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«Investment strategy in the portfolio investment market»

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Abstract

The paper analyzes the market for securities and financial instruments that may be attractive for portfolio investment. Due to the high demand for investing and trading, which is increasing every year, there is also a growing need for understanding the market, its structure and investment opportunities. The key points for investing are diversification and risk. As a result of the work, it will be proved how much diversification reduces the risk of investing. The most attractive portfolio for investment will be based on the distribution of the riskiness of the portfolio, depending on the risk tolerance of the investor himself

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1. Introduction

The need for financial literacy is becoming more and more urgent nowadays. There are more and more players in the investment market due to the great availability of investment instruments such as stocks, derivatives, cryptocurrency, and the latter is now in great abundance. According to KASE data, the total trading volume on KASE in 2022 amounted to 261.6 trillion tenge and increased relative to 2021 by 50.0% or 87.2 trillion tenge (kase.kz 2022). The number of investors is growing and knowledge in the field of finance and investing is increasing, all the same, novice investors are missing the most important detail in investing - diversification. One of the most important points in writing this paper is pore diversification. In this regard, the investment strategy becomes relevant. Even considering that the number of persons trading on the exchange is growing, the number of players who at least recoup their investments is not so much. For trading and investing, you need to have 3 things: trading strategy, money management, psychology (Valeev Renat 2018). For the first two things, it is diversification that is necessary so as not to be in default in the event of high volatility in the market. Often novice investors miss diversification and how volatile the asset is, that is, how risky the asset is. To build an investment strategy, it is necessary to have a clear understanding that investment is a deferral of consumption now in the name of consumption in the future (William Bernstein 2018). Because investing is not a matter of 1 day, but of a long-term perspective. Paul Samuelson, who is an economist and a Nobel laureate in economics, said that you need to be able to wait to invest, and if you need the excitement, then it is worth going to Las-Vegas. And besides, now, the level of confidence in financial institutions is increasing, because there is no longer such a difficult economic situation in which banks go bankrupt, which was in 2008 during the mortgage lending crisis. And all this leads to the fact that there is an increasing need for knowledge of financial and investment opportunities, including an understanding of portfolio diversification.

1.1 Research Question, objective, and hypothesis

Research question:

The underlying problem is that a large number of investors ignore diversification in their portfolio or do it ineffectively. In this regard, the research question is: How effective is portfolio diversification in the context of risky investing, and what benefits can it bring to the investor?

Objective:

1. Determine the role of diversification in the portfolio;
2. Determine the optimal allocation of assets in the portfolio.

Hypothesis:

1. Portfolio diversification leads to risk reduction;
2. With an ideal distribution of assets, return and risk are equal to each other.

1.2 Literature review

Portfolio investing and investing in general has several goals, but the main goal is to make a profit in the future to live comfortably after a certain time, which is stated in the book "Investor's Manifesto". Portfolio investing is not only investing in one instrument, but selecting, diversifying. Regardless of whether investments are made in the same industry, but in different instruments or in general in different sectors of the economy. The optimal number of instruments in the portfolio is 10-15, if you take more, that is, the likelihood of excessive diversification, which will lead to lost profits (Koh 2009). The distribution of funds must be done depending on the age of the investor, the younger he is, the more risks he can afford, given the fact that a young man, in theory, has more years in reserve to make up for losses than an old man, which means a young man can afford to use more risky instruments like stocks, but it is also important what kind of risk the investor is ready to take on, that is, what kind of portfolio the investor will use. And there are only 3 types: aggressive, moderate and conservative portfolio, and diversification is present in all three types, only in different portfolios there is a different share in risk-free instruments. In any case, if you do not do any diversification, then you can get huge profits, for example, by buying Tesla shares in mid-2019, then by the beginning of November 2021 each invested dollar would bring \$ 28, but, unfortunately, such sensational rises the market hasn't seen much. It is the lack of diversification that leads to crises (Turovets O.G. 2016). As the experience of the 2008 crisis, which arose due to the revaluation of mortgage bonds and the lack of diversification, showed, you cannot put all your eggs in one basket. It is those who have invested in various types of financial instruments that have not lost their investments, and some have even received benefits. An example of this is Michael Burry, who made over \$ 700 million for his hedge fund in the 2008 market crash. But the most important thing in portfolio investment is to have a risk-free asset, most often it is a bond. It is the bond that gives the right to a fixed annual or quarterly income. It is also worth considering that the bond market is an order of magnitude larger than the stock market (Zhukov E.F. 2017) In addition, bonds are required to be paid, and only in very rare cases, which the court establishes, payments on bonds can be frozen. To further reduce the risk of losing investments in bonds, an investment in which is in itself a low risk, it is worth taking Treasury government bonds, because the government is the best borrower, which always pays the bills. For example, US Treasury bonds have a yield of approximately 3,5% per annum and have a credit rating of AAA, which means almost about zero probability of default (Bloomberg.com 2021). Also, one of the most important portfolio investment instruments are derivatives such as futures, options, forwards and swaps, which will also help you insure your risks and this will be a kind of safety cushion and will be able to bring profit. The main task of derivatives is to hedge risks. Almost all investors in the world agree to this decision, it was thanks to them that in 2008 a group of investors received a profit of hundreds of percent, while, like the rest, suffered colossal losses. Derivatives are also used as a speculative instrument, but this is a completely different topic for study. The simplest description of the functions of derivatives - buy today, pay tomorrow, that is, I take the underlying

asset today at today's price, and pay the seller after a specified period, for example, in 2 months, and pay at the price that was when the underlying asset was purchased, regardless of what the market price is in 2 months (Gunther Rainer 2005).

1.3 Methodology

The work will use quantitative and analysis, which will help in the construction of models and the formation of an investment portfolio.

Quantitative methods

To start portfolio investing, investor need to understand which instruments are the most relevant in the given market. The most common instrument is equity securities, that is stocks. Then there are debt securities - bonds, treasury bonds, bills. To compile a portfolio, you need to understand the essence of each of the instruments. Equity securities - give the right to own a part of the company, whose shares or shares are acquired. They are risky instruments, but there are also blue chips that have shown their stable growth over several decades. Profitability is calculated based on the number of dividends and value gains. This asset should have higher volatility

Debt securities - have a fixed income, annual or quarterly. It is considered a low drawing instrument, depending on the issuer of the security. The most reliable are the AAA rating (table 2), which indicates a high credit rating. This asset should have lower volatility.

Diversification is important in a portfolio because it reduces the overall risk of an investment by investing in different assets that are not highly correlated. When there are different types of assets in the portfolio, such as stocks, bonds, then changes in one sector or market do not have a significant impact on other assets. Thus, diversification helps reduce risk and increase the likelihood of a stable return over the long term.

The most convenient tool is the universal one. The paper will show the universal distribution of assets for its diversification, and each investor will be able to choose the most suitable portfolio for him, depending on risk tolerance (Table 1). The distribution will be between stocks and bonds.

Table 1 (Asset allocation between stocks and bonds)

| % stocks | % bonds | risk level |
|-----------------|----------------|-------------------|
| 100% | 0% | high risk |
| 90% | 10% | |
| 80% | 20% | |
| 70% | 30% | |
| 60% | 40% | medium risk |
| 50% | 50% | |
| 40% | 60% | |
| 30% | 70% | low risk |
| 20% | 80% | |

| | | |
|-----|------|--|
| 10% | 90% | |
| 0% | 100% | |

Source: compiled by the author

It is assumed that if the portfolio contains more bonds than stocks, this may mean that the portfolio is aimed at capital preservation and a more conservative investment approach. In this regard, the table also shows the distribution of the riskiness of a certain type of portfolio, the more bonds, the less risky the portfolio. Depending on how risky the portfolio is needed for the investor (table 1), he can choose a gradation of instruments, from a portfolio with 100% shares to a portfolio that consists of 100% bonds. It should also be considered here that with a high risk there will be a high profitability, with a low risk, the opposite trend. That is, if an investor has a low-risk portfolio, then the return will be low. Suppose an investor has chosen a portfolio that consists of 100% bonds, these bonds are US Treasury bonds that have a yield of no more than 3-4%, the risk is low, the yield is low, but the return of funds will be 100%, that is, the investor made a portfolio for 10 years, then after 10 years he will receive back the entire amount of the initial investment. Also, it is worth considering the option of high-risk investment, the portfolio of which consists of 100% shares. In this case, the investor will have no restrictions on profitability, it can be 100% per year, but this is a very risky instrument, and there is a possibility that the investor may lose all his investments due to too risky investment instruments.

Also, calculating volatility when building a portfolio is important because it allows you to determine the level of risk of an investment and make informed decisions about how to allocate funds among different types of assets in a portfolio. High volatility is usually associated with large fluctuations in asset prices, which can lead to significant losses for the investor if risk management measures are not taken. The definition of volatility helps the investor to more accurately assess the expected return and risk of investments, as well as to choose the optimal ratio between return and risk in the portfolio. This allows you to create a more efficient and sustainable investment portfolio.

