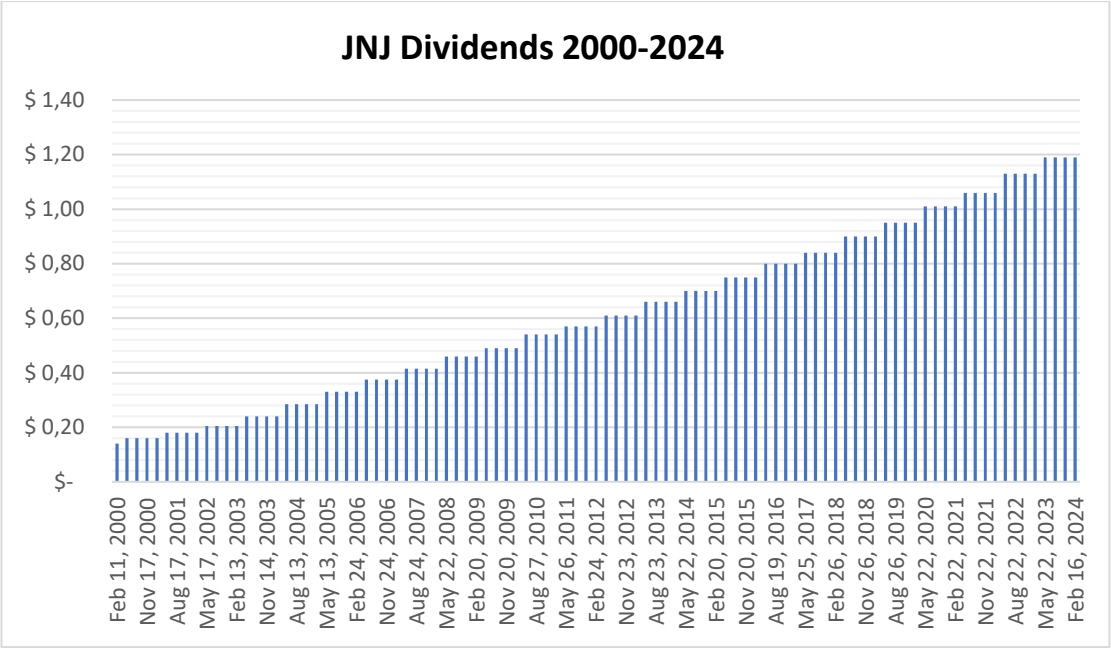
more favourable for F as it generates more money in relation to the invested capital in dividends.

Share JNJ loses in its dividend yield to F for the year 2024 based on the comparison of dividend yields in 05/2024. However, when cash flow is being analyzed with dividend payments, the predictability of continuity and growth must also be considered, as a comprehensive conclusion cannot yet be drawn based on a single year payment(s). In a deeper comparison, the values of the absolute dividends per share of both companies are listed from the period 2000-2024, so that a more comprehensive understanding can be formed. The dividend payments are listed in chronological order in a Microsoft Excel sheet and turned into line charts as follows:



Graph 2. Ford Motor Company dividend payments.

Data for the graph is derived sourced from Yahoo Finance (Yahoo Finance, Ford Motor Company dividends, 2000-2024).



Graph 3. Johnson&Johnson dividend payments. 2000 – 2024.
Data for the graph is derived from Yahoo Finance (Yahoo Finance, Johnson & Johnson dividends, 2000-2024).

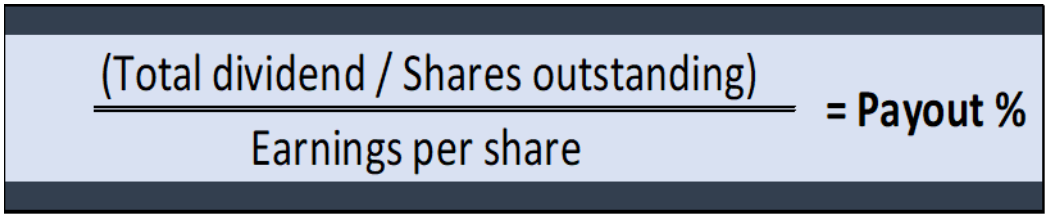
F’s high range between dividend payments reflects a situation in which the passive cash flow isn’t too predictable and either growing over the years. Based on the comparison, however, despite the current (05/2024) yield, JNJ has been able to increase the dividends in linear order over more than a decade.

As a summary for the comparison, two important points were achieved. Initially, F's price relative to the most recent dividend is higher that comparable stock JNJ and the S&P500, which has an average dividend of only 1.35% through 05/2024. Another observation is the importance historical information about total dividends, because of the dividend yield alone is not an effective indicator when making a dividend investment decision as the predictability is in key role when returns are being analyzed in a reliable way. Analysing the continuity of the distributions is especially important for companies that distribute dividends in regular basis as the shareholder value can be sourced in a long-term re-investment plan.

3.7 Dividend payout ratio

In a more complete analysis of a dividend and its relative return, it is important to understand the ratio in which the cash is paid out: the payout ratio. Dividend payout ratio indicates the proportion of profits that the company pays out as dividends to its shareholders. Therefore, the dividend payout ratio is not directly a similar valuation metric as the other shareholder ratios introduced in the earlier chapters as it's not based on the trading price. However, according to the Corporate Finance Institutes article, when a financial valuation is conducted from the perspective of dividend yield, it is important to assess the share of which the dividends are paid out of the company's profits. The dividend payout ratio assessment involves determining whether the payments are fiscally sustainable, and that the dividend is paid in similar quantities relative to profits so that predictability can be maintained (CFI Team, 2024c).

The formula for the payout ratio calculation is formed by dividing a single dividend (total dividend / total outstanding shares) by the earnings per share (Sim & Siegel, 2007, p. 339).



Formula 7. Dividend payout ratio.

Data for the formula is derived from Investopedia (Investopedia, Dividend payout ratio, 2024).

The dividend payout largely depend on the company's growth goals and dividend policy. A high ratio technically means that the company compromises on part of the investments made with its own capital in order to enable a passive cash flow for the shareholders (CFI Team). A company that holds all or a major share of earnings can reinvest the cash into its own shares or business for future growth. The withholding of profits on the company's balance sheet, on the other hand, can be seen as a possible increase in the share's value. In

addition to the fact that the taxation is avoided, the company's riskiness is also reduced because it guarantees more equity capital for its operations (CFI Team).

For a deeper examination of dividend payout ratio, two example stocks are selected for the comparative review: McDonald’s Corporation (MCD) and Altria Group (MO). To ensure the relevance of the comparison, both chosen companies are considered dividend stocks as the distribution of dividends has been ascending and consistent over the years. The data in the following calculations is from 05/2024:

1) MCD with $ 1,67 quarterly dividend per share and EPS of $ 11,83
   (($ 1,67 x 4) / $11,83) x 100 = 56,46 % payout ratio

2) MO with $ 0,98 quarterly dividend per share and EPS of $ 4,78
   (($ 0,98 x 4) / $ 4,78) x 100 = 82,00 % payout ratio

Both shares used in the example pay dividends in a significant proportion of their income. In fact, MO dividend payout ratio is in range of very high whereas MCD is in between moderate and high, according to the share of the out paid profits. A high dividend payout ratio is possible when a company has a stable position in the market, which thereby enables stable cash flows and limited growth opportunities. The companies in comparative review are relatively saturated in business and are in the large cap category in terms of market value. A high payout ratio can therefore be considered to be justified and, from the a dividend investors point of view, one key metric of the valuation. However, it should be taken into account as well that a high dividend payout ratio might indicate that a business has no upcoming investment for its winnings or trying to compensate the shareholders to cover a bad year(s), which could mean that MO has not as many upcoming investment opportunities as MCD.

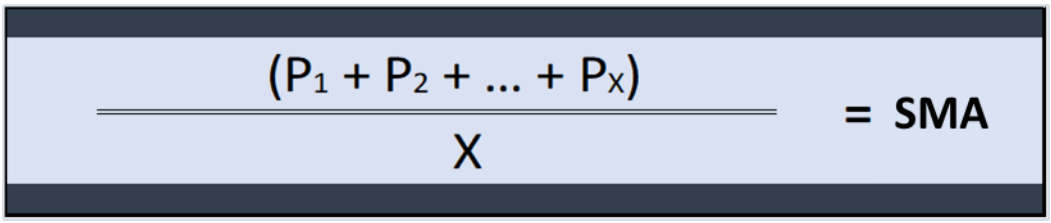
4 TECHNICAL METHODS

The second section of the theoretical work in the thesis introduces the descriptive statistics in technical interpretation of the stock evaluation. While the profit and balance sheet figures of a company are the key numbers that influences the share trading price, in technical analysis the primary focus will be on the trading price itself as excluded from other factors. In other words, the share trading price can be perceived as a phenomenon of its own and thus a subject for an analysis based on different statistical methods and models.
The models and concepts introduced in the following section are indicators derived from the fluctuation of the share trading price, measuring different variables, such as riskiness or correlation on general market – being completely unrelated to the actual business or finance behind the business that the share represents. In order to understand the theory of technical analysis and the relative complexity behind statistical applications in security analysis in general, the reader is expected to have an entry-level understanding of statistical concepts. A minimum understanding not only facilitates understanding the material introduced but allows the reader to make meaningful insights of how basic statistics can be applied on financial markets and in any other measurable context.

4.1 Simple moving average

Simple moving average (SMA) is one of the most common technical methods of security price movement analysis. The indicator is versatile but is mainly used to form a predictive view of the price trend in a certain time interval (Hayes, 2024, June 13). The choice of time interval in the calculation depends on the expected holding period of the investment, and any period from thirty minutes to two hundred days can be applied to the formula (Hayes). The mathematical formula for the indicator is formed by adding up the price averages of the sub-time intervals of the selected period and dividing them by the selected time interval. In other words: a set of numbers or stock prices are added together and then divided by the number of prices in the set (Hayes).

In a practise, the formula goes as follows: The closing prices of the last P_X days are selected. These prices are added together and then divided by X, resulting in the average price for the X-day period. Then, as the days progress, the X-day window is slid forward, always considering the most recent X days.

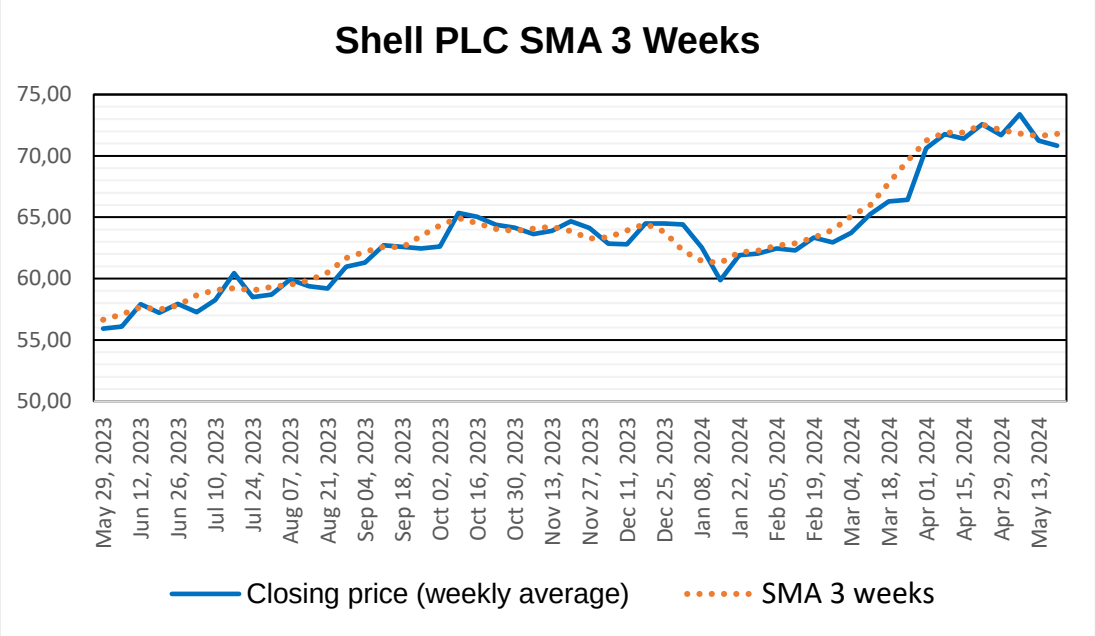


Formula 8. Simple moving average, where P_X = Share price at period X and X = number total periods.
Data for the formula is derived from Investopedia (Investopedia, Simple moving average, 2024).

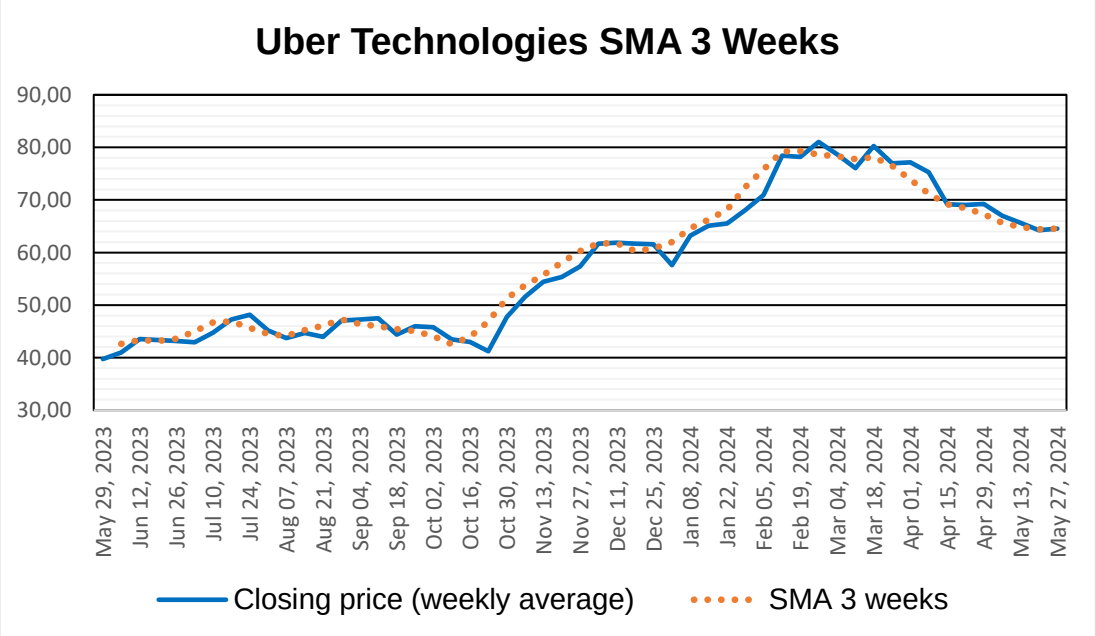
The main reason for calculating the averages is that it excludes the image distorted by individual and possibly high price deviations (also known as a noise) from the actual trend of the price direction (Mitchell, 2024, June 13). Calculating a moving average aims to interpret the relationship between the current price of a stock and its longer-term average: when the shorter-term SMA rises above the longer-term value, it can indicate an upward trend in the price and act as a buying signal. On the other hand, when the shorter-term SMA falls below the longer-term SMA, the investor can expect a down trend for the price and thus consider selling the stock or postponing the purchase for the future (Hayes).

