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***Dissertation Report***

## I) DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

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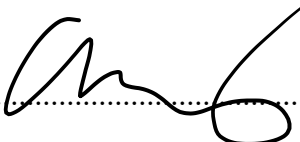
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## **II) Acknowledgment**

This endeavor would not have been possible without my supervisor Mr. Glenn Behenna. I am deeply indebted for your support during the preparation of the dissertation proposal, structuring the entire research, and during the whole process of making this report.

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Furthermore, I would like to thank to each participant of the questionnaire for their patience, honesty, and willingness to contribute to this research.

### **III) Abstract**

This report has been submitted as a part of Master of Business Administration (MBA) program - Dissertation module. The report aims to answer the question, whether there is any correlation between carefully researching stocks and the performance of the investment. Inspiration for this report has been a famous statement by Burton Malkiel (1973): “A blindfolded monkey throwing darts at a newspaper’s financial pages could select a portfolio that would do just as well as one carefully selected by experts” (Feri, 2012).

Author achieves to answer this problem through breaking it down into three main objectives to understand A.) what is the objective of average person to stock picking B.) what is the correlation between researching of a company and outcome of an investment, and C.) what is the difference between the successful and less successful investment.

The data has been collected through a questionnaire where a relatives and close family of an author has been asked a question that helped to formulate a conclusion in this report. Furthermore, author has used a technique learned during the course of a Master of Business Administration course, to analyze the companies in question and draw the conclusion. In order to do this, author has created an excel database which has been populated by a publicly available financial data published by the companies in question. Author has then applied a various financial ratios which helped him to determine the findings. The report concluded that there is a positive correlation between the research and the performance of a company. Based on the quantitative research, we can conclude that using the Price-to-Earnings ratio, Price-to-Book ratio and Debt-to-Equity ratio, investor would be more likely to identify a shares with a potential high gain.

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## 1. Introduction

Burton Malkiel, professor from Princeton University, in his best-selling book “A Random Walk Down Wall Street” in 1973 famously said that “A blindfolded monkey throwing darts at a newspaper’s financial pages could select a portfolio that would do just as well as one carefully selected by experts.” (Feri, 2012). As author has been patiently reading a numerous important publication with a focus on stock market, such as Intelligent Investor written by Benjamin Graham, A Random Walk Down Wall Street by Burton Malkiel, Security Analysis by B. Graham and David Dodd and many other publications, and was interested in a stock market even before signing up into this MBA course, he has realized that it is perfect opportunity to have a deeper look into this statement. He has decided to have a closer look and understand what is a role of a luck in a stock market, and up to what extend it is possible to affect it.

Krishnan (2022) suggests that investing involves an aspect of luck and skill. Furthermore, he claims, that in recent years, stock market became an attractive instrument for many individuals that are willing to test they knowledge and luck with the vision of making an easy money and with the goal to achieve the high, sometimes unrealistically high, returns on invested capital. He claims that these individuals that are relying more on a luck then a skill, are mostly ending up with holding a fairly similar portfolio (Krishnan, 2022). These might be due to the recent popularity of speculating in stock market, especially since the Covid19 lockdown, when the trading platforms such as Robinhood.com has gained enormous popularity among the retail investors. According to Curry (2022), since start of Covid19 pandemic, Robinhood platform has achieved tremendous growth in active users as it has more than doubled the user base from \$10 million in 2019 to \$22,5 million in 2021. Furthermore, Robinhood’s annual revenue had grown from \$0,27 billion in 2019 to \$1,81 billion in 2021, and its assets under management had nearly tripled from \$35 billion to \$98 billion in 2021 (Curry, 2022). This data shows that despite the global uncertainty and fear caused by a health crisis, stock market has been experiencing a rapid wave of newcomers. Rega (2020) suggests

that this has been fueled by stay-at-home orders, trading platforms that were offering low to zero commission access to market, and increased market volatility caused by a fear and changes in economy. He further claims that most of a newcomers have been an amateurs that were previously waiting on a sideline. These potential investors were earlier discouraged to enter the market due to high commissions and has now decided to enter the market and take the advantage of the volatility. He claims that most of the newcomers has been an amateurs without any appropriate education nor skills, which were relying on a current trends in the economy, word of mouth, publicly available analysis, or simply speculating by investing in mostly familiar companies which they thought would bring the desired results (Rega, 2020). Bradley and Stumper (2020) agree with this theory and are suggesting that some particular trends were visible already throughout the year of 2020. They claim that some companies in the certain sectors of an economy have been better positioned and were accelerating rapidly comparing to some other companies that were not as favorite, thus creating a gap between the leaders and a loser (Bradley and Stumper, 2020). To mention few, the companies that were benefiting from a lockdown such as streaming platforms, messaging clients, various internet stocks and companies that has been well positioned in an e-commerce could be listed among the winners. On the other hand, companies that were suffering from a stay-at-home orders such as cruise operators, airlines, companies operating in oil and gas industry, which has been affected by a low demand for traveling, decreased commuting to work, or in general reduced mobility were losing its ground and often found themselves battling existential issues. Bradley and Stumper (2020) describe that these events have fueled an aggressive growth in some companies which were taking the advantage of the momentum. They claim that the amateur investors started to pool their money into raising stocks, in belief that the growth will be permanent and justified by the shift in the economy caused by the pandemic (Bradley and Stumper, 2021). These investments of a retail investors were triggered by an external event such as pandemic and its consequences, rather than the systematic educated approach of buying a stocks of healthy companies on a regular basis.

As indicated in the report published by Dash and Maintra (2022), there is a strong relationship between the investor sentiment and stages of a pandemic. They claim that investor sentiment and overall mood of investment community has a strong impact on how investors behave on a stock market. In case of a recent COVID19 pandemic, they claim that the pandemic was mostly ignored by investors in the early stages, until the seriousness of the situation has become obvious. The following panic has been a reason for an increased volatility. As these events has been widely covered by a press and financial media and was spread among the general public sparking their interest in the potential opportunity that was forming in some particular stocks that were suddenly selling for a discounted prices. While in some cases these depressed prices have been a result of an overreacted panic selling, in most cases these price movements have been justified by a pandemic. That is due to the fact that the pandemic had created serious issues in a global supply chain and rapidly erased a demand for some key components such as oil or certain services. In that point, the coronavirus pandemic has been a very serious threat to a global economy, therefore it can be concluded that at this point an increased volatility has been justified (Dash and Maitra, 2022). While these movements and global events has created an opportunity for skilled and educated investors to conduct their research and carefully select a stock of a companies that were selling under their intrinsic value and still had a solid potential for solid earnings, it had also given an opportunity to amateur investors to speculate on a market and collect a stock of a various companies for a fraction of their recent price. These speculators have been betting on an assumption that the world will re-open, and economy will continue to grow instead of accepting the fact that the Covid-19 pandemic will seriously disrupt supply chain, lower the demands for various products and commodities and in general rapidly change the world for extended period of time. As some of the examples for these opportunities for speculation we could mention the stock of Carnival Corporation & Plc, which according to historical data taken from Yahoo Finance, has been selling on the 1<sup>st</sup> of December 2019 for \$50,83 per stock and has fallen to \$13,17 by 1<sup>st</sup> of March 2020.

This decrease in price has been caused purely by a grim outlook and as a result of a disruptions caused by pandemic, rather than a company specific decision, stock split, announcement, or actual financial report (Yahoo, 2022). However, the speculators have been seeing this as an opportunity relying on an assumption that cruises will re-open shortly after the virus will be taken under control and assuming the demand on pre-pandemic levels. Munarriz (2022) claims that similar faith has affected the entire cruise line industry, as stocks of other mayor cruise providers has seen a sharp decline in their stock price. He claims that this was caused mainly by the fact that their ships have been docked and the impact on their business model has been significant. However, he suggests that despite the fact that the cruise companies had begun to operate in more normal way as the economy begun to reopen, the volatility in their stock had continued. He claims that the speculation and relying solely on a fact that the world will reopen, and that the low prices of a cruise line stocks will begin to grow, might not be justified. This is confirmed by the stock price movements from 2022, as the stocks of three mayor players: Carnival, Royal Caribbean and Norwegian Cruise Line had witnessed its stocks to drop by 65%, 49% and 56% in a 2022 comparing to last year's prices. (Munarriz, 2022). Such a sudden drop in stock price was not only seen in companies operating in a cruise line industry, but also across the entire travel sector. For instance, a stocks of an airline companies have seen the similar selloff. This was mostly related due to weak demand for their services. To understand the full impact, we can compare the numbers posted by a various American airline companies prior pandemic and during a year of 2020. For instance, American Airlines Group has carried over 215 million people in a 2019, however during the year of 2020 they carried only 95 million. Similar decrease can be seen in other airline companies, such as third largest carrier by passengers, United Airlines Holdings. United Airlines Holdings has carried over 162 million people in a 2019, however similar to American Airlines Group, the demand for their services has shrunk to a third to 57 million (Wikipedia, 2022). Naturally, these events have been translated into the stock price as the stock of American Airlines Group had dropped from \$26,84 registered on 1<sup>st</sup> of

January 2020 to \$10,50 registered on 1<sup>st</sup> of May 2020. Similar faith has met the stock of United Airlines Holdings which has dropped from \$74,80 registered on 1<sup>st</sup> of January 2020 to \$28,04 registered on 1<sup>st</sup> of May (Yahoo, 2022). Both events had occurred because of a pandemic and not because of a stock split or similar. Fernando (2022) suggests that in order to follow the value of company more precisely, the Market Capitalization or Market Cap should be used to take into account stock splits and other elements. He suggests that Market Capitalization takes into account total value of all outstanding stocks, therefore it is more precise than following a single stock price. He claims that the Market Cap shows how much is the company worth according to stock market in a single point in time (Fernando, 2022). To translate this into Market Cap values, American Airlines Group had overall Market Capitalization of \$12,38b at the beginning of 2020, however this decreased to \$4,56b registered on the 1<sup>st</sup> of May. Also United Airlines Holdings had experienced its Market Capitalization shrink from \$22,30b registered on the beginning of year 2020 to \$7,47b registered on the 1<sup>st</sup> of May (Macrotrends, 2022). The interesting point in this case, is that the stock price of both carriers did also follow the pace on the way up with the recovery and increase of demand for travel as the world has started to reopen. In 2021, both companies had carried nearly double the number of passengers comparing to 2020, with American Airline Group carrying 165 million in 2021 comparing to 95 million in 2020, and United Airlines Holding carrying over 104 million passengers comparing to 57 million in 2020 (Wikipedia, 2022). Based on this, we can understand that demand for airway travel had started to recover, which was also a case with a Market Cap. In 2021, both companies had carried roughly 2/3 of a passengers carried in a 2019, and Market Cap was also reflecting this. Based on historical data, Market Cap of American Airlines Group at the end of 2021 has been \$11,57b, which was almost same to the end of 2019 despite carrying less passengers. In case of United Airlines Holdings, a Market Cap at the end of 2021 was \$14,09b, which was in line with the recovery of a demand. Based on demonstrated case in American airline carriers, we can see that from time to time, it is possible to foresee the market

movement based on certain rationale, as in this case travel recovery, however this is exception rather than a rule. It would still be difficult to pick the right entry point for the investment and properly understand when the travel demand is really picking up and another lockdown is not expected, therefore rendering this method rather risky and unreliable comparing to scientific approach based on financial results. In general, Frazier (2021) suggests that as a result of a sudden pandemic and chaos it has created, the stock market had seen some of its worst days in history, which after the dust had settled, attracted new retail investors. He claims that the Coronavirus related stock market crash had lasted from 20<sup>th</sup> February 2020 and ended on 7<sup>th</sup> of April 2020. He claims that the biggest opportunity has been created during the March meltdown. He claims that on March 7<sup>th</sup>, 2020, the Dow Jones Industrial Average had dropped by 2014 points, which equals 7,79%. Furthermore, three days later on March 12<sup>th</sup> of 2020, the Dow Jones had dropped 2352 points or 9,99%, which was the sixth largest drop in the history. Finally on March 16<sup>th</sup> the Dow Jones plummeted by nearly 3000 points, or 12,9%, creating massive buying opportunity not only for educated investors but also unexperienced speculators (Frazier, 2021). Furthermore, to combat the Covid-19, governments had introduced a various Covid-19 relief spending programs. Currently, it is estimated by official government website of United States “[www.usaspending.gov](http://www.usaspending.gov)” that by the December 2022, the United States’ total budgetary resources had amounted to \$4,5 trillion. These resources were categorized to support US economy in various ways (usaspending.gov, 2022). According to another United State government website “[www.usa.gov](http://www.usa.gov)” as a part of stimulus package, United State started to pay a checks to individuals to support the liquidity and economy and reduce the shock and impact on various small and large business across the country. There were in total three stimulus checks received by individuals in United States, \$1200 (April 2020), \$600 (January 2021) and \$1400 (March 2021) (usa.gov, 2022). Konish (2022) claims that according to researchers, 10% to 15% of these government stimulus checks had been invested in a stock market. He claims that for some individuals, this was seen as an opportunity to invest amid the stay-at-home

orders, while for others it was a reason to gamble on a stock market with a “free money”. He claims that it was partially a reason why certain stock has been seen as a “MEME” shares, such as a Gamestop (NYSE: GME) or AMC Entertainment (NYSE: AMC), which had seen rapid volatility mostly based on a Reddit forums (Konish, 2022).

As we can see in the introduction chapter, there are numerous events or reasons why there are investors and amateur speculators. At this point, we have understood that the external events and government impulses can from time to time fuel this behavior in direct or indirect way, as in case of sudden attractive price in case of stock market crash, or through various stimulus provided by government. Furthermore, we can see that there are numerous elements that are contributing to the investors sentiment and can influence it in positive and negative way, such as panic, optimism, reaction, trend, belief and many other. These elements do contribute to the stock picking in cases where it is not justified by a true research. The aim of the report is however to understand whether it pays off to be on a side of an investors that carefully judges their investments in comparison with the regular amateur investor which is picking up a portfolio based on his feelings, anticipation, rumors, or any other non-scientific method due to either lack of skill, knowledge, time, or passion. In order to achieve this, author will try to find an answer to three main objectives of this report which is to understand:

- What is the relationship of an average person to individual stock picking?
- What is a correlation between researching a company and the outcome of an investment?
- What is the difference between the most and least successful companies?

## **2. Literature Review**

The aim of this chapter is to understand what other previous research has been done on a topic. The skill, or in our case knowledge, against luck or randomness has been covered fairly thoroughly in various publications and analysis. In this chapter, we will investigate various findings and set a

foundation for our own investigation which is done in following chapters. Simon and Winkle (2013) claims that many investors take their inspiration from stock analysts, however they suggest that it is not simple to understand how what was a portion of luck involved in a results of a particular stock analyst, therefore it is not clear to understand whether the stock analysts will be able to repeat the similar results in the future, otherwise there wouldn't be a famous wall street quote "Past performance is no guarantee of future results". Carol (2020) adds that this quote was analyzed and confirmed by numerous studies, which aims to warn against the impression that the successful results from past performance will repeat again in future. She claims that relying on a past performance might be risky and there is a reason why this disclaimer is present in the most trading firms, analysts and commercial adds to various financial instruments. She claims that one of the studies performed by S&P Down Jones indices, were trying to understand how many active analysts can regularly outperform their peers. She claims that a study came to a conclusion that there are only a small number of analysts that were able to consistently outperform the peers, regardless of the asset class or style of focus. Furthermore, Carol claims that according to another statistic provided by SPIVA (S&P Indices Versus Active), it is interesting to see how the consistency in beating the indices decreases over a time. She claims that for a one-year period ending in June 2017, 71% of American equity funds had underperformed in relation to the Composite S&P 1500. She claims that in addition to this, what is even more interesting is that only 47% of the equity funds had kept their top-quartile performance and after 2-year period, only 8% of the equity funds remained in a top-quartile. She claims that the report is highlighting a fact that these 8% is consistent with a notion that future performance cannot be assumed based on a historical performance. She further claims that these studies provided a proof that there is an inverse relationship between the time horizon and the ability to perform on a top level (Carol, 2020). Simon and Winkle (2013) agree and claim that while it is easy to follow the performance of stock analyst down to a single basis point, it is difficult to understand how much of a luck was involved, as there

is no indicator or measuring tool to do that. They claim that despite the fact that it is unclear how much can be attributable to plain luck; the general assumption of a wall street is that the information provided by a prestigious analysts have a significant investing value and are treated with a credibility. They claim that this credibility can be achieved through numerous ways, such as correctly predicting the earning forecast of a company. They claim however that despite some analysts can have a forecast that seem to be close to actual results on a short term, the key is the persistency of a results that can filter the skilled analysts from the lucky ones. In their published research, they are trying to find a common element which can act as a base for a sort of measuring stick of a stock picking skill. This analysis should then help to pinpoint the analysts or help to understand which research or analysis has been performed based on skill and the element of luck has been minimized. They suggested a formula which considers numerous elements as indicated in

$$Accuracy_{i,j,t} = \frac{abs(Actual_{j,t} - Forecast_{i,j,t})}{stdev_{j,t}[Forecast_{i,j,t}]}$$

where  $Actual_{j,t}$  is firm  $j$ 's actual EPS for period  $t$ ,  $Forecast_{i,j,t}$  is analyst  $i$ 's forecast of firm  $j$ 's EPS for period  $t$ ,  $abs$  is the absolute value operator, and  $stdev_{j,t}[Forecast_{i,j,t}]$  is the standard deviation analyst one-year ahead earnings estimates of firm  $j$  for the fiscal period  $t$ .