Diversification and volatility are closely related in the context of an investment portfolio. Diversification allows you to reduce the risks in the portfolio by spreading investments among different types of assets, such as stocks, bonds, real estate, etc. If the portfolio contains assets with different volatility, then risks can be reduced due to a more even distribution of risks between assets. In this way, diversification helps reduce the overall volatility of a portfolio because it reduces the impact of individual assets on the overall return of a portfolio. In addition, the calculation of volatility helps to determine which assets are more or less risky, and how much they can affect the overall return of the portfolio. Thus, diversification and volatility calculation are interrelated and can help create a more efficient and sustainable investment portfolio. High volatility implies high risk, which should lead to high returns and vice versa.

To assess the risks and possible income when compiling the investment portfolio, the method of calculating the volatility of assets was used. As a tool for

calculating volatility, a program based on Microsoft Excel was chosen, which made it possible to analyze historical price data. The calculation of volatility was based on a statistical analysis of changes in asset prices and was calculated based on specified parameters over the past 10 years. The results of the volatility calculation were also used to determine the optimal ratio of stocks and bonds in the investment portfolio. Various methods can be used to calculate the volatility of an asset. One of the most common methods is to calculate the standard deviation of an asset's return, which consists of the following steps:

Data collection: The first step is to collect price data for an asset over a certain period. It is desirable to have data for several years to see the change in volatility over time. In our case, we have weekly data for the last 10 years.

Calculating logarithmic price changes: For each day, you need to calculate the logarithmic price change of an asset using the following formula:

$$\ln(P_t/P_{t-1})$$

where P_t is the price of the asset on day t and P_{t-1} is the price of the asset on day (t-1).

Calculation of the standard deviation of the logarithmic price changes: it is necessary to calculate the standard deviation formula in Excel, highlighting all the logarithmic changes

Yearly volatility: You need to multiply the standard deviation by a factor that corresponds to the length of the time period over which the volatility is calculated. The coefficient $\sqrt{52}$ is usually used, since there are about 52 weeks in a year:

$$\sigma \cdot \sqrt{52}$$

where σ is the standard deviation.

Thus, the historical volatility of an asset can be calculated as the weekly standard deviation of the logarithmic price changes multiplied by the coefficient.

Taking into account the credit rating of a stock or bond when compiling an investment portfolio is important, because a credit rating represents an assessment of the creditworthiness and financial stability of a company, state or issuer of securities. When compiling an investment portfolio, investors usually seek to diversify their investments in order to reduce risks and maximize returns. Considering a credit rating helps an investor choose securities with different levels of risk and return that are consistent with his investment strategy and goals. The Standard & Poor rating shown in Table 2.

Table 2 (S&P credit rating)

| Investment Grade | |
|-------------------------|--|
| AAA | Extremely strong capacity to meet financial commitments. Highest rating. |
| AA | Very strong capacity to meet financial commitments. |
| A | Strong capacity to meet financial commitments, but somewhat susceptible to adverse economic conditions and changes in circumstances. |

| | |
|--------------------------|---|
| BBB | Adequate capacity to meet financial commitments, but more subject to adverse economic conditions. |
| BBB- | Considered lowest investment-grade by market participants. |
| Speculative Grade | |
| BB+ | Considered highest speculative-grade by market participants. |
| BB | Less vulnerable in the near-term but faces major ongoing uncertainties to adverse business, financial and economic conditions. |
| B | More vulnerable to adverse business, financial and economic conditions but currently has the capacity to meet financial commitments. |
| CCC | Currently vulnerable and dependent on favorable business, financial and economic conditions to meet financial commitments. |
| CC | Highly vulnerable; default has not yet occurred, but is expected to be a virtual certainty. |
| C | Currently highly vulnerable to non-payment, and ultimate recovery is expected to be lower than that of higher rated obligations. |
| D | Payment default on a financial commitment or breach of an imputed promise; also used when a bankruptcy petition has been filed or similar action taken. |

Source: Guide to credit Rating Essentials (S&P, 2022).

In this research, only AAA to BBB- ratings will be used, because assets rated lower are high risk and have a high probability of default.

Credit rating is also part of the fundamental analysis that will be used in the work. Fundamental analysis is a method of analyzing investment opportunities, which is based on an assessment of the fundamental factors that affect the value of assets. It involves studying financial statements, company performance, industry, economic conditions, and other factors that may affect the price of an asset. One of the main tools of fundamental analysis is company reporting, including balance sheet, income statement, cash flow statement and others.

2. Analysis of the effectiveness of investment strategies in the portfolio investment market

The investment landscape is constantly changing, and investment strategies are no exception. Here are some of the current trends in investment strategies in the portfolio investment market:

Environmental, Social, and Governance (ESG) investing has become increasingly popular in recent years. Investors are increasingly looking for long-term investments that are consistent with their principles. ESG investing entails vetting businesses based on their governance standards, social responsibility, and environmental effect (S&P 2023).

Passive investing: Passive investing, also known as index investing, has gained popularity in recent years. A diversified portfolio of stocks or bonds that closely resembles the performance of a benchmark index is purchased using this technique. Passive investors typically have a long-term investment horizon and seek to minimize costs (James Chan 2020).

Alternative investments: Investors are increasingly turning to alternative investments, such as private equity, real estate, and hedge funds, in search of higher returns and diversification. Alternative investments can provide access to unique opportunities that are not available through traditional investments (CFA, 2023).

Often referred to as systematic investing, quantitative investing makes use of computer algorithms to find investment possibilities based on mathematical models and past data.

These trends collectively imply that diversity, cost-effectiveness, and long-term sustainability are becoming more important to investors. We can anticipate the emergence of new investment strategies as well as the evolution of current ones in response to the shifting demands of investors as technology develops.

As part of portfolio investment, almost any asset can be suitable, but only 2 instruments will be used in the dissertation - stocks and bonds. And the dissertation will use a combination of modern investment trends, and ESG will have a lot of weight, due to the fact that the company's environmental friendliness and its corporate governance is the most important criterion for investment, especially at the present time. Also, strong diversification will be used in the dissertation. Portfolio diversification: A well-diversified portfolio can help to reduce overall risk and volatility. The effectiveness of an investment strategy can be evaluated by how well it diversifies across asset classes, sectors, and geographies. A diversified portfolio can also help to ensure that an investor is not overly exposed to any single asset or sector (Segal Troy, 2022)

2.1 Portfolio overview

At this stage, the portfolios of the most popular investors at the moment will be considered - these are Warren Buffett and Bill Gates in comparison with the S&P 500 index.

Table 3 (Portfolio Berkshire Hathaway, Warren Buffet)

| Stock ticket | Company Name | % of Portfolio |
|--------------|--------------------|----------------|
| AAPL | Apple Inc | 38.90% |
| BAC | Bk Of America Corp | 11.19% |
| CVX | Chevron Corp New | 9.78% |

| | | |
|------|-------------------------|-------|
| KO | Coca Cola Co | 8.51% |
| AXP | American Express Co | 7.49% |
| KHC | Kraft Heinz Co | 4.43% |
| OXY | Occidental Pete Corp | 4.09% |
| MCO | Moodys Corp | 2.30% |
| ATVI | Activision Blizzard Inc | 1.35% |

Source: Bloomberg, 2023

This portfolio is heavily weighted towards Apple Inc, which makes up almost 40% of the portfolio. As a result, the portfolio's performance will be highly dependent on Apple's stock performance. The other holdings in the portfolio are relatively small in comparison, with Bank of America and Chevron being the next largest holdings.

Bank of America and American Express offer exposure to the financial sector, while Chevron provides exposure to the energy sector. Coca Cola is a consumer staples company, and Kraft Heinz is a consumer goods company. Occidental Petroleum provides exposure to the oil and gas industry, and Moody's Corporation offers exposure to the financial data and analytics sector. The portfolio is not very diversified across sectors, with the majority of the holdings being in the technology and financial sectors. This lack of diversification may lead to higher risk if any of the sectors underperform. Overall, this portfolio may be suitable for investors who are bullish on Apple and willing to take on higher risk due to the lack of diversification. The total value of the portfolio is \$299B, only those stocks that have more than 1 percent weight in the portfolio.