The simple moving average can be introduced in comparative review to gain deeper understanding of the indicator. To preview the concept in a real context, two example shares are chosen for the benchmark: Uber Technologies (UBER) and Shell PLC (SHEL), Unlike in comparisons in the shareholder ratio analysis, the industry, market value, or any other binary attribute in the businesses being compared is not relevant. The only data component applied in the analysis will be the trading price at a chosen period. At the beginning of

the comparison, weekly prices of both stocks are compared from the period 06/2023-06/2024 and the averages between the three weeks are calculated for the prices in Microsoft Excel spreadsheet. Below are the price graphs of both stocks with a three-week moving average added on the share price chart:



Graph 4. Shell PLC trading price & simple moving average 2023 – 2024. Data derived from Yahoo Finance (Yahoo Finance, Shell PLC 2023-2024).



Graph 5. Uber Technologies trading price & SMA 2023 – 2024. Data derived from Yahoo Finance (Yahoo Finance, Uber 2023-2024).

The UBER share price has remained stable and has traded in line with the moving average. This suggests that the market has kept the share price stable over the past twelve months and therefore no major deviations from the average have occurred. In the comparison stock SHEL, on the other hand, there has been a larger range of fluctuations with the averages of the selected period and as can be seen from the technical analysis created for the share (graph 4), the price has fallen below the three-week average in the period 01–13 May 2024. The SMA's fall in the trading price therefore indicates that the price might be in a downward trend, and it can therefore be thought that the SHEL share would have a buy indication on 13 May 2024.

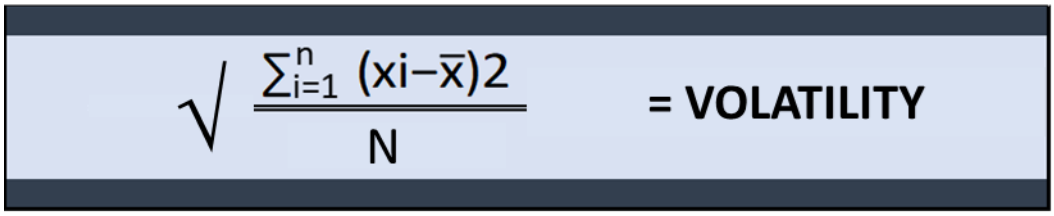
In summary, it can be stated that at the end of the review period, the price of UBER has a ratio of almost one to the average price, while the price of SHEL has decreased. When comparing the average value and the price, it must be considered that the calculation does not take into account what causes the potential downward trend or how long the trend might last, but simply models a situation where the stock is now more affordable than the average over the last three weeks. In this comparative review, twelve months are used as the review period, and the average weekly prices are calculated over a period of three weeks. The method used is therefore intended for a little longer investment horizon and not applicable for example day trading. An investor who uses the moving average method must relate the timing of buying and selling to the average: If trading transactions take place within a day or even minutes, the time span of a year in the calculation is not justified and the presented analysis is not therefore usable.

4.2 Volatility

In the securities market, the fluctuation of product prices in a certain amount and in a certain time creates a dispersion between the average and the price deviations. In the interpretation of the degree of dispersion, which in finance refers to riskiness, it is necessary to first calculate the variance. Basically, a variance measures the dispersion between data on a data set and therefore is

applied as a fundamental base in the risk measurement (Hayes, 2024, July 16). From variance, the standard deviation, which measures the volatility of normal returns in share price, can then be derived. Volatility is a statistical measure of the dispersion of returns applied in the securities market. Whereas variance describes the dispersion of returns around the average of the data in as well, volatility is a measure of that variance bounded by a specific time period (Hayes, 2024, July 03). Roughly speaking, the greater the dispersion (or volatility) between the returns, the greater the risk the stock investment carries as higher volatility means that the value of the share can be spread over a wider range of values and therefore be more unpredictable (Haeys).

The mathematical formula for calculating the volatility can be summarized in two phases. Initially, a variance value is compiled from the normal returns of share prices. This step is crucial because variance measures the dispersion of returns, showing how much returns deviate from their mean. After this, the square root of the variance is taken. The second step is important because it converts the variance into a more interpretable form, volatility, which is expressed in the same units as the returns (The investopedia Team, 2024, June 12).



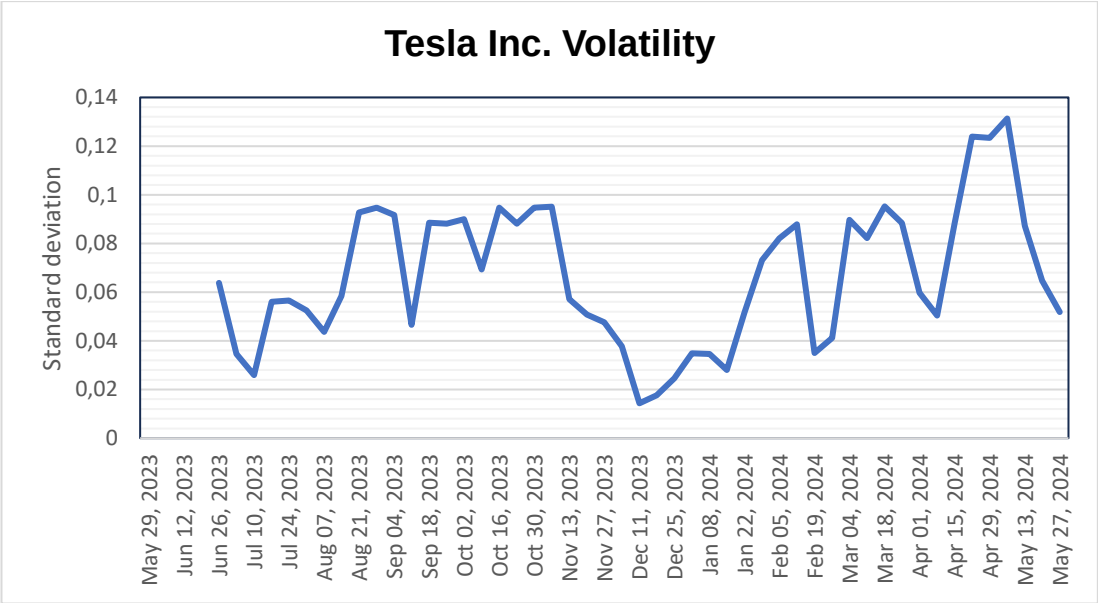
Formula 9. Volatility: A square root of variance, where X_i = Each value in the data set, $\bar{x}$ = mean of all values in the data set and N = Number of values in the data set.

Data for the formula is derived from Investopedia (Investopedia, Volatility, 2024).

To summarize the calculation process, initially, the prices of the selected share must be limited to the desired time interval. A logarithmic return is then calculated from the selected trading prices, which can be done for example in Microsoft Excel with the function "=LN". For the logarithmic returns, as shown

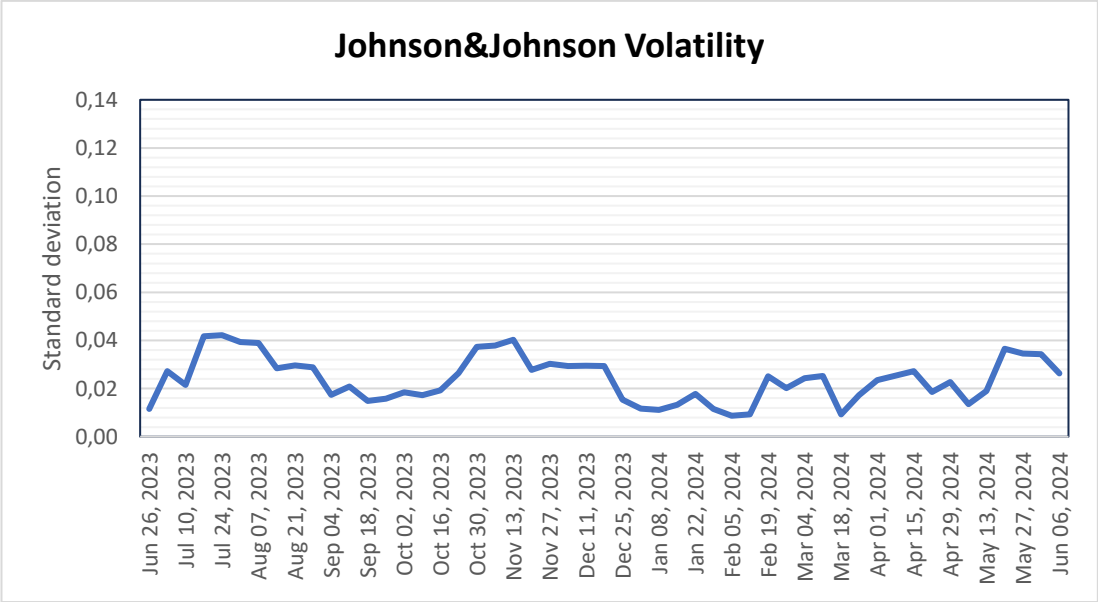
earlier, variance must be calculated. Variance is formed with the function "=VAR.S(data)" where the data describes the normal returns calculated for the trading prices earlier. Finally, the square root of the variance is taken with the function "=SQRT(variance)", equaling the standard deviation as the final result of the calculation. However, a more straightforward way to calculate the standard deviation, i.e. volatility, is to enter the logarithmic returns into the function "STDEV.S", leaving the intermediate steps of the calculation for the calculator to calculate. Either way, it is important to execute the calculation precisely for normal returns and not for share trading prices, because as John C. Hull writes in his book Options, Futures and Other Derivatives, volatility describes the standard deviation of the logarithmic returns of trading prices in financial mathematics (Hull, 2018, pp. 348–349).

The concept can be introduced in a comparative review where two example stocks are compared in terms of their volatility. The compared stocks in the following analysis are Tesla Inc. (TSLA) and Johnson&Johnson (JNJ). The companies are operating in completely different industries; automotive and pharmaceutics but in the following, the primary emphasis of this review is the statistical examination of trading prices, rather than an exploration of sector-specific factors or other company related characteristics. The weekly prices of both shares are imported from the period 06/2023-06/2024 to MS Excel for the benchmark. The line graphs below are modelling volatility for both shares. The calculation is based on the standard deviations (=STDEV.S) of four-week dispersion in normal return of 12 months:



Graph 6. Tesla Inc volatility in weekly prices 2023 – 2024.

Trading prices for the calculation is derived from Yahoo Finance (Yahoo Finance, Tesla Inc. 2023-2024).



Graph 7. Johnson&Johnson volatility in weekly prices 2023 – 2024.

Trading prices for the calculation is derived from Yahoo Finance (Yahoo Finance, Johnson&Johnson. 2023-2024).

The graphs above are visualizing volatility of the compared stocks. Expressed in numerical form, the volatility of TSLA stock in the selected period varies

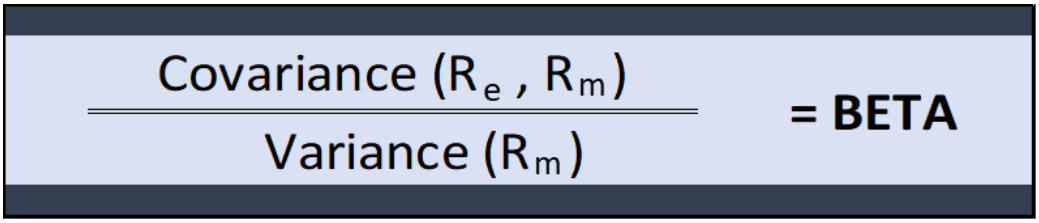
between 0,03 and 0,12 whereas JNJ's volatility ranges between 0,02 and 0,04. Based on the calculation, TSLA is a significantly riskier investment, because in addition to the wider range of returns, the peak values are also significantly higher. In other words, the dispersion of the returns offered by the share JNJ in the selected period has been significantly smaller, and the investor can therefore expect a more predictable movement in the price.
In summary, it can be stated that the standard deviation of TSLA's returns has been about three times larger, thus making the stock riskier. When analysing the volatility, however, it must also be taken into account that JNJ has not offered such excessive returns as TSLA's, meaning that a requirement for a higher return must be set for a share posessing higher risk.

4.3 Beta

The beta coefficient (symbol β) is a common indicator or “gauge” for assessing the risk profile of a security in relation to the general market fluctuation (CFI Team, 2024d). In other words: In β, riskiness is measured in how strongly the logarithmic returns in the security and in the market index are correlated (CFI Team). In the mathematical formula of beta coefficient, covariance is a key variable and understanding the concept of covariance is thereby essential for the theoretical understanding of the function of β value. In statistics, covariance is a common metric that measures the linear association between two variables (King & Eckersley, 2019). The variables in β are a security and an index. Positive covariance means that variables move in the same direction: if one increases, the other one increases too, while negative covariance means variables fluctuates in opposite order. In other terms, it measures how strongly or weakly two variables correlates (King & Eckersley).

The mathematical formula for calculating the β-value is formed by dividing the covariance of stock returns and market returns by the variance of the market returns (Kenton, 2024 July 11). Specifically, the formula is expressed as
$\beta = Cov(R_{share}, R_{market}) / Var(R_{market})$. Here, $Cov(R_{share}, R_{market})$ represents the covariance between the share's returns and the market's

returns, which indicates how the returns of the share and the market move together. The Var(R_market) stands for market returns variance (Kenton).



Formula 10. Beta coefficient. Re = the return on an individual stock, Rm = the return on the overall market (index)
Data for the formula is derived from Investopedia (Investopedia, Beta, 2024).

According to the Corporate Finance Institute's article on share valuation and risk assessing (CFI Team, 2024d), the result of the division indicates the correlation between the share and the market in volatility as in the scaling below:

- β >1 more volatile than the market
- β =1 exactly as volatile as the market
- β <1 less volatile than the market
- β =0 uncorrelated to the market
- β <0 negatively correlated to the market

Beta coefficient can be introduced in a form of benchmark to gain deeper understanding of the concept and systematic risk. In the comparative review, historical trading price data is sourced and applied from two case companies: Lockheed Martin Corporation (LMT) and Intel Corporation (INTC). The comparative review examines the relativity in the returns of the shares LMT and INTC to the S&P 500 index. The returns are calculated from adjusted closing prices using the logarithm =LN, as in the technical methods presented previously. Covariance values for both case stocks and the index is calculated with =COVARIANCE.P and divisors (index variance returns) with =VAR.P.
The return data used in the calculations below is based on monthly prices for the period 2019–2024, to ensure the long-scope approach in the analysis.

Lockheed Martin Corporation

Covariance (LMT:S&P 500): 0,00118
Variance (S&P 500): 0,00268
Beta: 0,00118 / 0,00268 = **0,44**

Intel Corporation

Covariance (INTC:S&P 500): 0,00283
Variance (S&P 500): 0,00268
Beta: 0,00283 / 0,00268 = **1,06**

LMT beta coefficient of 0,44 indicates that the general market is little more than twice as volatile as the share itself. This means that the returns on the share are significantly less sensitive to changes than the returns on the benchmark index, therefore making it a relatively low-risk investment in stock market.
INTC beta of 1,06 indicates that the stock is slightly more volatile than the general market. This means the returns on INTC are more sensitive to market changes, which indicates moderately higher risk compared to the index and a lot higher compared to LMT. A beta of 1,06 suggests that if the index moves by 1 %, INTC is expected to move by approximately 1,06 % either up or down. LMT beta coefficient of 0,44 means it is approximately 56 % less volatile than the market (as 1 – 0,44 = 0,56), making it safer in terms of volatility. INTC beta of 1,06 indicates that the stock is 6 % more volatile than the average market making it appealing to a strategy that accepts moderate risk for the potential of higher returns.
As a conclusion, the higher risk in INTC implies that the share might offer higher returns during market upswings but it also exposes investors to greater potential losses during downturns whereas LMT with lower sensitivity offers a possible pick for strategy that aims for stock market but with lower average risk.