*Figure 1: Formula proposed by Simon and Winkle.*

One of the elements is a rate of accuracy in analyst forecasts, however it is necessary to take into account also a complexity of a prediction. This is due to the fact that the analyst that covers a companies which are more predictable would be naturally rated as more accurate. Furthermore, they suggest to cover only the analysts that covers at least three companies, so that the median can be compared. Last but not least, they claim that the consistency can be measured only over a period of at least 3 years. They claim that even the most skilled investors can be affected by a good or bad luck; however, this tends to even out over the long period, therefore using the formula would be a good comparison tool to identify more skilled analysts. Furthermore, in addition to their proposed

ranking formula, they claim that one of the most important aspects for an investor is to focus and critically analyze the decision-making process behind the analyst recommendation (Simon and Winkle, 2013). Amanda Jones (2019) in her opinion on a skill against luck relates to a famous quote by a Daniel Kahneman who said: *“A majority of an industry appears to be built largely on illusion of skill. [...] For a large majority of fund managers, the selection of stocks is more like rolling a dice than a poker”* (Kahneman). She further claims that while investors are trying to understand the role of luck and skill in the investments, she suggests that the humans in general have a limited understanding of a dynamic interplay between the luck and a skill. She offers a view that the skill and also a luck are both needed in the investment world, and the successful investment manager does need to have both, as does the successful football manager. She claims that as in football, pure skill will not be sufficient alone if the external circumstances will not be positive towards the investor. She claims that Vanguard founder Jack Bogle in his book “The Little Book of Common-Sense Investing” monitored the performance of a top funds for a period 1982-1992 and then again for period 1995-2005. In both periods, the top performers were performing better than their peers, however in the following years, the top performers dropped among the worst performers. She therefore suggested an assumption that the investment is a reverting to mean, which means that the period of overachievements is usually followed by a period of underperformance. For this reason, she claims that this is another proof which suggests that the element of luck is greatly present in the investment world. She offers another idea to identify a skill against a luck. She claims that a long track record should be investigated, and that the time frame of an investing activities should be considered when comparing the individual statistics of an investors. She claims that it is not directly comparable if investor “A” achieves the certain percentage over a short period as investor “B” achieves over a long period covering multiple years or decades. She claims that it can take up to 27 years of data to claim with a reasonable degree of confidence that an investor or portfolio manager has a skill and is capable to beat a 2% profit per year. Furthermore, she claims that according to

research performed by Mauboussin and Arbesman (2011) who analyzed a track record of mutual fund streaks over a period of 40 years, it is believed that only a small percentage of an investors is truly skillful, and that this ratio is decreasing due to a fact that market is becoming more competitive and efficient. Therefore, she claims that the luck is playing a bigger role that we might think in the investment world (Jones, 2019). Deppore (2021) argues that the skill is more important than a luck and suggests that a smart people who did they homework on picking the right stocks based on their knowledge will be more likely to produce a positive result. He agrees that the luck is important factor in stock picking, however he suggests that it works in both ways. It can either influence a stock pick in positive or negative way, which in theory should equalize itself in a long term. He claims however that most people don't take this into account when judging their past performance and often dismiss the role of luck. He claims that this happens mostly in case of good luck. He suggests that it is a mistake to attribute the success purely to good decision and failure to a bad one, without analyzing what sort of luck was involved. He claims that the principle in this case is the same as in the game of poker, where you can make only a correct decision along a way, however you can still end up losing as your opponent was simply dealt with a better or more fitting cards. He claims that the mistake that is often done by investors is that they do not realize that they had a good luck in their previous performance, which will then lead to over confidence in the future decisions. Furthermore, Deporre (2021) puts forward a couple of tricks, which can help to deal with a luck factor in an investment world. He claims that an investor must consider a role of unknown elements every time he makes an investment decision. What is needed to analyze are the events that if occur will lead to positive results, events that if they occur will lead to negative results, and also consider what kind of unexpected events could in theory happen and somehow affect the investments. As the second point, he claims that for investor it is important to have a risk mitigation plan in place when entering into investment. This plan would mostly be built on a basis from step 1, where investor identified a potential risk or opportunities. Having a risk mitigation plan will help to

guide investor when certain situation arises and help to make an adequate decision. He claims that money management and diversification of investments is very important as it will help investor to keep a tools to defend himself in case of unhostile market environment, by for instance averaging down the cost basis. He claims that the general idea of this point is to have a damage limitation plan in case of a bad luck. The last advice that Deppore (2021) offers is that he urges the investors to focus on an important aspects of investment strategy like for instance a money management, instead of wasting a lot of time on a big bold prediction of future. He claims that the investor cannot really affect what sort of luck will affect his investments, however he can do his best to be prepared. He claims that what investor could do is for example be constantly updated on a news feed, have a stop loss in place, have a correct money management to be able to defend or react (Deppore, 2021). In another publication, Gao (2021) has looked into a claim that was already mentioned above by Deporre (2021), and that is whether the good luck makes a people overconfident. Gao (2021) claims that this effect is even stronger among the new or not much experienced investors. He had investigated this particular topic among over 10 000 000 investors which won an Initial Public Offering (IPO) allotment in China in a period between 2014 and 2016. He based his research on this event as he beliefs that winning an IPO allotment is a purely luck driven event as the potential investors are draw from a pool of numbers, allowing them to participate in an IPO which in China is capped at 23x IPO price of a certain period. In that case, the allocated investors tend to have a high chance to make a profit. In his research, he came to a conclusion that the activity of the traders had increased comparing to pre-IPO period, and their rate of success was lower comparing to other group of investors. He therefore concluded that having a good luck in a previous investments tends to motivate people to become overconfident and have higher risk appetite. He describes the overconfidence as an undesired bias which is influencing the decisions of the investors, and in certain situations motivates them to make irrational or highly ambitious investments comparable to gambling or lottery tickets. He takes the luck element even further by suggesting that most people

that experience a luck in their investments tends to create a belief in a lucky streak or lucky period. He claims that an investor which experienced a good luck may believe that he is in a lucky period, which will lead him into overconfidence in his decisions. He also claims that as per his research, it was notable that the investors that experienced a luck in the IPO allotment, tends to have a greater volatility in their portfolio comparing to other groups, which might suggest that their investments have a higher risk appetite and are not purely based on a financial indications, in other words, containing more lottery tickets. In his research, he also investigated how long does the boost of overconfidence typically lasts in the investors participating in successful IPO allocation. He claims that as per his analysis, the effect of overconfidence tends to decrease over a time and disappeared around 9 months after the successful event. He suggests that there is additional effect that might boost investor's confidence after the previous successful investment, so called house's money effect described by Thaler and Johnson in 1990. They claim that the investor winning a bigger sum of money on a previous investments does not necessary perceive the newly attained money as his own which leads him to overconfidence and increased risk appetite. However, he suggests that this effect was known and is taken into consideration in his research, therefore has not played any role, as the focus was on the overall portfolio of an investors excluding the newly attained IPO shares on which the gain was realized. Furthermore, he suggests that it is highly unlikely that the findings in his report are affected by so called wealth effect, which he suggests is an effect of changes in risk preference after winning a large sum on a previous investment. He claims that this is due to the fact that wealth could be positively or negatively correlated with the risk preference and points out that wealth effect is actually negatively associated with the turnover rate, which means that the wealth could predict the decrease in the turnover of the investor. Last but not least, he suggests that there is multiple research which confirms his opinion on overconfidence and its influence on people's decision-making process. He claims that literature published by Barber and Odean in 2001 suggests that overconfidence makes people trade and lose more money (Gao, 2021). In another research

published by Malmendier and Tate (2008), they have investigated what is the effect on a highly educated and business-wise personnel such as the CEOs of the companies. In particular, they have focused on analysis of whether the overconfidence has any impact on a business strategic decisions such as mergers or acquisitions. To identify the overconfident CEO, Malmendier and Tate (2008) has selected two criteria. The first criterium was what is the portrait of the CEO in a general press, and the second was whether the particular CEO is personally over-invested in a company. The results of the research performed on a CEOs confirms what was previously suggested by Gao (2021) in his research performed on an investors, and that is that the overconfidence leads to a riskier decisions. The findings suggests that the CEOs which are rated as overconfident are in average 65% more likely to make an acquisition. They suggest that the rate is even higher if the merger is classified as diversifying and if it does not require external finances. The market reaction on the mergers performed by a CEOs classified as overconfident is worse at -90 basis point comparing to a mergers performed by a CEOs that are not classified as overconfident at -12 basis point. However, they also claim that there is also an advantage to have an overconfident CEO as these CEOs tends to fuel the entrepreneurship, counteract risk aversion, or attract similarly minded employees. Malmendier and Tate (2008) suggest that according to previous publications, humans tend to have overconfident behavior in a situations when they feel deeply committed and feel that they have a control over a situation. This is also true in case of mergers as the CEO will gain a control over an acquiring company and furthermore be motivated or committed financially, as the successful merger would potentially bring them a financial reward, therefore managing the overconfidence is highly important in order to make a wise decisions (Malmendier and Tate, 2008). Gigerenzer and Todd (1999) had contributed with their publication to the topic of skill against a luck in the stock market. In their publication, they suggested that the investor lacking the appropriate skill, information, or education, are ignorant and therefore are analyzing whether ignorance can beat the stock market performance. They have decided to ignore all constructive

tools, and construct a portfolio simply based on a name recognition to test whether this strategy can in theory achieve the success and understand its implications. They suggest that the stock market is highly unpredictable, therefore it is a paradox that the investment firms and various stock analysts are investing millions of dollars and hours into its prediction. Despite this, they claim that based on a track record, it is believed that majority of active fund managers have a problem to beat a market measured by its passive indexes over a long term. Therefore, if the knowledge, experience, and expertise that these managers seem to have is so neglectable, they wonder how the ignorance of it would actually perform. They based their analysis on a group of 480 volunteers coming from either United States or Germany. These volunteers were supposed to pick a stock between 798 companies, where 500 were taken from S&P 500 (United States) and remaining 298 were from German market. These people were then group into four different categories which were, American laypeople, American experts, German laypeople, and German experts. Laypeople group was based on a regular civilians surveyed in a streets of Chicago and Munich. Expert group was consisting of a finance or economics graduate from University of Chicago and University of Munich. In total, 8 companies were recognized by 100% of German laypeople group and 25 companies by at least 90% of them. In general, American expert group recognized the most companies, surprisingly followed by American laypeople. It is interesting to see that American laypeople recognized more companies than German experts, however this might be attributed to higher number of American public actively following and participating in the stock market. Gigerenzer and Todd (1999) suggests that it can be also due to the fact that American stock market consist of more stocks than a German market. For their research, they have created a two portfolios per group, one domestic and one international, based on a most recognized stocks of the particular group. In total, 8 recognition-based portfolios were created and analyzed. Afterwards, they have analyzed the performance of these portfolios for a six months. Then, they have compared the performance of these portfolios with performance of a) stock of unrecognized companies (recognized by less than 10%

participants), b) market indices (DOW 30 or DAX 30), c) mutual funds (Fidelity Growth fund or Hypobank Equity Fund), d) chance portfolios (average returns of 5000 randomly drawn portfolios), e) individual's investment choices. The achieved results can be seen below on a Figure 2 for domestic recognition and Figure 3 for a respective international recognition, where the results of recognition-based portfolios (focus of the research) are named as "Recognition Heuristic".

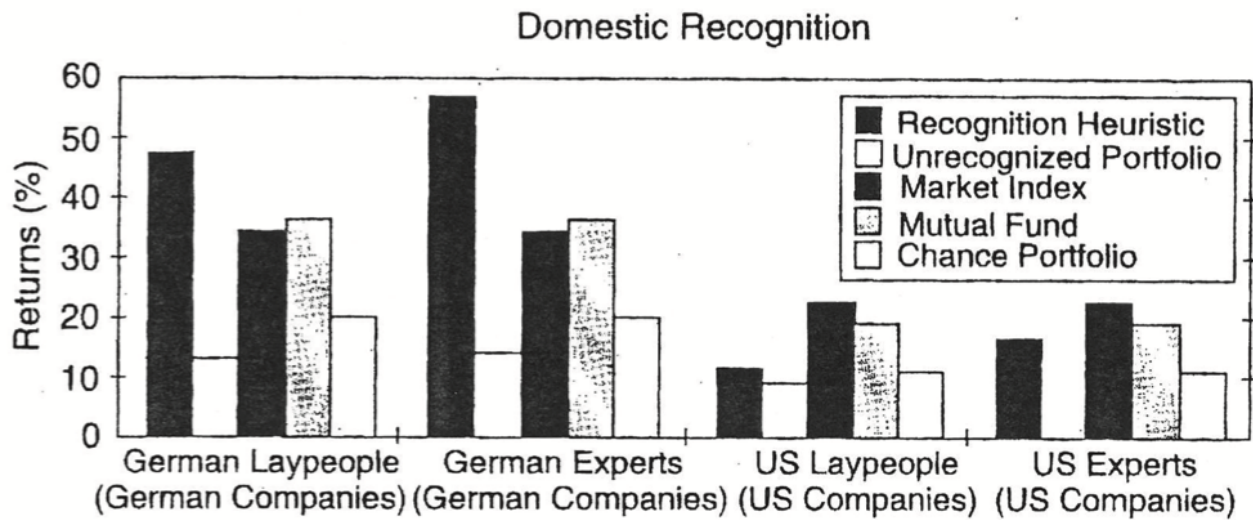


Figure 2: Domestic Recognition experiment (Gigerenzer and Todd, 1999)

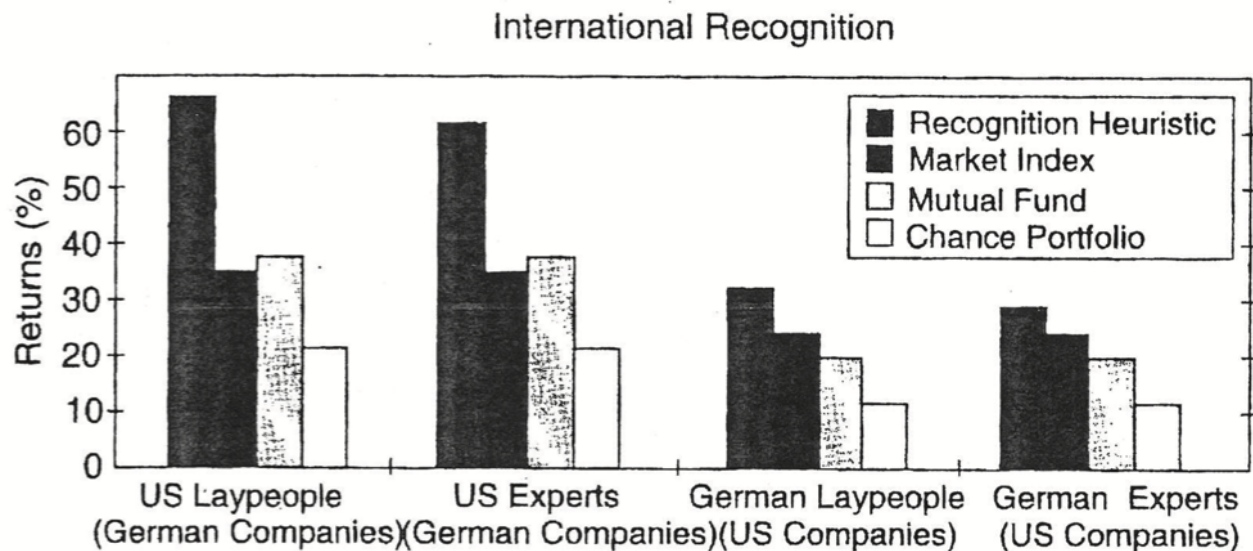


Figure 3: International Recognition experiment (Gigerenzer and Todd, 1999)

As we can see on the Figure 2 and Figure 3 above, the portfolio which consisted of a recognized stocks of German equities constructed by German laypeople group resulted in a gain of 47%, while the portfolio of German unrecognized equities constructed by a same group resulted with a gain of only 13% over a studied 6-month period. It can be seen that German recognized companies have achieved the best overall results regardless which group has selected the stocks into the portfolio. We can see that by using a random method of choosing the stock based on their name, each group had managed to overperform the indices and funds in a German market. The return of German portfolio consisting of stocks recognized by a volunteers has been in average among all four group almost three times higher against the portfolio consisting of stocks of unrecognized German companies. However, Gigerenzer and Todd (1999) performed additional analysis between the German laypeople and German experts, which aimed to answer the question how good are the experts and laypeople in picking a stock. Their aim in this experiment was to understand who will create a better portfolio. They asked both groups to select a 10 companies from each German market and US market, which they do recognize and would select for an investment purpose. Gigerenzer and Todd (1999) then created a portfolios based on 10 most often selected companies in each group per market, in total 4 portfolios. They claim that it was interesting to see that German laypeople tend to select a highly recognized German companies, as the average recognition rate of the ten selected stock was 0,8. However, German experts preferred to select a stocks of a less popular companies, as an average recognition rate of the ten selected stocks was only 0,48. Based on a first part of the research shown in Figure 2 and Figure 3, it should be expected that a stocks of highly recognized companies should achieve the better performance over a less recognized companies. In the second part of this research, this has been further validated, as the portfolio of a German laypeople consisting of a widely recognized companies achieved a high return, while portfolio of German experts consisting of less recognized, which might be regarded as the picks of a high potential niche or specialized companies identified by experts, has actually lost money. When

comes to portfolio made by German laypeople and experts consisting of US companies, both portfolios actually had a similar recognition rate of 0,27. However as can be seen on a Figure 4 below, the portfolio constructed by a German laypeople had surprisingly overperformed the portfolio constructed by a German experts by a wide margin and even beat the Dow 30 index.

