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Department of Economics



Bachelor Thesis

Analysis of Health-related Stocks

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BACHELOR THESIS ASSIGNMENT

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Economics Policy and Administration
Business Administration

Thesis title

Analysis of health related stocks

Objectives of thesis

The purpose of this thesis is to study the current state of the stocks of Pfizer, AbbVie, Merck, Johnson & Johnson and determine their further development for the coming year. The author of this thesis will also assess market performance and assess the financial performance of the stocks.

The thesis's theoretical part will consider concepts such as stocks, investing, the stock market, and technical analysis. This information will give a clear idea of the selected companies' stock and their forecast for the future (whether it is worth buying or selling shares of the selected companies).

In the practical part of the analysis, the author will conduct technical analyses to achieve the goal of the thesis.

Methodology

The literature review is devoted to using methods of extraction, synthesis, induction, and deduction. In other words, this dissertation aims to gain a basic understanding of the selected indicators. The objectives of the analytical section are achieved through the use of various techniques of technical analysis.

Technical analysis is the main part of the analytical part. The author uses moving averages and moving average convergence divergence as tools for this analysis. These indicators will help you understand how the trend is moving and the forecast for each of the stocks chosen by the author.

The proposed extent of the thesis

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Keywords

stock, HealthCare, stock market, Pfizer, AbbVie, Merck, Johnson & Johnson, technical analysis, moving average, moving average convergence divergence, forecast

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Declaration

I declare that I have worked on my bachelor thesis titled "Analysis of health related stocks" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 15th March 2021

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Analysis of Health-related Stocks

Abstract

This thesis aims to analyze the global stocks of Pfizer, AbbVie, Merck, and Johnson & Johnson.

The dissertation is divided into two parts, which complement each other as a source of information. The theoretical part introduces stocks and investing in general, then tests the stocks separately (overall performance, history, given situation on the stock exchange), and gives an idea of technical analysis of stocks. The practical part uses technical judgment as a key component to comparing past and future results. It makes recommendations as to whether the current signal is a buy or a sell. The result of this thesis is a prediction of how individual HealthCare sector stocks perform, their specific performance and recommendations, positive or negative warnings for trading..

Keywords: stock, HealthCare, stock market, Pfizer, AbbVie, Merck, Johnson & Johnson, technical analysis, moving average, moving average convergence divergence, forecast

Analýza Akcií Spojené Se Zdravím

Abstrakt

Cílem této práce je analýza globální akcie společností Pfizer, AbbVie, Merck a Johnson & Johnson.

Disertační práce je rozdělena do dvou částí, které se navzájem doplňují jako informační zdroje. Teoretická část zahrnuje obecné ponětí akcie a investování, poté akcie zkontroluje samostatně (celkový výkon, historii, danou situaci na burze) a dává představu o technické analýze akcií. Praktická část využívá technického úsudku jako klíčové komponenty pro porovnání minulých a budoucích výsledků. Dává doporučení, zda je aktuální signál nákup nebo prodej. Výsledkem této práce je predikce výkonu jednotlivých akcií sektoru HealthCare, jejich konkrétní výkon a doporučení, pozitivní nebo negativní varování pro obchodování.

Klíčová slova: akcie, HealthCare, akciový trh, Pfizer, AbbVie, Merck, Johnson & Johnson, technická analýza, klouzavý průměr, konvergenční divergence klouzavého průměru, prognóza

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1 Introduction

The coronavirus crisis of 2020 became infamous for a lot of different phenomena that occurred over the course of the entire period. First of all, the economy and social spheres fell under its influence. Moreover, the scale speaks of a macro crisis since the area of its distribution is too large. The worst months for global stock markets were February and March 2020. Stock indices lost tens of percent, and experts started talking about the end of the 11-year growth cycle since the last financial crisis. Hence, one should ask the question: is it worth investing in various financial assets in such a situation?

Indeed, the pandemic has proven to be a negative factor for a massive number of companies. The worst-hit were airlines, hotels, and real estate shares, as consumers almost immediately stopped using their services. However, the pandemic factor was not harmful to all companies. The financial performance of healthcare companies grew, as did their value. For this reason, the author opted for the shares of this sector in order to consider, analyze their performance and understand whether it is worth buying or selling them during this period.

The thesis will be divided into two parts, theoretical and practical. In the theoretical part, the author will acquaint you with all the necessary concepts, history, and current situation of the healthcare sector's selected stocks. The practical part of the thesis will contain an analysis of the selected stocks.

2 Objectives and Methodology

2.1 Objectives

The purpose of this thesis is to study the current state of the stocks of Pfizer, AbbVie, Merck, Johnson & Johnson and determine their further development for the coming year. The author of this thesis will also assess market performance and assess the financial performance of the stocks.

The thesis's theoretical part will consider concepts such as stocks, investing, the stock market, and technical analysis. This information will give a clear idea of the selected companies' stock and their forecast for the future (whether it is worth buying or selling shares of the selected companies).

In the practical part of the analysis, the author will conduct technical analyses to achieve the goal of the thesis.

All of these goals are achieved by the methods described in the next subsection.

2.2 Methodology

The literature review is devoted to using methods of extraction, synthesis, induction, and deduction. In other words, this dissertation aims to gain a basic understanding of the selected indicators. The objectives of the analytical section are achieved through the use of various techniques of technical analysis.

Technical analysis is the main part of the analytical part. The author uses moving averages and moving average convergence divergence as tools for this analysis. These indicators will help you understand how the trend is moving and the forecast for each of the stocks chosen by the author.

3 Literature Review

3.1 What is stock?

A stock (also known as equity) is a security that represents the ownership of a fraction of a corporation. This entitles the stock owner to a proportion of the corporation's assets and profits equal to how much stock they own. Units of stock are called "shares".¹

By purchasing shares, you are acquiring a part of the company. Shares are one of the leading investment instruments in the stock market and provide an opportunity to generate additional income.

3.2 Types of stocks

There are two main types of stock: common and preferred. Common stock usually entitles the owner to vote at shareholders' meetings and to receive any dividends² paid out by the corporation. Preferred stockholders generally do not have voting rights. However, they have a higher claim on assets and earnings than the common stockholders. For example, owners of preferred stock receive dividends before common shareholders and have priority if a company goes bankrupt and is liquidated.³

3.2.1 Common vs. Preferred stock

Common stock. The most common type of stock. They always give the right to vote at shareholders' meetings but do not guarantee dividends.

Preferred stock. Have a predetermined dividend amount - for example, a percentage of the company's profits. Their owners can only participate in voting if they have not received dividends for the last year.

In turn, sometimes, there are particular types of preferred shares: non-voting and with special rights.

Preferred non-voting shares. Have a fixed dividend and the right to receive payments first but are not allowed to vote.

¹ Retrieved from: <https://www.investopedia.com/terms/s/stock.asp>

² A dividend is the distribution of some of a company's earnings to a class of its shareholders, as determined by the company's board of directors. Retrieved from: <https://www.investopedia.com/terms/d/dividend.asp>

³ Retrieved from: <https://www.investopedia.com/terms/s/stock.asp#common-vs-preferred-stock>

Preferred with special rights shares. The conditions for the payment of dividends and the possibility of voting are prescribed in the company's charter. For example, the owners of such shares may be able to vote, receive priority in the payment of dividends, and the right to be the first to buy new issues of shares.