Table 4 (Bill & Melinda Gates Foundation Trust)

| Ticker | Company | % Portfolio |
|---------------|----------------------------------|--------------------|
| MSFT | Microsoft Corp. | 26,36% |
| BRK.B | Berkshire Hathaway Inc. | 21,35% |
| CNI | Canadian National Railway Co. | 18,24% |
| WM | Waste Management Inc. | 15,47% |
| CAT | Caterpillar Inc. | 4,93% |
| DE | Deere & Co. | 4,70% |
| ECL | Ecolab Inc. | 2,13% |
| WMT | Walmart Inc. | 1,20% |
| KOF | Coca-Cola Femsa SAB de CV | 1,18% |
| WCN | Waste Connections Inc | 0,80% |
| FDX | FedEx Corp. | 0,74% |
| CCI | Crown Castle International Corp. | 0,54% |
| CPNG | Coupang Inc. | 0,38% |
| SDGR | Schrodinger Inc. | 0,37% |

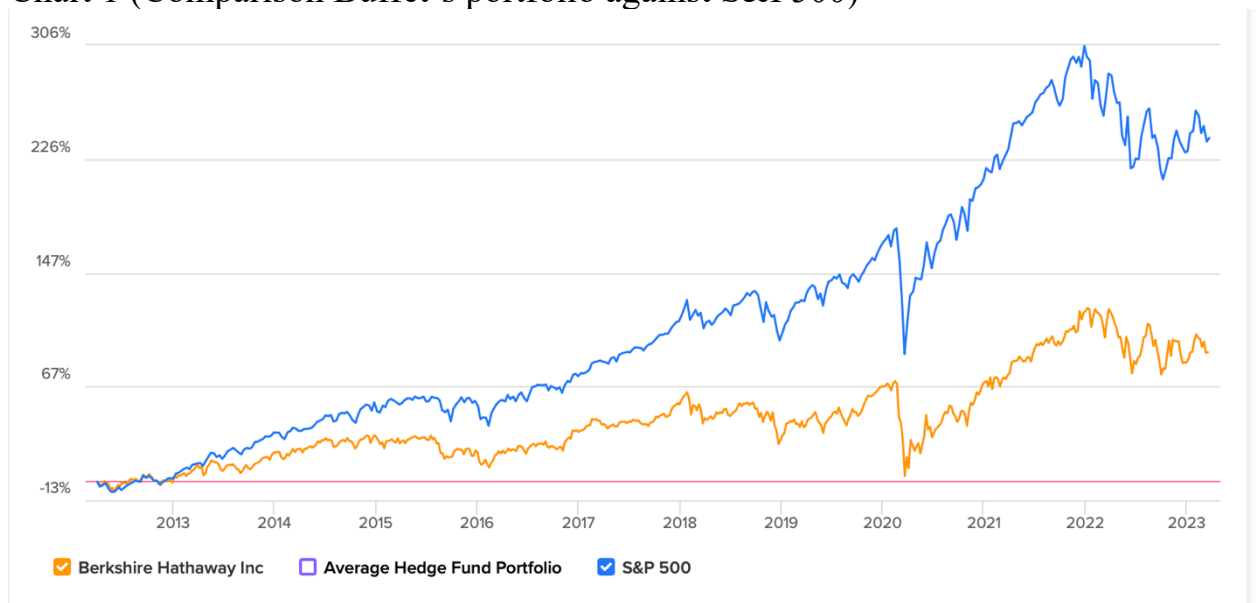
| | | |
|------|------------------------------------|-------|
| UPS | United Parcel Service Inc. | 0,36% |
| KHC | The Kraft Heinz Co. | 0,30% |
| MSGS | Madison Square Garden Sports Corp. | 0,30% |
| DHR | Danaher Corp | 0,28% |
| HRL | Hormel Foods Corp. | 0,28% |

Source: Bloomberg, 2023

This portfolio is heavily weighted towards large, well-established companies, with a focus on the technology, industrial, and transportation sectors. Microsoft and Berkshire Hathaway make up a significant portion of the portfolio, which indicates a strong conviction in these companies. Canadian National Railway and Waste Management are also significant holdings, indicating a focus on companies with strong and sustainable business models. Caterpillar and Deere & Co are both in the industrial sector and provide exposure to the global economic cycle, while Ecolab offers exposure to the chemicals industry. Walmart and Coca-Cola Femsa are both consumer staples companies, which tend to be more resilient in economic downturns. Overall, this portfolio appears to be well-diversified across sectors and offers exposure to some of the largest and most established companies in their respective industries. Bill & Melinda Gates Foundation trust portfolio associated with Microsoft and Warren Buffett's Berkshire Hathaway, with a total weight of 47.7%. The total value of the portfolio is over \$35B. At the table only those stocks that have more than 1 percent weight in the portfolio.

Comparative analysis Buffet's portfolio and Bill & Melinda Gates Foundation Trust against S&P 500 over the last 10 years (chart 1,2)

Chart 1 (Comparison Buffet's portfolio against S&P500)

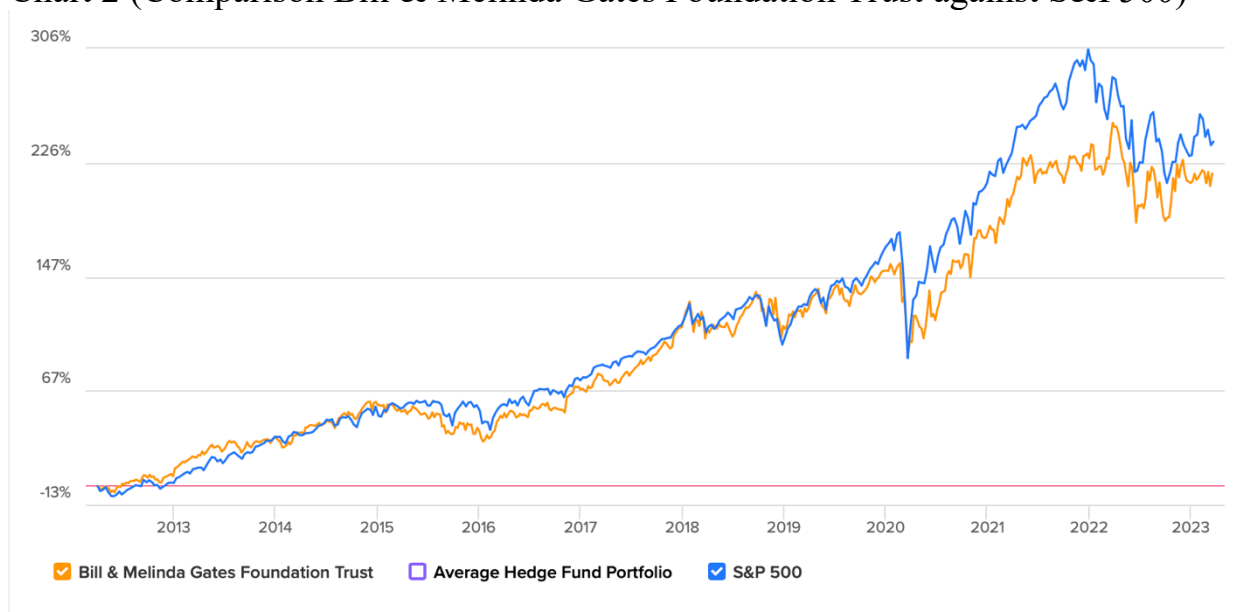


Source: Tipranks, 2023

As can be seen from the chart, the correlation between the index and the portfolio is direct, if the market rises, then the portfolio rises and vice versa. In general,

Buffett's portfolio is lagging the market, and the graph shows that the market is leading the portfolio.

Chart 2 (Comparison Bill & Melinda Gates Foundation Trust against S&P500)



Source: *Tipranks*, 2023

Like Buffett's portfolio, Bill & Melinda Gates Foundation Trust has a direct correlation with the S&P500, but in terms of returns, Bill Geist's asset value growth is much closer to the market than Buffett's, which indicates a good portfolio diversification, this is especially noticeable in 2020, when the portfolio of Mr. Gates did not react much to the Covid-19 crisis and was more confident than the market, that is, the S&P500. Choosing an optimal investment strategy for use in the portfolio investment market. Bill Gates' portfolio will be used as an object of study in the work, due to the fact that it is much closer to the market (S&P500) than Warren Buffett's portfolio.

Choosing an optimal investment strategy for investors in the portfolio investment market depends on several factors such as the investor's risk tolerance, investment objectives, time horizon, and market conditions. Here are some steps that investors can take to choose the best investment strategy:

Determine investment objectives and risk tolerance: The first step in selecting an investment strategy is to determine your investment objectives and risk tolerance. This includes understanding your financial goals, such as saving for retirement, funding a child's education, or purchasing a home. Additionally, understanding your risk tolerance will help you determine the level of risk you are willing to take on to achieve your investment goals.

Consider asset allocation: Asset allocation is the process of dividing your investment portfolio across different asset classes, such as stocks, bonds, and cash. The appropriate asset allocation for an investor will depend on their investment objectives, risk tolerance, and time horizon. A well-diversified portfolio can help reduce risk and improve returns.

Monitor and adjust: Once an investment strategy has been chosen, it is important to monitor and adjust the portfolio regularly to ensure it remains aligned with the investor's objectives, risk tolerance, and market conditions.

In summary, selecting an optimal investment strategy involves a combination of determining investment objectives and risk tolerance, asset allocation, investment style, considering market conditions, and monitoring and adjusting the portfolio regularly. It is important for investors to consult with a financial advisor to help them make informed investment decisions.

3. Research findings and analysis

3.1 Stocks

Portfolio overview

The object of the study is primarily the blue chips of the American market, which are included in the Bill & Melinda Gates Foundation Trust.