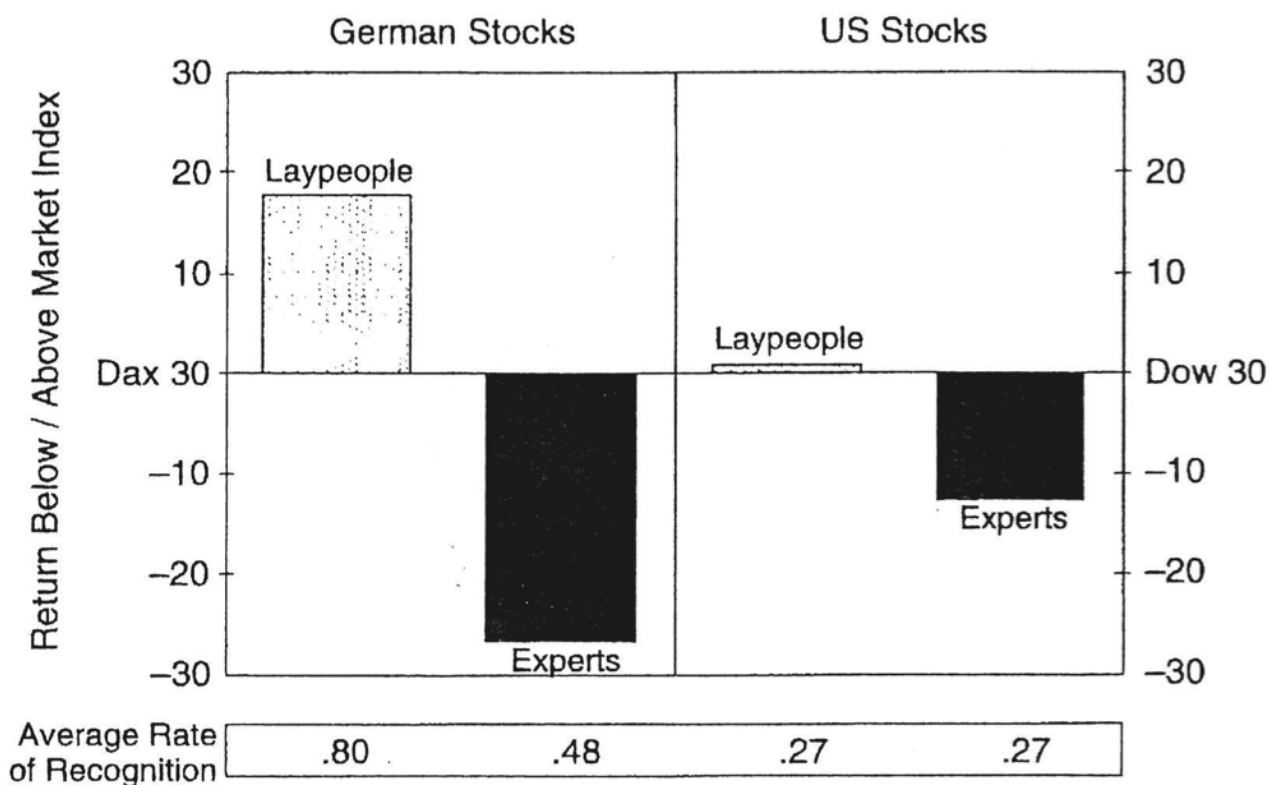


*Figure 4: Comparison of performance of stock picking-based portfolios constructed by German laypeople and German experts for each German and US market (Gigerenzer and Todd, 1999)*

Based on these data, Gigerenzer and Todd (1999) aims to answer the question whether the simple recognition of the name which exploits a nature of ignorance of knowledge or expertise can actually make a money on a market. They have concluded they research by observing that the portfolio of highly recognized companies outperformed the portfolios of less recognized companies in each of eight analyzed scenarios, see Figure 2, Figure 3. Furthermore, they conclude that in six out of eight scenarios the constructed portfolios outperformed market indices in both United States represented

by DOW 30, and also in Germany represented by DAX 30. This is significant as both of these indices represents a collection of thirty blue-chip companies taken from respective market. Furthermore, they concluded that in comparison with the two major actively managed funds Fidelity Growth Fund and Hypobank Equity Fund, the constructed portfolios overperformed the market also in six out of eight cases. They also claim that analyzed portfolios constructed based on a recognition factor which was a subject of this experiment had outperformed completely random portfolios in seven out of eight cases. They noticed that if the investor choices would be following the recognition element in this simulation, the returns from the portfolios would beat the DAX30, however as the recognition rate decreases, so does the performance of the portfolio. This can be seen also on a portfolio picked by a German experts with a low recognition rate, which had performed poorly in the simulation. Based on this, Gigerenzer and Todd (1999) concludes that the stock market is a complex, real-world environment which is unpredictable and indeed based on a form of luck, and as can be seen in this experiment where a random pedestrians managed to beat an educated experts, a certain level of an ignorance of skills and knowledge might be beneficial in constructing a portfolio (Gigerenzer and Todd, 1999). In general, all publications in this section have formed a base for an upcoming chapters and contributed to the research and this dissertation report. Various elements of decision-making process have been mentioned, such as overconfidence, ignorance of skill or education while selecting stocks, or luck, has been mentioned and analyzed. Therefore, upcoming chapters will be a continuation of author's research which has been based on a previously investigated elements by other authors mentioned in this chapter.

### 3. Methodology

In regard to methodology, both quantitative and qualitative research will be represented in this dissertation report, in order to get as precise understating of the analyzed topic as possible.

Quantitative research method will be represented by an analysis of companies within the same sector. Bhandari (2020) suggests that the quantitative research method includes the analysis and comparison of a numerical data, therefore this approach will be adopted in this report. He suggests that quantitative research method is widely used in numerous natural and social sciences including the economy. Bhundari (2020) claims that in order to draw a conclusion from a quantitative research, a statistical analysis is needed. In our research, this will be achieved on a comparative approach based on an individual performance of the stock among its peers within the selected sector. As Bhundari (2020) suggests, one of the main advantages of a quantitative research is that it offers a direct comparison of a results and furthermore this approach is capable to analyze large samples of a data. Both of these factors are necessary in our research; therefore, it is a key reason why this research method is used in this report. He further suggests that apart from an advantages, this research method also has its limitations. He suggests that the narrow focus of this research method and the structural bias which can lead to a misleading conclusions are the most critical (Bhandari, 2020). Both of these factors are acknowledged by an author and fall into a limitation of this report, as it is not an objective of this report to carefully analyze a single company or a single investment to determine whether to decide if invest in it or not. Rather the approach here is to identify a multiple possible companies for investment which are the best performers among their peers and thus have the biggest potential for investment, by using a general comparative approach. This is further confirmed by a Chetty (2016), as she suggests that the quantitative approach's main purpose is to actually quantify a data, therefore it allows a generalizations of a results, which is what this report is aiming for. She claims that in order to perform a solid and thorough research based on a quantitative method, two step approach is necessary. The first step should involve a

planning, while second step will be actual execution of the method (Chetty, 2016). This is in line with what has been done in this dissertation report, due to the fact that before the actual conclusion could be drawn, multiple other steps as a part of planning stage were performed. This included a detailed plan on selecting appropriate market segment for a research, get an understanding of which form of data collection would be most beneficial, determining the overall approach and setting up a milestones to reflect on short term achievements. This included a decision on which market segment the research will be conducted, how the data will be collected, and how they will be compared against each other. Caplinger (2022) suggests that according to Global Industry Classification Standard, overall stock market is divided into eleven market segments based on industries which he describes as following. **Energy** sector covers the companies which are involved in the oil and gas, and energy related business. **Material** sector covers a companies involved in a material industries, such as makers of chemicals or construction materials. **Industrial** sector covers a companies that generally make a use of a heavy equipment, however also transportation companies such as aerospace, defense or engineering companies are covered within this sector. **Utility** sector covers companies engaged in any type of utility such as water, however it also includes a various companies involved in renewable energy business. **Healthcare** sector covers a companies engaged in a pharmaceutical research and development, however also companies engaged in a delivery and supply of a medical equipment or services are included. **Financial** sector generally covers a companies involved with handling of a money, such as banks or various financial institutions. **Consumer Discretionary** includes a companies involved in selling a highly rated products such as automobiles, luxury, and leisure products. **Consumer Staples** includes a products which are needed for customers regardless of the income or their wealth situation, such as food, beverage, groceries, or tobacco products. **Information Technology** sector covers a companies involved in any kind of technology innovation, such as various software creators or hardware producers. **Communication services** groups a companies involved in a various wireless or

landline-based business, such as telecommunication companies or social media platforms. **Real Estate** sector covers a companies that are involved in a developing of real estate projects or a various real estate investment trusts. (Caplinger, 2022). For our research, the analysis was performed on a three following sectors: Industrial, Consumer Discretionary and Consumer Staples in order to cover a broad area of the market. The stocks of 20 largest companies from Standard & Poor's 500 (S&P 500) index of each respective sector based on the market capitalization will be taken into account. Afterwards, individual stocks of each company from a respective group will then be compared against their peers using a three selected formulas. Elmeraji et al. (2022) suggests that there are numerous formulas which can be used by a value investors to find out what is the intrinsic value of a given company, in order to assess whether the company is worth investing in. He claims that value investors are judging their investments based on a fundamentals and are seeking to purchase a stock of a companies selling for a favorable price or feels that are undervalued in a given moment instead of making an investments based on a trends, feelings, speculation, or any recommendation. Therefore, this approach is what we will consider in this report as a scientific approach, as the results of comparison are based on actual facts and figures. Based on Elmeraji et at. (2022) suggestion, as the first ratio we will use a so call **Price-to-Earnings ratio (P/E)**, which is helping investors to compare the actual price of a stock to the actual earnings which are produced by a company. They claim that P/E is one of the most popular comparison tool and in simple words this helps to understand investors how much they will pay for each dollar of return. They claim that when comparing the companies based on a P/E ratio, there are a few limitations which needs to be considered. It is necessary to understood if the earnings are actual earnings of a given period, or whether the comparison is based on a future forecasted earnings by a stock analysts. The P/E ratio also does not consider any growth, as there are other formulas designed for this purpose. In order to have our approach as scientific as possible, we base the earnings on the actual earnings of the companies achieved in a recently closed quarter, rather

than uncertain numbers drafted based on an opinion of a wall street. The reason for selecting this particular formula is to make sure that the selected company of underlying stock is producing earnings. (Elmerraji et al. 2022). In this research a following formula proposed by Fernand et al. will be applied:

$$P/E \text{ Ratio} = \frac{\text{Market value per share}}{\text{Earnings per share}}$$

*Figure 5: Price-to-Earnings (P/E) ratio (Fernando et al. 2022)*

Elmerraji et al. (2022) suggests that another important metric is the **Price-to-Book ratio (P/B)**, which helps investors to understand what is the relationship between the market value of a company at a given moment and the actual book value of a company. They claim that the understanding of the results of this ratio are important, as it is a conservative measurement of a company's wealth. They claimed that the P/B ratio at close to 1 is considered as a fair, as the company is selling for nearly a book value of its value. However, if the company is selling for a significantly lower number then 1, it means that the stocks of an underlying company are selling with a respective discount to its actual value. (Elmerraji, 2022). The reason for selecting this ratio is to make sure that the investors do not overpay for what they are actually buying. Following formula as proposed by Fernando et al. will be used in our analysis:

$$P/B \text{ Ratio} = \frac{\text{Market Price per Share}}{\text{Book Value per Share}}$$

*Figure 6: Price-to-Book (P/B) ratio (Fernando et al, 2022)*

As the final metric for our analysis, we will use a **Debt-to-Equity ratio (D/E)**. Elmerraji et al. (2022) claims that the D/E ratio helps investors to understand how efficiently the company finances its assets, as it shows the proportion of a debt to equity. They claim that as with the other two used financial ratios, the actual standards vary from industry to industry, therefore it is important to

compare the companies within the same sector, as will be done in this research (Elmerraji et al., 2022). Fernando et al. (2022) claims that the D/E ratio is important specially to understand the extent of a company's reliance on a debt. They claim that when comparing peers, the higher D/E ratio suggests that the investment is more risky as a company is taking more debt in order to finance its operation, expansion, or other elements. In order to use the ratio in our analysis, following formula as proposed by Fernando et al. (2022) will be applied:

$$\text{Debt/Equity} = \frac{\text{Total Liabilities}}{\text{Total Shareholders' Equity}}$$

*Figure 7: Debt-to-Equity (D/E) ratio (Fernando et al. 2022)*

To determine the results, we will compare a performance of the three highest ranking stocks comparing to performance of a benchmark which will be Standard & Poor's 500 (S&P 500), Dow Jones Industrial Average and similar. Furthermore, as a part of a discussion, we will look into the top three companies individually, and try to understand what is behind the actual performance. This analysis of either good or poor performance will be however done only on a high level, due to the limits of this report. As a main topic of this report is the actual comparison of the companies, and to understand a role of research against a randomly picked portfolio, we will devote most of our focus into that. A brief comparison of companies, as well as qualitative research described in the following paragraph, are included as supportive secondary arguments. In addition to quantitative research method described above, also qualitative research method is going to be performed and the results will be described in the following chapters. The qualitative research method in this report will be represented by a questionnaire, as author believes that it is the most efficient way to obtain the needed results. The intention for this is to complement and validate the overall research and achieve the best possible understanding of the researched problematic within the limitations of this dissertation report. Bhundari (2020) suggests that qualitative research method is focused on a

collection and analysis of non-numeric data in order to understand a concept or general opinion. He claims that the main intention of the qualitative research is to understand the general behavior or how people experience the studied topic. He suggests that the successful qualitative research is based on a focus group and should be conducted by an interview or a questionnaire. It is however important to note, that one of the shortcomings of a qualitative research is, that the collected data will go through the same person which has collected them, in order to form a conclusion. Therefore, authors own interpretation of a data might affect the findings in some way. (Bhundari, 2020). To limit this shortcoming, author will formulate questions where the answers in form of yes/no will be required. The results are needed in order to understand what is the general opinion of a random people close to author of this report on a stock market, and the qualitative research method is the valuable tool to perform this analysis. By asking a series of questions, author aims to understand what is the relationship between a general random people and the stock market, whether they are participating in it, and if so, how much research are they generally perform before they make any investment decision. The results from the questionnaire will help us to answer the first objective of this report which is to “understand the relationship of an average person to individual stock picking” and should also provide a valuable input to the second objective of this report which is to understand a “correlation between researching company and the outcome of an investment”. Furthermore, it must be noted that the qualitative method represented in this report by a questionnaire has also its limitations. Benson (2023) suggests that ethic in investment world is represented through an ethical investing. She claims that this means that an investor is selecting his investment choices based on his own internal beliefs, such as religious or social values that he might share. She claims that ethical investing can have multiple forms and can be directly related with the particular trends, such as sustainable investing, investment into green technology, or investment into companies that are reducing an impact of other form of business which might not be considered as clean (Benson, 2023). In order to focus on answering the key objectives of this report

in a straightforward way, it was decided to disregard this element from the questionnaire. This is done in a two ways. In quantitative method, no company has been filtered out or blacklisted due to the nature of their business model, nor any company has been given advantage despite being potentially considered as the green or sustainable. In qualitative research, our aim was not to ask any participant on their investment style nor investment preference when it comes to sustainability or ethics. Although it would be interesting to consider this element also in this research, it has been left out for a sake of simplicity. Another limitation of this report is that author does not seek to investigate any financial nor private data, therefore all the questions will be asked anonymously and answered on a voluntary basis. The intention of the questions is only to understand a general relationship and understand whether the particular action led to a success or failure. It is not intended to identify the percentage gain, amount invested, amount gained, personal finance statement nor any other detail information. Therefore, the qualitative research method will act as an addition to the quantitative research method described previously, which if combined will give an author needed overview and base for a further discussion of findings. This approach is further confirmed by a publications made by Busetto et al. (2020), as they claim that a qualitative research method tends to be more flexible and open, than a quantitative research method. It is especially efficient in a topics where performing only quantitative research method is not satisfactory. He claims that a solid qualitative research method must be well designed from a beginning in order to achieve a credible results. He claims that a first step is to understand the topic well enough to be able to formulate a main research objective. Following this, the actual research can be designed as a part of a second step, which will consist of a series of questions that should help to get an understanding of a topic identified previously as a part of step one. The following steps will include a data collection and data analysis. However, he claims that in qualitative research these steps are rather flexible, as a follow-up question or even a modification in a form of adding a follow-up question to research design is allowed. He describes this change as a part of iterative research

process as a collected data might lead to an evolution of a researched topic, and claims that it can even lead to a complete change of emphasis on a research question stated in a step one. This can be seen below on a “Iterative research process” flow shown in a (Busetto et al., 2020).