One joint-stock company may have several types of preferred shares.

Payment of dividends to holders of common stock is made only after the company has comprehensively fulfilled its bonds to all preferred shareholders.

3.3 Investing in stocks

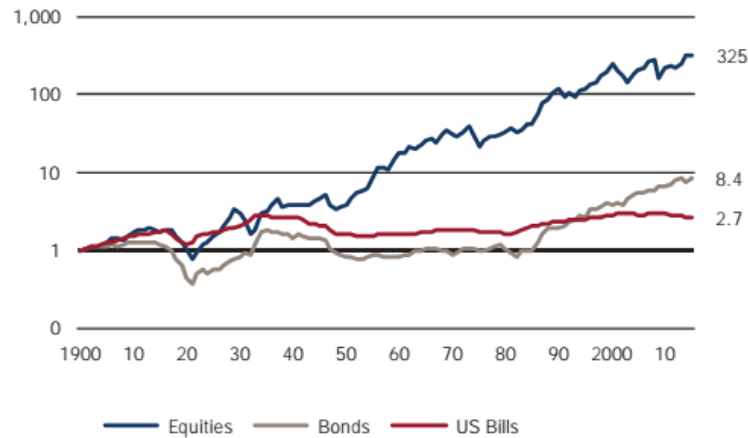
Against the backdrop of a crashed market, investing in stocks seems like a very attractive idea. Indeed, now you can buy securities at a price that is an order of magnitude lower than it was before the market crash. Nevertheless, investing in stocks is a game for the long term; it is essential to understand this. Furthermore, even more importantly, you need to invest only in what you understand. If you do not know what you are doing and buy any stocks, you will definitely burn out.

3.3.1 Why consider investing?

Many people think that investing in stocks is an empty and very risky thing, but there is a business behind all stocks. In turn, the business creates added value and generates income. By owning a share in a business, an investor receives a portion of the profit. Nevertheless, business is risky: competition, costs, taxes, losses. Oddly enough, if you look at the Forbes list of the wealthiest people, you will only see business people there. Warren Buffett's business, one of the world's wealthiest people, is based on the ownership of dozens of companies. The wealthiest people in the world are business owners. It turns out that owning a business is a profitable business.

If you look at the real return on assets across the world's countries, then, in the long run, it was stocks that showed the highest returns and overtook inflation. The average real annual return on stocks globally was 5.2%, long-term bonds only 1.9%. Real return means a return above inflation; that is, stocks increased the real purchasing power of money by an average of 5% per year. \$ 1 invested in stocks in 1900 would have increased its purchasing power 325 times by the end of 2014.

Figure 1 Cumulative real returns from 1900 to 2014



Source: researchgate.net

One of the most common questions is: “Can a mere mortal make a million dollars?”

99.99% of people consider this question rhetorical, moreover, only in a negative sense. Here is one illustrative example: take a small start-up capital of \$1,000 and invest it for 55 years at 20% per annum (average stock market return). Here is the output:

Table 1 Calculation of income for 55 years

20% per annum	
Number of years	Income
0	\$1 000
3	\$1 728
5	\$2 488
10	\$6 192
15	\$15 407
20	\$38 338
25	\$95 396
30	\$237 376
35	\$590 668
45	\$1 469 772
50	\$3 657 262
55	\$9 100 438

Source: the author

Your thousand in thirty-eight years will turn into one million dollars. And for this, you do not need to have a large start-up capital or work tirelessly. Now you understand that the rich people from Wall Street are not such fabulous people. Everything is quite real and reasonable.

3.3.2 How to invest?

There are three main ways to make money on stocks:

1. Buy low and sell high.

Earning on a change in the rate is possible in two ways: either buy when the price falls temporarily, and after a while, after waiting for a rise, sell (long), or borrow shares from a broker, sell at a high price, and then buy at a lower price (short). The second option assumes some experience and understanding of the market; the first is available to a wide range of players. In the first option, the benefit is less, but the risk is lower. The process itself does not require special specific knowledge and skills from the holder. In the second case, the ability to take a balanced risk, time, attentiveness, and deep immersion in the topic will be required.

2. Purchase shares as options in the conditions of which the price change is incorporated.
3. Form a portfolio of shares from which it will be possible to profit in the form of dividends. Only this way of earning can be considered as a full-fledged investment.

So how to invest in stocks correctly?

Here are some important theses on how to invest in stocks. They will be useful to market participants who do not yet have experience of interacting with this type of securities:

- Collect information. There is a ton of specialized literature such as Warren Buffett's annual letters, Lynch's, Graham's, and many more.
- Understand. If you can get to know the company where you will invest more closely, do it. Focusing only on documents, you will never learn about the many things that can play a key role in an organization's rise or failure. Moreover, such a factor can be a mere trifle, such as a well-located office or the vehicle fleet's renovation.
- Engage professionals. If you cannot make an informed and informed decision on your own, invite a professional broker or financier for consultation. However, remember that all the risks for the decisions made are borne only by you.
- Plan long. 8-10 years is the period for which it makes sense to focus. If there is any doubt that a potentially interesting company will live that long, then you do not need it.
- Do not waste your last. To invest in stocks, you need to have free funds. And preferably a financial cushion with a one-year margin.
- Diversify your risks. Build a portfolio of 10–12–15 stocks. Expand it as much as possible, increase your investment capital.

- Be flexible. If the share price has risen by 40-50% - think about whether it makes sense to sell the shares and “close” this part of the investment, remaining with a good profit.

The first deal for a newcomer to this market is likely to be done with the help of a company that is the official intermediary between investors and public companies on trading floors worldwide.⁴

3.3.3 Making profit from stocks?

Speaking about how to invest money in stocks, it should be noted right away that there are few countries in which these securities circulate in the classic form of securities proper. For a long time, trading has been carried out on electronic registers - this means that the range of opportunities for buyers of securities has expanded. Here is how you can invest money in stocks today:

- independently, buying shares from intermediaries or investors under an agreement;
- on the stock exchange through a broker (you will need an account opened with a brokerage company). This method assumes commission payments to the intermediary;
- indirectly - through mutual funds (mutual investment funds). In this case, portfolio management rests with the fund's management. The investor only invests funds, receives dividends, and pays commissions to the fund.

We can also mention options and futures - this is a way to make money on the difference in the price of shares in different time intervals, but not a full-fledged investment tool that involves long-term planning.

The same can be said about speculative investments in stocks. There are two options here: to buy shares during the crisis of the enterprise and resell later, when the situation stabilizes, or to buy shares in promising young companies in order to sell them after a short time at the peak of value. In this option, the risk is high, but the profit is also offered higher than for long-term investment.

Suppose the initial capital is modest for this market (for example, two thousand dollars). In that case, such short-term investments, if successful, will quickly increase capital. Subsequently, it will be possible to form a portfolio for a long-term investment. Nevertheless, success requires a good understanding of the stock market.

⁴ Wyckoff, R. D. (2006). *How I Trade and Invest in Stocks and Bonds*. Cosimo, Inc.. ISBN: 1-59605-960-5

3.3.4 Investment risks

When trading on the stock exchange, you must be aware of the risks that arise. Stocks are considered more risky assets than bonds and deposits, but they are potentially more profitable. Usually, the decision to pay dividends or not and their size is made by the company annually at the General Meeting of Shareholders. While the interest on bonds is guaranteed, and its size is known in advance. Interest on deposits is also known in advance.