5 DESIGN AND METHODS

The design and methods section provides a comprehensive overview of the key research components, including the case company AT&T, which is the subject of the valuation, as well as the data and analytical models applied in the stock valuation process. The ground for comparative review is introduced as well as the corporations that's shares are used in the benchmark. In addition to examining the research methods, the section addresses the reliability and credibility of the approaches in greater detail. A comprehensive overview on the research methods and its data not only facilitates the transparency but audits the material and calculations introduced and provides deeper understanding for a reader about the backgrounds.

5.1 Case company

In the empirical section of the thesis, an analysis is conducted using the models and figures introduced in the theoretical section. This analysis involves comparing a case company with the Standard & Poor's 500 stock index. AT&T Inc (T), a multinational company offering telecommunications and technology services, was selected as the case company. The company was established in 1885 and has been a subject of public trading since 1984 via New York stock exchange. The business consists of a broad portfolio of services and products, with a core focus on wireless internet and phone subscriptions, mobile phones, computers and other devices, as well as entertainment services for both individuals and organizations. The company, which is among the largest operators in the industry, has a well-established market position due to its long historical existence and an international customer base. These factors made AT&T Inc. an interesting subject for examining how its share price and financial indicators behave in relation to the broader market.

In the comparative analysis, the benchmark companies Verizon Communications (VZ) and T-Mobile US (TMUS) are also major corporations in the telecommunications sector, with product portfolios and operating areas comparable to those of the case company.

5.2 Data collection and analysis

A scientifically reliable analysis always occurs within a research context, involving the examination of subjects through either quantitative or qualitative methods. The difference between quantitative and qualitative research usually lies in the research materials and methods: Quantitativeness is based on examining numerical data to test a hypothesis or to explore relationships and differences between variables. The data, which are observation points collected for the research, may be based on pre-registered but uncontrolled observations and various values within a limited timeframe. Qualitative research, on the other hand, aims to achieve a more subjective understanding through descriptions and words, focusing on aspects that may be context-dependent and cannot be generalized like quantitative results. The qualitative research approach is often applicable when the goal is to describe the characteristics of a certain subject without relying on quantitative observations (Streefkerk, 2023, June 22).

In the following study, the objective is to create a valuation for the company AT&T Inc (T). The valuation is based on the financial ratios and models presented in the theoretical section, as well as a comprehensive analysis of these. The analysis is grounded in quantitative observations, serving as the foundation for the study. The core of this research is the numerical data, collected from the investor relations pages of AT&T and the Yahoo Finance database, thereby putting the entire study within the framework of quantitative research. The data is gathered in raw form and processed into financial ratios using Microsoft Excel spreadsheet software. The calculations derived from the raw data have been presented in a numerically and visually interpretable format from Excel as the basis for the comparative analysis. The comparative analysis is a compilation of quantitative data and their mutual comparison, which is summarized in the conclusion. The conclusions are based on the researcher's subjective observations on the objective data of stock's relative valuation.

5.3 Reliability and credibility

Reliability and credibility characteristic of quantitative research are evaluated in this chapter. Ensuring the scientific usability of research results is particularly important when the decision-making process based on it is to be made with credible and reliable grounds. The data used in the research is characterized by its measurability and verifiability, which makes it a typical source for quantitative analysis, as stated in the Corporate Finance Institute article (Taylor, 2024). The reliability of the analysis methods can be justified by the integrity of the data used: when the numbers used in the calculations come from, for example, audited financial reports and publicly available price data, it can be ensured that the calculated indicators are based on correct and as up-to-date numbers as possible.

The reliability of the valuation process and statistical interpretation is strengthened by applying only standardized parameters that are commonly used in economics research. These established parameters not only give a credible result, but also enable comparability of the results. In addition to data integrity and standardized parameters, the third method of ensuring the reliability of the research is the inspection of the data itself, its processing, and the final results. The purpose of the inspection process is to confirm and audit the content of the research.

6 EVALUATION

6.1 Shareholder ratios

In this section, the shareholder ratios for AT&T (T) and two benchmark corporations; Verizon Communications Inc (VZ) and T-Mobile Us (TMUS) are listed. The ratios for AT&T have been calculated individually from company's financial data (calculation models listed on Appendix 1) that is collected from the Yahoo Finance database and imported into Microsoft Excel as the basis for the calculations. The data for benchmark corporations is collected directly from

Yahoo Finance and MacroTrends databases as is. The evaluation of share holder ratios includes an individual analysis for (T) and a comparative review to (VZ) and (TMUS). The results are based on 2021 - 2023 and partially 2024 data, therefore serving solely as a practical example and not as a financial advice.

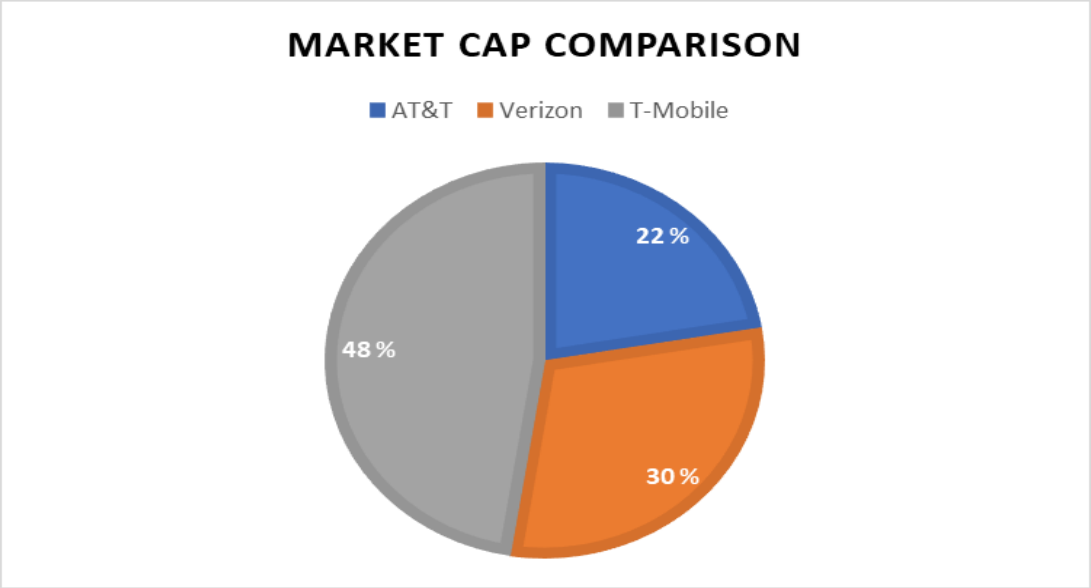
Market capitalization

AT&T	
2022	$ 131,200,000,000
2023	$ 119,970,000,000
2024	$ 129,636,000,000
Average market capitalization	$ 126,935,333,333

Verizon (VZ) 2024	$ 175,330,000,000
T-Mobile (TMUS) 2024	$ 275,680,000,000

AT&T market value has fluctuated by an average of about 11 billion dollars per year during the selected period. In 2022, the company's market value was 131,2 billion dollars and the following year, as a possible result of a bear market (long-term value decline in the stock market), 119,97 billion dollars. The overall decrease in value was approximately 8,5 percent. However, by 2024 the market capitalization rose to $129,64 billion, indicating the company's resurgence in the stock market. In the selected time interval of 2022-2024, the average market value of (T) has been approximately 126,27 billion dollars. The average value and observed values differ relatively much, which indicates a variation in the share price (or alternatively, the number of shares outstanding). However, a possible value fluctuation in the trading price of the share may be explained by external factors, such as the generally turbulent world market in the period in question. Despite the drastic fluctuations, the company is in the large cap category in terms of market value. Compared to other telecom corporations such as Verizon Communications (VZ) or T-Mobile Us (TMUS), (T) market cap in 2024 is remarkably small. (VZ) is set to be valued at $175,33 billion in 2024, surpassing the case company by about $45,7 billion. A higher

market value naturally reflects a stronger position in the market. Accordingly, (TMUS) is in a significant position with a market cap of $275,68 billion, which is more than double the (T) market valuation.



Graph 8. Visualized comparison of market capitalizations for T, VZ, TMUS.

The case company is still a major player in the telecommunications industry, but when looking at how it compares to major competitors, its market value remains at a significantly lower level. The recovery of (T) value in 2024 is a positive indicator, but the comparison still emphasizes that the company is not the largest player on the field of telecommunication in terms of market size.

Earnings per share

AT&T.

2022	$ -1,13
2023	$ 2,14
2024	$ 2,20 (Expected median)

Verizon (VZ) 2023	$ 2,75
T-Mobile (TMUS) 2023	$ 6,50

The company's earnings per share and its change during the chosen time interval shows an excellent turnaround in trend. In 2022 the company reported negative earnings per share of $1,13 and therefore a shareholder made a negative result per share during the year in question. In 2023 the performance increased and the company achieved a positive EPS of $2.14, which represents a significant change in profitability. The forecast for 2024 refers to EPS median of $2,20, which means improvement and growth from the previous. In 2022-2024 (T) average EPS has been approximately $1,07 which includes the impact of negative result in 2022. Excluding 2022, the average for the past two years is around $2.17, indicating positive earnings per share, which from an investor's perspective is always good. In a comparative review to AT&T's relevant competitors, the projected EPS of $2.20 in 2024 is lower than (VZ) $2.75 and well below (TMUS) $6.50. The underperformance is partly explained by the differences in the size of the market capitalizations. The high EPS of the two competing companies indicates stable profitability and a good return for the investor. These numbers suggest that while (T) has made significant progress since 2022, it still lags behind its competitors in terms of earnings growth. However, the earnings are currently positive and thus desirable for shareholder.

Price per earnings

AT&T.	
2022	-16,10
2023	14,50
09/2024	9,37

Verizon (VZ) 2023	7,80
T-Mobile (TMUS) 2023	23,15

The P/E ratio of AT&T has fluctuated considerably in recent years, which reflects changes in both the company's financial situation and the market's perception of it. In 2022 (T) average P/E was - 16.10, which indicates that the company was non-profitable during that fiscal year. A negative P/E is usually

a sign that the company has suffered losses or that it had large expenses that have had such a significant impact on profitability that the result is negative. Based on the average P/E ratio of 14,50, the situation in 2023 has improved considerably from the previous one. The positive turn shows that the company has managed to improve the result and on the other hand that the market had growing confidence in the company's ability to generate profit for the shareholders. At the end of the third quarter of 2024 the ratio was 9.37 that indicates a decline from the average P/E value in 2023. This decrease can be due to either a decline in the share price or an improvement in earnings in relation to the price. A decrease in the P/E ratio is not always a negative signal as a lower share price in relation to the company's earnings means that the share may be underpriced in relation to its ability to make a profit. The P/E ratio is in between of (VZ) and (TMUS). (VZ)'s average P/E ratio in 2023 was 7.80 that is significantly lower than (T)’s 14.50. This suggests that the market valued (VZ)'s stock more cautiously, for example because of its stability but smaller growth prospects. However, the P/E ratio of (TMUS) was 23,15 which is clearly higher than for both competitors. P/E above 20 also refers to a generally overpriced stock according to the principles of value investing.

Price per book value

AT&T.	
2022	0,82
2023	0,96
09/2024	1,24

Verizon (VZ) 2023	1,69
T-Mobile (TMUS) 2023	2,61

Price per book value has developed steadily in chosen time interval 2022-2024, which reflects the market's assessment of T’s financial position in relation to its book value. In 2022 the average ratio was 0,82 which means that the market priced the company's stock significantly below its book value. This valuation could indicate market skepticism either about T’s future prospects or an

underestimation of the potential of the assets. However, telecommunication companies usually have relatively large assets on their balance sheets, as data and telecommunication transmission is based on heavy infrastructure that also requires land areas. In 2023 the P/B ratio moved to 0,96, indicating a slight improvement in the company's ability to use its capital productively and profitable. The upward trend of the ratio continued in 2024 when the recorded value was 1,24 at the end of the third quarter. Such increase suggests that the market values the assets and profit-making ability increased and the company has achieved a valuation that exceeds the book value of the assets. Although the price is more than 1:1 to the assets, the valuation is still at a desirable level according to general value references. P/B of T is clearly lower than its main competitors VZ and TMOS. In 2023 VZ had an average P/B ratio of 1,69 whereas TMUS had a significantly higher 2.61. The prices of both benchmark companies in relation to their balance sheet values are also reasonable, especially when looking at market averages. This suggests that AT&T remains undervalued relative to its benchmarks, even though its P/B ratio has slightly increased.

Price per sales

AT&T.	
2022	1,02
2023	0,85
09/2024	1,28

Verizon (VZ) 2023	1,04
T-Mobile (TMUS) 2023	2,22

In 2022, the price per sales ratio of T was 1.02, which means that the market priced the company's stock 1:1 to its turnover. This valuation level is excellent in the telecommunications industry, where sales volumes are usually large (subscription-based phone plans and internet service) but growth expectations are limited. In 2023 the P/S ratio fell to 0,85, which shows that the share was priced lower than before compared to the turnover. This may indicate

weakened market expectations of the company's ability to convert revenue into profit, or just general market uncertainty about the company's performance. A decrease in the P/S can also reflect from a decrease in the share price without a significant change in turnover, and thus it is not a key figure offering an absolute and direct conclusion. However, in the third quarter of 2024 the P/S ratio increased by 1,28 which indicates an increase in the share price. This increase may be due to improved earnings or broader positive market trends in the telecommunications sector. Compared to competitors, T's P/S ratio is moderate. VZ's P/S in 2023 was 1,04 which on average suggests the same valuation level as T's on average. TMUS on the other hand, stands out with a clearly higher P/S ratio; 2.22 in 2023. The P/S figure is considered high in this case because the price in relation to the revenue per share is more than double.

Dividend yield

AT&T.	
2022	4,89 %
2023	4,97 %
09/2024	5,53 %

Verizon (VZ) 2023	6,00 %
T-Mobile (TMUS) 2023	1,49 %

The development of dividend yield in the chosen time interval 2022–2024 indicates a small but consistent growth which reflects the effort to provide shareholders with a competitive cash flow for the investment. The dividend yield was 4,89% in 2022 and it increased slightly to 4,97% in 2023. This dividend yield of almost five percent is significant, as it provides investors with a stable and predictable return regardless of the stock's price fluctuations. T's dividend yield rose to 5,53 % by the end of the third quarter of 2024. The development indicates two possible scenarios: either the company's dividend has been increased in relation to the share price or the share price has fallen while the company has kept its dividend distribution policy. In both cases a high dividend yield is especially attractive to dividend investors who value regular and stable

returns. What makes the T dividend yield competitive is the fact that the average dividend of the market index is only 1.32%. The dividend yield of company T is therefore almost four times what the S&P500 has to offer. In terms of dividend yield for 2023, T ranks in between to its two competitors. VZ's had a dividend yield of 6.00 %, which is higher than T's 4,97 %. This indicates that Verizon offers investors an even more competitive return, although a higher dividend yield rate is not a guarantee of a sustainable dividend payment. TMUS on the other hand stands out in comparison with its significantly lower dividend yield, which was only 1,49 % in 2023 and thus almost at the same level as what the market index S&P500 offers. Low yield may reflect a strategic focus on growth and expanding market share rather than prioritizing liquid return distribution to owners. A lower dividend yield may attract growth-oriented investors, but it does not offer the same liquid distribution as the two other.