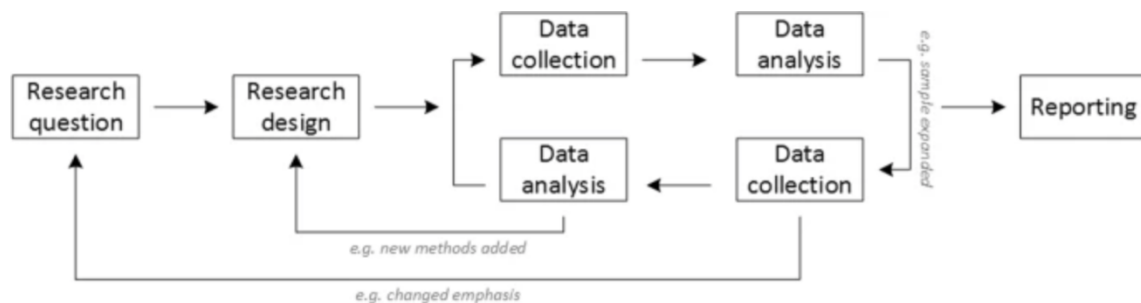


Figure 8: Iterative research process flow (Busetto et al., 2020)

As a part of the qualitative research, author has approached twenty people which belong to his friend circle and were a part of a focus group. Cornello (2022) suggests that it is important to clearly and correctly identify the right focus group as it has impact on overall success of a research. He claims that it is important to have a clear strategy and understand what our goal of the research is. Furthermore, he suggests that it is also important to prepare a right questions and clearly explain the objective of a research to the participants. He suggests that in case of a personal meeting, it is also important to think about the place where the meeting will be held. The place should be comfortable, so that the participants can focus on an actual assignment. Last but not least, he suggests that the questionnaire and overall duration of the session should be kept at a minimum, so that the questionnaire will not become boring for participants. This can lead to an impairment of a results as participants will select random answers due to lack of focus (Cornello, 2022). Focus group for the questionnaire of this dissertation report was designed to be an adult male or a female in a split of 50/50. The minimum age of a participant was set as 18, as according to Ranegar (2022), this is minimum age when a person is allowed to open a stock market account on its own (Ranegar, 2022). A maximum age of a participant was not defined, therefore anyone above 18 was allowed to participate. Furthermore, a focus group was selected to be strictly from author’s friends and family

circle in Slovakia as the idea of this research was to study the behavior of a particular group. In our research, sixteen people had been willing to participate on a questionnaire, out of which seven were women and other eight were men. This was sufficient as the balance between men and women, and overall number of participants are satisfactory to draw a solid conclusion.

In next step, following five questions were asked:

- 1) Are you, in general, interested in a stock market?
- 2) Have you ever tried investing on a stock market?
- 3) Did you ever studied anything related to stocks, finance, or economy?
- 4) Are you confident to say that you understand a stock market?
- 5) Do you make a deep analysis if you purchase stocks?

As a bonus question, if the answer to a question 2) was yes:

- 6) Are you satisfied with a results which you achieved so far?

The results of both, quantitative and qualitative research will be discussed in the following section.

#### **4. Data Analysis**

As the aim of this report is to answer the three questions below, it is necessary that the data collected through quantitative and qualitative analysis as described in a chapter 3. Methodology, will be appropriately analyzed and examined. Through the data analysis, author aims to answer three questions, which are a main objective of this dissertation report:

- A) What is the relationship of an average person to individual stock picking?
- B) What is the correlation between researching a company and the outcome of an investment?
- C) What is the difference between the most and least successful companies?

The question A) will be answered through a qualitative research method – questionnaire. Question B) and C) will be answered through a quantitative research method as described in a Chapter 3. Methodology.

In following section, the objective A) will be analyzed. In order to gather data for this purpose, author conducted an anonymous questionnaire with 20 of his friends and relatives all based in his hometown in Slovakia. The questionnaire was divided into two groups, one group consisting of 10 females and other group consisting of 10 males. The results of a questionnaire with female participants can be seen below on Table 1.

| <b>Females</b> | 1)<br>Are you, in general, interested in a stock market? | 2)<br>Have you ever tried an investing on a stock market? | 3)<br>Did you ever studied anything related to stocks, finance, or economy? | 4)<br>Are you confident to say that you understand a stock market? | 5)<br>Do you make a deep analysis if you purchase a stocks? | 6) (bonus)<br>Are you satisfied with a results which you achieved so far? |
|----------------|----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------|
| <b>F-A</b>     | No                                                       | No                                                        | No                                                                          | No                                                                 | No                                                          | N/A                                                                       |
| <b>F-B</b>     | No                                                       | Yes                                                       | Yes                                                                         | No                                                                 | No                                                          | No                                                                        |
| <b>F-C</b>     | Yes                                                      | Yes                                                       | Yes                                                                         | No                                                                 | No                                                          | No                                                                        |
| <b>F-D</b>     | No                                                       | No                                                        | Yes                                                                         | No                                                                 | No                                                          | N/A                                                                       |
| <b>F-E</b>     | No                                                       | No                                                        | No                                                                          | No                                                                 | No                                                          | N/A                                                                       |
| <b>F-F</b>     | Yes                                                      | Yes                                                       | Yes                                                                         | No                                                                 | No                                                          | Yes                                                                       |
| <b>F-G</b>     | Yes                                                      | Yes                                                       | Yes                                                                         | Yes                                                                | Yes                                                         | Yes                                                                       |
| <b>F-H</b>     | <i>Not willing to participate</i>                        |                                                           |                                                                             |                                                                    |                                                             |                                                                           |
| <b>F-I</b>     | <i>Not willing to participate</i>                        |                                                           |                                                                             |                                                                    |                                                             |                                                                           |
| <b>F-J</b>     | <i>Not willing to participate</i>                        |                                                           |                                                                             |                                                                    |                                                             |                                                                           |

Table 1: Questionnaire - Females

Table 1 above shows an anonymous answers of all ten female participants. Out of ten participants, we have been able to gather seven credible answers to our questions, as remaining three female participants intended for this were not able to participate, due to time constrains or lack of their interest in this topic. In general, based on question 1), we can determine that majority (57,14%) had answered that they are generally not interested in stock market. Despite this, the majority of a females (57,14%) had answered that they had actively participated at least once in stock market in various forms of investment. Furthermore, based on question 3), we can see that participants in this questionnaire had solid foundation on a topic, as majority of a participants (71.43%) had studied the topics related to stock market either as a spare-time activity or directly through university. Based on

answers submitted to question 4), despite having a solid foundation and knowledge in the topic, we can pinpoint a lack of confidence in participants to say that they actually do understand a stock market and the elements influencing the stock market, as only one female participant out of seven (14,29%) had claimed to be confident with it. Similar results are observed also among the answers to question 5), in which we asked if the participants are performing what they would describe as a “deep” analysis before they purchase a stock. We can see that only 1 female participant (14,29%) has taken an effort to perform a deep analysis of a stock prior purchasing, despite as earlier observed in question 2), four females had already participated in a stock market (57,14%). This is an important observation as it shows that a participants are in general willing to “bet” on a stock market, despite lacking a proper knowledge or confidence as proven in question 4). As a part of a questionnaire, the bonus question was introduced for a participants that had actively participated in a stock market based on answers in question 2). We can see that two out of four female participants (50%) are satisfied with their achievements. We however need to note that this satisfaction does not necessary means that their portfolio or investment performed financially well, however, they might have learned a valuable lesson or gained a new experience. To conclude the questionnaire based on female participants, relatively fair number of female participants are interested in a stock market. The majority of a females had experimented with a stock market at certain stage of their life or are still actively participating. However, what can be observed is a fact that only one participant “F-G” had answered to all questions positively, which means that her approach can be called as systematic. She does seem to have a genuine interest in a stock market, certain level of education, needed confidence, and furthermore seem to be making what she feels as a “deep” research prior to committing to the particular investment. As she also answered positively to a bonus question, thus claiming that she is satisfied with her results up to date, we can assume that her approach is paying off.

In following paragraph, same exercise was done also with a group of ten male participants, which are as well among the friends and relatives based in author's hometown in Slovakia. Their answers to the questions can be seen in Table 2 below.

|              | 1)                                                 | 2)                                                  | 3)                                                                    | 4)                                                           | 5)                                                    | 6) (bonus)                                                  |
|--------------|----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|
| <b>Males</b> | Are you, in general, interested in a stock market? | Have you ever tried an investing on a stock market? | Did you ever studied anything related to stocks, finance, or economy? | Are you confident to say that you understand a stock market? | Do you make a deep analysis if you purchase a stocks? | Are you satisfied with a results which you achieved so far? |
| <b>M-A</b>   | Yes                                                | No                                                  | No                                                                    | No                                                           | No                                                    | N/A                                                         |
| <b>M-B</b>   | Yes                                                | Yes                                                 | No                                                                    | No                                                           | No                                                    | No                                                          |
| <b>M-C</b>   | No                                                 | No                                                  | No                                                                    | No                                                           | No                                                    | N/A                                                         |
| <b>M-D</b>   | Yes                                                | Yes                                                 | Yes                                                                   | Yes                                                          | Yes                                                   | Yes                                                         |
| <b>M-E</b>   | Yes                                                | Yes                                                 | Yes                                                                   | No                                                           | Yes                                                   | No                                                          |
| <b>M-F</b>   | No                                                 | No                                                  | No                                                                    | No                                                           | No                                                    | N/A                                                         |
| <b>M-G</b>   | No                                                 | No                                                  | No                                                                    | No                                                           | No                                                    | N/A                                                         |
| <b>M-H</b>   | Yes                                                | Yes                                                 | No                                                                    | Yes                                                          | Yes                                                   | No                                                          |
| <b>M-I</b>   | <i>Not willing to participate</i>                  |                                                     |                                                                       |                                                              |                                                       |                                                             |
| <b>M-J</b>   | <i>Not willing to participate</i>                  |                                                     |                                                                       |                                                              |                                                       |                                                             |

Table 2: Questionnaire - Males

Based on the Table 2 above, we can see that 8 out of 10 participants were willing or available to answer the anonymous questionnaire. Based on question 1, we can see that the majority of males (62,5%) are interested in stock market. This is in line with a questionnaire performed on a females (57,14%), therefore we can deduct that the general level of an interest in a stock market is fair. However, this cannot be confirmed for an entire demographic of authors hometown, as most of the participants were in the similar age as author. In order to do so, wider, and more sophisticated research would need to be performed. However, for scope of this report, the results are sufficient in order to answer objective A). Based on question 2), we can see that four participants (50%) had actively participated in a stock market at some point during their lifetime. This is similar to the results obtained in female questionnaire, where 57,14% participants participated in a stock market. In general, we can conclude that in average every second person involved in this research had tried to invest or participate in some form in a stock market. Only two out of eight male participants

(25%) had studied anything related to a stock market either through university or during their spare time. This is a big difference in comparison with a female participants, where 71,43% of participants answered that they did study anything related to stock market either in university or during the spare time. Based on question 4), we can see that two participants of out eight (25%) answered that they are confident in a stock market, however it must be noted that one of the two is not the same person that studied anything related to a stock market. The level of confidence across both questionnaires is very low as only 25% of male participants and 14,29% of female participants have the confidence to participate in a stock market. It must be noted that despite having a confidence, does not necessary mean that these participants have the necessary set of skills. Based on question 5), we can see that three out of eight male participants (37,5%) answered that they are taking their time and effort to analyze an investment opportunity to a certain degree. This is more than what was observed among the females, where only 14,29% respondents have replied positively to the same question. Based on a bonus question 6), which was asked only to participants which ever participated in a stock market, we can see that only one male participant out of four (25%) is satisfied with a result that he had achieved so far. What comes as no surprise is a fact that similarly to a female questionnaire, this person replied positively to all questions, which means that he has genuine interest in a stock market, had studied a topic to a certain degree, and is taking a needed time to perform what he feels is a “deep research” before he participates in a stock market.

In order to answer the questions in objective B) and C), the quantitative research described in following section has been performed. In the first step, as shown in Table 3, Table 4 and Table 5 below, all companies in Standard & Poor's 500 index (S&P 500) listed in sectors Industrials, Consumer Staples, and Consumer Discretionary has been sorted based on a current 2023 market capitalization as of 22.01.2023 based on a values retreated from Yahoo Finance (Yahoo Finance, 2022).

| <b>S&amp;P500 - Industrials (^SP500-20)</b> |                                 |                      |                                                     |
|---------------------------------------------|---------------------------------|----------------------|-----------------------------------------------------|
| <b>Pos</b>                                  | <b>Name</b>                     | <b>Ticker (NYSE)</b> | <b>Market Capitalisation<br/>(as of 22.01.2023)</b> |
| 1                                           | United Parcel Service, Inc.     | UPS                  | 154.067.845.120 US\$                                |
| 2                                           | Raytheon Technologies Corporati | RTX                  | 138.714.857.472 US\$                                |
| 3                                           | Honeywell International Inc.    | HON                  | 135.829.209.088 US\$                                |
| 4                                           | Caterpillar, Inc.               | CAT                  | 129.951.334.400 US\$                                |
| 5                                           | Union Pacific Corporation       | UNP                  | 128.284.385.280 US\$                                |
| 6                                           | Boeing Company (The)            | BA                   | 123.225.440.256 US\$                                |
| 7                                           | Deere & Company                 | DE                   | 122.012.663.808 US\$                                |
| 8                                           | Lockheed Martin Corporation     | LMT                  | 116.172.161.024 US\$                                |
| 9                                           | General Electric Company        | GE                   | 84.878.598.144 US\$                                 |
| 10                                          | Illinois Tool Works Inc.        | ITW                  | 69.510.045.696 US\$                                 |
| 11                                          | Northrop Grumman Corporation    | NOC                  | 69.377.376.256 US\$                                 |
| 12                                          | CSX Corporation                 | CSX                  | 67.298.140.160 US\$                                 |
| 13                                          | 3M Company                      | MMM                  | 66.688.442.368 US\$                                 |
| 14                                          | General Dynamics Corporation    | GD                   | 63.912.259.584 US\$                                 |
| 15                                          | Waste Management, Inc.          | WM                   | 62.417.129.472 US\$                                 |
| 16                                          | Eaton Corporation, PLC          | ETN                  | 61.846.323.200 US\$                                 |
| 17                                          | Norfolk Southern Corporation    | NSC                  | 58.725.842.944 US\$                                 |
| 18                                          | Emerson Electric Company        | EMR                  | 50.864.164.864 US\$                                 |
| 19                                          | FedEx Corporation               | FDX                  | 47.167.950.848 US\$                                 |
| 20                                          | Johnson Controls International  | JCI                  | 45.356.802.048 US\$                                 |
| 21                                          | Cintas Corporation              | CTAS                 | 44.362.211.328 US\$                                 |
| 22                                          | Parker-Hannifin Corporation     | PH                   | 39.204.921.344 US\$                                 |
| 23                                          | Trane Technologies plc          | TT                   | 39.124.553.728 US\$                                 |
| 24                                          | Republic Services, Inc.         | RSG                  | 38.915.522.560 US\$                                 |
| 25                                          | L3Harris Technologies, Inc.     | LHX                  | 36.654.481.408 US\$                                 |
| 26                                          | Transdigm Group Incorporated    | TDG                  | 36.575.076.352 US\$                                 |

|    |                                 |      |                     |
|----|---------------------------------|------|---------------------|
| 27 | Carrier Global Corporation      | CARR | 35.599.675.392 US\$ |
| 28 | Old Dominion Freight Line, Inc. | ODFL | 35.025.002.496 US\$ |
| 29 | PACCAR Inc.                     | PCAR | 34.495.107.072 US\$ |
| 30 | Otis Worldwide Corporation      | OTIS | 33.664.313.344 US\$ |
| 31 | Cummins Inc.                    | CMI  | 33.217.732.608 US\$ |
| 32 | AMETEK, Inc.                    | AME  | 32.725.694.464 US\$ |
| 33 | CoStar Group, Inc.              | CSGP | 31.933.296.640 US\$ |
| 34 | Rockwell Automation, Inc.       | ROK  | 30.981.419.008 US\$ |
| 35 | Copart, Inc.                    | CPRT | 30.235.523.072 US\$ |
| 36 | Verisk Analytics, Inc.          | VRSK | 28.401.625.088 US\$ |
| 37 | W.W. Grainger, Inc.             | GWV  | 28.308.535.296 US\$ |
| 38 | Fastenal Company                | FAST | 27.969.789.952 US\$ |
| 39 | Equifax, Inc.                   | EFX  | 27.266.832.384 US\$ |
| 40 | United Rentals, Inc.            | URI  | 26.591.592.448 US\$ |
| 41 | Delta Air Lines, Inc.           | DAL  | 25.025.564.672 US\$ |
| 42 | Fortive Corporation             | FTV  | 23.156.731.904 US\$ |
| 43 | Ingersoll Rand Inc.             | IR   | 22.412.654.592 US\$ |
| 44 | Southwest Airlines Company      | LUV  | 22.004.449.280 US\$ |
| 45 | Quanta Services, Inc.           | PWR  | 20.897.841.152 US\$ |
| 46 | Xylem Inc.                      | XYL  | 19.856.859.136 US\$ |
| 47 | J.B. Hunt Transport Services, I | JBHT | 19.617.802.240 US\$ |
| 48 | Dover Corporation               | DOV  | 19.556.925.440 US\$ |
| 49 | Westinghouse Air Brake Technolo | WAB  | 18.523.254.784 US\$ |
| 50 | Rollins, Inc.                   | ROL  | 17.783.164.928 US\$ |
| 51 | IDEX Corporation                | IEX  | 17.437.358.080 US\$ |
| 52 | Expeditors International of Was | EXPD | 16.984.586.240 US\$ |
| 53 | United Airlines Holdings, Inc.  | UAL  | 16.169.859.072 US\$ |

|    |                                |      |                     |
|----|--------------------------------|------|---------------------|
| 54 | Howmet Aerospace Inc.          | HWM  | 16.010.654.720 US\$ |
| 55 | Jacobs Solutions Inc.          | J    | 15.200.916.480 US\$ |
| 56 | Textron Inc.                   | TXT  | 14.165.112.832 US\$ |
| 57 | Nordson Corporation            | NDSN | 13.364.403.200 US\$ |
| 58 | Leidos Holdings, Inc.          | LDOS | 13.130.440.704 US\$ |
| 59 | Stanley Black & Decker, Inc.   | SWK  | 12.697.862.144 US\$ |
| 60 | Snap-On Incorporated           | SNA  | 12.672.588.800 US\$ |
| 61 | Masco Corporation              | MAS  | 11.308.023.808 US\$ |
| 62 | C.H. Robinson Worldwide, Inc.  | CHRW | 11.011.677.184 US\$ |
| 63 | American Airlines Group, Inc.  | AAL  | 10.619.382.784 US\$ |
| 64 | Allegion plc                   | ALLE | 9.777.126.400 US\$  |
| 65 | A.O. Smith Corporation         | AOS  | 9.036.700.672 US\$  |
| 66 | Huntington Ingalls Industries, | HII  | 8.702.953.472 US\$  |
| 67 | Robert Half International Inc. | RHI  | 8.492.216.320 US\$  |
| 68 | Pentair plc.                   | PNR  | 8.086.721.536 US\$  |
| 69 | Generac Holdings Inc.          | GNRC | 6.873.535.488 US\$  |
| 70 | Alaska Air Group, Inc.         | ALK  | 6.319.069.184 US\$  |