When the market and economic situation changes, stock prices can both rise and fall.

Past performance of a stock does not guarantee future returns!

To reduce risks, use the diversification rule "don't put all your eggs in one basket" - buy stocks of different companies from different sectors of the economy and look for other types of securities, such as bonds or ETFs.

As the famous American economist Paul Samuelson said: "*We are diversifying because we cannot predict the future*".⁵

3.4 HealthCare stocks

Healthcare, one of the largest and most complex sectors, is comprised of a broad range of companies that sell medical products and services. The healthcare sector includes companies that sell drugs, medical devices, and insurance, as well as hospitals and healthcare providers.⁶

In the last ten years, the world's economic life has been full of events - bullish growth in securities, trade wars, and, finally, the coronavirus epidemic that broke out in early 2020 led to a collapse. Today, investors are rebalancing their investment portfolios, getting rid of unprofitable assets, and increasing the percentage of safe and promising securities. This led to a sharp drop in the stock market. However, like the shares of gaming companies, the healthcare sector is in high demand among investors during a pandemic.

Medicine is becoming an extremely relevant industry today because many of the leading corporations are now looking for a vaccine against coronavirus and in the process of intensified production of vital medical supplies and medicines.

⁵ Retrieved from: <https://thefrontmail.com/best-investing/investors-quotes-top-55-of-the-most-striking-quotes/>

⁶ Retrieved from: <https://www.investopedia.com/investing/top-healthcare-stocks/>

3.4.1 Selected stocks

This chapter describes which stocks will be considered in this thesis and why the author's choice fell on them.

First, consider the two largest healthcare companies in the world (according to Investopedia): Pfizer Inc. (PFE) and AbbVie Inc. (ABBV)⁷, which are among the 50 best market indices of the S&P 500⁸ and ranked 34th and 32nd, respectively. Will also review and analyze Merck & Co. Inc. (MRK), located between Pfizer Inc. and AbbVie Inc., in the same rating and ranks 33rd.

The fourth and the last company that the author of the thesis would like to consider is Johnson & Johnson (JNJ), as this company is not only in the top ten components of the S&P 500 but is also a partner of the job fair of Czech University of Life Sciences Prague.

3.5 Pfizer Inc. (PFE)

Pfizer is one of the world's leading biopharmaceutical companies, whose medicines and vaccines help people worldwide fight many diseases and lead healthy lives every year.

Through innovation and global resources, Pfizer works to improve people's health and well-being at every stage of life. The company's product portfolio includes pharmaceuticals, including vaccines, world-renowned vitamins, and other health-promoting products.⁹

3.5.1 History of Pfizer

Pfizer is named after German-American Charles Pfizer (Karl Pfizer) and Charles Erhardt (of Ludwigsburg, Germany), who established a pharmaceutical business in Brooklyn in 1849. They produced an anti-parasite drug called santonin. Their products were immediately successful.

The company's rapid growth began in 1880 when it began to produce citric acid, which was later used to manufacture drinks produced by companies such as Coca-Cola. After that, citric acid became the main product of Pfizer.

By 1910, by which time sales had reached \$ 3 million, Pfizer was considered an expert in fermentation technology. This knowledge was used for the mass production of penicillin during

⁷ Retrieved from: <https://www.investopedia.com/investing/top-healthcare-stocks/>

⁸ The S&P 500 index consists of most of the largest companies in the United States.

⁹ Retrieved from: <https://www.pfizer.com/about/leadership-and-structure/company-fact-sheet>

World War II at the US government's request. The allied forces' wounded soldiers badly needed this antibiotic, and soon they began to call it "life-giving medicine." Pfizer donated most of the penicillin that the Allied forces received.

In the 80s and 90s of the XX century, the company experienced intense growth, which was associated with the invention and sale of new popular drugs.

In 2000, Pfizer merged with Warner-Lambert and acquired all rights to Lipitor (atorvastatin).

In 2005, Pfizer was one of 53 companies that supported the inauguration of George W. Bush with a maximum amount of \$ 250,000.

Most of Pfizer's manufacturing facilities division were sold to Johnson & Johnson company in June 2006 for \$ 16.6 billion. The deal included brands such as Listerine, Visine, Neosporin, Zantac, and Nicorette.

On November 23, 2015, Pfizer agreed with the Irish company Allergan for the largest merger in the industry's history. The deal was valued at \$ 160 billion. As stated in the companies' press release, the value of Allergan shares in the deal was estimated at \$ 363.63, or 11.3 Pfizer shares. The premium to the quotes of both companies' securities at the close on October 28 (before the rumors about the deal) was about 30%. On April 6, 2016, the companies announced that they had abandoned the deal, and Pfizer paid the Irish company about \$ 400 million in costs. The deal was abandoned under pressure from the US Treasury and the US presidential administration in the fight against corporate tax evasion; if the deal was concluded, the combined company would be registered in Ireland and would not pay taxes in the United States.¹⁰

In 2020, the company's revenue increased by 2% compared to 2019, to \$ 41.9 billion, and net profit - by 16%, to \$ 12.5 billion.

3.5.2 Pfizer's current state of business affairs

Pfizer is a huge pharmaceutical company with a market capitalization of \$ 193,75 billion and annual revenues of \$ 47,5 billion.¹¹

Revenue is in the lateral. In 2010 there was a rise, but since then, in essence, nothing has changed. Since the end of 2018, a relatively gradual decline in indicators has been seen. Now the revenue is in the region of 47,5 billion and this revenue is essentially close to the revenue of 2008. In fact, in 10-12 years, the Pfizer company did not increase its revenue.¹²

¹⁰ Retrieved from: <https://www.britannica.com/topic/Pfizer-Inc>

¹¹ Retrieved from: <https://finviz.com/quote.ashx?t=pfe>

¹² Retrieved from: <https://www.macrotrends.net/stocks/charts/PFE/pfizer/revenue>

According to analysts' forecast, revenue will increase in 2021 and surpass any year in the last five years.

If you look at earnings per share, there has been a steady increase in earnings over the past five years, which stopped in 2018. In 2019 it began to decline, and the company closed this year worse than analysts' expectations. In 2021, judging by analysts' expectations, a fairly good earnings of \$ 3.36 per share and a slight decline in 2022.¹³

Regarding the balance sheet, the company is doing quite well: the cash covers the debt by 17%, the debt load is moderate, at 63 percent, the debt-to-EBITDA is high, but the interest coverage is normal-7.7. The debt to equity is less than 1. This cannot be called an ideal balance, but in principle, no problems are visible. Operating margin 21%, net margin - 23%, return on equity 15%.¹⁴

What else is interesting about the Pfizer company? The fact that the company pays great dividends. The current dividend yield is around 4.5%, and the payout ratio is below 50%. That is, the company pays less than half of its net profit in the form of dividends. This year the company once again raises dividends, and it has been raising dividends for 11 years already. That is, from the point of view of dividends, the company may be quite interesting.¹⁵

Another very positive point about the company is vaccines. They will be able to earn at least \$ 15 billion from vaccines in 2021, and maybe more. They have already provided 65 million doses of vaccines worldwide, another 29 million doses in the US. They expect to ship 200 million in the US by the end of May. However, they could potentially deliver up to 2 billion doses by the end of 2021. That is, this is the maximum potential opportunity for a company to make money. Pfizer's vaccine-driven revenue and profit growth in 2021 could be outstanding. It turned out that the vaccine from this company prevents other people from re-infection from vaccinated people. It is also effective against South African virus strains and new virus strains registered in the UK. For this reason, analysts' forecast for 2021 is quite optimistic in terms of the company's profit and revenue.

