The performance of impact investing – a market comparison

Bachelor Thesis for Obtaining the Degree

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International Management

Submitted to Dr. Karl Weinmayer

Maximilian Schmerold

1621005

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Affidavit

I hereby affirm that this Bachelor's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

The thesis was not submitted in the same or in a substantially similar version, not even partially, to another examination board and was not published elsewhere.

August 26th, 2019

Date

Abstract

This research is concerned with the emerging investment strategy of SDG investing within the area of sustainable finance. These investments are conducted with a second goal, next to gaining solely financial profit, the investors want to generate a positive impact on society and/or environment. The aim of this research is to determine how public equity investments proposed by TONIIC, a US based group of impact investors, perform compared to the broad market. Further, the investments have to be in line with at least one out of the 17 United Nations Sustainable Development Goals. The investment period is seven years, from May 2012 until May 2019 and the broad market is represented by the S&P 500 and the MSCI World as benchmarks. For the portfolios, two different asset allocation strategies (naïve & value-weighted) are implemented and analyzed on a monthly basis based on 84 observations for each strategy. The key findings are that both portfolios significantly outperform the benchmarks with the naïve strategy achieving the highest sharpe ratio of all. Furthermore, the results indicate a more desirable relationship of return and risk for the portfolios constructed compared to the market benchmarks. Overall, the study concludes that investors can achieve both, a better financial return and a desirable impact by preselecting their investments according to the UN Sustainable Development Goals.

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1 Introduction

1.1 Background and Aim of the Study

Sustainability and moreover sustainable development are among the most prominent topics of the recent time and political debate. This led to the emergence of a new field in the investment sector concerned with this issue: Impact Investing. Impact investors are, as the majority of investors, still aiming for a high return combined with low risk, but additionally there is a second aim in place to generate a positive impact by investing accordingly. There are countless different opinions on what should be considered as desirable, ranging from clean energy sources over mobile connection to clean sanitation, just to name a few. A recent approach to sustainable asset selection originates from the Sustainable Development Goals (SDGs) defined by the United Nations in 2014 (Blanc, 2015; TONIIC Institute, 2018). These consist of 17 specific goals, which shall be achieved until 2030. This enables impact investors to decide on an individual basis if investing in a particular corporation is going to be beneficial towards achieving one or more of these Sustainable Development Goals.

For the purpose of this study, the decision which investments are considered is transferred to the TONIIC directory. TONIIC is an association of impact investors spread globally, who exchange their experiences and expectations with each other. The basic information, which public equity investments are viewed to benefit at least one SDG is published in their directory. This study therefore fully relies on the information advantage of TONIIC regarding the SDG classification due to their internal due diligence process, as the TONIIC members are invested personally in each of these public equity firms.

The aim of this study is to determine whether an investor achieves a significantly different financial outcome, when following the TONIIC directory for public equity investments concerned with at least one UN Sustainable Development Goal. The current literature reveals different findings for the results of impact investing, ranging from outperforming to underperforming the market. These previous studies

vary in their sample size, geographical regions and timeframes in which they were conducted.

Using the TONIIC directory, built on the knowledge of a worldwide impact investor crowd the author aims to reveal whether investors following this information are achieving a significantly different performance, compared to simply investing in the broad market.

The timeframe for this study lasts seven years, from May 2012 until May 2019. Based on the proposed investments two different investment portfolios are constructed. Both include all investments, but one is built using a naïve asset allocation and the second one using a value-weighted approach. Further, two benchmarks are chosen allowing a comparison to the broad market, namely the S&P 500 and the MSCI World. Based on the investments' distribution among the 17 UN SDGs two additional portfolios are built each focusing on one of the two predominantly represented SDGs.