*Table 3: S&P500 - Industrials - ranked by market capitalization.*

| S&P500 - Consumer Staples (^SP500-30) |                                 |               |                                             |
|---------------------------------------|---------------------------------|---------------|---------------------------------------------|
| Pos                                   | Name                            | Ticker (NYSE) | Market Capitalisation<br>(as of 22.01.2023) |
| 1                                     | Walmart Inc.                    | WMT           | 379.008.253.952 US\$                        |
| 2                                     | Procter & Gamble Company (The)  | PG            | 337.286.266.880 US\$                        |
| 3                                     | Coca-Cola Company (The)         | KO            | 259.816.587.264 US\$                        |
| 4                                     | Pepsico, Inc.                   | PEP           | 234.045.374.464 US\$                        |
| 5                                     | Costco Wholesale Corporation    | COST          | 213.038.727.168 US\$                        |
| 6                                     | Philip Morris International Inc | PM            | 157.841.375.232 US\$                        |
| 7                                     | Estee Lauder Companies, Inc. (T | EL            | 95.468.617.728 US\$                         |
| 8                                     | Mondelez International, Inc.    | MDLZ          | 87.454.302.208 US\$                         |
| 9                                     | Altria Group, Inc.              | MO            | 80.540.114.944 US\$                         |
| 10                                    | Colgate-Palmolive Company       | CL            | 63.008.546.816 US\$                         |
| 11                                    | Monster Beverage Corporation    | MNST          | 52.212.498.432 US\$                         |
| 12                                    | Keurig Dr Pepper Inc.           | KDP           | 49.158.037.504 US\$                         |
| 13                                    | The Kraft Heinz Company         | KHC           | 48.850.210.816 US\$                         |
| 14                                    | Archer-Daniels-Midland Company  | ADM           | 46.556.057.600 US\$                         |
| 15                                    | General Mills, Inc.             | GIS           | 45.671.268.352 US\$                         |
| 16                                    | Kimberly-Clark Corporation      | KMB           | 45.605.294.080 US\$                         |
| 17                                    | The Hershey Company             | HSY           | 43.994.406.912 US\$                         |
| 18                                    | Constellation Brands, Inc.      | STZ           | 40.763.629.568 US\$                         |
| 19                                    | Sysco Corporation               | SYF           | 39.441.756.160 US\$                         |
| 20                                    | Kroger Company (The)            | KR            | 31.818.289.152 US\$                         |
| 21                                    | Brown Forman Inc                | BF-B          | 31.714.934.784 US\$                         |
| 22                                    | Walgreens Boots Alliance, Inc.  | WBA           | 30.946.643.968 US\$                         |
| 23                                    | Hormel Foods Corporation        | HRL           | 24.359.583.744 US\$                         |
| 24                                    | Tyson Foods, Inc.               | TSN           | 23.151.339.520 US\$                         |
| 25                                    | Kellogg Company                 | K             | 23.036.467.200 US\$                         |
| 26                                    | McCormick & Company, Incorporat | MKC           | 20.799.145.984 US\$                         |

|    |                                |     |                     |
|----|--------------------------------|-----|---------------------|
| 27 | Church & Dwight Company, Inc.  | CHD | 20.289.816.576 US\$ |
| 28 | ConAgra Brands, Inc.           | CAG | 18.102.104.064 US\$ |
| 29 | Clorox Company (The)           | CLX | 17.589.766.144 US\$ |
| 30 | J.M. Smucker Company (The) New | SJM | 15.881.745.408 US\$ |
| 31 | Campbell Soup Company          | CPB | 15.584.315.392 US\$ |
| 32 | Lamb Weston Holdings, Inc.     | LW  | 13.892.184.064 US\$ |
| 33 | Molson Coors Beverage Company  | TAP | 10.873.448.448 US\$ |

*Table 4: S&P 500 - Consumer Staples – ranked by market capitalization.*

| S&P500 - Consumer Discretionary (^SP500-25) |                                 |               |                                             |
|---------------------------------------------|---------------------------------|---------------|---------------------------------------------|
| Pos                                         | Name                            | Ticker (NYSE) | Market Capitalisation<br>(as of 22.01.2023) |
| 1                                           | Amazon.com, Inc.                | AMZN          | 992.115.359.744 US\$                        |
| 2                                           | Tesla, Inc.                     | TSLA          | 421.306.990.592 US\$                        |
| 3                                           | Home Depot, Inc. (The)          | HD            | 321.044.840.448 US\$                        |
| 4                                           | McDonald's Corporation          | MCD           | 196.714.430.464 US\$                        |
| 5                                           | Nike, Inc.                      | NKE           | 196.331.913.216 US\$                        |
| 6                                           | Lowe's Companies, Inc.          | LOW           | 123.679.899.648 US\$                        |
| 7                                           | Starbucks Corporation           | SBUX          | 120.564.916.224 US\$                        |
| 8                                           | TJX Companies, Inc. (The)       | TJX           | 91.908.472.832 US\$                         |
| 9                                           | Booking Holdings Inc. Common St | BKNG          | 90.933.600.256 US\$                         |
| 10                                          | Target Corporation              | TGT           | 74.666.893.312 US\$                         |
| 11                                          | Marriott International          | MAR           | 52.833.693.696 US\$                         |
| 12                                          | Dollar General Corporation      | DG            | 51.558.633.472 US\$                         |
| 13                                          | General Motors Company          | GM            | 50.221.744.128 US\$                         |
| 14                                          | Ford Motor Company              | F             | 49.854.074.880 US\$                         |
| 15                                          | O'Reilly Automotive, Inc.       | ORLY          | 49.646.469.120 US\$                         |
| 16                                          | AutoZone, Inc.                  | AZO           | 43.660.468.224 US\$                         |
| 17                                          | Chipotle Mexican Grill, Inc.    | CMG           | 43.111.575.552 US\$                         |
| 18                                          | Las Vegas Sands Corp.           | LVS           | 41.700.540.416 US\$                         |
| 19                                          | Ross Stores, Inc.               | ROST          | 39.854.059.520 US\$                         |
| 20                                          | Hilton Worldwide Holdings Inc.  | HLT           | 37.517.656.064 US\$                         |
| 21                                          | Yum! Brands, Inc.               | YUM           | 35.670.151.168 US\$                         |
| 22                                          | Dollar Tree, Inc.               | DLTR          | 32.688.781.312 US\$                         |
| 23                                          | D.R. Horton, Inc.               | DHI           | 32.552.896.512 US\$                         |
| 24                                          | Aptiv PLC                       | APTIV         | 28.200.478.720 US\$                         |
| 25                                          | Lennar Corporation              | LEN           | 27.567.190.016 US\$                         |
| 26                                          | eBay Inc.                       | EBAY          | 25.320.468.480 US\$                         |

|    |                                 |      |                     |
|----|---------------------------------|------|---------------------|
| 27 | Ulta Beauty, Inc.               | ULTA | 24.995.192.832 US\$ |
| 28 | Tractor Supply Company          | TSCO | 23.425.888.256 US\$ |
| 29 | Genuine Parts Company           | GPC  | 22.831.380.480 US\$ |
| 30 | Garmin Ltd.                     | GRMN | 18.562.658.304 US\$ |
| 31 | Best Buy Co., Inc.              | BBY  | 18.291.894.272 US\$ |
| 32 | Darden Restaurants, Inc.        | DRI  | 17.936.883.712 US\$ |
| 33 | Expedia Group, Inc.             | EXPE | 17.372.930.048 US\$ |
| 34 | Etsy, Inc.                      | ETSY | 16.568.193.024 US\$ |
| 35 | D/B/A Royal Caribbean Cruises L | RCL  | 16.073.914.368 US\$ |
| 36 | NVR, Inc.                       | NVR  | 16.056.374.272 US\$ |
| 37 | MGM Resorts International       | MGM  | 14.995.980.288 US\$ |
| 38 | LKQ Corporation                 | LKQ  | 14.951.112.704 US\$ |
| 39 | Pool Corporation                | POOL | 13.774.708.736 US\$ |
| 40 | Carnival Corporation            | CCL  | 13.612.151.808 US\$ |
| 41 | Domino's Pizza Inc              | DPZ  | 12.320.407.552 US\$ |
| 42 | PulteGroup, Inc.                | PHM  | 11.552.751.616 US\$ |
| 43 | V.F. Corporation                | VFC  | 11.400.526.848 US\$ |
| 44 | Wynn Resorts, Limited           | WYNN | 11.248.679.936 US\$ |
| 45 | Tapestry, Inc.                  | TPR  | 10.532.405.248 US\$ |
| 46 | CarMax Inc                      | KMX  | 10.442.226.688 US\$ |
| 47 | BorgWarner Inc.                 | BWA  | 10.396.437.504 US\$ |
| 48 | Bath & Body Works, Inc.         | BBWI | 10.280.958.976 US\$ |
| 49 | Caesars Entertainment, Inc.     | CZR  | 10.196.176.896 US\$ |
| 50 | Hasbro, Inc.                    | HAS  | 8.745.378.816 US\$  |
| 51 | Advance Auto Parts Inc.         | AAP  | 8.739.329.024 US\$  |
| 52 | Whirlpool Corporation           | WHR  | 8.216.432.640 US\$  |
| 53 | Ralph Lauren Corporation        | RL   | 7.985.971.200 US\$  |

|    |                                |      |                    |
|----|--------------------------------|------|--------------------|
| 54 | Mohawk Industries, Inc.        | MHK  | 7.280.996.352 US\$ |
| 55 | Norwegian Cruise Line Holdings | NCLH | 6.510.567.936 US\$ |
| 56 | Newell Brands Inc.             | NWL  | 6.224.679.936 US\$ |

*Table 5: S&P 500 - Consumer Discretionary - ranked by market capitalization.*

Based on a Table 3, Table 4 and Table 5, twenty largest companies based on market capitalization from each of the sector has been selected for further analysis in this research. As mentioned in Chapter 3. Methodology, as a next steps, three following tools will be applied for a further analysis: Price-to-Earnings ratio, Price-to-Book ratio, and Debt-to-Equity ratio.

### **Price-to-Earnings ratio:**

Table 6, Table 7 and Table 8 below contain twenty largest companies as per market capitalizations from each respective analyzed sector using Price-to-Earnings ratio. Earnings per share has been taken from the annual report of each respective company as listed in the Chapter 8. Reference list. The prices for this comparison were taken from the historical price database (Yahoo Finance, 2022) and were adjusted in case of a stock splits in order to match the actual price from 2018, so that the actual ratios in respect to values reported in an annual reports of a companies are valid. In this category, the most points were given for the lowest Price-to-Earnings ratio. Murphy (2022) suggests that the lower the Price-to-Earnings ratio, the less the investor actually pays for an earnings of a company. In other words, the low Price-to-Earnings ratio indicates that the stock price is low comparing to actual earnings, while high P/E ratio might indicate that the price is possibly overvalued (Murphy, 2022).

| Sector: Industrials (^SP500-20)   |               |                   |                         |           | (Points) |
|-----------------------------------|---------------|-------------------|-------------------------|-----------|----------|
| Name                              | Ticker (NYSE) | Price-to-Earnings |                         |           |          |
|                                   |               | EPS*              | Price**<br>(31.12.2018) | P/E ratio |          |
| FedEx Corporation                 | FDX           | 16,79 US\$        | 161,33 US\$             | 9,6       | 20       |
| Raytheon Technologies Corporation | RTX (UTX***)  | 6,50 US\$         | 67,01 US\$              | 10,3      | 19       |
| Caterpillar, Inc.                 | CAT           | 10,26 US\$        | 127,07 US\$             | 12,4      | 18       |
| Johnson Controls International    | JCI           | 2,32 US\$         | 29,65 US\$              | 12,8      | 17       |
| Northrop Grumman Corporation      | NOC           | 18,49 US\$        | 244,90 US\$             | 13,2      | 16       |
| Eaton Corporation, PLC            | ETN           | 4,91 US\$         | 68,66 US\$              | 14,0      | 15       |
| General Dynamics Corporation      | GD            | 11,18 US\$        | 157,21 US\$             | 14,1      | 14       |
| Honeywell International Inc.      | HON           | 8,98 US\$         | 132,12 US\$             | 14,7      | 13       |
| Lockheed Martin Corporation       | LMT           | 17,59 US\$        | 261,84 US\$             | 14,9      | 12       |
| Norfolk Southern Corporation      | NSC           | 9,51 US\$         | 149,54 US\$             | 15,7      | 11       |
| CSX Corporation                   | CSX           | 3,84 US\$         | 62,13 US\$              | 16,2      | 10       |
| Illinois Tool Works Inc.          | ITW           | 7,60 US\$         | 126,69 US\$             | 16,7      | 9        |
| Emerson Electric Company          | EMR           | 3,46 US\$         | 59,75 US\$              | 17,3      | 8        |
| Union Pacific Corporation         | UNP           | 7,91 US\$         | 138,23 US\$             | 17,5      | 7        |
| United Parcel Service, Inc.       | UPS           | 5,51 US\$         | 97,53 US\$              | 17,7      | 6        |
| Boeing Company (The)              | BA            | 17,85 US\$        | 322,50 US\$             | 18,1      | 5        |
| Waste Management, Inc.            | WM            | 4,45 US\$         | 88,99 US\$              | 20,0      | 4        |
| Deere & Company                   | DE            | 7,24 US\$         | 149,17 US\$             | 20,6      | 3        |
| 3M Company                        | MMM           | 8,89 US\$         | 190,54 US\$             | 21,4      | 2        |
| General Electric Company          | GE            | -2,43 US\$        | 5,68 US\$               | -         | 1        |

\* Data as per fiscal year end 2018

\*\*Close price adjusted for splits.

\*\*\* Pre-merger data

CSX: 3-1 stock split in 2021

GE: 1-8 stock split in 2021

Table 6: Price-to-Earnings: Industrials (S&P500)

| Sector: Consumer Staples (^SP500-30) |               |                   |                         |           | (Points) |
|--------------------------------------|---------------|-------------------|-------------------------|-----------|----------|
| Name                                 | Ticker (NYSE) | Price-to-Earnings |                         |           |          |
|                                      |               | EPS*              | Price**<br>(31.12.2018) | P/E ratio |          |
| General Mills, Inc.                  | GIS           | 3,22 US\$         | 38,94 US\$              | 12,1      | 20       |
| Pepsico, Inc.                        | PEP           | 8,78 US\$         | 110,48 US\$             | 12,6      | 19       |
| Archer-Daniels-Midland Company       | ADM           | 3,19 US\$         | 40,97 US\$              | 12,8      | 18       |
| Philip Morris International Inc      | PM            | 5,08 US\$         | 66,76 US\$              | 13,1      | 17       |
| Kroger Company (The)                 | KR            | 2,09 US\$         | 27,50 US\$              | 13,2      | 16       |
| Altria Group, Inc.                   | MO            | 3,68 US\$         | 49,39 US\$              | 13,4      | 15       |
| Constellation Brands, Inc.           | STZ           | 11,55 US\$        | 160,82 US\$             | 13,9      | 14       |
| Mondelez International, Inc.         | MDLZ          | 2,46 US\$         | 40,03 US\$              | 16,3      | 13       |
| The Hershey Company                  | HSY           | 5,58 US\$         | 107,18 US\$             | 19,2      | 12       |
| Colgate-Palmolive Company            | CL            | 2,75 US\$         | 59,52 US\$              | 21,6      | 11       |
| Sysco Corporation                    | SYZ           | 2,70 US\$         | 62,66 US\$              | 23,2      | 10       |
| Procter & Gamble Company (The)       | PG            | 3,67 US\$         | 91,92 US\$              | 25,0      | 9        |
| Monster Beverage Corporation         | MNST          | 1,76 US\$         | 49,22 US\$              | 28,0      | 8        |
| Kimberly-Clark Corporation           | KMB           | 4,03 US\$         | 113,94 US\$             | 28,3      | 7        |
| Walmart Inc.                         | WMT           | 3,28 US\$         | 93,15 US\$              | 28,4      | 6        |
| Costco Wholesale Corporation         | COST          | 7,09 US\$         | 203,71 US\$             | 28,7      | 5        |
| Coca-Cola Company (The)              | KO            | 1,50 US\$         | 47,35 US\$              | 31,6      | 4        |
| Estee Lauder Companies, Inc. (T      | EL            | 2,95 US\$         | 130,10 US\$             | 44,1      | 3        |
| Keurig Dr Pepper Inc.                | KDP           | 0,53 US\$         | 25,64 US\$              | 48,4      | 2        |
| The Kraft Heinz Company              | KHC           | -8,36 US\$        | 43,04 US\$              | -         | 1        |

\* Data as per fiscal year end 2018

\*\* Close price adjusted for splits.