6.2 Technical analysis

The technical calculations based on the historical stock price data of the case company are listed in this section. The price history is limited to the period of 2021-2024 for the calculations and SMA and volatility are calculated from daily and Beta from weekly prices. The limitation ensures the usability of the key figures. The trading prices has been collected from the Yahoo Finance up to 09/2024 and imported into Microsoft Excel as the basis for the calculations. The results are based on 2022, 2023 and partially 2024 data and therefore serving solely as a practical example and not as a financial advice.

Simple moving average

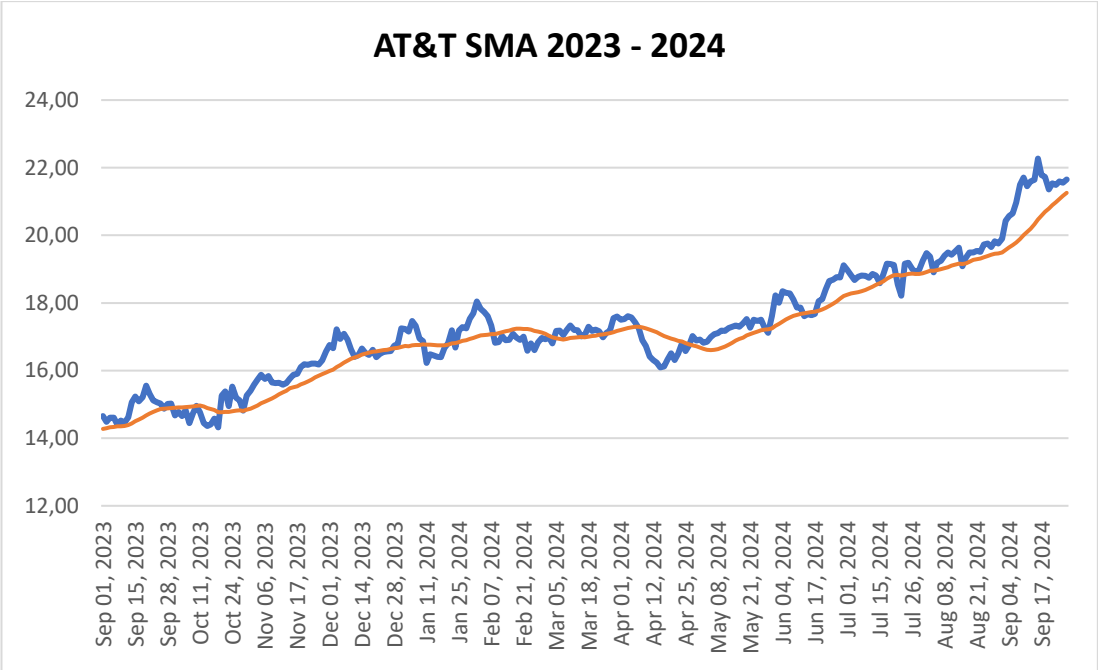
The moving average of the share AT&T has been calculated by listing the daily trading prices from the period 09/2021-09/2024. The averages are calculated for each year separately to compare and analyze the price trend. A moving average of twenty days has been calculated for the trading prices as follows; the first average is calculated for the price of the twentieth day, starting from the first (B3) with the formula =AVERAGE(B3:B22). For each data observation

from then on, the average value is obtained by dragging cell C22 from the right corner all the way to cell B774, as shown in Appendix 2.

The trading price and it's relation to moving average is visualized in an interpretable form with a line diagram. Content A2 - C774 is selected for the diagram and separated in yearly data sets between 2021 and 2024 to compare the results:

Graph 9. AT&T price chart & 20 days simple moving average 2021 – 2022.

Graph 10. AT&T price chart & 20 days simple moving average 2022 – 2023.



Graph 11. AT&T price chart & 20 days simple moving average 2023 – 2024.

The moving average is only measured for the case company share as the characteristic of the indicator isn't suitable for comparison. During the years 2021-2024, as indicated in the diagrams above, T had relatively significant trading price fluctuations. These sharp movements may be caused by both, the general development of the US market at the time of the chosen interval and/or possible failures in the company itself. According to the diagram, the stock started a downward trend in 2021, which continued until the end of 2022. The sharp decline in the stock price during 2022 is likely linked to the overall bearish sentiment in the stock market. The development of the downward trend can also be seen in the technical analysis (SMA), strengthening the trend in the selected time interval for the stock.

The price curve remained almost all the time below the SMA, which in turn indicates clear selling pressure and/or a bear market situation, as was presented in the theory section. The SMA indicator gives the technical analyst a clear signal that the stock was not worth buying in that time frame. The year 2022 also brought instability to the share's price development. Although the downward trend was still noticeable, there were occasional rises in the price curve that could arouse uncertainty in the market about the direction of the trend. Even in this situation, the SMA proved to be a useful tool: the indicator

reacted more slowly to short-term changes, but at the same time offered a more reliable picture of the long-term downward trend. The SMA direction remained down, which confirmed the general negative sentiment of the market. A turn in the trend occurred in October 2023, when the share price began to slowly go upward. The indicator started to reflect a positive trend since the beginning of the month, and the share price exceeded the indicator, staying above it for a significant part of the selected time frame. From a technical analysis point of view, this was a strong signal that T had entered an uptrend.

Volatility

In standard deviation or volatility calculation, the share trading prices must be listed as shown in SMA. The time interval is the same but instead of obtaining averages, the logarithmic returns are calculated with function =LN(D4/D3), as in Appenix 2. Calculating the logarithmic return as part of the standard deviation is important, as logarithmic returns tend to follow a normal distribution, i.e., a "bell curve" distribution, better compared to simple percentage returns. The returns are then given for each value point by dragging from the lower right side of cell D4 all the way to cell D774. Variance is calculated for logarithmic returns with the function =VAR.P. Standard deviation is the equal to square root of the variance and can be calculated as =SQRT(*insert variance here*). The complete process available in Appendix 1 volatility calculation table.

AT&T	
2022	0,021183
2023	0,017428
2024	0,012797
Average volatility	0,01713

Verizon (VZ) 2024	0,01431
T-Mobile (TMUS) 2024	0,00914

The standard deviation of T's annual normal returns has decreased steadily during the chosen time interval 2022 - 2024. The volatility was 0,021183 in

2022 and in 2023 it decreased to 0,017428. The decreasing trend continued in 2024, equaling an annual rate of 0,012797. This development indicates a decrease in the share's price fluctuation and suggests that the returns offered by the share are distributed more stable. The average volatility over the entire time interval is 0,01713 which means that the standard deviation of the daily returns per year is 1,71 percent. The percentage number indicates how much the daily returns (percentage changes) of the share deviate from their long-term (annual) mean on average. The volatility of T is low compared to many other industries. Companies in the telecommunications sector usually offer stable cash flows and moderate price fluctuations due to their business model and predictability. The dispersion of returns for T is slightly higher than VZ, with corresponding figure of 0,01431 (1.43%) in 2024. During the review period, the volatility of both T and VZ was significantly higher than the share TMUS, which was 0.00914 (0.91%) being the most stable out of three. The standard deviations of stock returns can be calculated and compared as shown in calculations. However, an annual volatility can be expressed in a percentage as well and is often expressed in that form too.

Beta

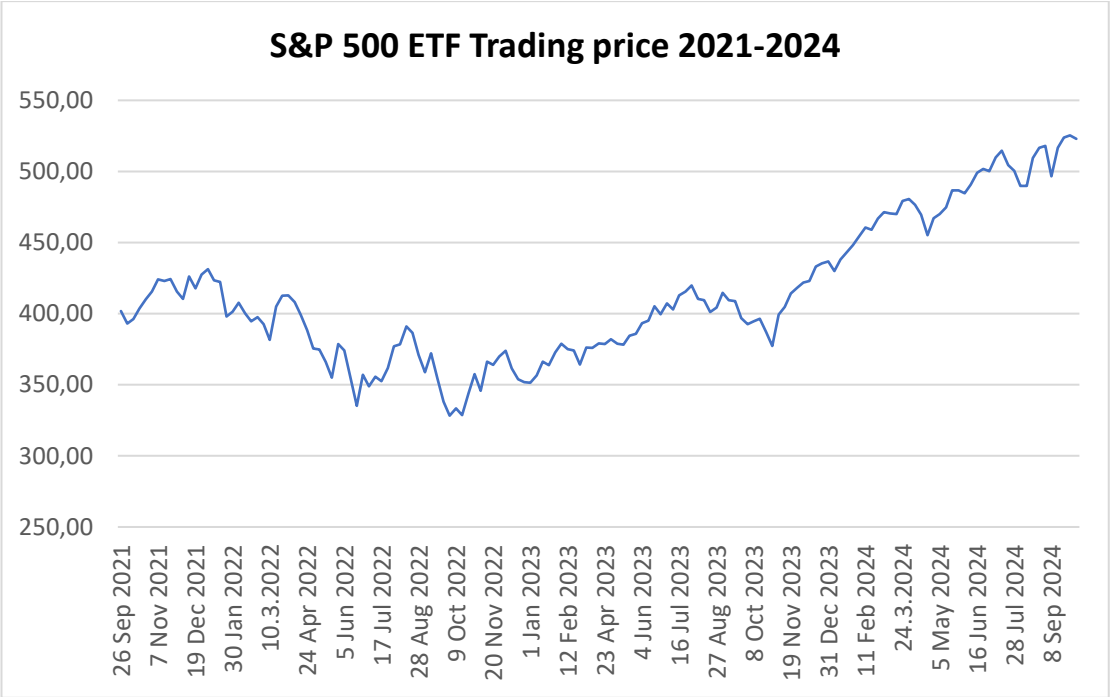
In the calculation of the Beta value, the stock trading prices are listed on an Excel sheet in chronologic order and logarithmic returns are calculated as in the volatility. Because Beta is essentially a comparative volatility calculation, the second component required for the calculation is the prices and normal returns of a comparative index. Standard & Poor’s 500 describes the general markets the best so in this example, an exchange traded fund, VOO serves as the index. In the Beta calculation, the formula of which is presented in more detail in Appendix 1, the covariance between both T and VOO is calculated. The variance of the index serves as the divider of the covariance.

AT&T	
2022	0,94
2023	0,31
2024	0,50

Average Beta	0,58
Verizon (VZ) 2024	0,42
T-Mobile (TMUS) 2024	0,50

The Beta values of the share T have shown some variation in the selected time interval 2022–2024, which indicates changes in the sensitivity of the share price in relation to market developments. In 2022, the T Beta value was 0,94 which indicates that the share moved in almost perfect correlation with the market, but with slightly lower volatility. In 2023, Beta decreased to 0,31 which again shows a considerable increase in stability in the share's returns. This means that the stock was only slightly correlated with market movements and offered investors protection from so-called market risk. In 2024 Beta increased to 0,50 which is still below the average market Beta (1). This suggests that the stock is moderately stable and reacts to market movements only to a limited extent. The average Beta of the entire review period is 0,58 which again confirms that AT&T stock is low-risk for the investor in relation to the market. T's average beta of 0.50 puts it in the same category as its competitors Verizon (0,42) and T-Mobile (0,50). With the outcome of the benchmark, it is possible to state that the telecommunication companies offer, on average, returns protected from market risk to their shareholders.

The interpretation of the movements of a general stock index and the case company can be approached visually and with a model, which is not directly the same as the mathematically calculated Beta coefficient. However, the visual interpretation gives depth for the concept of market correlation, how the movement of the stock price in relation to the index can appear on a practical level and what kind of external influences may be associated with the phenomenon. The changes in the case company share price and the general market index S&P500 in the period 2021-2024 are attached below.



Graph 12. S&P 500 Exchange traded fund development 2021-2024

Graph. 13. AT&T trading price development 2021-2024.

Graph number 12 depicts the development of the trading price of the S&P 500 index fund from 2021 to 2024, as Graph 13 describes same information concerning the stock AT&T on the same time interval. The index fund mirrors the broader US stock market. While examining these lines, a sharp decline during

2022 can be seen. The index fell from around $430 to around $330. This decline was probably caused by the global economic challenges during that period, which include accelerated inflation, increases in key interest rates and geopolitical tensions in the Eastern part of the world. Case company AT&T's stock price fell from $27 to $14,50 in the same period, following the general downward trend but with stronger decline in that time. The recovery of the index fund began in 2023 and continued until 2024, when its price rose above $500. This upward trend has also been reflected in the trading price of the case company's share and is probably the result of the easing of inflationary pressures and the Us central bank's decisions to slow down or stop raising interest rates.

In beta coefficient analysis, the correlation between the market index and the movement of the case stock trading price is examined using a mathematical model, but based on a visual comparison, it can already be concluded that the case company has an impact on the movement of the general stock market.

7 CONCLUSIONS

The summary of valuation for a publicly traded stock combines the results of the shareholder ratios and the technical analysis. The purpose of the summary is to provide comprehensive insights into the AT&T Inc. share market performance in relation to its primary competitors and the general market trends. The key figures for shareholders indicates mixed trends for AT&T. Based on the market value scale, the company is a significant player in the telecommunications industry, but it is clearly behind its biggest competitors, Verizon Communication Inc. and T-Mobile US. Fluctuations in market value during the period 2022-2024 reflect a certain market instability, which may be caused by external factors such as turbulence in global markets on the chosen time interval. Although AT&T's average market value between 2022 and 2024 is reasonably good large cap value, the company's position relative to its competitors highlights the need for expansion.

The company's earnings per share (EPS) improved from the negative value from 2022. In 2023-2024, the earnings per share offered the shareholder a positive return and although the turnaround is promising in terms of earnings, the EPS is still lower than benchmarked reference companies, which emphasizes the need for stronger profitability. Regarding the price per earnings ratio (P/E), the company seems to improve its position from 2022 to 2024. This development is positive, but based on the P/E figures, the company's stock is moderately valued compared to its competitors. A moderate valuation in the relationship between price and earnings is a positive factor from the point of view of a value investor on picking stocks: the earnings offered by the acquired stock position can be obtained at a lower price than the shares of reference companies.

Price per book (P/B) and price per sales (P/S) values both indicates steady growth and valued on lower end than Verizon and T-Mobile, suggesting that AT&T is undervalued relative to its competitors in terms of assets on the balance sheet and absolute sales quantum. Besides the benchmark companies, AT&T is low valued in relation to the index as well: the average P/B value of the S&P 500 stock index is approximately 3,07 and P/S 3,08, making the index almost three times more expensive than AT&T in this respect. The dividend yield clearly stands out as one of the strengths of the case company. In general, compared to the return offered by the index or risk-free money market products, the competitive and growing dividend yield offers a stable return to AT&T shareholders. The dividend yield is at a good level compared to benchmarked companies too and considerably more than the market average dividend (1,80%) on S&P 500. The company therefore guarantees cash income in addition to the potential increase in value.

Technical analysis provides additional insight into the character of AT&T share and its trading price. With the assist of applied statistical models, the formation of an overall understanding can be supported. The moving average (SMA) indicated significant volatility and market pressure during 2022. The company was in a downward trend that continued until the end of 2023. In October 2023, however, the trading price turned to an upward trend, which is a strong positive signal for the future. The upward trend in the trading price has also continued during 2024 and the stock has been trading above it’s average the whole

September 2024, which indicates a possible appreciation in trading price in the near future too.