Table 5 (Investing portfolio)

| Ticker | Company | % Portfolio | Sector |
|---------------|------------------------------------|--------------------|------------------------|
| MSFT | Microsoft Corp. | 26,36% | Information Technology |
| BRK.B | Berkshire Hathaway Inc. | 21,35% | Financials |
| CNI | Canadian National Railway Co. | 18,24% | Transport |
| WM | Waste Management Inc. | 15,47% | Industrials |
| CAT | Caterpillar Inc. | 4,93% | Producer Manufacturing |
| DE | Deere & Co. | 4,70% | Industrials |
| ECL | Ecolab Inc. | 2,13% | Basic Materials |
| WMT | Walmart Inc. | 1,20% | Consumer Defensive |
| KOF | Coca-Cola Femsa SAB de CV | 1,18% | Consumer Discretionary |
| WCN | Waste Connections Inc | 0,80% | Industrials |
| FDX | FedEx Corp. | 0,74% | Industrials |
| CCI | Crown Castle International Corp. | 0,54% | Real Estate |
| CPNG | Coupage Inc. | 0,38% | Consumer Cyclical |
| SDGR | Schrodinger Inc. | 0,37% | Healthcare |
| UPS | United Parcel Service Inc. | 0,36% | Industrials |
| KHC | The Kraft Heinz Co. | 0,30% | Consumer Defensive |
| MSGS | Madison Square Garden Sports Corp. | 0,30% | Communication Services |
| DHR | Danaher Corp | 0,28% | Healthcare |
| HRL | Hormel Foods Corp. | 0,28% | Consumer Defensive |

Source: compiled by the author

The portfolio heavily invested in three sectors: Information Technology, Financials, and Industrials. Microsoft Corp. and Berkshire Hathaway Inc. are the two largest holdings in the portfolio and are both in the Information Technology and Financials sectors, respectively. Waste Management Inc., Canadian National Railway Co., and Deere & Co. are the largest holdings in the Industrials sector. The portfolio also includes smaller holdings in other sectors such as Basic Materials, Consumer Defensive, Consumer Discretionary, Health Care, Communication Services, and Real Estate.

Bill Gates, the founder of Microsoft, is known for his interest in various sectors such as technology, healthcare, energy and education. He has invested a significant part of his fortune in funds, stock indices and other assets. In his portfolio, he has probably chosen stocks that he considers promising, based on his personal experience, knowledge and market analysis. His investments can be directed to companies and industries that he sees as capable of solving global problems such as poverty, disease and climate change. Ultimately, the specific reasons and details behind Bill Gates' stock selections in Bill Gates' portfolio can only be known to himself or his investment team.

3.2 Stocks analysis

At this stage, an analysis of the stocks that are used in the study will be carried out. The analysis consists of a part of fundamental analysis and technical analysis. Also on this excitation, an analysis was made of the volatility of all assets in the expected portfolio, i.e. stocks and bonds.

MSFT

Microsoft is one of the largest transnational companies developing proprietary software for various types of computing equipment - personal computers, game consoles, PDAs, mobile phones and others. The most famous products are the families of Windows operating systems and Microsoft Office applications (microsoft.com, 2023).

Financial indicators of Microsoft are in table 6.

Table 6 (Financial indicators MSFT)

| | |
|--------------------------------|-------|
| Annual volatility for 10 years | 23,7% |
| Credit rating | AAA |
| Net income (billion dollars) | 67,45 |
| Diluted EPS | 8,9 |
| Total debt (billion dollars) | 77,98 |

| | |
|-----|-------|
| P/E | 32,57 |
| ROA | 14,8% |
| ROE | 39,3% |

Source: compiled by the author

Based on the financial indicators provided, the company appears to be performing very well:

An annual volatility of 23.7% over the past 10 years indicates that the investment has experienced significant fluctuations in its returns during that time. This suggests that the investment may be considered more risky or volatile compared to other investments with lower volatility. It is important to note that past volatility does not guarantee future performance and should be used in conjunction with other metrics and analysis when making investment decisions.

Credit rating: The company has a high credit rating of AAA, which suggests that it has a strong ability to repay its debts and is considered a low credit risk.

Net income: The company has reported a high net income of 67.45 billion dollars, which indicates that the company is generating significant revenue and is highly profitable.

Diluted EPS: The diluted earnings per share (EPS) is positive and relatively high at 8.9, which suggests that the company is generating earnings for its shareholders.

Total debt: The total debt of the company is relatively low compared to its net income, which indicates that the company is managing its debt levels well and may have a lower risk of defaulting on its debt obligations.

P/E ratio: The P/E ratio of 32.57 suggests that the market values the company's earnings positively and is willing to pay a premium for its shares.

ROA: The return on assets (ROA) is high at 14.8%, which indicates that the company is generating strong returns from its assets.

ROE: The return on equity (ROE) is very high at 39.3%, which suggests that the company is generating significant returns for its shareholders.

BRK-B

Berkshire Hathaway – American holding company controlled by billionaire Warren Buffett. (berkshirehathaway.com, 2023).

Financial indicators of BRK-B are in table 7.

Table 7 (Financial indicators BRK-B)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 18% |
| Credit rating | AA- |
| Net income (Billion dollars) | -22,82 |
| EPS | -10,42 |
| Total debt (Billion dollars) | 127,68 |

| | |
|-----|---------|
| P/E | -30,523 |
| ROA | -1,84% |
| ROE | -4,43% |

Source: compiled by the author

Based on the financial indicators provided, here are some observations:

An annual volatility of 18% for Berkshire Hathaway over a 10-year period suggests that the stock price of the company has been relatively stable over the period. Lower volatility indicates that the price of the stock has not fluctuated much over time, which may be an attractive quality for some investors seeking more stable returns. However, it's important to note that past performance is not a guarantee of future results, and other factors such as economic conditions and company-specific events can influence the stock's volatility in the future.

Credit rating: The AA- credit rating is a good rating, indicating that the company has a low default risk and is considered a relatively safe investment.

Net income: The company has a net loss of -\$22.82 billion, which is a negative sign. It indicates that the company is not generating enough revenue to cover its expenses and is operating at a loss.

EPS: The earnings per share of -\$10.42 is a negative sign. It indicates that the company is generating a loss per share, which is not beneficial for the investors.

Total debt: The company has a high total debt of \$127.68 billion, which is a concern as it could be challenging to manage the debt effectively.

P/E: The negative P/E ratio of -30.523 indicates that the company is currently not profitable and its stock may be overvalued.

ROA: The negative return on assets (ROA) of -1.84% is a negative sign. It indicates that the company is not efficiently utilizing its assets to generate profits.

ROE: The negative return on equity (ROE) of -4.43% is also a negative sign. It indicates that the company is not generating enough profits to cover the cost of its equity.

CNI

The Canadian National Railway Company is the largest railway network in North America, located in Canada and the United States with a total track length of over 30,000 km (cn.com, 2023). Financial indicators of CNI are in table 8.

Table 8 (Financial indicators of CNI)

| | |
|--------------------------------|-------|
| Annual volatility for 10 years | 21% |
| Credit rating | A- |
| Net income (Billion dollars) | 5.42 |
| EPS | 5,88 |
| Total debt (Billion dollars) | 16.97 |

| | |
|-----|--------|
| P/E | 22.88 |
| ROA | 10.49% |
| ROE | 25.38% |

Source: compiled by the author

Based on the information provided, the asset has an annual volatility of 21% over the past 10 years. This suggests that the asset has experienced significant fluctuations in value over the years.

The credit rating of the asset is A-, which indicates a relatively low credit risk. This is a positive factor for investors as it suggests that the issuer is financially stable and has a strong ability to meet its financial obligations.

The net income of the asset is \$5.42 billion, which is a measure of the company's profitability.

The EPS, or earnings per share, is \$5.88, which indicates the amount of profit that is attributed to each outstanding share of the asset's stock.

The total debt of the asset is \$16.97 billion, which is a measure of the company's debt load. The P/E, or price-to-earnings ratio, is 22.88, which suggests that the asset's stock is relatively expensive compared to its earnings.

The ROA, or return on assets, is 10.49%, which is a measure of how efficiently the company is using its assets to generate profit.

The ROE, or return on equity, is 25.38%, which indicates the rate of return that the company is generating on the equity invested by shareholders.

Overall, the asset appears to have a relatively low credit risk, a strong profitability, and a high rate of return on equity.

WM

Waste Management, Inc., doing business as WM, is a waste management, comprehensive waste, and environmental services company operating in North America. Founded in 1968, the company is headquartered in the Bank of America Tower in Houston, Texas (wm.com, 2023). Financial indicators of WM are in table 9.

Table 9 (Financial indicators of WM)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 18% |
| Credit rating | BBB+ |
| Net income (Billion dollars) | 2.26 |
| EPS | 5.45 |
| Total debt (Billion dollars) | 15.37 |
| P/E | 30.41 |
| ROA | 7.16% |
| ROE | 32.36% |

Source: compiled by the author

Annual volatility for 10 years: This indicates the level of risk associated with the company's stock. Lower volatility means lower risk, but it also suggests potentially lower returns.

Credit rating: This indicates the creditworthiness of the company and its ability to repay its debts. BBB+ is considered a medium investment grade rating, meaning that the company is considered to have a moderate risk of default.

Net income: This indicates the profitability of the company. A positive net income means that the company is generating profits, which is generally seen as a good sign.

EPS: Earnings per share (EPS) is calculated by dividing the company's net income by the number of outstanding shares. A higher EPS indicates that the company is generating more profit per share, which is generally seen as a positive sign for investors.

Total debt: This is the total amount of debt that the company has. A high level of debt can be a cause for concern, as it indicates that the company may have difficulty repaying its obligations.

P/E: The price-to-earnings ratio (P/E) is calculated by dividing the current market price of the stock by the EPS. A higher P/E indicates that investors are willing to pay more for each dollar of earnings, which can be a positive sign if the company is expected to continue to grow.