It is also worth noting that the company has significantly increased the number of drugs that go from the first phase of testing to 21% approval in the entire industry. The company has a fairly large Pipeline (95 drugs, 24 of them are in the third phase, and 9 drugs are in the registration phase and approval). Looking at the company's income statement, we see that

¹³ Retrieved from: <https://seekingalpha.com/symbol/PFE>

¹⁴ Retrieved from: <https://www.gurufocus.com/stock/PFE/summary>

¹⁵ Retrieved from: <https://seekingalpha.com/symbol/PFE>

revenue and earnings per share have increased. Management says they will have revenue growth over the next few years (at an average rate of 6% per year) and earnings per share growth (at an average rate of 10% per year). The forecasts are generally optimistic.

Table 2 Values of Pfizer

Location	New York, USA
Founded	1849
Key people	Albert Bourla (CEO)
Market capitalization	US \$ 193,75 trillion
Volume	US \$ 24,4 million
Exchanges	New York Stock Exchange

Source: finviz.com

3.6 AbbVie Inc. (ABBV)

AbbVie is an American biopharmaceutical company. AbbVie came about by splitting Abbott Laboratories into two public entities, first focusing on medical products and second focusing on research pharmaceuticals. The medical device manufacturer retained the Abbott name, and the pharmaceutical company became AbbVie. On January 2, 2013, the company was officially listed on the New York Stock Exchange.

AbbVie is led by Richard A. Gonzales, who was formerly Executive Vice President of Pharmaceuticals. He also served as President and Chief Operating Officer of Abbott before his retirement in 2007.¹⁶

3.6.1 History of AbbVie

AbbVie Inc. its history begins in 1888, with the Abbott company, founded by Dr. Wallace Abbott, a native of Chicago. Over the decades, the company has managed to take a prominent place in the healthcare industry. Abbott Laboratories produces medicines and baby and medical food, instruments and texts for medical diagnostics, and medical equipment. The company operates in more than 150 countries around the world. In these countries, its products are popular and in good demand.

The very same company AbbVie finally stood out from the "parent" in 2013. The official date of foundation is January 1, 2013. The headquarters of the company is located in Illinois.

As a "dowry", the new company from Abbott received the drug for the treatment of rheumatoid arthritis Humira. It is he who, from the very foundation of the company, has made the main

¹⁶ Retrieved from: <https://www.abbvie.com/our-company.html>

contribution to the company's sales. In the first quarter of 2013, AbbVie sales increased 3.7% to \$ 4.3 billion, driven by a 16% increase in Humira sales to \$ 2.2 billion. This trend continued in 2014: sales increased by 5.9% to \$ 19.9 billion, Humira sales increased by 11% to \$ 12.5 billion.

In 2014, AbbVie intended to buy the Irish pharmaceutical manufacturer Shire for \$ 54 billion. However, in the end, management decided to abandon the deal. The company said that changes in US tax laws regarding inversion transactions, which occurred shortly before the purchase was completed, significantly affected Shire's value to AbbVie, as the primary purpose of the purchase of Shire was to reduce tax payments by moving the company's headquarters to the UK.

In early 2015, AbbVie announced the purchase of Pharmacyclics and its innovative blood cancer treatment product Imbruvica for approximately \$ 21 billion.

As of December 2015, the company employed over 28,000 people worldwide and has provided products to individuals in over 170 countries.

In March 2020, as the COVID-19 pandemic escalated into an international crisis, the Israeli government announced it would force AbbVie to license its patents for Kaletra, the brand name for lopinavir/ritonavir, a fixed combination drug for the treatment and prevention of HIV or AIDS that believed to can be used to combat COVID-19. In response, AbbVie announced that it would ultimately end the use of its patents for the drug.¹⁷

3.6.2 AbbVie's current state of business affairs

AbbVie is a large biopharmaceutical company with a market capitalization of \$ 189 billion. Sales of \$ 46 billion, at the Pfizer level. But if you look at the company's price chart, it is relatively high. That is, in 2019-2020, the price tags were much lower. The company is now trading at about \$ 108 per share.¹⁸

In 2019-2020, the company's debt grew significantly. Debt coverage by the cash is quite low - 10%. The company's debt load is very high - 90%. Debt to equity ratio 6,8. Debt EBITDA-5,7. Based on these data, the author can say that the company is heavily indebted and has a very high debt burden. However, the company still manages to cover its debt payments (interest coverage 4,85).¹⁹

¹⁷ Retrieved from: <https://www.abbvie.com/landing/a-history-of-impact.html>

¹⁸ Retrieved from: <https://finviz.com/quote.ashx?t=ABBV&ty=c&ta=1&p=d>

¹⁹ Retrieved from: <https://www.gurufocus.com/stock/ABBV/summary?search=abbv>

If you look at the forecasts, you can see that the company's revenue is growing, and in 2021-2022 it is planned to increase revenue and profit. For P/E, even with the current price, the score is very low- 8,5.

The company is doing well with dividends. The company, since its separation from Abbot lab., has consistently paid and increased its dividends. Because the company inherited dividend payments from its parent company, it has been able to increase its dividend annually, which it has been doing for the past 40 years. The company's current dividend yield is around 4,8%, and the payout ratio is below 43%.²⁰

The company has a drug called Humira. It is one of the market leaders (a drug for the treatment of rheumatoid arthritis). However, the drug accounts for the majority of the company's revenue. In the fourth quarter, almost \$ 5 billion out of 14 is this drug. What is the problem? In 2023, the patent expires in the United States. Other drugs will replace Humira, which is the largest drug, then the proceeds will fall out. But on the other hand, in the same area, they have interesting new drugs, Skyrizi and Rinvoq, which are growing very well. Their growth is projected to 10, every year until 2023. Perhaps these drugs will help replace the lost revenue from Humira.

The company's pipeline is very diverse. The company has many drugs in oncology (about 20), but most of them are at the first stage of development. There is also a reasonably large pipeline in neuroscience (Alzheimer's and Parkinson's) - 9 drugs. After the takeover of Allergan, aesthetic medicine, gastroenterology, and general medicine have also emerged.

Table 3 Values of AbbVie

Location	Lake Bluff, Illinois, USA
Founded	2013
Key people	Richard A. Gonzalez (CEO)
Market capitalization	US \$ 188,61 trillion
Volume	US \$ 4,66 million
Exchanges	New York Stock Exchange

Source: finviz.com

3.7 Merck & Co. Inc. (MRK)

Merck is the world's oldest chemical and pharmaceutical company, founded in 1668 in Germany.

²⁰ Retrieved from: <https://seekingalpha.com/symbol/ABBV>

Today "Merck" is one of the leading scientific and technological companies in the field of healthcare, life science, and high-tech materials.