The analysis of volatility reveals an increase in stability, although the standard deviation of the stock's normal returns is slightly higher than Verizon's and significantly higher than T-Mobile's. A higher volatility figure indicates that the company is a somewhat riskier investment than the shares of the benchmarked reference companies in terms of predictability of return distribution in trading price. However, the stability trend is in a better direction and the telecommunications company is still an solid investment target compared to the average market when analysing volatility.

Beta analysis confirms the low-risk nature of the stock, as the average Beta is significantly below the market average. A low degree of correlation with market (Beta < 1) volatility equals little sensitivity to market fluctuation. Lower end Beta value makes AT&T a relatively stable investment compared to the overall market.

In summary, while AT&T shows progress in key metrics such as earnings growth, dividend yield and technical stability, its overall valuation (market cap, P/E, P/B and P/S) highlights that the stock is undervalued relative to rivals Verizon and T-Mobile. This undervaluation presents an opportunity for investors looking for a reasonably priced telecom major. On the other hand, a low valuation can also be related to lower demand on the stock market, as investors prefer companies with potentially better earnings. Overall, the AT&T share is undervalued by the metrics reviewed, both in relation to its biggest competitors and to the stock market average. The attractive valuation level in 2024 may be due, for example to the share's long-term bear market, which started in 2020 and reached the middle of 2023, as a result of which the share's price in relation to value creation metrics has decreased. The dividend yield and Beta value offers especially competitive income stream and balance as well as moderation from market fluctuation, making the company an excellent opportunity for a security seeking value investor. Overall, the positive trends in shareholder ratios and technical indicators point to cautious optimism regarding future growth.

The primary research problem addressed in this thesis was whether a combination of shareholder ratios and technical analysis could provide an effective method for a valuation of a publicly traded stock. The study showed that the combined application of financial and statistical methods gives a comprehensive perspective of the stock valuation in relation to companies competing in the same field. By integrating key shareholder ratios based on the company's financial values with unrelated technical models of trading price fluctuation and market correlation, a deep solution to the research problem was obtained: The stock was undervalued and technically a low-risk investment, providing an opportunity for competitive dividends and value appreciation.
The research with all its parts can be considered as valid and reliable. All figures, formulas and conclusions presented in the study were based on publicly available sources, such as the Yahoo Finance and Investopedia databases. Data processing was performed, using Microsoft Excel and attached step-by-step basis, ensuring the transparency and reproducibility of the calculations. Standardized shareholder ratios and technical measures were consistently applied throughout the analysis. In addition, the use of benchmarked reference companies (Verizon and T-Mobile) ensured that the comparative review and conclusions were placed within the framework of the telecommunications industry, thereby strengthening the relevance in the results.

As the author of this thesis, I see significant potential for further research in comprehensive valuation of publicly traded stocks. Future studies could apply similar methods across different industries to determine whether the results and insights generalize to sectors with varying risk and growth profiles. Additionally, further research could introduce and apply other relevant parameters used in financial valuation. By incorporating additional shareholder ratios, such as return on equity (ROE), the debt per equity ratio and/or current ratio could be valuable for comprehensiveness in the analysis. This approach would provide deeper insights into both return potential and risk profile.
Discounted cash flow analysis (DCF) would bring a completely new angle to the whole research: the value of the case company and reference companies could be evaluated based on their predicted future cash flows. The reliability of cash flow analysis based on forecasting could be strengthened by back-

testing, for example, the average of changes over a period of twenty years to the obtained forecast. The share of technical analysis in further research could be deepened at least by annualizing the daily standard deviation of logarithmic returns into a form that can be interpreted as percentage volatility.

The valuation of publicly traded stocks is a complex and large-scale process. As demonstrated in this thesis, the importance of clear and focused boundaries is crucial and to be set both in this research and in future studies. The evaluation of a publicly traded stock can be conducted by applying a variety of metrics, each designed to serve specific purposes and provide unique insights. These metrics can be traditional quantitative and binary observations, such as shareholder ratios, technical analysis or historical trends, which were presented in this work. On the other hand, the evaluation of the company's share value can also be approached using qualitative methods as well. These methods could for example focus on the quality of the company's operations, the ability of the management, the future prospects of the market and other factors that are more difficult to measure in numbers but are as fundamental as the metrics based on quantitative financials. Which evaluation methods are relevant or mutually usable is its own question and opens wide range of possibilities for the study of valuation mechanisms in a scientific context for future.

This thesis is not a financial advice.

REFERENCES

Corporate Finance Institute. (2024a). Market to book ratio. Retrieved July 16th, 2024, from https://corporatefinanceinstitute.com/resources/valuation/market-to-book-ratio-price-book/

Corporate Finance Institute. (2024b). Price to sales ratio. Retrieved July 16th, 2024, from https://corporatefinanceinstitute.com/resources/valuation/price-to-sales-ratio/

Corporate Finance Institute. (2024c). Dividend payout ratio formula. Retrieved July 16th, 2024, from https://corporatefinanceinstitute.com/resources/accounting/dividend-payout-ratio-formula/

Corporate Finance Institute. (2024d). Beta. Retrieved July 16th, 2024, from Beta - What is Beta (β) in Finance? Guide and Examples (corporatefinanceinstitute.com)

Fernando, J. (2024, May 31). Dividend Yield: Meaning, Formula, Example, and Pros and Cons. Retrieved July 16th, 2024, from https://www.investopedia.com/terms/d/dividendyield.asp

Graham, B. (1973). The Intelligent Investor. HarperCollins Publisher Inc.

Hayes, A. (2024, July 03). Volatility: Meaning in Finance and How It Works With Stocks. Retrieved July 16th, 2024, from https://www.investopedia.com/terms/v/volatility.asp

Hayes, A. (2024, August 06). What Is Variance in Statistics? Definition, Formula, and Example. Retrieved July 16th, 2024, from https://www.investopedia.com/terms/v/variance.asp

Hayes, A. (2024, June 13). Simple Moving Average (SMA): What It Is and the Formula. Retrieved July 16th, 2024, from https://www.investopedia.com/terms/s/sma.asp

Hull, John C. (2018). Options, Futures and Other Derivatives, Ninth Edition. Pearson.

Kenton, W. (2024, July 11). What Beta Means for Investors. Retrieved July 16th, 2024, from https://www.investopedia.com/terms/b/beta.asp#toc-what-is-beta

Andrew P. King & Robert J. Eckersley. (2019). Statistics for Biomedical Engineers and Scientists. Elsevier Ltd.

Lianos, C. (2024, August 14). What is a P/E ratio? Retrieved July 16th, 2024, from https://www.chase.com/personal/investments/learning-and-insights/article/what-is-a-p-e-ratio

Macrotrends. (n.d.). Pfizer revenue. Macrotrends. Retrieved August 20, 2024, from https://www.macrotrends.net/stocks/charts/PFE/pfizer/revenue

Mannion, M. (2023, November 14). What is EPS? Retrieved July 16th, 2024, from https://www.chase.com/personal/investments/learning-and-insights/article/what-is-eps

Maveric, J.B. (2022, May 19). Price-to-Book Ratio: What it is, How it Works. Retrieved July 16th, 2024, from https://www.investopedia.com/ask/answers/040815/what-average-pricetobook-ratio-bank.asp

McClure, B. (2022, May 19). How to Use Price-To-Sales Ratios to Value Stocks. Retrieved July 16th, 2024, from https://www.investopedia.com/articles/fundamental/03/032603.asp

Merril Edge. (2024). Company size: Why market capitalization matters? Retrieved July 16th, 2024, from https://www.merrilledge.com/article/company-size-why-market-capitalization-matters-ose

Mitchell, C. (2024, June 13). How to Use a Moving Average to Buy Stocks. Retrieved July 16th, 2024, from https://www.investopedia.com/articles/active-trading/052014/how-use-moving-average-buy-stocks.asp

Murphy, C. (2022, March 17). Weighted Average of Outstanding Shares Definition and Calculation. Retrieved July 16th, 2024, from https://www.investopedia.com/ask/answers/05/weightedoutstandingshares.asp

Murphy, C. (2024, June 21). Using the Price-to-Earnings (P/E) Ratio and PEG Ratio to Assess a Stock. Retrieved July 16th, 2024, from https://www.investopedia.com/investing/use-pe-ratio-and-peg-to-tell-stocks-future/

Schmidt, J. (2024). Earnings Per Share Formula (EPS). Retrieved July 16th, 2024, from https://corporatefinanceinstitute.com/resources/valuation/earnings-per-share-eps-formula/

Shim, Jae K & Siegel, Joel G. (2007). Financial Management, Third Edition. The McGraw Hill Companies, Inc.

Taylor, S. (2024) Quantitative Analysis. Retrieved July 20th, 2024 from https://corporatefinanceinstitute.com/resources/data-science/quantitative-analysis/

The Investopedia Team. (2024, June 12). Standard Deviation vs. Variance: What's the Difference? Retrieved July 16th, 2024, from https://www.investopedia.com/ask/answers/021215/what-difference-between-standard-deviation-and-variance.asp

The Investopedia Team. (2024, March 5). How to Use Market Capitalization to Evaluate a Stock. Retrieved July 16th, 2024, from https://www.investopedia.com/ask/answers/042415/how-can-i-use-market-capitalization-evaluate-stock.asp

Formula 1. Investopedia. (2024). How can I use market capitalization to evaluate a stock? Retrieved July 16, 2024, from https://www.investopedia.com/ask/answers/042415/how-can-i-use-market-capitalization-evaluate-stock.asp

Formula 2. Investopedia. (2024). Earnings Per Share (EPS): What It Means and How to Calculate It. Retrieved July 16, 2024, from https://www.investopedia.com/terms/e/eps.asp

Formula 3. Investopedia. (2024). Price-to-Earnings (P/E) Ratio: Definition, Formula, and Examples. Retrieved July 16, 2024, from https://www.investopedia.com/terms/p/price-earningsratio.asp

Formula 4. Investopedia. (2024). Price-to-Book (P/B) Ratio: Meaning, Formula, and Example. Retrieved July 16, 2024, from https://www.investopedia.com/terms/p/price-to-bookratio.asp

Formula 5. Investopedia. (2024). How to Use Price-To-Sales Ratios to Value Stocks. Retrieved July 16, 2024, from https://www.investopedia.com/articles/fundamental/03/032603.asp

Formula 6. Investopedia. (2024). Dividend Yield: Meaning, Formula, Example, and Pros and Cons. Retrieved July 16, 2024, from https://www.investopedia.com/terms/d/dividendyield.asp

Formula 7. Investopedia. (2024). Dividend Payout Ratio: Definition, Formula, and Calculation. Retrieved July 16, 2024, from https://www.investopedia.com/terms/d/dividendpayoutratio.asp

Formula 8. Investopedia. (2024). Simple Moving Average (SMA): What It Is and the Formula. Retrieved July 16, 2024, from https://www.investopedia.com/terms/s/sma.asp

Formula 9. Investopedia. (2024). What Is Variance in Statistics? Definition, Formula, and Example. Retrieved July 16, 2024 from https://www.investopedia.com/terms/v/variance.asp

Formula 10. Investopedia. (2024). What Beta Means for Investors?. Retrieved July 16, 2024 from https://www.investopedia.com/terms/b/beta.asp#toc-what-is-beta

APPENDIX 1

AT&T shareholder ratio calculations

Market capitalization

	A	B	C
1	**Variable**	**Value**	**Function**
2	Number of shares outstanding	7202000000	
3	Trading price average 23-24	$ 17,25	
4	**Market capitalization**	$ 124 234 500 000,00	=B2*B3

Earnings per share

	A	B	C
1	**Variable**	**Value**	**Function**
2	Number of shares outstanding	7202000000	
3	Net income (2023)	$ 15 620 000 000,00	
4	Preferred dividends	$ 208 000 000,00	
5	**Earnings per share**	$ 2,14	=(B3-B4)/B2

Price per earnings

	A	B	C
1	**Variable**	**Value**	**Function**
2	Earnings per share	$ 2,15	
3	Trading price (09/2024)	$ 20,15	
4	**Price per earnings**	9,37	=B3/B2

Price per book value

	A	B	C
1	**Variable**	**Value**	**Function**
2	Equity	$ 117 442 000 000,00	
3	Number of shares outstanding	7170000000	
4	Trading price (09/2024)	$ 20,15	
5	**Price per book value**	1,23	=B4/(B2/B3)

Price per sales

	A	B	C
1	**Variable**	**Value**	**Function**
2	Turnover (2023)	$ 122 428 000 000,00	
3	Market capitalization	$ 144 475 500 000,00	
4	**Price per sales**	0,85	=B2/B3

Dividend yield

	A	B	C
1	**Variable**	**Value**	**Function**
2	Total dividend (2023)	$ 7 991 000 000,00	
3	Number of shares outstanding	7170000000	
4	Trading price (09/2024)	$ 20,15	
5	**Dividend yield**	5,53 %	=(B2/B3)/B4

Dividend payout ratio

	A	B	C
1	**Variable**	**Value**	**Function**
2	Total dividend (2023)	$ 7 991 000 000,00	
3	Number of shares outstanding	7170000000	
4	Earnings per share	$ 2,15	
5	**Payout ratio**	51,84 %	=(B2/B3)/B4

AT&T Descriptive statistics

Simple moving average

	A	B	C
1	**Variable**	**Value**	**Function**
2	Share closing prices 20XX	N/a	
3	Average returns 20 days	N/a	=AVERAGE(B3:B22)
4	**SMA**	N/a	

Volatility

	A	B	C
1	**Variable**	**Value**	**Function**
2	Variance of log returns	0,000304	=VAR.P(D4:D774)
3	Squareroot of variance	0,017428	=SQRT(B2)
4	**Volatility**	0,017428	=B3

Beta

	A	B	C
1	**Variable**	**Value**	**Function**
2	Variance of index log returns	0,0006	=VAR.P()
3	Covariance VOO:T	0,0003	=SQRT(B2)
4	**Beta**	0,50	=B3

APPENDIX 2

AT&T trading prices, simple moving averages, and distributions of normal returns by date 2021 - 2024

1	A	B	C	D
2	**Date**	**Closing price $**	**Simple moving average**	**Logarithmic return**
3	Sep 01, 2021	27,19		
4	Sep 02, 2021	27,64		0,0164
5	Sep 03, 2021	27,56		-0,0029
6	Sep 07, 2021	27,42		-0,0051
7	Sep 08, 2021	27,60		0,0065
8	Sep 09, 2021	27,42		-0,0065
9	Sep 10, 2021	27,18		-0,0088
10	Sep 13, 2021	27,52		0,0124
11	Sep 14, 2021	27,33		-0,0069
12	Sep 15, 2021	27,57		0,0087
13	Sep 16, 2021	27,60		0,0011
14	Sep 17, 2021	27,53		-0,0025
15	Sep 20, 2021	27,21		-0,0117
16	Sep 21, 2021	26,96		-0,0092
17	Sep 22, 2021	27,01		0,0019
18	Sep 23, 2021	27,19		0,0066
19	Sep 24, 2021	27,13		-0,0022
20	Sep 27, 2021	27,40		0,0099
21	Sep 28, 2021	27,24		-0,0059
22	Sep 29, 2021	27,40	27,36	0,0059
23	Sep 30, 2021	27,01	27,35	-0,0143
24	Oct 01, 2021	27,16	27,32	0,0055
25	Oct 04, 2021	27,25	27,31	0,0033
26	Oct 05, 2021	27,35	27,30	0,0037
27	Oct 06, 2021	27,31	27,29	-0,0015
28	Oct 07, 2021	27,09	27,27	-0,0081
29	Oct 08, 2021	26,77	27,25	-0,0119
30	Oct 11, 2021	26,03	27,18	-0,0280
31	Oct 12, 2021	25,43	27,08	-0,0233
32	Oct 13, 2021	25,30	26,97	-0,0051
33	Oct 14, 2021	25,62	26,87	0,0126
34	Oct 15, 2021	25,70	26,78	0,0031
35	Oct 18, 2021	25,33	26,68	-0,0145
36	Oct 19, 2021	25,59	26,62	0,0102
37	Oct 20, 2021	25,91	26,56	0,0124
38	Oct 21, 2021	25,76	26,49	-0,0058
39	Oct 22, 2021	25,49	26,41	-0,0105
40	Oct 25, 2021	25,64	26,32	0,0059
41	Oct 26, 2021	25,37	26,23	-0,0106
42	Oct 27, 2021	25,06	26,11	-0,0123
43	Oct 28, 2021	25,55	26,04	0,0194
44	Oct 29, 2021	25,26	25,94	-0,0114
45	Nov 01, 2021	25,37	25,85	0,0043