Table 7: Price-to-Earnings ratio: Consumer Staples (S&P500)

| Sector: Consumer Discretionary (^SP500-25) |               |                   |                         |           | (Points) |
|--------------------------------------------|---------------|-------------------|-------------------------|-----------|----------|
| Name                                       | Ticker (NYSE) | Price-to-Earnings |                         |           |          |
|                                            |               | EPS*              | Price**<br>(31.12.2018) | P/E ratio |          |
| General Motors Company                     | GM            | 5,58 US\$         | 33,45 US\$              | 6,0       | 20       |
| Ford Motor Company                         | F             | 0,92 US\$         | 7,65 US\$               | 8,3       | 19       |
| Target Corporation                         | TGT           | 5,51 US\$         | 66,09 US\$              | 12,0      | 18       |
| Las Vegas Sands Corp.                      | LVS           | 3,07 US\$         | 52,05 US\$              | 17,0      | 17       |
| AutoZone, Inc.                             | AZO           | 48,77 US\$        | 838,34 US\$             | 17,2      | 16       |
| Dollar General Corporation                 | DG            | 5,97 US\$         | 108,08 US\$             | 18,1      | 15       |
| Home Depot, Inc. (The)                     | HD            | 9,37 US\$         | 171,82 US\$             | 18,3      | 14       |
| TJX Companies, Inc. (The)                  | TJX           | 2,43 US\$         | 44,74 US\$              | 18,4      | 13       |
| Ross Stores, Inc.                          | ROST          | 4,26 US\$         | 83,20 US\$              | 19,5      | 12       |
| Starbucks Corporation                      | SBUX          | 3,24 US\$         | 64,40 US\$              | 19,9      | 11       |
| Marriott International                     | MAR           | 5,38 US\$         | 108,56 US\$             | 20,2      | 10       |
| Booking Holdings Inc. Common St            | BKNG          | 83,26 US\$        | 1722,42 US\$            | 20,7      | 9        |
| O'Reilly Automotive, Inc.                  | ORLY          | 16,10 US\$        | 344,33 US\$             | 21,4      | 8        |
| McDonald's Corporation                     | MCD           | 7,54 US\$         | 177,57 US\$             | 23,6      | 7        |
| Hilton Worldwide Holdings Inc.             | HLT           | 2,50 US\$         | 71,80 US\$              | 28,7      | 6        |
| Lowe's Companies, Inc.                     | LOW           | 2,84 US\$         | 92,36 US\$              | 32,5      | 5        |
| Nike, Inc.                                 | NKE           | 1,17 US\$         | 74,14 US\$              | 63,4      | 4        |
| Chipotle Mexican Grill, Inc.               | CMG           | 6,31 US\$         | 431,79 US\$             | 68,4      | 3        |
| Amazon.com, Inc.                           | AMZN          | 20,14 US\$        | 1502,00 US\$            | 74,6      | 2        |
| Tesla, Inc.                                | TSLA          | -5,72 US\$        | 332,85 US\$             | -         | 1        |

\* Data as per fiscal year end 2018

\*\* Close price adjusted for splits.

AMZN: 20-1 stock split in 2022

TSLA: 3-1 stock split in 2022, 5-1 in 2020

Table 8: Price-to-Earnings ratio: Consumer Discretionary (S&P500)

## Price-to-Book ratio:

Table 9, Table 10 and Table 11 below contain twenty largest companies as per market capitalizations from each respective sector analyzed using Price-to-Book ratio. Book value per share has been taken from the annual report of each respective company as listed in the Chapter 8. Reference list. The formula of shareholder equity divided by total shares count has been used to determine the book value, if it was not directly available in the report. The share prices for the ratio were taken from the historical price database (Yahoo Finance, 2022) and were adjusted in case of a stock splits in order to match the actual price from 2018, so that the actual ratios in respect to values

reported in an annual reports of a companies are valid. The most points were given for the company with the lowest value of Price-to-Book ratio. As McClure (2022) suggests, if the value of the Price-to-Book ratio is greater than 1, it means that the investor is paying the premium over its actual book value. The greater the number is, the higher premium is paid (McClure, 2022).

| Sector: Industrials (^SP500-20)   |               | Price-to-Book           |                                 |           | (Points) |
|-----------------------------------|---------------|-------------------------|---------------------------------|-----------|----------|
| Name                              | Ticker (NYSE) | Price**<br>(31.12.2018) | Net Book Value *<br>(per share) | P/B Ratio |          |
| Raytheon Technologies Corporation | RTX (UTX***)  | 67,01 US\$              | 50,14 US\$                      | 1,34      | 20       |
| General Electric Company          | GE            | 5,68 US\$               | 3,56 US\$                       | 1,59      | 19       |
| Eaton Corporation, PLC            | ETN           | 68,66 US\$              | 36,87 US\$                      | 1,86      | 18       |
| FedEx Corporation                 | FDX           | 161,33 US\$             | 71,38 US\$                      | 2,26      | 17       |
| Norfolk Southern Corporation      | NSC           | 149,54 US\$             | 57,30 US\$                      | 2,61      | 16       |
| General Dynamics Corporation      | GD            | 157,21 US\$             | 40,64 US\$                      | 3,87      | 15       |
| Emerson Electric Company          | EMR           | 59,75 US\$              | 14,15 US\$                      | 4,22      | 14       |
| CSX Corporation                   | CSX           | 62,13 US\$              | 14,61 US\$                      | 4,25      | 13       |
| Deere & Company                   | DE            | 149,17 US\$             | 34,50 US\$                      | 4,32      | 12       |
| Union Pacific Corporation         | UNP           | 138,23 US\$             | 27,08 US\$                      | 5,11      | 11       |
| Northrop Grumman Corporation      | NOC           | 244,90 US\$             | 46,89 US\$                      | 5,22      | 10       |
| Caterpillar, Inc.                 | CAT           | 127,07 US\$             | 23,49 US\$                      | 5,41      | 9        |
| Honeywell International Inc.      | HON           | 132,12 US\$             | 24,38 US\$                      | 5,42      | 8        |
| Waste Management, Inc.            | WM            | 88,99 US\$              | 14,52 US\$                      | 6,13      | 7        |
| Johnson Controls International    | JCI           | 29,65 US\$              | 2,95 US\$                       | 10,06     | 6        |
| 3M Company                        | MMM           | 190,54 US\$             | 16,36 US\$                      | 11,65     | 5        |
| Illinois Tool Works Inc.          | ITW           | 126,69 US\$             | 9,66 US\$                       | 13,11     | 4        |
| United Parcel Service, Inc.       | UPS           | 97,53 US\$              | 3,49 US\$                       | 27,94     | 3        |
| Lockheed Martin Corporation       | LMT           | 261,84 US\$             | 5,05 US\$                       | 51,86     | 2        |
| Boeing Company (The)              | BA            | 322,50 US\$             | 0,70 US\$                       | 460,55    | 1        |

\* Data as per fiscal year end 2018

\*\*Close price adjusted for splits.

\*\*\* Pre-merger data

CSX: 3-1 stock split in 2021

GE: 1-8 stock split in 2021

Table 9: Price-to-Book ratio: Industrials (S&P500)

| Sector: Consumer Staples (^SP500-30) |               |                         |                                |           | (Points) |
|--------------------------------------|---------------|-------------------------|--------------------------------|-----------|----------|
| Name                                 | Ticker (NYSE) | Price-to-Book           |                                |           |          |
|                                      |               | Price**<br>(31.12.2018) | Net Book Value*<br>(per share) | P/B Ratio |          |
| The Kraft Heinz Company              | KHC           | 43,04 US\$              | 53,61 US\$                     | 0,80      | 20       |
| Archer-Daniels-Midland Company       | ADM           | 40,97 US\$              | 33,92 US\$                     | 1,21      | 19       |
| Keurig Dr Pepper Inc.                | KDP           | 25,64 US\$              | 20,53 US\$                     | 1,25      | 18       |
| Mondelez International, Inc.         | MDLZ          | 40,03 US\$              | 17,67 US\$                     | 2,27      | 17       |
| Constellation Brands, Inc.           | STZ           | 160,82 US\$             | 67,09 US\$                     | 2,40      | 16       |
| Kroger Company (The)                 | KR            | 27,50 US\$              | 8,52 US\$                      | 3,23      | 15       |
| General Mills, Inc.                  | GIS           | 38,94 US\$              | 11,66 US\$                     | 3,34      | 14       |
| Walmart Inc.                         | WMT           | 93,15 US\$              | 26,85 US\$                     | 3,47      | 13       |
| Procter & Gamble Company (The)       | PG            | 91,92 US\$              | 19,91 US\$                     | 4,62      | 12       |
| Coca-Cola Company (The)              | KO            | 47,35 US\$              | 9,94 US\$                      | 4,76      | 11       |
| Altria Group, Inc.                   | MO            | 49,39 US\$              | 7,89 US\$                      | 6,26      | 10       |
| Costco Wholesale Corporation         | COST          | 203,71 US\$             | 29,66 US\$                     | 6,87      | 9        |
| Monster Beverage Corporation         | MNST          | 49,22 US\$              | 6,40 US\$                      | 7,69      | 8        |
| Estee Lauder Companies, Inc. (T      | EL            | 130,10 US\$             | 12,54 US\$                     | 10,38     | 7        |
| Pepsico, Inc.                        | PEP           | 110,48 US\$             | 10,25 US\$                     | 10,78     | 6        |
| Sysco Corporation                    | SY            | 62,66 US\$              | 4,82 US\$                      | 12,99     | 5        |
| The Hershey Company                  | HSY           | 107,18 US\$             | 6,70 US\$                      | 16,00     | 4        |
| Colgate-Palmolive Company            | CL            | 59,52 US\$              | 0,23 US\$                      | 258,78    | 3        |
| Philip Morris International Inc      | PM            | 66,76 US\$              | -6,91 US\$                     | -         | 2        |
| Kimberly-Clark Corporation           | KMB           | 113,94 US\$             | -0,13 US\$                     | -         | 1        |

\* Data as per fiscal year end 2018

\*\* Close price adjusted for splits.

Table 10: Price-to-Book ratio: Consumer Staples (S&P500)

| Sector: Consumer Discretionary (^SP500-25) |               | Price-to-Book           |                                |              | (Points) |
|--------------------------------------------|---------------|-------------------------|--------------------------------|--------------|----------|
| Name                                       | Ticker (NYSE) | Price**<br>(31.12.2018) | Net Book Value*<br>(per share) | P/B Ratio    |          |
|                                            |               |                         |                                |              |          |
| Ford Motor Company                         | F             | 7,65 US\$               | 9,05 US\$                      | <b>0,85</b>  | 20       |
| General Motors Company                     | GM            | 33,45 US\$              | 29,89 US\$                     | <b>1,12</b>  | 19       |
| Target Corporation                         | TGT           | 66,09 US\$              | 22,61 US\$                     | <b>2,92</b>  | 18       |
| Dollar General Corporation                 | DG            | 108,08 US\$             | 24,12 US\$                     | <b>4,48</b>  | 17       |
| Las Vegas Sands Corp.                      | LVS           | 52,05 US\$              | 8,58 US\$                      | <b>6,07</b>  | 16       |
| Chipotle Mexican Grill, Inc.               | CMG           | 431,79 US\$             | 51,55 US\$                     | <b>8,38</b>  | 15       |
| Ross Stores, Inc.                          | ROST          | 83,20 US\$              | 8,98 US\$                      | <b>9,27</b>  | 14       |
| Booking Holdings Inc. Common St            | BKNG          | 1722,42 US\$            | 182,96 US\$                    | <b>9,41</b>  | 13       |
| Tesla, Inc.                                | TSLA          | 332,85 US\$             | 31,95 US\$                     | <b>10,42</b> | 12       |
| TJX Companies, Inc. (The)                  | TJX           | 44,74 US\$              | 4,01 US\$                      | <b>11,16</b> | 11       |
| Nike, Inc.                                 | NKE           | 74,14 US\$              | 5,01 US\$                      | <b>14,80</b> | 10       |
| Marriott International                     | MAR           | 108,56 US\$             | 6,36 US\$                      | <b>17,08</b> | 9        |
| Amazon.com, Inc.                           | AMZN          | 1502,00 US\$            | 87,10 US\$                     | <b>17,24</b> | 8        |
| Lowe's Companies, Inc.                     | LOW           | 92,36 US\$              | 4,58 US\$                      | <b>20,18</b> | 7        |
| Hilton Worldwide Holdings Inc.             | HLT           | 71,80 US\$              | 1,91 US\$                      | <b>37,68</b> | 6        |
| Starbucks Corporation                      | SBUX          | 64,40 US\$              | 0,84 US\$                      | <b>76,80</b> | 5        |
| O'Reilly Automotive, Inc.                  | ORLY          | 344,33 US\$             | 4,30 US\$                      | <b>80,11</b> | 4        |
| Home Depot, Inc. (The)                     | HD            | 171,82 US\$             | -1,64 US\$                     | -            | 3        |
| McDonald's Corporation                     | MCD           | 177,57 US\$             | -7,97 US\$                     | -            | 2        |
| AutoZone, Inc.                             | AZO           | 838,34 US\$             | -55,44 US\$                    | -            | 1        |

\* Data as per fiscal year end 2018

\*\* Close price adjusted for splits.

AMZN: 20-1 stock split in 2022

TSLA: 3-1 stock split in 2022, 5-1 in 2020

Table 11: Price-to-Book ratio: Consumer Discretionary (S&P500)

## Debt-to-Equity ratio:

Table 12, Table 13 and Table 14 below, contains twenty largest companies as per market capitalizations from each respective sector analyzed using Debt-to-Equity ratio. Actual debt and shareholder's equity values has been taken from the annual report of each respective company as listed in the Chapter 8. Reference list. The most points were given for a company with the lowest value in a Debt-to-Equity results. As Carlson (2022) suggests, Debt-to-Equity ratio indicates how much debt and how much equity company uses to finance its operation. Therefore, if the amount of the debt is lower comparing to equity, the company can be regarded as less risky over a companies

that are highly indebted (Carlson, 2022). Gallo (2015) adds that the Debt-to-Equity ratio tells the investors or business managers how much the company is using the debt to run its business. He claims that it means how much debt the company has for each dollar of its equity. He claims that it should be in interest of a company and its managers to have a favorable Debt-to-Equity ratio as the lenders or investors tends to pay attention to it, when assessing a company (Gallo, 2015).

| Sector: Industrials (^SP500-20)   |               | Debt-to-Equity       |                      |               | (Points) |
|-----------------------------------|---------------|----------------------|----------------------|---------------|----------|
| Name                              | Ticker (NYSE) | Total Debt*          | Shareholders Equity* | D/E Ratio     |          |
| Eaton Corporation, PLC            | ETN           | 14.985.000.000 US\$  | 16.107.000.000 US\$  | <b>0,93</b>   | 20       |
| Johnson Controls International    | JCI           | 3.216.000.000 US\$   | 2.745.000.000 US\$   | <b>1,17</b>   | 19       |
| Emerson Electric Company          | EMR           | 11.400.000.000 US\$  | 8.990.000.000 US\$   | <b>1,27</b>   | 18       |
| Norfolk Southern Corporation      | NSC           | 20.877.000.000 US\$  | 15.362.000.000 US\$  | <b>1,36</b>   | 17       |
| FedEx Corporation                 | FDX           | 32.914.000.000 US\$  | 19.416.000.000 US\$  | <b>1,70</b>   | 16       |
| Union Pacific Corporation         | UNP           | 38.724.000.000 US\$  | 20.423.000.000 US\$  | <b>1,90</b>   | 15       |
| CSX Corporation                   | CSX           | 24.149.000.000 US\$  | 12.580.000.000 US\$  | <b>1,92</b>   | 14       |
| Honeywell International Inc.      | HON           | 39.415.000.000 US\$  | 18.358.000.000 US\$  | <b>2,15</b>   | 13       |
| Raytheon Technologies Corporation | RTX (UTX***)  | 93.492.000.000 US\$  | 40.610.000.000 US\$  | <b>2,30</b>   | 12       |
| Waste Management, Inc.            | WM            | 16.374.000.000 US\$  | 6.276.000.000 US\$   | <b>2,61</b>   | 11       |
| 3M Company                        | MMM           | 26.652.000.000 US\$  | 9.848.000.000 US\$   | <b>2,71</b>   | 10       |
| General Dynamics Corporation      | GD            | 33.676.000.000 US\$  | 11.732.000.000 US\$  | <b>2,87</b>   | 9        |
| Illinois Tool Works Inc.          | ITW           | 11.612.000.000 US\$  | 3.258.000.000 US\$   | <b>3,56</b>   | 8        |
| Northrop Grumman Corporation      | NOC           | 29.466.000.000 US\$  | 8.187.000.000 US\$   | <b>3,60</b>   | 7        |
| Caterpillar, Inc.                 | CAT           | 64.429.000.000 US\$  | 14.080.000.000 US\$  | <b>4,58</b>   | 6        |
| Deere & Company                   | DE            | 58.802.200.000 US\$  | 11.291.200.000 US\$  | <b>5,21</b>   | 5        |
| General Electric Company          | GE            | 278.145.000.000 US\$ | 30.981.000.000 US\$  | <b>8,98</b>   | 4        |
| United Parcel Service, Inc.       | UPS           | 46.979.000.000 US\$  | 3.037.000.000 US\$   | <b>15,47</b>  | 3        |
| Lockheed Martin Corporation       | LMT           | 43.427.000.000 US\$  | 1.449.000.000 US\$   | <b>29,97</b>  | 2        |
| Boeing Company (The)              | BA            | 116.949.000.000 US\$ | 410.000.000 US\$     | <b>285,24</b> | 1        |

\* Data as per fiscal year end 2018

\*\*Close price adjusted for splits.