The company designs, develops, and manufactures innovative prescription drugs, including biologics and vaccines, that help maintain and improve people's health. The company's portfolio includes drugs to prevent and treat cancer, diabetes mellitus, hepatitis C, HIV infections, autoimmune inflammatory and respiratory diseases, and also diseases of the circulatory system.²¹

3.7.1 History of Merck

The company was founded by Friedrich Merck, a pharmacist who bought the Angel Pharmacy in Darmstadt in 1668. In 1816, a descendant of Frederick, Emmanuel, invents a dosage form of morphine and other chemicals and medicines, putting them on the industrial stream at his factory. Gradually, the Merck plant began to produce its pharmaceuticals and chemicals, and raw materials for sale.

Throughout its development and history, the German company changed its names and logos. Merck's American subsidiary, which lost the right to use its original name during nationalization and reverse privatization, became Merck Sharp and Dohme (MSD), and the original Merck group from Germany in the USA and Canada became EMD (Emanuel Merck, Darmstadt). At the beginning of the 20th century, the company produced drugs under the name E. Merck "(Emanuel Merck Darmstadt). Today, the Merck family still controls 70% of the company's shares.

The company's fantastic history includes numerous expansions and acquisitions of various related businesses, which eventually led to the formation of the most considerable concern, The Merck Group, with offices and representative offices in 70 countries and 50 thousand employees. Merck operates in Europe, Africa, Asia, Oceania, and the Americas and includes approximately 250 companies.

The company is known for its commercial monopoly on morphine in the 19th century and held a monopoly on cocaine for a while. There is a well-known collaboration in coca research between Sigmund Freud and the Merck company.

Following Germany's defeat in World War II, Merck received military government approval to manufacture drugs, pesticides, food preservatives, reagents, and fine chemicals for

²¹ Retrieved from: <https://www.merck.com/company-overview/>

laboratory use. Soon after, a boom began known as the "Wirtschaftswunder" (economic miracle). For Merck, this has meant double-digit sales growth over the years.

Merck's current pharmaceutical research focus is on oncology and cardio-metabolic care. Other Merck products include metformin, bisoprolol, levothyroxine, and digitoxin.

In IT technologies, Merck is the pioneer and largest manufacturer of liquid crystals required to produce LCD / TFT displays. Merck has become an extremely skillful manufacturer, which explains why Merck's two production units produced 60% of all liquid crystals worldwide in 2013 in Darmstadt, Germany.

The third major area of the company's current activity is producing pigments for varnishing, printing, and safety technologies (for example, unique pigments used for printing watermarks), pigments for the food industry, pharmaceuticals, and finally, pigments for cosmetics.

Merck also maintains a museum reflecting the physical history of its products.²²

3.7.2 Merck's current state of business affairs

Merck is a company with a market capitalization of \$ 187 billion and sales of \$ 48 billion.²³

In terms of revenue, we see that there has been no growth for the last ten years. Moreover, there was a drawdown, which is only now beginning to recover.²⁴

On the other hand, the forecasts are quite interesting: 2021 and 2022 will show a smooth growth in revenue.

Earnings per share in 2021 will be higher than in the last five years, and according to this indicator, the company does not look bad. Even though the company closed 2020 in terms of earnings per share worse than analysts' expectations, the smooth growth of earnings per share is awe-inspiring.²⁵

According to the current estimate of P/E, the company is not expensive in principle - 11.6; 2022 -10.5, and 2023-10. That is, in principle, the company is now trading relatively cheaply.

If you look at dividends, the company has a reasonable dividend yield of 3.5%, a payout ratio of 40%, and pays less than half of the profit in the form of dividends. For eleven years, it has been consistently increasing its dividends. The company is quite interesting in the dividend strategy.²⁶

²² Retrieved from: <https://www.merck.com/company-overview/history/>

²³ Retrieved from: <https://finviz.com/quote.ashx?t=MRK&ty=c&ta=1&p=d>

²⁴ Retrieved from: <https://www.macrotrends.net/stocks/charts/MRK/merck/revenue>

²⁵ Retrieved from: <https://seekingalpha.com/symbol/MRK>

²⁶ Retrieved from: <https://seekingalpha.com/symbol/MRK>

If we look at the balance sheet, we see that the debt covered by cash is 26%, the debt load is 27%. The debt of EBITDA is relatively low (lower than that of competitors) 2.36, and the coverage of interest payments on debt is already 10. It can be said unequivocally that of all the companies under consideration, Merck is the best company in the industry (compared to Pfizer and AbbVie). The efficiency of return on equity is 26%, which is generally an excellent indicator. The operating margin is 17.7%, net margin- 14.7%, which is not bad either. In general, in terms of indicators, the company looks great.²⁷

What is important to note about this company?

Merck had a problem with the vaccine, the fact that all vaccines showed poor results, and it was the main problem because competitors have a vaccine and Merck does not. However, the company has MK-7110, an anti-inflammatory drug that is intended to treat patients with a severe form of coronavirus. This drug may have quite a promising future, according to analysts. However, Merck's earnings per share are worse than expected, and this is mainly due to the coronavirus pandemic.

The Merck portfolio's primary drug is Keytruda, which sales grew by 28% in the fourth quarter, and by 30% in 2020. Now it is the drug with the highest revenue for the company. It is a cancer drug. Analysts predict that this drug will become the world's best-selling drug by 2024. This is one of the main things that you can bet on in the company.

Another important thing is that Kenneth Frazier will step down as CEO (June 30, 2021) and will be replaced by CFO Robert Davis.

Let's look at the company's portfolio of drugs. The company's portfolio is quite extensive: in the second phase of clinical trials, it has 31 programs, on the third - 25, and already on approval - 3. Furthermore, they have an outstanding portfolio of oncology and veterinary medicine. That is, it may be in these industries that Merck will develop well. If the Keytruda drug becomes the most widely used drug in 2024, that is, the top drug for cancer, then Merck has very excellent prospects in this regard. Moreover, at the current price tag, taking into account the current estimates of P/E, it seems that Merck is a rather interesting company.

²⁷ Retrieved from: <https://www.gurufocus.com/stock/MRK/summary?search=mrk>

Table 4 Values of Merck

Location	New Jersey, USA
Founded	1917
Key people	Kenneth Frazier (CEO)
Market capitalization	US \$ 186,38 trillion
Volume	US \$ 12,57 million
Exchanges	New York Stock Exchange

Source: *finviz.com*

3.8 Johnson & Johnson (JNJ)

Johnson & Johnson is an American company, a large manufacturer of cosmetics, sanitary products, and medical equipment. Included in the Fortune 1000²⁸ list. Headquarters is in New Brunswick, New Jersey (USA).²⁹

3.8.1 History of Johnson & Johnson

The history of Johnson & Johnson began with Sir Joseph Lister, a famous English surgeon. He identified bacteria in the air of operating rooms that cause infectious diseases. Robert Wood Johnson was one of those who attended Lister's 1876 talk and did not question his theory of surgical antiseptics.

After that, for several years, Johnson pondered the possibility of practical use of Lister's theory. He had the idea of creating a new type of dressing material that would be sterile, convenient, and ready to use without the patient's risk of infection. To bring these ideas to life, Robert and his brothers James and Edward founded Johnson & Johnson in Brunswick, New Jersey, in 1885.

Active research began. The first products of the company were improved plasters containing medications mixed with an adhesive. Soon an innovative type of dressing was developed and introduced to the market.

Johnson & Johnson has also actively promoted antiseptic surgical procedures.

In 1890, thanks to Fred B. Kilmer, one of the most famous "Johnson & Johnson" products appeared - talc.

²⁸ Fortune 1000 is a list compiled by Fortune Magazine of the 1,000 companies with the highest revenue in the United States ranked.