ROA: Return on assets (ROA) measures how efficiently a company is using its assets to generate profits. A higher ROA is generally seen as a positive sign, as it indicates that the company is generating more profits with its assets.

ROE: Return on equity (ROE) measures how efficiently a company is using its equity to generate profits. A higher ROE is generally seen as a positive sign, as it indicates that the company is generating more profits with its equity.

Overall, this company appears to have a moderate credit rating and moderate profitability, with a high P/E ratio indicating positive investor sentiment. However, the company also has a significant amount of debt, which could pose a risk to investors if the company is unable to meet its obligations.

CAT

Caterpillar Inc. is an American company, one of the world's largest manufacturers of construction and mining equipment (caterpillar.com, 2023). Financial indicators of CAT are in table 10.

Table 10 (Financial indicators of CAT)

| | |
|--------------------------------|-------|
| Annual volatility for 10 years | 29% |
| Credit rating | A- |
| Net income (Billion dollars) | 6,7 |
| EPS | 11,93 |
| Total debt (Billion dollars) | 36 |
| P/E | 16.18 |

| | |
|-----|-----|
| ROA | 8% |
| ROE | 42% |

Source: compiled by the author

Annual volatility for 10 years: this indicates that the company's stock has been subject to relatively high fluctuations in price over the past decade, which may make it a riskier investment compared to companies with lower volatility.

Credit rating: this is a relatively high credit rating, which suggests that the company has a lower risk of defaulting on its debts compared to companies with lower credit ratings.

Net income: this indicates that the company is generating significant profits.

EPS: this suggests that the company is earning a good amount of profit per share of stock.

Total debt: this indicates that the company has a significant amount of debt, which may increase its financial risk.

P/E: this indicates that the company's stock is trading at a relatively low price compared to its earnings per share, which may make it an attractive investment opportunity.

ROA: this indicates that the company is generating a relatively low amount of profit per dollar of assets.

ROE: this indicates that the company is generating a high return on the investment made by shareholders.

Overall, this company appears to be generating solid profits and has a relatively high credit rating, but it also has a significant amount of debt and has experienced relatively high volatility in its stock price over the past decade.

DE

Deere & Company is an American engineering company that manufactures agricultural, construction and forestry equipment (deere.com, 2023). Financial indicators of DE are in table 11.

Table 11 (Financial indicators of DE)

| | |
|--------------------------------|-------|
| Annual volatility for 10 years | 29% |
| Credit rating | A |
| Net income (Billion dollars) | 8.19 |
| EPS | 26.36 |
| Total debt (Billion dollars) | 55.15 |

| | |
|-----|--------|
| P/E | 14.14 |
| ROA | 8.36% |
| ROE | 41.70% |

Source: compiled by the author

Annual volatility for 10 years is 29%, indicating that the stock price has experienced significant fluctuations over the past decade.

Credit rating is A, indicating a relatively low risk of default for the company's debt.

Net income is 8.19 billion dollars, indicating that the company is profitable.

EPS (earnings per share) is 26.36, which means that the company is generating a high level of earnings per share.

Total debt is 55.15 billion dollars, which is a substantial amount of debt.

P/E (price-to-earnings) ratio is 14.14, which means that the stock is relatively cheap compared to its earnings.

ROA (return on assets) is 8.36%, which indicates that the company is generating a reasonable return on its assets.

ROE (return on equity) is 41.70%, indicating that the company is generating a high return on the investment made by shareholders.

Overall, the company appears to be profitable and is generating a high return on investment for its shareholders. However, it has a substantial amount of debt, which may be a cause for concern. The stock is relatively cheap compared to its earnings, which could make it an attractive investment opportunity for value investors.

ECL

Ecolab Inc. is an American corporation headquartered in Saint Paul, Minnesota. It develops and offers services, technology and systems that specialize in treatment, purification, cleaning, and hygiene of water in a wide variety of applications (ecolab.com, 2023) Financial indicators of ECL are in table 12.

Table 12 (Financial indicators of ECL)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 24% |
| Credit rating | A- |
| Net income (Billion dollars) | 1.15 |
| EPS | 4,01 |
| Total debt (Billion dollars) | 9.07 |
| P/E | 45.74 |
| ROA | 5.58% |
| ROE | 16.20% |

Source: compiled by the author

Annual volatility for 10 years: this indicates that the stock price has experienced relatively high fluctuations over the past decade, which could indicate higher risk.

Credit rating: this is a good credit rating, indicating that the company has a relatively low risk of defaulting on its debt.

Net income: this is the amount of profit the company has made over the past year.

EPS: earnings per share is a measure of a company's profitability, indicating how much profit is attributable to each share of stock.

Total debt: this is the total amount of debt the company owes.

P/E: the price-to-earnings ratio is a valuation ratio that compares a company's current share price to its earnings per share. A high P/E ratio indicates that the market has high expectations for the company's future earnings growth.

ROA: return on assets measures how efficiently a company is using its assets to generate profit.

ROE: return on equity measures how much profit a company generates with the money shareholders have invested.

Overall, this company has relatively high volatility and a high P/E ratio, indicating that it may be viewed as a riskier investment with higher growth potential. The company's credit rating is good, and its net income, EPS, ROA, and ROE are all positive, indicating some level of financial stability. The high P/E ratio may indicate that investors have high expectations for future earnings growth, and the high debt levels could be a concern.

WMT

Walmart Inc. is an American company that operates the world's largest wholesale and retail chain operating under the Walmart brand (walmart.com, 2023). Financial indicators of WMT are in table 13.

Table 13 (Financial indicators of WMT)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 20% |
| Credit rating | AA |
| Net income (Billion dollars) | 11.68 |
| EPS | 4,56 |
| Total debt (Billion dollars) | 61.03 |
| P/E | 35.54 |
| ROA | 6.28% |
| ROE | 12.84% |

Source: compiled by the author

Annual volatility for 10 years is 20%, which indicates moderate volatility.

The credit rating is AA, which indicates a very strong capacity to meet financial commitments.

The net income is 11.68 billion dollars, which indicates a healthy financial performance.

The EPS is 4.56, which indicates the company's profitability per share.

The total debt is 61.03 billion dollars, which is a significant amount but may be manageable for the company given its strong credit rating and financial performance.

The P/E ratio is 35.54, which is relatively high and may suggest that the company is overvalued by the market.

The ROA is 6.28%, which indicates that the company is generating a moderate return on its assets.

The ROE is 12.84%, which indicates that the company is generating a moderate return on its equity.

Overall, the company seems to be financially stable with a strong credit rating and healthy financial performance. However, the high P/E ratio may suggest that the company is overvalued by the market and should be approached with caution.

KOF

Coca-Cola FEMSA is a Mexican company of the Coca-Cola system. It operates in 10 Latin American countries, produces, and sells soft and low alcohol drinks, bottled water, and juices (coca-colafemsa.com, 2023). Financial indicators of KOF are in table 14.

Table 14 (Financial indicators of KOF)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 25% |
| Credit rating | A- |
| Net income (Billion dollars) | 20.06 |
| EPS | 0.92 |
| Total debt (Billion dollars) | 81.17 |
| P/E | 131.45 |
| ROA | 6.66% |
| ROE | 16.83% |

Source: compiled by the author

The company has a high annual volatility of 25% over the last 10 years, which indicates that its stock price has been fluctuating significantly over time.

The credit rating of the company is A-, which is a good credit rating and indicates a relatively low credit risk for investors.

The net income of the company is \$20.06 billion, which is a high amount and suggests that the company is profitable.

The earnings per share (EPS) of the company are \$0.92, which is relatively low compared to other companies.

The total debt of the company is \$81.17 billion, which is a significant amount and could be a cause for concern for investors.

The price-to-earnings (P/E) ratio of the company is 131.45, which is very high and indicates that the stock may be overvalued.

The return on assets (ROA) of the company is 6.66%, which is a relatively low return compared to other companies.

The return on equity (ROE) of the company is 16.83%, which is a decent return and suggests that the company is efficiently using its equity to generate profits.

WCN

Waste Connections is a North American integrated waste services company that provides waste collection, transfer, disposal and recycling services, primarily of solid waste (wasteconnections.com, 2023). Financial indicators of WCN are in table 15.

Table 15 (Financial indicators of WCN)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 20% |
| Credit rating | BBB+ |
| Net income (Million dollars) | 853.15 |
| EPS | 3,29 |
| Total debt (Billion dollars) | 7.16 |
| P/E | 41.25 |
| ROA | 5.07% |
| ROE | 12.19% |

Source: compiled by the author

The annual volatility for the past 10 years is 20%, indicating a moderate level of volatility.

The credit rating of the company is BBB+, which is a relatively good credit rating, but still considered to be a medium-grade investment quality.

The net income of the company is 853.15 million dollars, which is relatively low compared to some of the other companies mentioned earlier.

The EPS (earnings per share) is 3.29, which is also relatively low compared to some of the other companies mentioned earlier.

The total debt of the company is 7.16 billion dollars, which is lower than many of the other companies mentioned earlier.

The P/E (price-to-earnings) ratio is 41.25, which is relatively high and indicates that the market has high expectations for future growth.

The ROA (return on assets) is 5.07%, which is relatively low compared to some of the other companies mentioned earlier.