\*\*\* Pre-merger data

CSX: 3-1 stock split in 2021

GE: 1-8 stock split in 2021

Table 12: Debt-to-Equity ratio: Industrials (S&P500)

| Sector: Consumer Staples (^SP500-30) |               |                      |                      |           | (Points) |
|--------------------------------------|---------------|----------------------|----------------------|-----------|----------|
| Name                                 | Ticker (NYSE) | Debt-to-Equity       |                      |           |          |
|                                      |               | Total Debt*          | Shareholders Equity* | D/E Ratio |          |
| Monster Beverage Corporation         | MNST          | 916.000.000 US\$     | 3.611.000.000 US\$   | 0,25      | 20       |
| The Kraft Heinz Company              | KHC           | 54.162.000.000 US\$  | 65.407.000.000 US\$  | 0,83      | 19       |
| Coca-Cola Company (The)              | KO            | 47.240.000.000 US\$  | 42.730.000.000 US\$  | 1,11      | 18       |
| Archer-Daniels-Midland Company       | ADM           | 21.837.000.000 US\$  | 18.996.000.000 US\$  | 1,15      | 17       |
| Keurig Dr Pepper Inc.                | KDP           | 26.385.000.000 US\$  | 22.533.000.000 US\$  | 1,17      | 16       |
| Procter & Gamble Company (The)       | PG            | 65.427.000.000 US\$  | 52.883.000.000 US\$  | 1,24      | 15       |
| Constellation Brands, Inc.           | STZ           | 16.394.300.000 US\$  | 12.837.200.000 US\$  | 1,28      | 14       |
| Mondelez International, Inc.         | MDLZ          | 37.016.000.000 US\$  | 25.637.000.000 US\$  | 1,44      | 13       |
| Walmart Inc.                         | WMT           | 123.700.000.000 US\$ | 80.822.000.000 US\$  | 1,53      | 12       |
| Estee Lauder Companies, Inc. (T      | EL            | 7.857.000.000 US\$   | 4.710.000.000 US\$   | 1,67      | 11       |
| Costco Wholesale Corporation         | COST          | 27.727.000.000 US\$  | 13.103.000.000 US\$  | 2,12      | 10       |
| Altria Group, Inc.                   | MO            | 40.810.000.000 US\$  | 14.789.000.000 US\$  | 2,76      | 9        |
| General Mills, Inc.                  | GIS           | 23.056.700.000 US\$  | 7.054.500.000 US\$   | 3,27      | 8        |
| Pepsico, Inc.                        | PEP           | 63.046.000.000 US\$  | 14.602.000.000 US\$  | 4,32      | 7        |
| Kroger Company (The)                 | KR            | 30.292.000.000 US\$  | 6.905.000.000 US\$   | 4,39      | 6        |
| The Hershey Company                  | HSY           | 6.296.000.000 US\$   | 1.407.000.000 US\$   | 4,47      | 5        |
| Sysco Corporation                    | SYU           | 15.563.000.000 US\$  | 2.507.000.000 US\$   | 6,21      | 4        |
| Colgate-Palmolive Company            | CL            | 11.946.000.000 US\$  | 197.000.000 US\$     | 60,64     | 3        |
| Philip Morris International Inc      | PM            | 50.540.000.000 US\$  | -10.739.000.000 US\$ | -         | 2        |
| Kimberly-Clark Corporation           | KMB           | 14.564.000.000 US\$  | -46.000.000 US\$     | -         | 1        |

\* Data as per fiscal year end 2018

\*\* Close price adjusted for splits.

Table 13: Debt-to-Equity ratio: Consumer Staples (S&P500)

| Sector: Consumer Discretionary (^SP500-25) |               |                      |                      |           | (Points) |
|--------------------------------------------|---------------|----------------------|----------------------|-----------|----------|
| Name                                       | Ticker (NYSE) | Debt-to-Equity       |                      |           |          |
|                                            |               | Total Debt*          | Shareholders Equity* | D/E Ratio |          |
| Chipotle Mexican Grill, Inc.               | CMG           | 824.179.000 US\$     | 1.441.339.000 US\$   | 0,57      | 20       |
| Ross Stores, Inc.                          | ROST          | 2.767.945.000 US\$   | 3.305.746.000 US\$   | 0,84      | 19       |
| Dollar General Corporation                 | DG            | 6.786.645.000 US\$   | 6.417.393.000 US\$   | 1,06      | 18       |
| Nike, Inc.                                 | NKE           | 12.724.000.000 US\$  | 9.812.000.000 US\$   | 1,30      | 17       |
| Booking Holdings Inc. Common St            | BKNG          | 13.902.000.000 US\$  | 8.785.000.000 US\$   | 1,58      | 16       |
| TJX Companies, Inc. (The)                  | TJX           | 9.277.423.000 US\$   | 5.048.606.000 US\$   | 1,84      | 15       |
| Target Corporation                         | TGT           | 27.290.000.000 US\$  | 11.709.000.000 US\$  | 2,33      | 14       |
| Las Vegas Sands Corp.                      | LVS           | 15.802.000.000 US\$  | 6.745.000.000 US\$   | 2,34      | 13       |
| Amazon.com, Inc.                           | AMZN          | 162.648.000.000 US\$ | 43.549.000.000 US\$  | 3,73      | 12       |
| General Motors Company                     | GM            | 184.562.000.000 US\$ | 42.777.000.000 US\$  | 4,31      | 11       |
| Tesla, Inc.                                | TSLA          | 23.426.010.000 US\$  | 4.923.243.000 US\$   | 4,76      | 10       |
| Ford Motor Company                         | F             | 220.474.000.000 US\$ | 36.066.000.000 US\$  | 6,11      | 9        |
| Lowe's Companies, Inc.                     | LOW           | 30.864.000.000 US\$  | 3.644.000.000 US\$   | 8,47      | 8        |
| Marriott International                     | MAR           | 21.471.000.000 US\$  | 2.225.000.000 US\$   | 9,65      | 7        |
| Starbucks Corporation                      | SBUX          | 22.986.900.000 US\$  | 1.169.500.000 US\$   | 19,66     | 6        |
| O'Reilly Automotive, Inc.                  | ORLY          | 7.627.122.000 US\$   | 353.667.000 US\$     | 21,57     | 5        |
| Hilton Worldwide Holdings Inc.             | HLT           | 13.437.000.000 US\$  | 558.000.000 US\$     | 24,08     | 4        |
| Home Depot, Inc. (The)                     | HD            | 45.881.000.000 US\$  | -1.878.000.000 US\$  | -         | 3        |
| McDonald's Corporation                     | MCD           | 39.069.200.000,00    | -6.258.000.000 US\$  | -         | 2        |
| AutoZone, Inc.                             | AZO           | 10.034.611.000 US\$  | -1.520.355.000 US\$  | -         | 1        |

\* Data as per fiscal year end 2018

\*\* Close price adjusted for splits.

AMZN: 20-1 stock split in 2022

TSLA: 3-1 stock split in 2022, 5-1 in 2020

Table 14: Debt-to-Equity ratio: Consumer Discretionary (S&P500)

## Overall performance:

For simplicity, results of each ratio were sorted and ranked. Based on the position in the list, points ranging from 1 (for worst performing company) to 20 (for best performing company) were assigned to each company. The point system will help us to determine the best performing companies across all three analyzed ratios, which will then be discussed and compared against the general indexes, to draw the conclusions needed to answer the objective B) and C) in Chapter 5. Discussion and Conclusion.

| Sector: Industrials (^SP500-20)   |               | Points achieved   |               |                |              | Actual Price Development |              |           |
|-----------------------------------|---------------|-------------------|---------------|----------------|--------------|--------------------------|--------------|-----------|
| Name                              | Ticker (NYSE) | Price-to-Earnings | Price-to-Book | Debt-to-Equity | Total points | 31/12/2018**             | 30/12/2022** | Gain/Loss |
| Eaton Corporation, PLC            | ETN           | 15                | 18            | 20             | 53           | 68,66 US\$               | 156,95 US\$  | 128,6 %   |
| Emerson Electric Company          | EMR           | 18                | 14            | 18             | 50           | 59,75 US\$               | 96,06 US\$   | 60,8 %    |
| Raytheon Technologies Corporation | RTX (UTX***)  | 16                | 20            | 12             | 48           | 67,01 US\$               | 100,92 US\$  | 50,6 %    |
| Johnson Controls International    | JCI           | 19                | 6             | 19             | 44           | 29,65 US\$               | 64,00 US\$   | 115,9 %   |
| CSX Corporation                   | CSX           | 17                | 13            | 14             | 44           | 62,13 US\$               | 92,94 US\$   | 49,6 %    |
| General Electric Company          | GE            | 20                | 19            | 4              | 43           | 5,68 US\$                | 8,18 US\$    | 43,9 %    |
| Norfolk Southern Corporation      | NSC           | 7                 | 16            | 17             | 40           | 149,54 US\$              | 246,42 US\$  | 64,8 %    |
| FedEx Corporation                 | FDX           | 5                 | 17            | 16             | 38           | 161,33 US\$              | 173,20 US\$  | 7,4 %     |
| Union Pacific Corporation         | UNP           | 9                 | 11            | 15             | 35           | 138,23 US\$              | 207,07 US\$  | 49,8 %    |
| Waste Management, Inc.            | WM            | 14                | 7             | 11             | 32           | 88,99 US\$               | 156,88 US\$  | 76,3 %    |
| Honeywell International Inc.      | HON           | 10                | 8             | 13             | 31           | 132,12 US\$              | 214,30 US\$  | 62,2 %    |
| General Dynamics Corporation      | GD            | 6                 | 15            | 9              | 30           | 157,21 US\$              | 248,11 US\$  | 57,8 %    |
| Caterpillar, Inc.                 | CAT           | 11                | 9             | 6              | 26           | 127,07 US\$              | 239,56 US\$  | 88,5 %    |
| Deere & Company                   | DE            | 8                 | 12            | 5              | 25           | 149,17 US\$              | 428,76 US\$  | 187,4 %   |
| Illinois Tool Works Inc.          | ITW           | 12                | 4             | 8              | 24           | 126,69 US\$              | 220,30 US\$  | 73,9 %    |
| Northrop Grumman Corporation      | NOC           | 3                 | 10            | 7              | 20           | 244,90 US\$              | 545,61 US\$  | 122,8 %   |
| United Parcel Service, Inc.       | UPS           | 13                | 3             | 3              | 19           | 97,53 US\$               | 173,84 US\$  | 78,2 %    |
| 3M Company                        | MMM           | 4                 | 5             | 10             | 19           | 190,54 US\$              | 119,92 US\$  | -37,1 %   |
| Lockheed Martin Corporation       | LMT           | 2                 | 2             | 2              | 6            | 261,84 US\$              | 486,49 US\$  | 85,8 %    |
| Boeing Company (The)              | BA            | 1                 | 1             | 1              | 3            | 322,50 US\$              | 190,49 US\$  | -40,9 %   |

\* Data as per fiscal year end 2018

\*\*Close price adjusted for splits.

\*\*\* Pre-merger data

CSX: 3-1 stock split in 2021

GE: 1-8 stock split in 2021

Table 15: Overall results - Industrials (S&P500)

As can be seen above in Table 15, Eaton Corporations (“ETN”), Emerson Electric Company (“EMR”) and Raytheon Technologies Corporation (“RTX”) had been ranked as the three companies that should be selected for investments according to our criterions. In the section “Actual Price Development” we have compared a historical closing share price from the last trading day of 2018 with the last trading day of 2022. We can see that the best performing company, Eaton Corporation, has been a second top gainer among all twenty companies in terms of percentage gain for studied period. Both, Emerson Electric Company, and Raytheon Technologies Corporation, had obtained fairly average results compared to peers, where actual average gain was 66,3% among all 20 companies. What is important to notice in the Table 15 is, that both companies which has produced a loss (3M Company and Boeing Company) are in the very bottom of the table. Therefore, we can

conclude that in this case, scientific view on the actual hard numbers reported by companies actually helped us to protect from a losing companies in the Industrials sector.

| Sector: Consumer Staples (^SP500-30) |               | Points achieved   |               |                |              | Actual Price Development |              |           |
|--------------------------------------|---------------|-------------------|---------------|----------------|--------------|--------------------------|--------------|-----------|
| Name                                 | Ticker (NYSE) | Price-to-Earnings | Price-to-Book | Debt-to-Equity | Total points | 31/12/2018**             | 30/12/2022** | Gain/Loss |
| Archer-Daniels-Midland Company       | ADM           | 18                | 19            | 17             | 54           | 40,97 US\$               | 92,85 US\$   | 126,6 %   |
| Constellation Brands, Inc.           | STZ           | 14                | 16            | 14             | 44           | 160,82 US\$              | 231,75 US\$  | 44,1 %    |
| Mondelez International, Inc.         | MDLZ          | 13                | 17            | 13             | 43           | 40,03 US\$               | 66,65 US\$   | 66,5 %    |
| General Mills, Inc.                  | GIS           | 20                | 14            | 8              | 42           | 38,94 US\$               | 83,85 US\$   | 115,3 %   |
| The Kraft Heinz Company              | KHC           | 1                 | 20            | 19             | 40           | 43,04 US\$               | 40,71 US\$   | -5,4 %    |
| Kroger Company (The)                 | KR            | 16                | 15            | 6              | 37           | 27,50 US\$               | 44,58 US\$   | 62,1 %    |
| Procter & Gamble Company (The)       | PG            | 9                 | 12            | 15             | 36           | 91,92 US\$               | 151,56 US\$  | 64,9 %    |
| Monster Beverage Corporation         | MNST          | 8                 | 8             | 20             | 36           | 49,22 US\$               | 101,53 US\$  | 106,3 %   |
| Keurig Dr Pepper Inc.                | KDP           | 2                 | 18            | 16             | 36           | 25,64 US\$               | 35,66 US\$   | 39,1 %    |
| Altria Group, Inc.                   | MO            | 15                | 10            | 9              | 34           | 49,39 US\$               | 45,71 US\$   | -7,5 %    |
| Coca-Cola Company (The)              | KO            | 4                 | 11            | 18             | 33           | 47,35 US\$               | 63,61 US\$   | 34,3 %    |
| Pepsico, Inc.                        | PEP           | 19                | 6             | 7              | 32           | 110,48 US\$              | 180,66 US\$  | 63,5 %    |
| Walmart Inc.                         | WMT           | 6                 | 13            | 12             | 31           | 93,15 US\$               | 141,79 US\$  | 52,2 %    |
| Costco Wholesale Corporation         | COST          | 5                 | 9             | 10             | 24           | 203,71 US\$              | 456,50 US\$  | 124,1 %   |
| Philip Morris International Inc      | PM            | 17                | 2             | 2              | 21           | 66,76 US\$               | 101,21 US\$  | 51,6 %    |
| Estee Lauder Companies, Inc. (T      | EL            | 3                 | 7             | 11             | 21           | 130,10 US\$              | 248,11 US\$  | 90,7 %    |
| The Hershey Company                  | HSY           | 12                | 4             | 5              | 21           | 107,18 US\$              | 231,57 US\$  | 116,1 %   |
| Sysco Corporation                    | SY            | 10                | 5             | 4              | 19           | 62,66 US\$               | 76,45 US\$   | 22,0 %    |
| Colgate-Palmolive Company            | CL            | 11                | 3             | 3              | 17           | 59,52 US\$               | 78,79 US\$   | 32,4 %    |
| Kimberly-Clark Corporation           | KMB           | 7                 | 1             | 1              | 9            | 113,94 US\$              | 135,75 US\$  | 19,1 %    |

\* Data as per fiscal year end 2018

\*\* Close price adjusted for splits.

\* Data as per fiscal year end 2018

\*\* Close price adjusted for splits.

Table 16: Overall results - Consumer Staples (S&P500)

In Consumer Staples category, based on a Table 16, the top three companies based on overall total points were Archer-Daniels-Midland Company (“ADM”), Constellation Brands (“STZ”) and Mondelez International (“MDLZ”). It is interesting to see that our top performer Archer-Daniels-Midland-Company which has obtained a remarkable 54 points out of 60 possible, has been also a top gainer among all twenty companies. As previously seen in Industrials, the other two companies in top three had produced a gains that were fairly average, as the average gain among all twenty companies was 60,9%. We can also notice that the three companies that ranked on the very bottom of the table had rapidly underperformed the average percentage gain. However, we must also note that the only two companies producing an actual loss are fairly high in our table on 5<sup>th</sup> and 10<sup>th</sup> position. This might indicate that despite the fact that based on our table, these companies were

representing fairly good value for investing in 2018, their actual business results after the investment would be realized had been unsatisfactory for various reasons, thus generating a loss over 4-year period.

| Sector: Consumer Discretionary (^SP500-25) |               | Points achieved   |               |                |              | Actual Price Development |              |           |
|--------------------------------------------|---------------|-------------------|---------------|----------------|--------------|--------------------------|--------------|-----------|
| Name                                       | Ticker (NYSE) | Price-to-Earnings | Price-to-Book | Debt-to-Equity | Total points | 31/12/2018**             | 30/12/2022** | Gain/Loss |
| Target Corporation                         | TGT           | 18                | 18            | 14             | 50           | 66,09 US\$               | 149,04 US\$  | 125,5 %   |
| Dollar General Corporation                 | DG            | 15                | 17            | 18             | 50           | 108,08 US\$              | 246,25 US\$  | 127,8 %   |
| General Motors Company                     | GM            | 20                | 19            | 11             | 50           | 33,45 US\$               | 33,64 US\$   | 0,6 %     |
| Ford Motor Company                         | F             | 19                | 20            | 9              | 48           | 7,65 US\$                | 11,63 US\$   | 52,0 %    |
| Las Vegas Sands Corp.                      | LVS           | 17                | 16            | 13             | 46           | 52,05 US\$               | 48,07 US\$   | -7,6 %    |
| Ross Stores, Inc.                          | ROST          | 12                | 14            | 19             | 45           | 83,20 US\$               | 116,07 US\$  | 39,5 %    |
| TJX Companies, Inc. (The)                  | TJX           | 13                | 11            | 15             | 39           | 44,74 US\$               | 79,60 US\$   | 77,9 %    |
| Booking Holdings Inc. Common St            | BKNG          | 9                 | 13            | 16             | 38           | 1722,42 US\$             | 2015,28 US\$ | 17,0 %    |
| Chipotle Mexican Grill, Inc.               | CMG           | 3                 | 15            | 20             | 38           | 431,79 US\$              | 1387,49 US\$ | 221,3 %   |
| Nike, Inc.                                 | NKE           | 4                 | 10            | 17             | 31           | 74,14 US\$               | 117,01 US\$  | 57,8 %    |
| Marriott International                     | MAR           | 10                | 9             | 7              | 26           | 108,56 US\$              | 148,89 US\$  | 37,1 %    |
| Tesla, Inc.                                | TSLA          | 1                 | 12            | 10             | 23           | 332,85 US\$              | 1847,70 US\$ | 455,1 %   |
| Amazon.com, Inc.                           | AMZN          | 2                 | 8             | 12             | 22           | 1502,00 US\$             | 1680,00 US\$ | 11,9 %    |
| Starbucks Corporation                      | SBUX          | 11                | 5             | 6              | 22           | 64,40 US\$               | 99,20 US\$   | 54,0 %    |
| AutoZone, Inc.                             | AZO           | 16                | 3             | 3              | 22           | 838,34 US\$              | 2466,18 US\$ | 194,2 %   |
| Lowe's Companies, Inc.                     | LOW           | 5                 | 7             | 8              | 20           | 92,36 US\$               | 199,24 US\$  | 115,7 %   |
| Home Depot, Inc. (The)                     | HD            | 14                | 2             | 2              | 18           | 171,82 US\$              | 315,86 US\$  | 83,8 %    |
| O'Reilly Automotive, Inc.                  | ORLY          | 8                 | 4             | 5              | 17           | 344,33 US\$              | 844,03 US\$  | 145,1 %   |
| Hilton Worldwide Holdings Inc.             | HLT           | 6                 | 6             | 4              | 16           | 71,80 US\$               | 126,36 US\$  | 76,0 %    |
| McDonald's Corporation                     | MCD           | 7                 | 1             | 1              | 9            | 177,57 US\$              | 263,53 US\$  | 48,4 %    |

\* Data as per fiscal year end 2018

\*\* Close price adjusted for splits.