²⁹ Retrieved from: <https://www.jnj.com/about-jnj>

In 1897, the company made another invaluable contribution to surgery's history - it offered an improved sterilization technique when applying catguts (absorbable sutures from the small intestine of small ruminants).

In 1910, the company's first president, Robert Wood Johnson, died. His brother James, who headed the company until 1932, took over as president.

The international expansion of the company began in 1919 with the opening of a branch in Canada.

In 1936, General Johnson created the Johnson & Johnson Charitable Foundation, which included caring for the poor with chronic diseases, fighting against drug dependence, smoking, and obesity in children and adolescents.

During the 1950s, the company faced the need to diversify its business. It began to expand its activities into the pharmaceutical industry.

One of the first acquisitions was McNeil Laboratories Inc., which introduced the well-known pain reliever Tylenol to the market.

General Johnson soon resigned as chairman of the board of directors of Johnson & Johnson in 1963.

For ten years, from 1989 to 1999 Johnson & Johnson has grown by 44 companies and product lines.

In 1996, Johnson & Johnson was awarded the National Medal of Technological Achievement in recognition of its excellence in the development of cutting-edge technology.

Today Johnson & Johnson is widely recognized for its brand names "Johnson's baby", "pH 5.5", "CareFree", and "o.b." worldwide.³⁰

3.8.2 Johnson & Johnson's current state of business affairs

Johnson & Johnson is a company with a market capitalization of \$ 410 billion, more than double the previous companies reviewed. The sales volume is also two times higher - \$ 82 billion.³¹

The revenue over the past ten years shows that there was a drawdown in 2016-2018, but it quickly recovered in mid-2018 and is now growing smoothly.

The company's forecasts are also optimistic: 2021 and 2022 will show smooth revenue growth.

³⁰ Retrieved from: <https://ourstory.jnj.com/timeline>

³¹ Retrieved from: <https://finviz.com/quote.ashx?t=JNJ&ty=c&ta=1&p=d>

Earnings per share, according to analysts' forecasts, in 2021, will be higher than in the last five years, and according to this indicator, the company looks good. It is also a positive indicator that the company, in terms of earnings per share, closes every year.

If you look at dividends, the company has a lower dividend yield of 2.5% (compared to the other three companies in question), a payout ratio of 42.5%. It pays out less than half of its profits in dividends. The company has a relatively long history and has been consistently increasing and paying its dividends for 58 years. In terms of the dividend strategy, the company is exciting.³²

If we look at the balance sheet, we will see that the debt at the expense of cash is 71%, the debt load is 36%. Debt EBITDA is low (lower than that of competitors) 1.47, and the coverage of interest payments on debt is very high - 99. It can be unequivocally said that JNJ has the best performance in the industry (compared to Pfizer, Merck, and AbbVie). The efficiency of the return on equity is 24%, which is generally an excellent indicator. The operating margin is 24%, net margin is 18%, which is also the best result among the companies in question. Overall, the company looks great in terms of performance.³³

The company's pipeline is also promising. The company is currently developing more than 50 drugs, and most of them are already being considered at the third stage of development. The main development area is cancer drugs, which occupy half of the company's portfolio (24 drugs).

On a par with other pharmaceutical companies, JNJ has also developed a coronavirus vaccine. Results from a Phase III clinical trial of the vaccine indicate that the drug reduces the risk of moderate to severe covid disease by 66 percent after four weeks of vaccination.

Table 5 Values of Johnson & Johnson

Location	New Jersey, USA
Founded	1886, January
Key people	Alex Gorsky (CEO)
Market capitalization	US \$ 410,21 trillion
Volume	US \$ 6,29 million
Exchanges	New York Stock Exchange

Source: finviz.com

³² Retrieved from: <https://seekingalpha.com/symbol/JNJ>

³³ Retrieved from: <https://www.gurufocus.com/stock/JNJ/summary?search=jnj>

3.9 Factors of stock's technical analysis

An active trader is interested in supply and demand, what drives the stock price at the moment, and technical analysis helps him in this. The Dow Theory states that the market considers everything: basic information, news, and even what will happen in the future. That is, there is no point in poking around in various ratios and numbers. You just have to look at the stock chart to conclude buying, selling, or staying with your own.

What should you look for in this type of stock market analysis? First of all, these are price dynamics and trading volume. They are the only objective indicators of a stock. Further, traders use all kinds of graphical elements, indicators, and more.³⁴

3.9.1 Stock technical analysis indicators

The indicators used by traders in the technical analysis of issuers' stocks are nothing more than various mathematical functions. They are calculated based on previous trading sessions and use statistical data on value and trading volume changes. As a rule, they are based on the averaging method; that is, the calculation is made without considering external factors affecting trade. This is the main drawback of technical indicators.

Indicators can typically be split into two different types: lagging indicators and leading indicators.

Lagging indicators, as the name suggests, lag the price movement.

The information and data these indicators show develop and changes as the result of past price movement. These indicators are typically the ones a trader would use to supplement their analysis of a market. Indicators such as Moving Averages and Bollinger bands are considered to be lagging indicators.

Leading indicators confusingly still lag price (as sadly there are not any indicators that truly lead price). However, they are referred to as leading indicators as they are usually used to suggest that a particular price move is likely to happen. That is why these indicators are often used as entry and exit signals for trades. Oscillating indicators such as the Relative Strength Index, Stochastic oscillator, and Moving Average Convergence Divergence are considered to be leading indicators. It is generally accepted that a trader does not need to use any more than one lagging and one leading indicator as part of their analysis and strategy because they have

³⁴ Taylor, M. P., & Allen, H. (1992). The use of technical analysis in the foreign exchange market. *Journal of international Money and Finance*, 11(3), 304-314.

the same purpose. Two or more could potentially give conflicting analyses. Therefore, the author uses two different types of indicators in this analysis: Moving Averages and Moving Average Convergence Divergence.³⁵

3.9.2 Moving averages (MA)

Moving averages smooth out the price data: the smooth line represents the average price over a period of time. Which moving average will be used depends on the chosen time frame for trading. For investors who implement long-term strategies (including those built around substantial and long-term trends), there are 200, 100, and 50-day moving averages.

There are several ways to use these indicators. One of them is to analyze the angle of the moving average. If the line runs horizontally for a long time, then this means that the asset price does not have a pronounced trend; it is within certain limits ("sideways" in terms of exchange traders). If the line is at an angle, then there is a trend - upward or downward, depending on the direction.

The critical point is that moving averages cannot be considered a tool that can somehow predict an asset's future behavior. The indicator only shows what happens to the price, on average, over a specific period.

It is generally accepted that if the price is above the moving average, then this is an upward trend, and vice versa, if the price is below the moving average, then this is a downward trend. Moreover, the higher the period, the more long-term trend.