The ROE (return on equity) is 12.19%, which is also relatively low compared to some of the other companies mentioned earlier.

Overall, based on this information, the company seems to have relatively low net income, EPS, and ROA and ROE compared to some of the other companies mentioned earlier, but has a relatively low amount of total debt. The high P/E ratio indicates that the market has high expectations for future growth.

FDX

FedEx Corporation is an American company that provides postal, courier and other logistics services worldwide (fedex.com, 2023). Financial indicators of FDX are in table 16.

Table 16 (Financial indicators of FDX)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 30% |
| Credit rating | BBB |
| Net income (Billion dollars) | 2.99 |
| EPS | 11,61 |
| Total debt (Billion dollars) | 38.09 |
| P/E | 19.67 |
| ROA | 3.68% |
| ROE | 12.15% |

Source: compiled by the author

The company has a relatively high annual volatility of 30% over the past 10 years, indicating a relatively high level of risk in its stock performance.

Its credit rating is BBB, which is a moderate investment grade rating, indicating a moderate level of creditworthiness and default risk.

The company's net income is 2.99 billion dollars, which is a moderate level of profitability.

Its earnings per share (EPS) is 11.61, indicating the earnings generated per share of common stock outstanding.

The company has a total debt of 38.09 billion dollars, which is a relatively high amount compared to its net income.

Its price-to-earnings ratio (P/E) is 19.67, which indicates that investors are willing to pay a premium for its stock compared to its earnings.

Its return on assets (ROA) is 3.68%, indicating that it generates a relatively low amount of profit per dollar of assets.

Its return on equity (ROE) is 12.15%, indicating that it generates a moderate level of profit per dollar of shareholder equity.

Overall, the company seems to have moderate profitability and creditworthiness but a relatively high level of debt, which may increase its financial risk. Its high P/E ratio suggests that investors are willing to pay a premium for its stock, potentially indicating growth prospects for the company. However, its relatively low ROA suggests that it may have difficulty generating profit per dollar of assets.

CCI

Crown Castle Inc (CCI) is a provider of wireless communication infrastructure services (crowncastle.com, 2023). Financial indicators of CCI are in table 17.

Table 17 (Financial indicators of CCI)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 23,09% |
| Credit rating | BBB+ |
| Net income (Billion dollars) | 1.67 |
| EPS | 3,93 |
| Total debt (Billion dollars) | 28.52 |
| P/E | 34.60 |
| ROA | 3.93% |
| ROE | 21.92% |

Source: compiled by the author

Annual volatility for the past 10 years is 23.09%, indicating a moderate level of volatility.

The credit rating is BBB+, which suggests that the company has a good creditworthiness, but may be more susceptible to changes in economic conditions compared to higher-rated companies.

Net income is 1.67 billion dollars, which is a measure of profitability.

EPS (Earnings Per Share) is 3.93, which means that the company's profit is distributed among a certain number of outstanding shares.

Total debt is 28.52 billion dollars, which is the total amount of money the company owes to creditors and lenders.

P/E (Price-to-Earnings) ratio is 34.60, which is a valuation ratio used to determine a company's current share price relative to its per-share earnings.

ROA (Return on Assets) is 3.93%, which measures how efficiently the company is using its assets to generate profit.

ROE (Return on Equity) is 21.92%, which measures how much profit the company generates relative to the amount of shareholder equity.

Overall, the company has moderate volatility and a good credit rating. However, it has relatively low net income and ROA compared to other companies, although it does have a high ROE. The high P/E ratio may indicate that the stock is currently overvalued compared to its earnings.

CPNG

Coupang is a South Korean e-commerce company founded in 2010. Financial indicators of CPNG are in table 18.

Table 18 (Financial indicators of CPNG)

| | |
|--------------------------------|---------|
| Annual volatility for 10 years | 30% |
| Net income (Million dollars) | -92 |
| EPS | -0,05 |
| Total debt (Billion dollars) | 2,4 |
| P/E | 107.53 |
| ROA | -9,68% |
| ROE | -38,33% |

Source: compiled by the author

Based on the given information, this company seems to be performing poorly. It has a negative net income and earnings per share, high volatility, and a high P/E ratio despite its negative earnings. The company also has a high level of debt, which could pose a risk to its financial stability. Additionally, its negative ROA and ROE indicate that it is not generating positive returns on its assets and shareholder equity. Overall, these factors suggest that the company may not be a sound investment opportunity.

SDGR

Schrödinger, Inc. is an international scientific software company that specializes in developing computational tools and software for drug discovery and materials science (schrodinger.com, 2023). Financial indicators of SDGR are in table 19.

Table 19 (Financial indicators of SDGR)

| | |
|--------------------------------|-------|
| Annual volatility for 10 years | 29% |
| Net income (Million dollars) | -100 |
| EPS | -1,42 |
| Total debt (Million dollars) | 76 |

| | |
|-----|---------|
| P/E | -13,1 |
| ROA | -13,23% |
| ROE | -17,95% |

Source: compiled by the author

Based on the information provided, this company has a negative net income and EPS, indicating that it is currently operating at a loss. The high volatility over the past 10 years suggests that the company may be exposed to significant market risk. The total debt of 76 million dollars is a relatively small amount, but it's worth considering the company's ability to service this debt given its negative earnings. The negative P/E ratio suggests that the company is not currently profitable, and investors are not willing to pay a premium for its stock.

The negative ROA and ROE indicate that the company is not generating a return on its assets or equity, respectively. This may be a cause for concern for potential investors as it suggests that the company is not efficiently using its resources to generate profits.

Overall, the negative earnings and low profitability metrics make this company a risky investment and would require a careful analysis of its financial statements, management, and industry outlook before considering an investment.

UPS

United Parcel Service, Inc. is an American express delivery and logistics company (upc.com, 2023). Financial indicators of UPS are in table 20.

Table 20 (Financial indicators of UPS)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 24% |
| Credit rating | A |
| Net income (Billion dollars) | 10.78 |
| EPS | 12,26 |
| Total debt (Billion dollars) | 26.4 |
| P/E | 14.22 |
| ROA | 11.23% |
| ROE | 60.76% |

Source: compiled by the author

The company seems to have a relatively low annual volatility and a solid credit rating of A, indicating a low default risk. Its net income is 10.78 billion dollars, with an EPS of 12.26. The total debt is 26.4 billion dollars, which seems to be a reasonable level given the company's financial position.

The P/E ratio of 14.22 indicates that the market is willing to pay 14.22 times the company's earnings per share, which seems to be a reasonable valuation. The

company has a high ROE of 60.76%, indicating that it generates a significant return for its shareholders. Its ROA is also strong at 11.23%.

Overall, the company seems to be in a good financial position with a solid credit rating, reasonable debt levels, and strong profitability metrics.

KHC

The Kraft Heinz Company is an American food concern that emerged from the merger of Kraft Foods Inc. and H.J. Heinz Company (www.kraftheinzcompany.com, 2023). Financial indicators of KHC are in table 21.

Table 21 (Financial indicators of KHC)

| | |
|--------------------------------|-------|
| Annual volatility for 10 years | 28% |
| Credit rating | BBB |
| Net income (Billion dollars) | 2.42 |
| EPS | 1,95 |
| Total debt (Billion dollars) | 20.18 |
| P/E | 21,07 |
| ROA | 3.44% |
| ROE | 4.89% |

Source: compiled by the author

The company has an annual volatility of 28% for the past 10 years, indicating that its stock price tends to fluctuate significantly.

The credit rating of the company is BBB, which suggests that it has a moderate credit risk.

The company has a net income of 2.42 billion dollars and an EPS of 1.95.

The total debt of the company is 20.18 billion dollars, which suggests that it has a considerable debt burden.

The P/E ratio of the company is 21.07, which suggests that investors are willing to pay 21.07 times the earnings per share for the company's stock.

The company has an ROA of 3.44%, which indicates that it is generating 3.44 cents of profit for each dollar of assets it owns.

The ROE of the company is 4.89%, which indicates that it is generating 4.89 cents of profit for each dollar of shareholders' equity. The ROE is relatively low, which may indicate that the company is not utilizing its equity as efficiently as it could.

MSGs

Madison Square Garden Sports Corp. is an American sports holding company based in New York City (msgsports.com, 2023). Financial indicators of MSGS are in table 22.

Table 22 (Financial indicators of MSGS)

| | |
|--------------------------------|-------|
| Annual volatility for 10 years | 28% |
| Net income (Million dollars) | 82.18 |
| EPS | 3,3 |
| Total debt (Billion dollars) | 1.14 |
| P/E | 60.86 |
| ROA | 5.54% |
| ROE | -57% |

Source: compiled by the author

Based on the provided information, we can see that the company has a moderate annual volatility of 28% over the past 10 years. The net income of the company is 82.18 million dollars, with an EPS of 3.3. The company has total debt of 1.14 billion dollars, which may indicate that it has a relatively low debt burden compared to its earnings.

The P/E ratio of the company is high, at 60.86, which could indicate that the stock is overvalued. The ROA is 5.54%, indicating that the company is generating a modest return on its assets. However, the ROE is negative at -57%, suggesting that the company is not generating a return on shareholder equity. It's worth noting that the negative ROE could be due to factors such as stock buybacks, dividends, or other financial decisions that reduce shareholder equity.