46	Nov 02, 2021	25,23	25,74	-0,0055
47	Nov 03, 2021	25,18	25,63	-0,0020
48	Nov 04, 2021	24,80	25,52	-0,0152
49	Nov 05, 2021	25,10	25,44	0,0120
50	Nov 08, 2021	24,88	25,38	-0,0088
51	Nov 09, 2021	24,71	25,34	-0,0069
52	Nov 10, 2021	24,95	25,33	0,0097
53	Nov 11, 2021	24,92	25,29	-0,0012
54	Nov 12, 2021	24,94	25,25	0,0008
55	Nov 15, 2021	24,80	25,23	-0,0056
56	Nov 16, 2021	24,66	25,18	-0,0057
57	Nov 17, 2021	24,66	25,12	0,0000
58	Nov 18, 2021	24,39	25,05	-0,0110
59	Nov 19, 2021	24,13	24,98	-0,0107
60	Nov 22, 2021	24,70	24,93	0,0233
61	Nov 23, 2021	24,76	24,90	0,0024
62	Nov 24, 2021	24,47	24,87	-0,0118
63	Nov 26, 2021	24,22	24,81	-0,0103
64	Nov 29, 2021	23,89	24,74	-0,0137
65	Nov 30, 2021	22,83	24,61	-0,0454
66	Dec 01, 2021	22,23	24,46	-0,0266
67	Dec 02, 2021	23,05	24,35	0,0362
68	Dec 03, 2021	23,46	24,29	0,0176
69	Dec 06, 2021	23,28	24,20	-0,0077
70	Dec 07, 2021	23,08	24,11	-0,0086
71	Dec 08, 2021	23,17	24,03	0,0039
72	Dec 09, 2021	22,94	23,93	-0,0100
73	Dec 10, 2021	22,84	23,83	-0,0044
74	Dec 13, 2021	22,44	23,70	-0,0177
75	Dec 14, 2021	22,29	23,57	-0,0067
76	Dec 15, 2021	22,17	23,45	-0,0054
77	Dec 16, 2021	23,71	23,40	0,0672
78	Dec 17, 2021	23,78	23,37	0,0029
79	Dec 20, 2021	24,19	23,38	0,0171
80	Dec 21, 2021	24,47	23,36	0,0115
81	Dec 22, 2021	24,78	23,36	0,0126
82	Dec 23, 2021	24,87	23,38	0,0036
83	Dec 27, 2021	24,78	23,41	-0,0036
84	Dec 28, 2021	24,82	23,46	0,0016
85	Dec 29, 2021	24,64	23,55	-0,0073
86	Dec 30, 2021	24,78	23,68	0,0057
87	Dec 31, 2021	24,60	23,75	-0,0073
88	Jan 03, 2022	25,43	23,85	0,0332
89	Jan 04, 2022	25,64	23,97	0,0082
90	Jan 05, 2022	26,21	24,13	0,0220
91	Jan 06, 2022	26,11	24,27	-0,0038
92	Jan 07, 2022	26,29	24,44	0,0069
93	Jan 10, 2022	26,46	24,62	0,0064
94	Jan 11, 2022	26,34	24,82	-0,0045
95	Jan 12, 2022	26,45	25,03	0,0042
96	Jan 13, 2022	26,80	25,26	0,0131
97	Jan 14, 2022	27,18	25,43	0,0141
98	Jan 18, 2022	27,31	25,61	0,0048

99	Jan 19, 2022	27,28	25,76	-0,0011
100	Jan 20, 2022	27,02	25,89	-0,0096
101	Jan 21, 2022	26,61	25,98	-0,0153
102	Jan 24, 2022	26,34	26,05	-0,0102
103	Jan 25, 2022	26,48	26,14	0,0053
104	Jan 26, 2022	24,25	26,11	-0,0880
105	Jan 27, 2022	24,12	26,09	-0,0054
106	Jan 28, 2022	25,21	26,11	0,0442
107	Jan 31, 2022	25,50	26,15	0,0114
108	Feb 01, 2022	24,42	26,10	-0,0433
109	Feb 02, 2022	24,54	26,05	0,0049
110	Feb 03, 2022	24,56	25,96	0,0008
111	Feb 04, 2022	24,08	25,86	-0,0197
112	Feb 07, 2022	23,93	25,74	-0,0062
113	Feb 08, 2022	23,94	25,62	0,0004
114	Feb 09, 2022	24,50	25,53	0,0231
115	Feb 10, 2022	24,25	25,42	-0,0103
116	Feb 11, 2022	24,13	25,28	-0,0050
117	Feb 14, 2022	24,05	25,13	-0,0033
118	Feb 15, 2022	24,34	24,98	0,0120
119	Feb 16, 2022	23,94	24,81	-0,0166
120	Feb 17, 2022	23,76	24,65	-0,0075
121	Feb 18, 2022	23,87	24,51	0,0046
122	Feb 22, 2022	23,75	24,38	-0,0050
123	Feb 23, 2022	23,51	24,23	-0,0102
124	Feb 24, 2022	23,23	24,18	-0,0120
125	Feb 25, 2022	23,91	24,17	0,0289
126	Feb 28, 2022	23,69	24,10	-0,0092
127	Mar 01, 2022	23,53	24,00	-0,0068
128	Mar 02, 2022	23,82	23,97	0,0122
129	Mar 03, 2022	23,91	23,94	0,0038
130	Mar 04, 2022	23,87	23,90	-0,0017
131	Mar 07, 2022	23,57	23,88	-0,0126
132	Mar 08, 2022	23,00	23,83	-0,0245
133	Mar 09, 2022	23,26	23,79	0,0112
134	Mar 10, 2022	23,19	23,73	-0,0030
135	Mar 11, 2022	23,19	23,68	0,0000
136	Mar 14, 2022	22,89	23,61	-0,0130
137	Mar 15, 2022	23,09	23,57	0,0087
138	Mar 16, 2022	23,19	23,51	0,0043
139	Mar 17, 2022	23,19	23,47	0,0000
140	Mar 18, 2022	23,22	23,44	0,0013
141	Mar 21, 2022	23,16	23,41	-0,0026
142	Mar 22, 2022	23,21	23,38	0,0022
143	Mar 23, 2022	23,21	23,37	0,0000
144	Mar 24, 2022	23,33	23,37	0,0052
145	Mar 25, 2022	23,84	23,37	0,0216
146	Mar 28, 2022	23,87	23,38	0,0013
147	Mar 29, 2022	23,99	23,40	0,0050
148	Mar 30, 2022	24,14	23,42	0,0062
149	Mar 31, 2022	23,63	23,40	-0,0214
150	Apr 01, 2022	23,98	23,41	0,0147
151	Apr 04, 2022	24,18	23,44	0,0083

152	Apr 05, 2022	23,89	23,48	-0,0121
153	Apr 06, 2022	24,03	23,52	0,0058
154	Apr 07, 2022	23,73	23,55	-0,0126
155	Apr 08, 2022	24,14	23,60	0,0171
156	Apr 11, 2022	19,63	23,43	-0,2068
157	Apr 12, 2022	19,56	23,26	-0,0036
158	Apr 13, 2022	19,42	23,07	-0,0072
159	Apr 14, 2022	19,54	22,89	0,0062
160	Apr 18, 2022	19,46	22,70	-0,0041
161	Apr 19, 2022	19,49	22,51	0,0015
162	Apr 20, 2022	19,43	22,32	-0,0031
163	Apr 21, 2022	20,21	22,17	0,0394
164	Apr 22, 2022	19,52	21,98	-0,0347
165	Apr 25, 2022	19,51	21,77	-0,0005
166	Apr 26, 2022	19,30	21,54	-0,0108
167	Apr 27, 2022	19,07	21,29	-0,0120
168	Apr 28, 2022	19,42	21,06	0,0182
169	Apr 29, 2022	18,86	20,82	-0,0293
170	May 02, 2022	19,12	20,58	0,0137
171	May 03, 2022	19,33	20,33	0,0109
172	May 04, 2022	19,95	20,14	0,0316
173	May 05, 2022	19,95	19,93	0,0000
174	May 06, 2022	20,03	19,75	0,0040
175	May 09, 2022	19,55	19,52	-0,0243
176	May 10, 2022	19,36	19,50	-0,0098
177	May 11, 2022	19,43	19,50	0,0036
178	May 12, 2022	19,72	19,51	0,0148
179	May 13, 2022	19,84	19,53	0,0061
180	May 16, 2022	20,28	19,57	0,0219
181	May 17, 2022	20,57	19,62	0,0142
182	May 18, 2022	20,23	19,66	-0,0167
183	May 19, 2022	20,21	19,66	-0,0010
184	May 20, 2022	20,40	19,71	0,0094
185	May 23, 2022	20,74	19,77	0,0165
186	May 24, 2022	21,16	19,86	0,0200
187	May 25, 2022	21,30	19,97	0,0066
188	May 26, 2022	21,32	20,07	0,0009
189	May 27, 2022	21,29	20,19	-0,0014
190	May 31, 2022	21,29	20,30	0,0000
191	Jun 01, 2022	21,22	20,39	-0,0033
192	Jun 02, 2022	21,19	20,45	-0,0014
193	Jun 03, 2022	20,90	20,50	-0,0138
194	Jun 06, 2022	20,94	20,55	0,0019
195	Jun 07, 2022	21,14	20,63	0,0095
196	Jun 08, 2022	21,05	20,71	-0,0043
197	Jun 09, 2022	20,88	20,78	-0,0081
198	Jun 10, 2022	20,69	20,83	-0,0091
199	Jun 13, 2022	19,76	20,83	-0,0460
200	Jun 14, 2022	19,45	20,79	-0,0158
201	Jun 15, 2022	19,44	20,73	-0,0005
202	Jun 16, 2022	18,96	20,67	-0,0250
203	Jun 17, 2022	19,38	20,63	0,0219
204	Jun 21, 2022	19,96	20,60	0,0295

205	Jun 22, 2022	20,32	20,58	0,0179
206	Jun 23, 2022	20,61	20,55	0,0142
207	Jun 24, 2022	20,99	20,54	0,0183
208	Jun 27, 2022	20,78	20,51	-0,0101
209	Jun 28, 2022	20,61	20,48	-0,0082
210	Jun 29, 2022	20,95	20,46	0,0164
211	Jun 30, 2022	20,96	20,45	0,0005
212	Jul 01, 2022	21,31	20,45	0,0166
213	Jul 05, 2022	21,17	20,47	-0,0066
214	Jul 06, 2022	21,09	20,48	-0,0038
215	Jul 07, 2022	21,15	20,48	0,0028
216	Jul 08, 2022	20,80	20,46	-0,0167
217	Jul 11, 2022	20,66	20,45	-0,0068
218	Jul 12, 2022	20,60	20,45	-0,0029
219	Jul 13, 2022	20,45	20,48	-0,0073
220	Jul 14, 2022	20,33	20,53	-0,0059
221	Jul 15, 2022	20,57	20,58	0,0117
222	Jul 18, 2022	20,53	20,66	-0,0019
223	Jul 19, 2022	20,80	20,73	0,0131
224	Jul 20, 2022	20,48	20,76	-0,0155
225	Jul 21, 2022	18,92	20,69	-0,0792
226	Jul 22, 2022	18,40	20,58	-0,0279
227	Jul 25, 2022	18,53	20,45	0,0070
228	Jul 26, 2022	18,30	20,33	-0,0125
229	Jul 27, 2022	18,39	20,22	0,0049
230	Jul 28, 2022	18,58	20,10	0,0103
231	Jul 29, 2022	18,78	19,99	0,0107
232	Aug 01, 2022	18,73	19,86	-0,0027
233	Aug 02, 2022	18,36	19,72	-0,0200
234	Aug 03, 2022	18,37	19,59	0,0005
235	Aug 04, 2022	18,27	19,44	-0,0055
236	Aug 05, 2022	18,35	19,32	0,0044
237	Aug 08, 2022	18,00	19,19	-0,0193
238	Aug 09, 2022	18,10	19,06	0,0055
239	Aug 10, 2022	18,01	18,94	-0,0050
240	Aug 11, 2022	18,04	18,83	0,0017
241	Aug 12, 2022	18,27	18,71	0,0127
242	Aug 15, 2022	18,39	18,60	0,0065
243	Aug 16, 2022	18,57	18,49	0,0097
244	Aug 17, 2022	18,42	18,39	-0,0081
245	Aug 18, 2022	18,43	18,36	0,0005
246	Aug 19, 2022	18,43	18,37	0,0000
247	Aug 22, 2022	18,13	18,35	-0,0164
248	Aug 23, 2022	18,06	18,33	-0,0039
249	Aug 24, 2022	18,01	18,32	-0,0028
250	Aug 25, 2022	18,09	18,29	0,0044
251	Aug 26, 2022	17,89	18,25	-0,0111
252	Aug 29, 2022	17,78	18,20	-0,0062
253	Aug 30, 2022	17,82	18,17	0,0022
254	Aug 31, 2022	17,54	18,13	-0,0158
255	Sep 01, 2022	17,50	18,09	-0,0023
256	Sep 02, 2022	17,19	18,03	-0,0179
257	Sep 06, 2022	16,79	17,97	-0,0235