The crossing of lines is another way to use this indicator, and it is most often used for trading. When the fast-moving average crosses the slow one upwards, it is a buy signal. Conversely, when the fast-moving average crosses the slow one downwards, it is a sell signal.³⁶

3.9.3 Moving average convergence divergence (MACD)

MACD is an indicator developed by Gerald Appel based on the ratio of moving averages. It has the form of a graph and a histogram. The chart shows a signal line calculated as a smoothing moving average - the difference between exponential moving averages over short and long periods. And the histogram is the difference between MACD and signal. If the MACD curve

³⁵ Bauer, R. J., & Dahlquist, J. R. (1998). *Technical Markets Indicators: Analysis & Performance* (Vol. 64). John Wiley & Sons. ISBN: 0-471-19721-1

³⁶ Bauer, R. J., & Dahlquist, J. R. (1998). *Technical Markets Indicators: Analysis & Performance* (Vol. 64). John Wiley & Sons. ISBN: 0-471-19721-1

is above the signal line, it is a buy recommendation; if it is below it then it is a sell recommendation.³⁷

³⁷ Bauer, R. J., & Dahlquist, J. R. (1998). *Technical Markets Indicators: Analysis & Performance* (Vol. 64). John Wiley & Sons. ISBN: 0-471-19721-1

4 Practical Part

This part of the dissertation analyzes Pfizer, AbbVie, Merck, and Johnson & Johnson's stocks. The author will conduct a technical analysis of the selected stocks. The indicators for this analysis will be the Moving Average and Moving Average Convergence Divergence, which will help assess the stock's latest and future performance. To build the graph, the author uses the software available on the investing.com website. This software provides a powerful technical analysis tool and is available for free use on this web page.

4.1 Technical analysis of PFE

The first stock for which the author will conduct technical analysis will be Pfizer's stock. First, a graph with moving averages will be built, and then with the MACD indicator.

4.1.1 Moving average (MA) of PFE

For the analysis, the author will apply the moving average crossover theory. For the fast-moving average, 20 days will be used (blue line), and for the slow-moving average, 200 days (orange line).

A one-day interval was used to build the graph during the last year (from March 10, 2020 to March 10, 2021).

The author used an exponential moving average since this type of moving average response more quickly to price changes. It also distributes more weight for the current period and less for the average, and as a result, displays a faster change in trend and price.

Figure 2 Moving average of PFE



Source: investing.com, constructed by the author

As you can see from the chart, the price is now relatively low. The price went up several times on the news about the Covid-19 vaccine, and this was in November and December 2020. However, since then, there has been a fairly significant decline in quotations for Pfizer shares. For convenience, the point at which the fast-moving average crosses the slow one upwards is indicated by the author using green arrows. Otherwise, red arrows were used. Considering the theory, the points indicated by the green arrows should serve as a signal to buy, and the red ones - to sell. Judging by the graph, this trend is visible, but the trend is changing rather quickly. Also, the price has been in a positive trend for a short time.

4.1.2 Moving average convergence divergence (MACD) of PFE

For the second part of the Pfizer's technical analysis, the author uses the MACD indicator. A day interval was also used to build the graph over the past year (March 10, 2020-March 10, 2021).

Figure 3 Moving average convergence divergence of PFE



Source: investing.com, constructed by the author

By building a default chart using a website, it can be seen that a histogram with two lines appeared under the price graph. The blue line shows the difference between moving averages. An orange line on the histogram is a signal line. According to the theory, when the MACD is over the signal line, then this is a signal to buy, otherwise, to sell. For convenience, the author used vertical lines to check whether this theory works. Green lines were carried out through the points where crossing the MACD curve and the signal line should be a signal to buy. Red lines are carried out through the points where the curves' intersection should be a signal to sell. Looking at the schedule, it is clear that this trend is visible everywhere very well, except for one moment. This moment the author showed by the blue line. In this gap, the intersection of

curves shows that the investor should buy stocks, but then the price begins to fall. This price behavior is associated with the news of the vaccine.

However, in other cases, it can be seen that the theory of intersection of curves is observed and reacts to change prices much faster than the moving averages in the previous subparagraph.

4.2 Technical analysis of ABBV

The second stock to be considered for technical analysis will be the AbbVie stock. As well as with the Pfizer company, the author will conduct an analysis using the moving average and MACD indicators.

4.2.1 Moving average (MA) of ABBV

Also, as with the Pfizer company, the author will apply the moving average crossover theory. In this case, two moving averages also were used with periods of 20 (blue curve) and 200 (orange curve) for this stock. The interval for plotting is the same: one-day, during the last year (March 10, 2020 - March 10, 2021).

Figure 4 Moving average of ABBV



Source: investing.com, constructed by the author

Having built the graph, you can immediately see that this stock's price is more stable (in comparison with Pfizer). By drawing a trend line through the lowest price values (purple line), you can see that the trend is up.

For convenience, on this chart, the intersection points of the moving averages were also indicated with the help of arrows. The green arrows show the intersection, after which the price should rise, and the red arrows - decrease.

As you can see from the graph, this trend is visible. However, unlike Pfizer, AbbVie has a longer positive trend, as indicated by the trend line (purple). And although the price fell from

the end of July to the end of October, it quickly recovered by the middle of November. Since then, the price decrease has been relatively insignificant.

4.2.2 Moving average convergence divergence (MACD) of ABBV

In the following part of the technical analysis of AbbVie, the author will use the MACD indicator. A day interval was also used to build the graph over the past year (March 10, 2020-March 10, 2021).

Figure 5 Moving average convergence divergence of ABBV



Source: investing.com, constructed by the author

The blue line of the built graph also shows the difference between the moving average, and the orange line on the histogram is the signal line. Also, as with the company Pfizer, the author used vertical lines for convenience. Green lines were carried out through the points where the crossing of the curve MACD and the signal line should signal the stock purchasing. Red lines are carried out through the points where the curves' intersection should be a signal to sell. Looking at the chart, it is clear that this trend is visible everywhere quite clearly. However, there are two periods in which these curves intersect too often, and therefore the trend does not remarkably change. The first period is from the beginning of June to the end of July 2020, the second, from the end of August to the end of October (a two-way purple arrow shows both periods). However, in the first case, these intersections are located above the histogram's zero line, and in the second, under it. Therefore, in the first case, the trend continues to increase, and in second-decrease.

4.3 Technical analysis of MRK

The third stock, which the author will analyze in the practical part, will be the Merck company's stock. Two indicators will also be used for analysis: moving average and moving average convergence divergence.

4.3.1 Moving average (MA) of MRK

To apply the moving average crossover theory for Merck, the author uses two moving averages with periods of 20 (blue curve) and 200 (orange curve). The interval for plotting is the same: one-day, during the last year (March 10, 2020 - March 10, 2021).

Figure 6 Moving average of MRK



Source: investing.com, constructed by the author

The first thing that you can pay attention to when drawing a graph is that the price of a Merck share is not stable compared to AbbVie.

The following vital point is that the 200-period exponential moving average curve is located above the price chart in most cases. This is a lousy indicator and indicates that the price is in a negative trend.

On this chart, the author also indicates the intersection points of the moving averages with the help of arrows. The green arrows show the intersection, after which the price should rise, and the red arrows - decrease.

As you can see from the graph, this trend is visible. However, it can be seen that changes in moving averages are lagging behind changes in price. This is especially noticeable after the second red arrow, where the trend should decrease but almost immediately increases. And as soon as the crossing of the moving averages indicates an increase in price (the third green arrow), it starts to decrease again. This was a problem for the investors since, in this case, they could lose money based on this indicator.

4.3.2 Moving average convergence divergence (MACD) of MRK

In the second part of the technical analysis of Merck, the author uses the MACD indicator. A day interval was also used to build the graph over the past year (10 March 2020-10 March 2021).