Overall, the company appears to have moderate financials, but the negative ROE and high P/E ratio may be cause for further investigation.

DHR

Danaher Corporation is an American globally diversified conglomerate founded by brothers Stephen and Mitchell Rales in 1984 (danaher.com, 2023). Financial indicators of DHR are in table 23.

Table 23 (Financial indicators of DHR)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 21% |
| Credit rating | BBB+ |
| Net income (Billion dollars) | 6.85 |
| EPS | 9,19 |
| Total debt (Billion dollars) | 20.93 |
| P/E | 25,02 |
| ROA | 6.21% |
| ROE | 14.17% |

Source: compiled by the author

The company has a relatively low annual volatility of 21%, indicating a relatively stable stock price compared to other companies. Its credit rating is BBB+, which is considered a medium-grade investment with moderate credit risk.

The company's net income is \$6.85 billion, and its earnings per share (EPS) is \$9.19. Its total debt is \$20.93 billion, indicating that it has taken on some debt to finance its operations. The P/E ratio is 25.02, which means that the stock is trading at a premium compared to its earnings.

The company has a ROA of 6.21%, which means that for every dollar of assets, it generates 6.21 cents of profit. Its ROE is 14.17%, which means that for every dollar of shareholder equity, the company generates a return of 14.17 cents.

Overall, the company appears to have a solid financial position, with a stable stock price and a moderate credit rating. However, its P/E ratio indicates that the stock may be trading at a premium compared to its earnings. The company's ROA and ROE are relatively strong, indicating that it is generating profits efficiently.

HRL

Hormel Foods Corporation is an American food processing company founded in 1891 in Austin, Minnesota, by George A. Hormel as George A. Hormel & Company (hormelfoods.com, 2023). Financial indicators of HRL are in table 24.

Table 24 (Financial indicators of HRL)

| | |
|--------------------------------|--------|
| Annual volatility for 10 years | 20% |
| Credit rating | A- |
| Net income (Million dollars) | 978.13 |
| EPS | 1,79 |
| Total debt (Billion dollars) | 3.3 |
| P/E | 22.72 |
| ROA | 5.97% |
| ROE | 13.28% |

Source: compiled by the author

Annual volatility for 10 years: this indicates the degree of fluctuation in the company's stock price over the past 10 years, with a lower percentage suggesting a more stable stock.

Credit rating: this is a rating assigned to the company by credit agencies based on their creditworthiness and financial stability. An A- rating suggests the company is considered to have a relatively low risk of defaulting on its debt.

Net income (million dollars): this is the amount of profit the company made in the past year, after deducting all expenses and taxes.

EPS (earnings per share): this is the amount of profit the company made per share of its common stock outstanding. It is calculated by dividing the company's net income by its number of shares outstanding.

Total debt (billion dollars): this is the total amount of debt that the company owes, including both short-term and long-term debt.

P/E (price-to-earnings) ratio: this is the ratio of the company's current stock price to its earnings per share. It is used as a measure of the company's valuation, with a higher P/E ratio suggesting that the market is willing to pay more for each dollar of the company's earnings.

ROA (return on assets): this is the company's net income divided by its total assets, expressed as a percentage. It measures how efficiently the company is using its assets to generate profit.

ROE (return on equity): this is the company's net income divided by its shareholder's equity, expressed as a percentage. It measures how efficiently the company is generating profit from the money invested by its shareholders.

3.3 Stocks performance total

In parallel with the fundamental analysis in Section 3.2, an analysis was made of the volatility of the assets that are in the portfolio. More details in the table 25.

Table 25 (Volatility of portfolio)

| Ticker | Company | %Portfolio | Volatility (annual) | Volatility (annual) in portfolio |
|---------------|-------------------------------|-------------------|----------------------------|---|
| MSFT | Microsoft Corp. | 26,36% | 23,72% | 6,25% |
| BRK.B | Berkshire Hathaway Inc. | 21,35% | 18,22% | 3,89% |
| CNI | Canadian National Railway Co. | 18,24% | 20,71% | 3,78% |
| WM | Waste Management Inc. | 15,47% | 17,58% | 2,72% |
| CAT | Caterpillar Inc. | 4,93% | 28,52% | 1,41% |
| DE | Deere & Co. | 4,70% | 28,86% | 1,36% |
| ECL | Ecolab Inc. | 2,13% | 23,74% | 0,51% |
| WMT | Walmart Inc. | 1,20% | 19,92% | 0,24% |
| KOF | Coca-Cola Femsa SAB de CV | 1,18% | 25,44% | 0,30% |
| WCN | Waste Connections Inc | 0,80% | 19,74% | 0,16% |
| FDX | FedEx Corp. | 0,74% | 29,86% | 0,22% |

| | | | | |
|-------------------------------|------------------------------------|-------|--------|---------------|
| CCI | Crown Castle International Corp. | 0,54% | 23,09% | 0,13% |
| CPNG | Coupang Inc. | 0,38% | 30,49% | 0,12% |
| SDGR | Schrodinger Inc. | 0,37% | 34,16% | 0,13% |
| UPS | United Parcel Service Inc. | 0,36% | 23,74% | 0,09% |
| KHC | The Kraft Heinz Co. | 0,30% | 27,83% | 0,08% |
| MSGS | Madison Square Garden Sports Corp. | 0,30% | 28,07% | 0,09% |
| DHR | Danaher Corp | 0,28% | 21,19% | 0,06% |
| HRL | Hormel Foods Corp. | 0,28% | 19,55% | 0,06% |
| Stand dev of portfolio | | | | 21,53% |

Source: compiled by the author

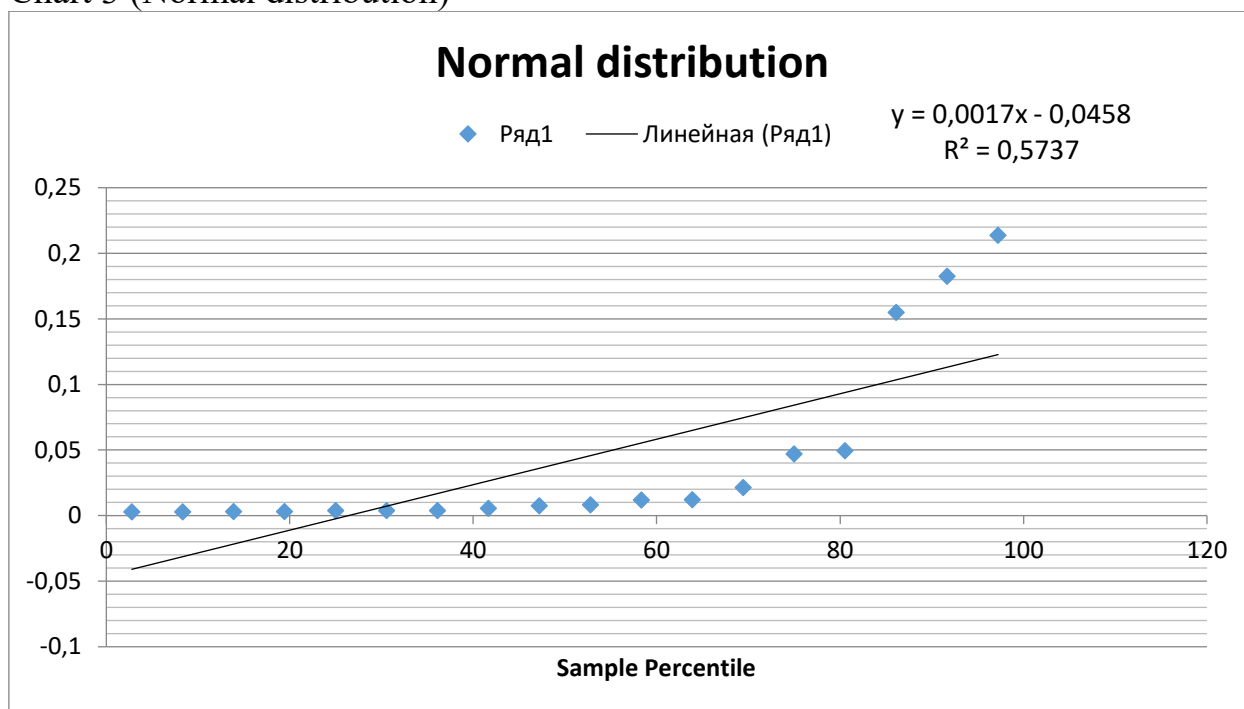
The standard deviation (annual) represents the volatility of each individual stock in the portfolio. It measures how much the stock's returns deviate from its average return over a specific period. The higher the standard deviation, the greater the range of returns and the higher the risk associated with the stock.

The standard deviation (annual) in portfolio is the weighted average of the individual stock's standard deviations, taking into account their percentage weight in the portfolio. This metric measures the overall risk of the portfolio.

Looking at the table, the annual standard deviation of each stock and its contribution to the overall portfolio standard deviation are provided. The highest contributor to the portfolio standard deviation is Microsoft Corp. with 6.25%, followed by Berkshire Hathaway Inc. with 3.89% and Canadian National Railway Co. with 3.78%. The lowest contributor is Hormel Foods Corp. with 0.06%.