258	Sep 07, 2022	16,87	17,91	0,0048
259	Sep 08, 2022	16,77	17,85	-0,0059
260	Sep 09, 2022	17,03	17,80	0,0154
261	Sep 12, 2022	17,38	17,75	0,0203
262	Sep 13, 2022	16,83	17,68	-0,0322
263	Sep 14, 2022	16,77	17,59	-0,0036
264	Sep 15, 2022	16,76	17,50	-0,0006
265	Sep 16, 2022	16,74	17,42	-0,0012
266	Sep 19, 2022	16,76	17,34	0,0012
267	Sep 20, 2022	16,56	17,26	-0,0120
268	Sep 21, 2022	16,25	17,17	-0,0189
269	Sep 22, 2022	16,24	17,08	-0,0006
270	Sep 23, 2022	16,01	16,97	-0,0143
271	Sep 26, 2022	15,67	16,86	-0,0215
272	Sep 27, 2022	15,73	16,76	0,0038
273	Sep 28, 2022	15,83	16,66	0,0063
274	Sep 29, 2022	15,53	16,56	-0,0191
275	Sep 30, 2022	15,34	16,45	-0,0123
276	Oct 03, 2022	15,90	16,39	0,0359
277	Oct 04, 2022	16,09	16,35	0,0119
278	Oct 05, 2022	15,93	16,31	-0,0100
279	Oct 06, 2022	15,32	16,23	-0,0390
280	Oct 07, 2022	14,94	16,13	-0,0251
281	Oct 10, 2022	14,90	16,01	-0,0027
282	Oct 11, 2022	14,81	15,90	-0,0061
283	Oct 12, 2022	14,63	15,80	-0,0122
284	Oct 13, 2022	15,12	15,72	0,0329
285	Oct 14, 2022	14,99	15,63	-0,0086
286	Oct 17, 2022	15,31	15,56	0,0211
287	Oct 18, 2022	15,60	15,51	0,0188
288	Oct 19, 2022	15,54	15,47	-0,0039
289	Oct 20, 2022	16,74	15,50	0,0744
290	Oct 21, 2022	17,10	15,55	0,0213
291	Oct 24, 2022	17,51	15,64	0,0237
292	Oct 25, 2022	17,69	15,74	0,0102
293	Oct 26, 2022	18,14	15,86	0,0251
294	Oct 27, 2022	18,03	15,98	-0,0061
295	Oct 28, 2022	18,48	16,14	0,0247
296	Oct 31, 2022	18,23	16,26	-0,0136
297	Nov 01, 2022	18,35	16,37	0,0066
298	Nov 02, 2022	18,43	16,49	0,0044
299	Nov 03, 2022	18,17	16,64	-0,0142
300	Nov 04, 2022	18,32	16,80	0,0082
301	Nov 07, 2022	18,36	16,98	0,0022
302	Nov 08, 2022	18,57	17,17	0,0114
303	Nov 09, 2022	18,38	17,35	-0,0103
304	Nov 10, 2022	18,84	17,54	0,0247
305	Nov 11, 2022	19,05	17,74	0,0111
306	Nov 14, 2022	19,06	17,93	0,0005
307	Nov 15, 2022	19,02	18,10	-0,0021
308	Nov 16, 2022	18,93	18,27	-0,0047
309	Nov 17, 2022	18,95	18,38	0,0011
310	Nov 18, 2022	18,97	18,47	0,0011

311	Nov 21, 2022	18,84	18,54	-0,0069
312	Nov 22, 2022	19,00	18,61	0,0085
313	Nov 23, 2022	19,09	18,65	0,0047
314	Nov 25, 2022	19,12	18,71	0,0016
315	Nov 28, 2022	18,82	18,73	-0,0158
316	Nov 29, 2022	19,01	18,76	0,0100
317	Nov 30, 2022	19,28	18,81	0,0141
318	Dec 01, 2022	19,19	18,85	-0,0047
319	Dec 02, 2022	19,02	18,89	-0,0089
320	Dec 05, 2022	18,75	18,91	-0,0143
321	Dec 06, 2022	19,17	18,95	0,0222
322	Dec 07, 2022	19,30	18,99	0,0068
323	Dec 08, 2022	19,12	19,03	-0,0094
324	Dec 09, 2022	19,09	19,04	-0,0016
325	Dec 12, 2022	19,30	19,05	0,0109
326	Dec 13, 2022	19,12	19,05	-0,0094
327	Dec 14, 2022	18,90	19,05	-0,0116
328	Dec 15, 2022	18,47	19,03	-0,0230
329	Dec 16, 2022	18,49	19,00	0,0011
330	Dec 19, 2022	17,86	18,95	-0,0347
331	Dec 20, 2022	18,07	18,91	0,0117
332	Dec 21, 2022	18,15	18,87	0,0044
333	Dec 22, 2022	18,27	18,83	0,0066
334	Dec 23, 2022	18,31	18,78	0,0022
335	Dec 27, 2022	18,46	18,77	0,0082
336	Dec 28, 2022	18,22	18,73	-0,0131
337	Dec 29, 2022	18,45	18,69	0,0125
338	Dec 30, 2022	18,41	18,65	-0,0022
339	Jan 03, 2023	18,74	18,63	0,0178
340	Jan 04, 2023	19,14	18,65	0,0211
341	Jan 05, 2023	19,21	18,65	0,0037
342	Jan 06, 2023	19,53	18,67	0,0165
343	Jan 09, 2023	19,04	18,66	-0,0254
344	Jan 10, 2023	19,47	18,68	0,0223
345	Jan 11, 2023	19,41	18,69	-0,0031
346	Jan 12, 2023	19,41	18,70	0,0000
347	Jan 13, 2023	19,55	18,73	0,0072
348	Jan 17, 2023	19,33	18,78	-0,0113
349	Jan 18, 2023	19,02	18,80	-0,0162
350	Jan 19, 2023	18,94	18,86	-0,0042
351	Jan 20, 2023	19,23	18,91	0,0152
352	Jan 23, 2023	19,10	18,96	-0,0068
353	Jan 24, 2023	19,16	19,01	0,0031
354	Jan 25, 2023	20,42	19,11	0,0637
355	Jan 26, 2023	20,00	19,19	-0,0208
356	Jan 27, 2023	19,95	19,28	-0,0025
357	Jan 30, 2023	20,16	19,36	0,0105
358	Jan 31, 2023	20,37	19,46	0,0104
359	Feb 01, 2023	20,18	19,53	-0,0094
360	Feb 02, 2023	20,28	19,59	0,0049
361	Feb 03, 2023	19,83	19,62	-0,0224
362	Feb 06, 2023	19,58	19,62	-0,0127
363	Feb 07, 2023	19,25	19,63	-0,0170

364	Feb 08, 2023	19,16	19,62	-0,0047
365	Feb 09, 2023	18,97	19,59	-0,0100
366	Feb 10, 2023	19,07	19,58	0,0053
367	Feb 13, 2023	19,26	19,56	0,0099
368	Feb 14, 2023	19,15	19,55	-0,0057
369	Feb 15, 2023	19,25	19,57	0,0052
370	Feb 16, 2023	19,26	19,58	0,0005
371	Feb 17, 2023	19,44	19,59	0,0093
372	Feb 21, 2023	19,21	19,60	-0,0119
373	Feb 22, 2023	19,38	19,61	0,0088
374	Feb 23, 2023	19,35	19,56	-0,0015
375	Feb 24, 2023	19,24	19,52	-0,0057
376	Feb 27, 2023	19,03	19,47	-0,0110
377	Feb 28, 2023	18,91	19,41	-0,0063
378	Mar 01, 2023	18,66	19,32	-0,0133
379	Mar 02, 2023	18,66	19,25	0,0000
380	Mar 03, 2023	18,81	19,17	0,0080
381	Mar 06, 2023	18,77	19,12	-0,0021
382	Mar 07, 2023	18,71	19,08	-0,0032
383	Mar 08, 2023	18,61	19,05	-0,0054
384	Mar 09, 2023	18,32	19,00	-0,0157
385	Mar 10, 2023	18,43	18,98	0,0060
386	Mar 13, 2023	18,30	18,94	-0,0071
387	Mar 14, 2023	18,44	18,90	0,0076
388	Mar 15, 2023	18,31	18,85	-0,0071
389	Mar 16, 2023	18,39	18,81	0,0044
390	Mar 17, 2023	18,13	18,76	-0,0142
391	Mar 20, 2023	18,49	18,71	0,0197
392	Mar 21, 2023	18,54	18,67	0,0027
393	Mar 22, 2023	18,39	18,62	-0,0081
394	Mar 23, 2023	18,46	18,58	0,0038
395	Mar 24, 2023	18,61	18,55	0,0081
396	Mar 27, 2023	18,87	18,54	0,0139
397	Mar 28, 2023	18,72	18,53	-0,0080
398	Mar 29, 2023	19,00	18,55	0,0148
399	Mar 30, 2023	19,08	18,57	0,0042
400	Mar 31, 2023	19,25	18,59	0,0089
401	Apr 03, 2023	19,39	18,62	0,0072
402	Apr 04, 2023	19,64	18,67	0,0128
403	Apr 05, 2023	19,88	18,73	0,0121
404	Apr 06, 2023	19,65	18,80	-0,0116
405	Apr 10, 2023	19,57	18,86	-0,0041
406	Apr 11, 2023	19,69	18,93	0,0061
407	Apr 12, 2023	19,77	18,99	0,0041
408	Apr 13, 2023	19,96	19,07	0,0096
409	Apr 14, 2023	19,93	19,15	-0,0015
410	Apr 17, 2023	19,79	19,23	-0,0070
411	Apr 18, 2023	19,82	19,30	0,0015
412	Apr 19, 2023	19,70	19,36	-0,0061
413	Apr 20, 2023	17,65	19,32	-0,1099
414	Apr 21, 2023	18,22	19,31	0,0318
415	Apr 24, 2023	17,53	19,26	-0,0386
416	Apr 25, 2023	17,51	19,19	-0,0011

417	Apr 26, 2023	17,20	19,11	-0,0179
418	Apr 27, 2023	17,61	19,04	0,0236
419	Apr 28, 2023	17,67	18,97	0,0034
420	May 01, 2023	17,50	18,88	-0,0097
421	May 02, 2023	17,07	18,77	-0,0249
422	May 03, 2023	17,09	18,64	0,0012
423	May 04, 2023	16,91	18,49	-0,0106
424	May 05, 2023	17,13	18,37	0,0129
425	May 08, 2023	17,12	18,24	-0,0006
426	May 09, 2023	17,02	18,11	-0,0059
427	May 10, 2023	17,04	17,97	0,0012
428	May 11, 2023	16,96	17,82	-0,0047
429	May 12, 2023	17,03	17,68	0,0041
430	May 15, 2023	16,95	17,54	-0,0047
431	May 16, 2023	16,53	17,37	-0,0251
432	May 17, 2023	16,66	17,22	0,0078
433	May 18, 2023	16,55	17,17	-0,0066
434	May 19, 2023	16,31	17,07	-0,0146
435	May 22, 2023	16,38	17,01	0,0043
436	May 23, 2023	16,10	16,94	-0,0172
437	May 24, 2023	15,95	16,88	-0,0094
438	May 25, 2023	15,15	16,76	-0,0515
439	May 26, 2023	15,50	16,65	0,0228
440	May 30, 2023	15,64	16,55	0,0090
441	May 31, 2023	15,73	16,49	0,0057
442	Jun 01, 2023	15,81	16,42	0,0051
443	Jun 02, 2023	15,21	16,34	-0,0387
444	Jun 05, 2023	15,39	16,25	0,0118
445	Jun 06, 2023	15,67	16,18	0,0180
446	Jun 07, 2023	16,10	16,13	0,0271
447	Jun 08, 2023	16,07	16,08	-0,0019
448	Jun 09, 2023	15,95	16,03	-0,0075
449	Jun 12, 2023	15,93	15,98	-0,0013
450	Jun 13, 2023	15,82	15,92	-0,0069
451	Jun 14, 2023	15,84	15,89	0,0013
452	Jun 15, 2023	16,03	15,86	0,0119
453	Jun 16, 2023	16,06	15,83	0,0019
454	Jun 20, 2023	15,78	15,81	-0,0176
455	Jun 21, 2023	15,61	15,77	-0,0108
456	Jun 22, 2023	15,58	15,74	-0,0019
457	Jun 23, 2023	15,45	15,72	-0,0084
458	Jun 26, 2023	15,63	15,74	0,0116
459	Jun 27, 2023	15,84	15,76	0,0133
460	Jun 28, 2023	15,78	15,76	-0,0038
461	Jun 29, 2023	15,98	15,78	0,0126
462	Jun 30, 2023	15,95	15,78	-0,0019
463	Jul 03, 2023	16,12	15,83	0,0106
464	Jul 05, 2023	16,07	15,86	-0,0031
465	Jul 06, 2023	15,87	15,87	-0,0125
466	Jul 07, 2023	15,61	15,85	-0,0165
467	Jul 10, 2023	15,27	15,81	-0,0220
468	Jul 11, 2023	15,23	15,77	-0,0026
469	Jul 12, 2023	15,12	15,73	-0,0072

470	Jul 13, 2023	15,12	15,70	0,0000
471	Jul 14, 2023	14,50	15,63	-0,0419
472	Jul 17, 2023	13,53	15,51	-0,0692
473	Jul 18, 2023	13,45	15,37	-0,0059
474	Jul 19, 2023	14,59	15,32	0,0814
475	Jul 20, 2023	14,66	15,27	0,0048
476	Jul 21, 2023	14,76	15,23	0,0068
477	Jul 24, 2023	14,95	15,20	0,0128
478	Jul 25, 2023	14,80	15,16	-0,0101
479	Jul 26, 2023	14,89	15,11	0,0061
480	Jul 27, 2023	14,51	15,05	-0,0259
481	Jul 28, 2023	14,45	14,97	-0,0041
482	Jul 31, 2023	14,52	14,90	0,0048
483	Aug 01, 2023	14,30	14,81	-0,0153
484	Aug 02, 2023	14,35	14,72	0,0035
485	Aug 03, 2023	14,09	14,64	-0,0183
486	Aug 04, 2023	14,00	14,55	-0,0064
487	Aug 07, 2023	14,01	14,49	0,0007
488	Aug 08, 2023	14,18	14,44	0,0121
489	Aug 09, 2023	14,27	14,40	0,0063
490	Aug 10, 2023	14,17	14,35	-0,0070
491	Aug 11, 2023	14,37	14,34	0,0140
492	Aug 14, 2023	14,26	14,38	-0,0077
493	Aug 15, 2023	14,14	14,41	-0,0085
494	Aug 16, 2023	14,10	14,39	-0,0028
495	Aug 17, 2023	14,01	14,36	-0,0064
496	Aug 18, 2023	14,05	14,32	0,0029
497	Aug 21, 2023	14,10	14,28	0,0036
498	Aug 22, 2023	14,26	14,25	0,0113
499	Aug 23, 2023	14,16	14,22	-0,0070
500	Aug 24, 2023	14,15	14,20	-0,0007
501	Aug 25, 2023	14,11	14,18	-0,0028
502	Aug 28, 2023	14,21	14,16	0,0071
503	Aug 29, 2023	14,77	14,19	0,0387
504	Aug 30, 2023	14,73	14,21	-0,0027
505	Aug 31, 2023	14,79	14,24	0,0041
506	Sep 01, 2023	14,65	14,27	-0,0095
507	Sep 05, 2023	14,48	14,30	-0,0117
508	Sep 06, 2023	14,61	14,32	0,0089
509	Sep 07, 2023	14,61	14,34	0,0000
510	Sep 08, 2023	14,40	14,35	-0,0145
511	Sep 11, 2023	14,52	14,36	0,0083
512	Sep 12, 2023	14,46	14,37	-0,0041
513	Sep 13, 2023	14,62	14,39	0,0110
514	Sep 14, 2023	15,06	14,44	0,0297
515	Sep 15, 2023	15,23	14,50	0,0112
516	Sep 18, 2023	15,09	14,55	-0,0092
517	Sep 19, 2023	15,21	14,61	0,0079
518	Sep 20, 2023	15,55	14,67	0,0221
519	Sep 21, 2023	15,31	14,73	-0,0156
520	Sep 22, 2023	15,12	14,78	-0,0125
521	Sep 25, 2023	15,06	14,82	-0,0040
522	Sep 26, 2023	15,02	14,86	-0,0027