As with the previous stocks, analyzed in this thesis, the author will show the difference between the moving averages by the blue line and the signal line-by orange. Green vertical lines are carried out through the points where crossing the MACD curve and the signal line should be a signal to purchase. Red vertical lines are carried out through the points where the intersection of the curves should be a signal to sell.

Figure 7 Moving average convergence divergence of MRK



Source: investing.com, constructed by the author

Looking at the graph, it is clear that this trend is visible everywhere quite clearly, as with other stocks. However, here, as with AbbVie, there is a period in which these curves intersect each other too often. This period by the author indicated using a double-sided purple arrow. It is worth noting that even though the price is unstable in this period, but the trend is still positive. The author conducted a local trend line (blue line) to show that the trend increases in this period clearly.

4.4 Technical analysis of JNJ

The fourth and final stock analyzed in this part of the thesis will be the Johnson & Johnson stock. As with previous stocks, the author will use two indicators for analysis: the moving average and the moving average convergence divergence.

4.4.1 Moving average (MA) of JNJ

As with the previous stocks, for the first part of the analysis, the author will apply the theory of moving averages intersection for JNJ. The author uses two moving averages with different periods. The period is 20 (blue curve) for the fast-moving line and for the slow-moving line - 200 (orange curve). The interval for plotting is the same: one-day, during the last year (March 10, 2020 - March 10, 2021).

Figure 8 Moving average of JNJ



Source: investing.com, constructed by the author

The first thing to notice when building a graph is that it is very similar to the AbbVie graph. That is, the stock price is mostly stable, and if you draw a trend line through the lowest price points, you will see that the price trend is increasing.

However, the negative point is that the moving average with a period of 200 showed price fluctuations with a lag, although they were insignificant (these periods are underlined on the chart with red lines).

However, in most moments, this moving average is below the price chart, which indicates an increase in the trend.

On this chart, the author also indicates the moving averages' intersection points with the help of arrows. The green arrows show the intersection, after which the price should rise, and the red arrows - decrease.

As you can see from the graph, this trend is visible. However, it can be seen that changes in moving averages lag behind changes in price, as is the case with other stocks.

4.4.2 Moving average convergence divergence (MACD) of JNJ

The second part of the JNJ technical analysis will contain an analysis through the MACD indicator. A one-day interval will be used to build a graph over the past year (March 10, 2020-

March 10, 2021). The signal line will be shown by the orange curve and the difference between sliding averages by the blue curve. The indicator values are selected by default (EMA 16, 26).

Figure 9 Moving average convergence divergence of JNJ



Source: investing.com, constructed by the author

As with the previous shares, the author spent vertical lines through the intersection points of the curve MACD and the signal line. Red vertical lines are carried out through the points where the curves crossing should serve as a signal to sell, green - to buy.

Looking at the graph, it is clear that this trend is visible everywhere quite clearly, as with other stocks. It is worth noting that the indicator is lagging. However, it reacts faster to a trend change rather than moving averages. This makes it possible for investors to respond faster to price changes. However, if you rely only on this indicator, you can make an erroneous forecast. The chart shows the period in which these two curves intersect too often, but there are no significant changes in the trend, and it continues to grow. This period on the graph is shown by a double-sided purple arrow.

5 Results and Discussion

In this chapter of the thesis, the author will summarize the analysis. Each stock will be considered separately. The results will be constructed using both indicators considered in the thesis's practical part (moving average and moving average convergence divergence). The author will compare both indicators' performance and will give recommendations on whether to buy or sell a share of each of the analyzing companies.

5.1 Results of Pfizer

To summarize the analysis carried out in the practical part, the author will compare both indicators' charts: the moving average and the moving average convergence divergence.

Figure 10 MA and MACD of Pfizer



Source: investopedia.com, constructed by the author

First of all, you should pay attention to the MACD indicator. The signal line on the histogram (orange) is below the MACD curve (blue), which is a buy signal. However, it should be borne in mind that in the period from January 2021, both lines tended to intersect frequently, which does not change the trend significantly, and the value of MACD curve is negative (-0,2). And in this case, there is a possibility that the trend will continue to fall. In support of this, you need to look at the moving averages. If you look at these indicators, you will notice that the fast-moving average is below the slow one, which serves as a sell signal. Also, for reliability, the author will draw local trend lines (purple) through the minimum and maximum price values. As you can see on the chart, the trend is decreasing. Based on all of the above, we can say that the trend is unstable, and the price will continue to fall more likely. In this situation, it is better to refrain from buying.

Result: SELL

5.2 Results of AbbVie

Next, the author will summarize the results of the AbbVie company. For this, the author will also compare the charts of both indicators, the moving average and the moving average convergence divergence, presented in the thesis's practical part.

Figure 11 MA and MACD of AbbVie



Source: investopedia.com, constructed by the author

In this case, you can see a clear picture than in the case of Pfizer. By drawing a trend line (purple) through the minimum price values, you can understand that the trend is positive. The moving average indicator also confirms this. The fast-moving average is eight points higher than the slow one, which also confirms the trend's growth. Also, based on the slow-moving average, which is located under the price chart, we can safely say that the trend will continue to grow.

Result: BUY

5.3 Results of Merck

The third company to summarize the results will be MERC. The author will also compare the moving average and moving average convergence divergence charts presented in the practical part to determine the forecast.

Figure 12 MA and MACD of Merck



Source: investopedia.com, constructed by the author

In this case, it is difficult to determine the price trend from the chart. The only option would be to conduct a local price trend over the past few months. Having drawn two trend lines (purple), through the minimum and maximum price values, you can see that the trend is decreasing. Moving averages also indicate a further decline in prices. The slow-moving average is four points above the price chart, which also contributes to the further price decline. The only refutation of this can be the MACD line, which is located above the signal line. However, the MACD line value is negative (-0.79), and the author cannot rely on this indicator.

Result: SELL

5.4 Results of Johnson & Johnson

The following company to summarize the results will be JNJ. As well as with previous companies (Pfizer, AbbVie, and Merck), the author will compare the moving average and moving average convergence divergence charts presented in the practical part to determine the forecast.

Figure 13 MA and MACD Johnson & Johnson



Source: investopedia.com, constructed by the author

In this case, you can see a clear picture, as in the case of AbbVie. The author also drew a trend line (purple) through the lows of the price. Along the trend line, we can safely say that the trend is positive. The fast-moving average is seven points higher than the slow one, which also confirms the trend's growth. The slow-moving one, in this case, is the support line that pushes the price chart up. This is visible at the point indicated by the green arrow. Looking at the MACD, we can also say that there are all prerequisites for buying shares. Although in the period from the beginning of February, the signal line was above the MACD line. However, the last moment that can be observed shows the intersection of these curves. It can be assumed that further, the MACD curve's value will increase, and the signal line will decrease.

Result: BUY

6 Conclusion

This thesis aimed to study the current state of shares of Pfizer, AbbVie, Merck, Johnson & Johnson and predict their forecast. These goals were achieved through a technical analysis conducted by the author of the thesis. The analysis showed that at the moment, investors should buy shares of AbbVie and Johnson & Johnson and sell shares of Pfizer and Merck. Despite the coronavirus pandemic, which favors a rally in healthcare stocks, one cannot be sure that all stocks in the sector are going up. As Pfizer and Merck's price charts have shown, any stock can now be in an unstable trend. Moreover, it is better to conduct a complete analysis of the stock before purchasing it.

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