The portfolio standard deviation is 21.5%, which means that the portfolio is relatively volatile and has a high level of risk. It is important for investors to consider the standard deviation and other measures of risk when making investment decisions. A high standard deviation may indicate a potentially high return, but it also means there is a higher risk of losing money.

Chart 3 (Normal distribution)



Source: compiled by the author

Chart 3 shows clearly how strong the dispersion and volatility of the portfolio is. The width of the graph of the normal distribution reflects the spread of the values of the random variable around the mean value, the graph is wide enough, the data scatter is large.

The portfolio's cumulative return over 10 years is the total percentage gain or return generated over the observation period. In case of occurrence, the resulting return is 140.24%, which means that the portfolio has grown by 140.24% of the original return in 10 years, the average annual yield is 14.02%. Both indicators indicate the success of the portfolio in the period under review.

3.4 Bonds

A bond is a debt security issued by a company, government, or other organization to raise capital. When an investor buys a bond, they are essentially lending money to the bond issuer for a specified period in exchange for regular interest payments and the return of the principal at the end of the bond's term (Jason Fernando, 2023).

Bonds typically have a fixed interest rate, also known as the coupon rate, which is the rate at which the issuer pays interest to the bondholder. The interest payments are made periodically (e.g., annually, semi-annually, or quarterly), and the bond's maturity date is when the issuer repays the principal amount borrowed.

Bonds are usually classified by their issuer and the length of their term. For example, government bonds are issued by national governments, while corporate bonds are issued by companies. The length of a bond's term can range from a few months to

several decades, with longer-term bonds typically offering higher interest rates to compensate investors for the increased risk of inflation and interest rate changes (Richard Portes, 2001).

Bonds are considered a relatively conservative investment compared to stocks because they offer a fixed rate of return and have a lower risk of volatility. However, they still carry risks, such as interest rate risk, credit risk, and inflation risk, and investors should carefully consider their investment goals and risk tolerance before investing in bonds (Martin Hoesli & Camilo Moreno 2020).

Determine your investment goals: Before investing in bonds, it is essential to identify your investment goals, such as generating income, preserving capital, or diversifying your portfolio. Your investment goals will help you determine the type of bonds that may be suitable for your investment strategy.

Consider your risk tolerance: Bonds carry different levels of risk, depending on factors such as the issuer's creditworthiness, interest rate sensitivity, and duration. It is essential to assess your risk tolerance and select bonds that align with your investment goals and risk tolerance.

Evaluate the bond's credit rating: The credit rating of a bond issuer indicates its creditworthiness and ability to repay its debt. The higher the credit rating, the lower the risk of default. Investors typically consider bonds with investment-grade ratings (such as BBB- or higher) as lower risk than those with lower ratings.

Look at the bond's yield: The yield on a bond indicates the return an investor can expect to receive from holding the bond. The yield may be affected by various factors, including the issuer's credit rating, interest rates, and the bond's maturity. Bonds with higher yields typically carry higher risk.

Consider the bond's maturity: The maturity of a bond refers to the length of time until the bond issuer repays the bond's principal. Longer-maturity bonds tend to carry more significant interest rate risk, as their prices are more sensitive to changes in interest rates.

That is, based on all points, the risk of non-payment of obligations arises only in the event of a default by a company or state. That is what the credit rating of a bond and a company or country is for. A credit rating indicates how likely a bond is to default. With an AAA rating, the probability of default is between 0.1% and 0.5%.

In this study, we will use a GT5:GOV, 5-year US Treasury bond in the portfolio, with a coupon of 3.63. Now, the annual yield is 3.61% per annum, and a very good yield, considering that all US government bonds are 100% repayable and there has not been a single case of default on these bonds. Accordingly, the credit rating of bond is AAA, sovereign credit rating of USA is AA+. Average default probability is between 0.1% to 1%, and this is a very low risk indicator. Theoretically, with a

return of 3.61%, the risk is a maximum of 1%. It is this factor that plays a role in reducing the riskiness of the portfolio, which makes it more diversified and because of this was selected for the research GT5:GOV, 5-year US Treasury bond. Also, for the research, the risk of the bond on the upper edge of 1%.

For example, if we take the same bonds from the government of Kazakhstan, then the sovereign credit rating of Kazakhstan is BBB-, which indicates the probability of default from 15% to 20%, and the yield on such bonds is from 14% to 17%, respectively. And this asset can increase the riskiness of the entire portfolio.

3.5 Research findings

Having done all the calculations and analysis of the two types of assets, understanding how risky the asset is separately, a table was compiled (Table 26), which shows the distribution of assets, their volatility /risk and the average annual return for 10 years.

Table 26 (Asset allocation, volatility/risk, and reward)

| Asset allocation | | Volatility/risk | Reward (average for 10 years) |
|------------------|---------|-----------------|-------------------------------------|
| Stocks | Bonds | | |
| 100,00% | 0,00% | 21,53% | 14,02% |
| 90,00% | 10,00% | 19,48% | 12,98% |
| 80,00% | 20,00% | 17,43% | 11,94% |
| 70,00% | 30,00% | 15,37% | 10,90% |
| 60,00% | 40,00% | 13,32% | 9,86% |
| 50,00% | 50,00% | 11,27% | 8,82% |
| 40,00% | 60,00% | 9,21% | 7,78% |
| 30,00% | 70,00% | 7,16% | 6,73% |
| 20,00% | 80,00% | 5,11% | 5,69% |
| 10,00% | 90,00% | 3,05% | 4,65% |
| 0,00% | 100,00% | 1,00% | 3,61% |

Source: compiled by the author

The data shows a trade-off between risk and return. Generally, stocks have a higher expected return, but also higher volatility compared to bonds, this is shown in the table, the more bonds in the portfolio, the less volatility, respectively, the less risks. The study does not consider the return on assets, but it is worth adding that with an increase in risks, profitability increases. It also works vice versa, lower risk - lower income.

It's important to note that these values are estimates and historical data. Actual volatility and risk may vary based on market conditions and other factors. It's always

recommended to conduct thorough research and consult with a financial advisor before making investment decisions.

This research proves the underlying theory that diversifying even between two types of assets: stocks, and bonds, smooths out volatility and reduces risk.

4. Conclusion

The problems of finding the right investment strategy are not only in Kazakhstan but are also applicable to world practice. And most investors ignore diversification, using only 1-2 assets when investing. This can happen in two cases: the investor does not have enough funds to diversify his investments, or there is not enough financial literacy.

Throughout the study, diversification played a major role. Section 3.3 clearly shows that a single stock has more volatility than it has in the portfolio. With volatility increases the risk that can lead to a default, given that stocks in general are very risky assets, even if it is a blue chip, but it is the distribution of assets within the portfolio that smooths out the volatility, which leads to a decrease in risks.

In the case of bonds, it is also possible to diversify, but given the credit rating of the bond that is used in the study and the probability of default, which is close to zero, then diversification will not bring any results in reducing risks.

This completely closes the first goal of the study, which speaks about the role of portfolio diversification. In the paper, it arises how diversification manifests itself in the portfolio and how it smooths out volatility /risk when investing.

Table 27 (Asset allocation, volatility/risk, and reward)

| Asset allocation | | Volatility/risk | Reward |
|------------------|---------------|-----------------|--------------|
| Stocks | Bonds | | |
| 30,00% | 70,00% | 7,16% | 6,73% |
| 29,00% | 71,00% | 6,95% | 6,63% |
| 28,00% | 72,00% | 6,75% | 6,53% |
| 27,00% | 73,00% | 6,54% | 6,42% |
| 26,00% | 74,00% | 6,34% | 6,32% |
| 25,00% | 75,00% | 6,13% | 6,21% |
| 24,00% | 76,00% | 5,93% | 6,11% |
| 23,00% | 77,00% | 5,72% | 6,01% |
| 22,00% | 78,00% | 5,52% | 5,90% |
| 21,00% | 79,00% | 5,31% | 5,80% |
| 20,00% | 80,00% | 5,11% | 5,69% |

Source: compiled by the author

This table provides a more detailed description of the asset allocation shown in Table 26 and depicts the ideal balance between stocks and bonds in a portfolio. In the table in bold type is the optimal number of stocks and bonds that provides a break-even investment. This distribution of assets allows you to achieve a balance between volatility/risk and reward, in which they cancel each other out, creating a break-even point. Based on the table, we can conclude that the asset allocation, where stocks make up 26% of the portfolio and bonds 74%, provides a balance between risk and reward. A higher than optimal asset allocation may have higher risk but potentially higher returns, while a sub-optimal asset allocation will be less risky but less expected in the long run. This distribution is directly related to the 2nd objective of the study, in which it speaks of the proportions of assets in the portfolio, which was shown in tables 26 and 27.

But don't forget that the optimal asset allocation may depend on individual factors such as investment objectives, risk tolerance and time frame. This is just one of many approaches to portfolio balancing, and it is recommended that you consider other factors and consult with financial professionals when making asset allocation decisions. It must be added that the distribution comes from many factors, the main ones being: age, investment goals and risk tolerance. The younger the investor, the riskier portfolio he can acquire. If the goal of investing is to ensure a comfortable old age, then you can use a portfolio with less risk. In the case when risk tolerance is high, then it is worth taking a portfolio with the least amount of bonds.

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