523	Sep 27, 2023	14,87	14,87	-0,0100
524	Sep 28, 2023	15,01	14,88	0,0094
525	Sep 29, 2023	15,02	14,90	0,0007
526	Oct 02, 2023	14,67	14,90	-0,0236
527	Oct 03, 2023	14,78	14,91	0,0075
528	Oct 04, 2023	14,65	14,91	-0,0088
529	Oct 05, 2023	14,83	14,92	0,0122
530	Oct 06, 2023	14,45	14,93	-0,0260
531	Oct 09, 2023	14,73	14,94	0,0192
532	Oct 10, 2023	14,96	14,96	0,0155
533	Oct 11, 2023	14,77	14,97	-0,0128
534	Oct 12, 2023	14,45	14,94	-0,0219
535	Oct 13, 2023	14,36	14,90	-0,0062
536	Oct 16, 2023	14,41	14,86	0,0035
537	Oct 17, 2023	14,58	14,83	0,0117
538	Oct 18, 2023	14,32	14,77	-0,0180
539	Oct 19, 2023	15,26	14,77	0,0636
540	Oct 20, 2023	15,38	14,78	0,0078
541	Oct 23, 2023	14,95	14,77	-0,0284
542	Oct 24, 2023	15,53	14,80	0,0381
543	Oct 25, 2023	15,19	14,82	-0,0221
544	Oct 26, 2023	15,12	14,82	-0,0046
545	Oct 27, 2023	14,82	14,81	-0,0200
546	Oct 30, 2023	15,26	14,84	0,0293
547	Oct 31, 2023	15,40	14,87	0,0091
548	Nov 01, 2023	15,58	14,92	0,0116
549	Nov 02, 2023	15,73	14,96	0,0096
550	Nov 03, 2023	15,88	15,03	0,0095
551	Nov 06, 2023	15,75	15,09	-0,0082
552	Nov 07, 2023	15,84	15,13	0,0057
553	Nov 08, 2023	15,65	15,17	-0,0121
554	Nov 09, 2023	15,63	15,23	-0,0013
555	Nov 10, 2023	15,64	15,30	0,0006
556	Nov 13, 2023	15,58	15,35	-0,0038
557	Nov 14, 2023	15,63	15,41	0,0032
558	Nov 15, 2023	15,76	15,48	0,0083
559	Nov 16, 2023	15,88	15,51	0,0076
560	Nov 17, 2023	15,90	15,54	0,0013
561	Nov 20, 2023	16,10	15,59	0,0125
562	Nov 21, 2023	16,19	15,63	0,0056
563	Nov 22, 2023	16,17	15,68	-0,0012
564	Nov 24, 2023	16,21	15,73	0,0025
565	Nov 27, 2023	16,21	15,80	0,0000
566	Nov 28, 2023	16,18	15,85	-0,0019
567	Nov 29, 2023	16,30	15,89	0,0074
568	Nov 30, 2023	16,57	15,94	0,0164
569	Dec 01, 2023	16,76	15,99	0,0114
570	Dec 04, 2023	16,66	16,03	-0,0060
571	Dec 05, 2023	17,22	16,10	0,0331
572	Dec 06, 2023	16,94	16,16	-0,0164
573	Dec 07, 2023	17,09	16,23	0,0088
574	Dec 08, 2023	16,92	16,30	-0,0100
575	Dec 11, 2023	16,62	16,34	-0,0179

576	Dec 12, 2023	16,41	16,39	-0,0127
577	Dec 13, 2023	16,45	16,43	0,0024
578	Dec 14, 2023	16,65	16,47	0,0121
579	Dec 15, 2023	16,52	16,50	-0,0078
580	Dec 18, 2023	16,46	16,53	-0,0036
581	Dec 19, 2023	16,61	16,56	0,0091
582	Dec 20, 2023	16,40	16,57	-0,0127
583	Dec 21, 2023	16,49	16,58	0,0055
584	Dec 22, 2023	16,55	16,60	0,0036
585	Dec 26, 2023	16,57	16,62	0,0012
586	Dec 27, 2023	16,58	16,64	0,0006
587	Dec 28, 2023	16,74	16,66	0,0096
588	Dec 29, 2023	16,78	16,67	0,0024
589	Jan 02, 2024	17,25	16,70	0,0276
590	Jan 03, 2024	17,23	16,72	-0,0012
591	Jan 04, 2024	17,15	16,72	-0,0047
592	Jan 05, 2024	17,47	16,75	0,0185
593	Jan 08, 2024	17,32	16,76	-0,0086
594	Jan 09, 2024	16,95	16,76	-0,0216
595	Jan 10, 2024	16,87	16,77	-0,0047
596	Jan 11, 2024	16,23	16,76	-0,0387
597	Jan 12, 2024	16,48	16,77	0,0153
598	Jan 16, 2024	16,44	16,75	-0,0024
599	Jan 17, 2024	16,41	16,75	-0,0018
600	Jan 18, 2024	16,40	16,75	-0,0006
601	Jan 19, 2024	16,67	16,75	0,0163
602	Jan 22, 2024	16,80	16,77	0,0078
603	Jan 23, 2024	17,19	16,80	0,0229
604	Jan 24, 2024	16,68	16,81	-0,0301
605	Jan 25, 2024	17,18	16,84	0,0295
606	Jan 26, 2024	17,29	16,88	0,0064
607	Jan 29, 2024	17,25	16,90	-0,0023
608	Jan 30, 2024	17,53	16,94	0,0161
609	Jan 31, 2024	17,69	16,96	0,0091
610	Feb 01, 2024	18,04	17,00	0,0196
611	Feb 02, 2024	17,83	17,04	-0,0117
612	Feb 05, 2024	17,73	17,05	-0,0056
613	Feb 06, 2024	17,61	17,06	-0,0068
614	Feb 07, 2024	17,33	17,08	-0,0160
615	Feb 08, 2024	16,82	17,08	-0,0299
616	Feb 09, 2024	16,84	17,11	0,0012
617	Feb 12, 2024	17,02	17,14	0,0106
618	Feb 13, 2024	16,90	17,16	-0,0071
619	Feb 14, 2024	16,91	17,19	0,0006
620	Feb 15, 2024	17,09	17,22	0,0106
621	Feb 16, 2024	16,97	17,24	-0,0070
622	Feb 20, 2024	16,91	17,24	-0,0035
623	Feb 21, 2024	17,00	17,23	0,0053
624	Feb 22, 2024	16,59	17,23	-0,0244
625	Feb 23, 2024	16,80	17,21	0,0126
626	Feb 26, 2024	16,60	17,17	-0,0120
627	Feb 27, 2024	16,83	17,15	0,0138
628	Feb 28, 2024	16,96	17,12	0,0077

629	Feb 29, 2024	16,93	17,09	-0,0018
630	Mar 01, 2024	16,98	17,03	0,0029
631	Mar 04, 2024	16,80	16,98	-0,0107
632	Mar 05, 2024	17,17	16,95	0,0218
633	Mar 06, 2024	17,18	16,93	0,0006
634	Mar 07, 2024	17,05	16,92	-0,0076
635	Mar 08, 2024	17,20	16,94	0,0088
636	Mar 11, 2024	17,33	16,96	0,0075
637	Mar 12, 2024	17,20	16,97	-0,0075
638	Mar 13, 2024	17,19	16,98	-0,0006
639	Mar 14, 2024	17,01	16,99	-0,0105
640	Mar 15, 2024	17,05	16,99	0,0023
641	Mar 18, 2024	17,30	17,00	0,0146
642	Mar 19, 2024	17,17	17,02	-0,0075
643	Mar 20, 2024	17,21	17,03	0,0023
644	Mar 21, 2024	17,16	17,06	-0,0029
645	Mar 22, 2024	16,98	17,07	-0,0105
646	Mar 25, 2024	17,12	17,09	0,0082
647	Mar 26, 2024	17,18	17,11	0,0035
648	Mar 27, 2024	17,55	17,14	0,0213
649	Mar 28, 2024	17,60	17,17	0,0028
650	Apr 01, 2024	17,50	17,20	-0,0057
651	Apr 02, 2024	17,52	17,23	0,0011
652	Apr 03, 2024	17,61	17,26	0,0051
653	Apr 04, 2024	17,57	17,28	-0,0023
654	Apr 05, 2024	17,42	17,29	-0,0086
655	Apr 08, 2024	17,25	17,30	-0,0098
656	Apr 09, 2024	16,90	17,27	-0,0205
657	Apr 10, 2024	16,73	17,25	-0,0101
658	Apr 11, 2024	16,42	17,21	-0,0187
659	Apr 12, 2024	16,31	17,18	-0,0067
660	Apr 15, 2024	16,24	17,14	-0,0043
661	Apr 16, 2024	16,09	17,08	-0,0093
662	Apr 17, 2024	16,12	17,02	0,0019
663	Apr 18, 2024	16,33	16,98	0,0129
664	Apr 19, 2024	16,51	16,95	0,0110
665	Apr 22, 2024	16,31	16,91	-0,0122
666	Apr 23, 2024	16,50	16,88	0,0116
667	Apr 24, 2024	16,81	16,86	0,0186
668	Apr 25, 2024	16,58	16,82	-0,0138
669	Apr 26, 2024	16,75	16,77	0,0102
670	Apr 29, 2024	17,02	16,75	0,0160
671	Apr 30, 2024	16,89	16,72	-0,0077
672	May 01, 2024	16,92	16,68	0,0018
673	May 02, 2024	16,82	16,65	-0,0059
674	May 03, 2024	16,85	16,62	0,0018
675	May 06, 2024	16,99	16,60	0,0083
676	May 07, 2024	17,08	16,61	0,0053
677	May 08, 2024	17,11	16,63	0,0018
678	May 09, 2024	17,18	16,67	0,0041
679	May 10, 2024	17,17	16,71	-0,0006
680	May 13, 2024	17,26	16,76	0,0052
681	May 14, 2024	17,30	16,83	0,0023

682	May 15, 2024	17,33	16,89	0,0017
683	May 16, 2024	17,30	16,93	-0,0017
684	May 17, 2024	17,40	16,98	0,0058
685	May 20, 2024	17,52	17,04	0,0069
686	May 21, 2024	17,27	17,08	-0,0144
687	May 22, 2024	17,50	17,11	0,0132
688	May 23, 2024	17,47	17,16	-0,0017
689	May 24, 2024	17,50	17,19	0,0017
690	May 28, 2024	17,27	17,21	-0,0132
691	May 29, 2024	17,12	17,22	-0,0087
692	May 30, 2024	17,62	17,25	0,0288
693	May 31, 2024	18,22	17,32	0,0335
694	Jun 03, 2024	18,01	17,38	-0,0116
695	Jun 04, 2024	18,35	17,45	0,0187
696	Jun 05, 2024	18,30	17,51	-0,0027
697	Jun 06, 2024	18,28	17,57	-0,0011
698	Jun 07, 2024	18,10	17,61	-0,0099
699	Jun 10, 2024	17,86	17,65	-0,0133
700	Jun 11, 2024	17,86	17,68	0,0000
701	Jun 12, 2024	17,61	17,69	-0,0141
702	Jun 13, 2024	17,67	17,71	0,0034
703	Jun 14, 2024	17,64	17,73	-0,0017
704	Jun 17, 2024	17,67	17,74	0,0017
705	Jun 18, 2024	18,05	17,77	0,0213
706	Jun 20, 2024	18,11	17,81	0,0033
707	Jun 21, 2024	18,40	17,86	0,0159
708	Jun 24, 2024	18,65	17,91	0,0135
709	Jun 25, 2024	18,69	17,97	0,0021
710	Jun 26, 2024	18,76	18,05	0,0037
711	Jun 27, 2024	18,75	18,13	-0,0005
712	Jun 28, 2024	19,11	18,20	0,0190
713	Jul 01, 2024	18,98	18,24	-0,0068
714	Jul 02, 2024	18,82	18,28	-0,0085
715	Jul 03, 2024	18,68	18,30	-0,0075
716	Jul 05, 2024	18,77	18,32	0,0048
717	Jul 08, 2024	18,81	18,35	0,0021
718	Jul 09, 2024	18,80	18,38	-0,0005
719	Jul 10, 2024	18,74	18,43	-0,0032
720	Jul 11, 2024	18,86	18,48	0,0064
721	Jul 12, 2024	18,81	18,54	-0,0027
722	Jul 15, 2024	18,58	18,58	-0,0123
723	Jul 16, 2024	18,85	18,64	0,0144
724	Jul 17, 2024	19,16	18,72	0,0163
725	Jul 18, 2024	19,15	18,77	-0,0005
726	Jul 19, 2024	19,12	18,82	-0,0016
727	Jul 22, 2024	18,55	18,83	-0,0303
728	Jul 23, 2024	18,21	18,81	-0,0185
729	Jul 24, 2024	19,16	18,83	0,0509
730	Jul 25, 2024	19,19	18,86	0,0016
731	Jul 26, 2024	19,01	18,87	-0,0094
732	Jul 29, 2024	18,90	18,86	-0,0058
733	Jul 30, 2024	18,98	18,86	0,0042
734	Jul 31, 2024	19,25	18,88	0,0141

735	Aug 01, 2024	19,47	18,92	0,0114
736	Aug 02, 2024	19,37	18,95	-0,0051
737	Aug 05, 2024	18,91	18,95	-0,0240
738	Aug 06, 2024	19,19	18,97	0,0147
739	Aug 07, 2024	19,25	19,00	0,0031
740	Aug 08, 2024	19,40	19,03	0,0078
741	Aug 09, 2024	19,49	19,06	0,0046
742	Aug 12, 2024	19,43	19,10	-0,0031
743	Aug 13, 2024	19,52	19,14	0,0046
744	Aug 14, 2024	19,63	19,16	0,0056
745	Aug 15, 2024	19,09	19,16	-0,0279
746	Aug 16, 2024	19,34	19,17	0,0130
747	Aug 19, 2024	19,49	19,21	0,0077
748	Aug 20, 2024	19,49	19,28	0,0000
749	Aug 21, 2024	19,54	19,30	0,0026
750	Aug 22, 2024	19,51	19,31	-0,0015
751	Aug 23, 2024	19,73	19,35	0,0112
752	Aug 26, 2024	19,76	19,39	0,0015
753	Aug 27, 2024	19,65	19,43	-0,0056
754	Aug 28, 2024	19,82	19,45	0,0086
755	Aug 29, 2024	19,76	19,47	-0,0030
756	Aug 30, 2024	19,90	19,50	0,0071
757	Sep 03, 2024	20,43	19,57	0,0263
758	Sep 04, 2024	20,57	19,64	0,0068
759	Sep 05, 2024	20,65	19,71	0,0039
760	Sep 06, 2024	20,97	19,79	0,0154
761	Sep 09, 2024	21,50	19,89	0,0250
762	Sep 10, 2024	21,71	20,00	0,0097
763	Sep 11, 2024	21,45	20,10	-0,0120
764	Sep 12, 2024	21,59	20,20	0,0065
765	Sep 13, 2024	21,64	20,33	0,0023
766	Sep 16, 2024	22,27	20,47	0,0287
767	Sep 17, 2024	21,78	20,59	-0,0222
768	Sep 18, 2024	21,73	20,70	-0,0023
769	Sep 19, 2024	21,36	20,79	-0,0172
770	Sep 20, 2024	21,54	20,89	0,0084
771	Sep 23, 2024	21,49	20,98	-0,0023
772	Sep 24, 2024	21,59	21,07	0,0046
773	Sep 25, 2024	21,56	21,17	-0,0014
774	Sep 26, 2024	21,65	21,26	0,0042