AMZN: 20-1 stock split in 2022

TSLA: 3-1 stock split in 2022, 5-1 in 2020

Table 17: Overall results - Consumer Discretionary (S&P500)

In our last category, which is Consumer Discretionary, following three companies had been ranked as the top three: Target Corporation (“TGT”), Dollar General Corporation (“DG”) and General Motors Company (“GM”). Based on a Table 17, we can see that our top two companies “TGT” and “DG” has produced 5<sup>th</sup> and 6<sup>th</sup> best result overall among all twenty companies. However, we need to note that the third selected company “GM” has rapidly underperformed the average of Consumer Discretionary peers which was the gain of 96,7%. This average was however rapidly influenced by a staggering gain of 455,1% achieved by Tesla (“TSLA”). It is needed to highlight that the “TSLA” has actually been ranked in the lower part of the table at their starting point in 2018. However,

despite this, they were able to produce high return. This suggests that there are other important factors to be analyzed beyond the Price-to-Earnings ratio, Price-to-Book ratio, and Debt-to-Equity ratio. In order to understand and determine whether these results are actually successful, it is needed to compare the results also to the results of a general indexes as reported in a Table 18 below.

| <b>Benchmark</b>                           |                      |                    |                    |                  |
|--------------------------------------------|----------------------|--------------------|--------------------|------------------|
| <b>Name</b>                                | <b>Ticker (NYSE)</b> | <b>31/12/2018*</b> | <b>30/12/2022*</b> | <b>Gain/Loss</b> |
| <b>Dow Jones Industrial Average</b>        | ^DJI                 | 23.327,46          | 33.147,25          | <b>42,1 %</b>    |
| <b>NASDAQ Composite</b>                    | ^IXIC                | 6.635,28           | 10.466,48          | <b>57,7 %</b>    |
| <b>Russell 2000</b>                        | ^RUT                 | 1.348,56           | 1.761,25           | <b>30,6 %</b>    |
| <b>S&amp;P 500</b>                         | ^GSPC                | 2.506,85           | 3.839,50           | <b>53,2 %</b>    |
| <b>S&amp;P 500 Industrials (Sector)</b>    | ^SP500-20            | 542,16             | 831,40             | <b>53,3 %</b>    |
| <b>S&amp;P 500 Consumer Staples (Secto</b> | ^SP500-30            | 521,88             | 779,13             | <b>49,3 %</b>    |
| <b>S&amp;P 500 Consumer Discretionary</b>  | ^SP500-25            | 781,5              | 1.005,48           | <b>28,7 %</b>    |

\*Close price adjusted for splits.

*Table 18: Benchmark gain - Indexes*

Based on a Table 18 above, we can see that the NASDAQ Composite, as the best performer, achieved the gain of 57,7% over same period. The average gain of all the indexes mentioned in the Table 18 has been a 45%. S&P500 has achieved a similar gain of 53,2%, while a blue-chip Dow Jones Industrial Average has lacked with the gain of 42,1%. It is interesting to point out that the gain of a whole S&P 500 – Consumer Discretionary sector has achieved only 28,7% gain, despite having 7 companies among the 20 largest by market capitalization with a gain of over 100%. To put these information into perspective, an actual overview of results can be seen in Table 19 below.

| Comparison                                  |               |             |             |                |
|---------------------------------------------|---------------|-------------|-------------|----------------|
| Name                                        | Ticker (NYSE) | 31/12/2018* | 30/12/2022* | Gain/Loss      |
| <b>Industrials (top 3)</b>                  |               |             |             |                |
| Eaton Corporation, PLC                      | ETN           | 68,66 US\$  | 156,95 US\$ | <b>128,6 %</b> |
| Emerson Electric Company                    | EMR           | 59,75 US\$  | 96,06 US\$  | <b>60,8 %</b>  |
| Raytheon Technologies Corporati             | RTX           | 67,01 US\$  | 100,92 US\$ | <b>50,6 %</b>  |
| <b>Portfolio** (Industrials)</b>            |               |             |             | <b>80,0 %</b>  |
| <b>Consumer Staples (top 3)</b>             |               |             |             |                |
| Archer-Daniels-Midland Company              | ADM           | 40,97 US\$  | 92,85 US\$  | <b>126,6 %</b> |
| Constellation Brands, Inc.                  | STZ           | 160,82 US\$ | 231,75 US\$ | <b>44,1 %</b>  |
| Mondelez International, Inc.                | MDLZ          | 40,03 US\$  | 66,65 US\$  | <b>66,5 %</b>  |
| <b>Portfolio** (Consumer Staples)</b>       |               |             |             | <b>79,1 %</b>  |
| <b>Consumer Discretionary (top 3)</b>       |               |             |             |                |
| Target Corporation                          | TGT           | 66,09 US\$  | 149,04 US\$ | <b>125,5 %</b> |
| Dollar General Corporation                  | DG            | 108,08 US\$ | 246,25 US\$ | <b>127,8 %</b> |
| General Motors Company                      | GM            | 33,45 US\$  | 33,64 US\$  | <b>0,6 %</b>   |
| <b>Portfolio** (Consumer Discretionary)</b> |               |             |             | <b>84,6 %</b>  |
| <b>9 Share portfolio**</b>                  |               |             |             | <b>81,2 %</b>  |
| <b>Benchmarks</b>                           |               |             |             |                |
| Dow Jones Industrial Average                | ^DJI          | 23.327,46   | 33.147,25   | <b>42,1 %</b>  |
| NASDAQ Composite                            | ^IXIC         | 6.635,28    | 10.466,48   | <b>57,7 %</b>  |
| Russell 2000                                | ^RUT          | 1.348,56    | 1.761,25    | <b>30,6 %</b>  |
| S&P 500                                     | ^GSPC         | 2.506,85    | 3.839,50    | <b>53,2 %</b>  |
| S&P 500 Industrials (Sector)                | ^SP500-20     | 542,16      | 831,40      | <b>53,3 %</b>  |
| S&P 500 Consumer Staples (Secto             | ^SP500-30     | 521,88      | 779,13      | <b>49,3 %</b>  |
| S&P 500 Consumer Discretionary              | ^SP500-25     | 781,5       | 1.005,48    | <b>28,7 %</b>  |
| <b>Indexes - Average gain</b>               |               |             |             | <b>45,0 %</b>  |

\*Close price adjusted for splits.

\*\*Portfolios equally balanced (average)

Table 19: Final overview - comparison of portfolios and indexes

Table 19 above offers a multiple observations that are important to mention. As first, we can conclude that 7 out of 9 selected companies based on our Price-to-Earning, Price-to-Book and Debt-to-Equity ratios have outperformed the average gain of seven indexes selected for this exercise. We

can also conclude that 6 out of 9 companies had outperformed the best performing index NASDAQ Composite which has gained 57,7% over a studied four-year period. Furthermore, a three-share portfolios which would be constructed equally from a top three companies in each respective S&P500 sector (Industrials, Consumer Staples, Consumer Discretionary) based on our exercise, would rapidly outperform the average gain of all seven indexes as well as the top performing index NASDAQ Composite by fair margin. Last but not least, if we would construct a nine-share portfolio consisting of three selected shares in each studied sector, this combined portfolio would achieve an average gain of 81,2% over a studied four-year period. This would again outperform an average gain of seven indexes (gain of 45%) as well as a gain of top performing index NASDAQ Composite (gain of 57,7%) over a four-year period starting at the end of 2018 and finishing at the end of 2022.

## 5. Discussion and Conclusion

In this chapter, we will summarize a findings from both quantitative and qualitative research performed in previous chapters, in order to answer all three questions which were base for this report. In order to answer **Objective A)** “What is the relationship of an average person to individual stock picking”, we can conclude the following: Based on two questionnaires performed on females and males, we can conclude that target group of friends and relatives of author from his hometown are generally fairly interested in a stock market as eight out of fifteen participants (53.33%) replied positively to this question. Furthermore, we can conclude that participants are also fairly involved in stock market. This can be said based on the fact that eight out of fifteen participants (53.33%) have replied that they have actively participated in stock market at some point during their life. Education does not seem to be a limiting factor, as seven out of fifteen people (46%) replied that they do have some form of education, which is in one way or another related to stock market. However, based on the questionnaire we can identify that participant’s confidence is low, as only three out of fifteen (20%) participants feel confident with their skill and knowledge of a stock market. This suggests that the level of research performed prior investment decision might not be sufficient enough. This

leads us to an **Objective B**), which aims to answer if there is any correlation between researching of company and outcome of an investment. Based on a Table 15, Table 16 and Table 17, we can conclude that performing scientific comparative research has proven to be success and it contributed in numerous ways in our case. First it gave us an overview of each particular company in respect to its sector peers. Furthermore, it helped to highlight a potential risk through a comparison of Debt-to-Equity ratio. Also, by comparing a peers against each other, it can help us via averaging the results, to determine what would be the fair price to pay for earnings of the company in respect to average of the respective sector. In this case, investor can make sure that he does not overpay for the earnings in respect to the peers in same sector. Finally, by researching the companies prior an investment, potential investor will gain the confidence as he will understand the company better and more in details. In this case, it will allow him to actually follow his investment more closely over lifetime of an investment. He can define actual reason why he has decided to enter the particular investment and follow the progress over time. Once the reason why he has entered the investment disappears or is no longer expected to bring expected benefits to the company, an investor can determine the right exit point for himself to abandon the investment and move on. As an example, this might be based on Price-to-Earnings ratio, where initially undervalued company at the time of entering an investment might not be any longer undervalued years later. Or alternatively, it can also be that what was initially a low-risk company, based on a Debt-to-Equity ratio, has become a high-risk company as it became more indebted over the recent period. When analyzing an actual gains, we can see that simulated portfolios which would be constructed using our approach would successfully beat all major indexes including Dow Jones Industrial Average, NASDAQ Composite or even S&P500 from which the stocks were taken. Contributions of our research in this context are numerous. It would help to build a relatively well diversified nine-share portfolio consisting of Industrials, Customer Staples and Customer Discretionary which during our studied four-year period was able to achieve a solid overall gain and

beat the benchmarks. Also, it helped to filter shares with a solid returns in each of studied sectors, with exception being the General Motors company, which were in line or above the market average. Furthermore, we can conclude that our approach was fairly successful tool to indicate a single stocks. Out of all 60 studied stocks, there had been only 34 stocks (56%) which have achieved a higher gain as the most successful index – NASDAQ Composite (gain of 57,7%). Based on our Table 19, we were able to select six of them out of nine picks with 66,6% rate of success. We cannot conclude whether we would beat any random portfolio constructed by a “blindfolded monkey”, as suggested by Burton Malkiel (1973). However, we can conclude that based on a research, we have been able to construct a portfolio that is very likely to be a very competitive one. Last but not least, the most important is however an observation that in every sector, our research has safely helped to avoid any of the five companies (“MMM”, “BA”, “KHC”, “MO”, “LVS”), which had generated a loss over a studied four-year period. Based on all these facts, it is fair to conclude that in our particular case, there has been a positive correlation between the researching of a stock and an actual performance. Despite using only three ratios, and no additional in-depth analysis has been performed, the benefit of this exercise has been visible. It must however be noted that in order to validate and confirm this conclusion, a further analysis using a same methodology should be performed across a different time spans and time periods. It would be beneficial to validate these observations also on remaining sectors of an S&P500 index, other than what we had studied. However, we can say that as we were analyzing three different sectors, our analysis was fairly diverse within a limitation of a time and range provided for this research. In order to answer the **Objective C**), which is to identify whether the is any difference between the successful and less successful investment, we would need to look deeper especially into Table 15, Table 16 and Table 17. We can see that the majority of a companies scoring triple digit gains had in general performed well in a Price-to-Earnings ratio, which suggests that if they were purchased as “undervalued”, therefore there was room for an improvement. However, this is not a rule as in contrast the highest

gainer among all 60 companies, Tesla “TSLA” with a gain of 455%, had actually received only one point for Price-to-Earnings ratio. This suggests that investors were eager to invest in a shares of Tesla despite it actually losing money as shown in Table 8. Similar trend can be observed also in a second top gainer among all 60 companies, Chipotle Mexican Grill “CMG”, which also scored only 3 points for Price-to-Earnings ratio. As shown in Table 8, investors of Chipotle Mexican Grill were paying over 68 times its annual earnings. Murphy suggests that sometimes investors are willing to pay a high multiple of earnings in certain companies where they expect a high potential growth. These are typically companies that grow faster than their competitors due to some form of a knowhow advantage or because they have differentiated themselves from their competitors in a positive way (Murphy, 2022). Based on our table, we did not identify any clear distinction between a successful and not successful companies. As previously mentioned, our approach helped to identify a potentially good investments which have potential to beat the benchmark. However, it does not mean that the companies ranking at the bottom of the table will necessarily produce a loss or bad return. This is due to the fact that the selection of a particular stock is only a starting point. With our approach, we are able to select a promising, possibly undervalued, investment opportunities which in theory should be also well covered in terms of debt. However as mentioned in earlier chapters, there are numerous elements including luck, external events or investors behavior that will influence the outcome of an investment. Due to a complexity of an investment world, investor has multiple tools or techniques how he can affect its investment outcome even after the initial call was wrong. These includes a dollar cost averaging of a cost basis, rebalancing of a portfolio on a regular basis depending on external factors, taking advantage of a negative or positive developments in the company or general market. Therefore, to conclude an objective C), in order to define with a high probability whether the investment will be a success or will likely result in loss, using of Price-to-Earnings ratio, Price-to-Book ratio and Debt-to-Equity comparison alone are not sufficient enough. Last but not least, following recommendations are provided. It would be

beneficial to extend the research performed in this report to the remaining eight sectors of S&P 500 market segments and validate usability and results of a three-formula “tool” designed in this report. Furthermore, it would be beneficial to investigate whether another, more usable or sophisticated formulas should replace the ones selected in this report. This could however be dependent on an investor’s profile and his risk appetite. This is another topic that could be expanded as the defensively oriented investor would potentially use different set of ratios than the investor that is willing to risk more. Despite the fact that both, defensive and aggressive investors, could base their selection on a scientific approach as we have advocated in this report, the final set of ratios and thus the potential results might vary significantly. This could be due to the fact that defensive investor could be more interested in defensive aspects such as cash perseverance, stable cash flow, healthy balance sheet or reasonable debt ratio. On the other hand, less defensive investor might be more interested in a forecasted future earnings or growth thus might select for instance PEG: Earnings-to-Growth ratio among his criteria for company selection. It would be interesting to see a difference and the obtained results between these two investment styles. Furthermore, it could be interesting to understand if by using our scientific approach presented in this report, we would still be able to construct a portfolio that would beat market indices in the studied period, regardless of investment style. As a next recommendation, it is suggested to look beyond the main, most frequently used, ratios and consider whether it would be possible to pinpoint most fitting ratios for each different market segment separately. It is believed by author that it would be the case, as for instance Financial market segment has rapidly different business environment as for instance Industrial market segment. Furthermore, author would recommend to investigate an impact of ethical based investing discussed in Chapter 3. Methodology. Author believes that it would be interesting to compare the results of this exercise between companies solely engaged in a business model which is considered as environmentally friendly such as renewables, green and sustainable business against companies that are not. This would however require additional analysis to precisely filter

out companies that have all their income and earnings strictly from such activities. In order to conclude this report, author will offer his own opinion on the performed research. In his view, it was beneficial to perform this exercise and try to better understand a role of luck in an investment world. In his opinion, based on the achieved results, there is a clear benefit of performing this exercise before committing to a certain investment. While the overperformance of a market might have been a random act or could be strictly related to the selected studied period, in author's opinion there is clear advantage to study the companies before making and investment. This is not only due to the fact that it might help to pick the winners, but also to the fact that, as we have discussed in this report, helps to understand the investor what he has committed into and help him to "monitor" the investment along its lifetime.

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