The second chapter of this thesis contains a literature review of previously conducted research related to performance of impact investing. Chapter 3 covers the historical background of impact investing and provides a detailed explanation of TONIIC and the UN Sustainable Development Goals. The fourth chapter focuses on the methods used to conduct this study, including the arrangement of the portfolios as well as the modes used to analyze the gathered data. Subsequently the resources used to gather the data, as well as the structure of the data are elaborated. Chapter 6 lists all results in an objective and clear fashion, including monthly and annualized outcomes. Finally, the findings are discussed and reviewed, covering the answer to the initial raised research question.

2 Literature Review

2.1 Impact Investing

Impact Investing has been one of the dominant trends in the fund industry over the past decade and therefore also gained the interest of financial researchers (Auer & Schuhmacher, 2016; Halbritter & Dorfleitner, 2015). The concept implies that not only a financial benefit should be derived from an investment, but furthermore prevailing social and/or environmental challenges should be considered as well (Auer & Schuhmacher, 2016; Bugg-Levine & Emerson, 2011). Within this framework impact investing excludes charitable projects or organizations, since it is not in their nature to generate any financial profit (Hellsten & Mallin, 2006).

From a historical perspective, impact investing is not really a recent phenomenon. Bugg-Levine and Emerson (2011) draw the comparison to the Religious Society of Friends, which were founded already during the 17th-century in England. This is in line with the concept of 'doing good while doing well', which can be compared to the centuries-old perception that the wealthier are held responsible for the broader community's prosperity (Auer & Schuhmacher, 2016; Bugg-Levine & Emerson, 2011). Impact investing has the clear intention to fulfill certain social or environmental criteria while generating a financial return (SIITF, 2014). This supplementary objective adds a third dimension to the existing two dimensions, namely risk and return (SIITF, 2014). The fairly new aspect of impact investing is, that the common good can be improved by using financial tools to leverage socially responsible organizations. (Bugg-Levine & Emerson, 2011; SIITF, 2014). Impact Investing is only one aspect of a new paradigm that evolved over the last decade, it can be compared to the phenomenon that the younger generation wishes to combine the effort they put into their work again with meaning and purpose (Hellsten & Mallin, 2006; SIITF, 2014). This desire in combination with the funds available for impact enterprises led to a significant rise of young socially responsible entrepreneurs, which in turn enhances the market for impact investing (SIITF, 2014). The total value of impact investing is disputable, however, $12.0 trillion, or 26% of total US Assets under professional management were invested according to ESG criteria, not including

private investments. (US SIF Foundation, 2018). The UK alone has experienced a ten-fold expansion over the past ten years (Hellsten & Mallin, 2006).

The literature often uses the terms 'impact investing' and 'socially responsible investments' interchangeably, contradictory the latter is often only linked to corporate social responsibility. Hellsten and Mallin (2006) describe 'socially responsible investments' in a broader sense. Their main argument is that nowadays the market is used to pursue ethical and social obligations, in contrary to the former view of 'blaming in the business' which accompanied the moral dilemma of capitalism and pure profit maximization. This development is supported by the extended power of markets over our lives combined with consumer's increased awareness for environmental and social responsibilities. Alongside other developments, but most importantly new media technologies have led to a consumer base that can put tremendous pressure on corporations to demand acknowledgment not only of their financial concerns of their shareholders, but also social responsibilities for their stakeholders. This major change in market forces changes the meaning of a successful corporation towards an attitude where only such that fulfill the criteria to be considered as impact investing can be viewed as the best performing ones. Furthermore, this tendency leads to a financial market where investments that support these values gain significant attention and optimally, make profit especially because of these values and not only by following them (Hellsten & Mallin, 2006).

Different strategies are existing concerning socially responsible investments and the four main strategies at the moment are: Negative/exclusionary screening, ESG integration, corporate engagement & shareholder action. Negative screening is the most commonly used globally and in Europe, in the United States ESG integration has the highest share. The largest markets where corporate engagement and shareholder action, as well as norms-based screening, are executed is again Europe. However, there are strategies with a minor share of the global volume, but they are the fastest growing ones: impact/community investing and sustainability-themed investing. Impact investing was on top with a growth rate of 146% between 2014 and 2016 (Global Sustainable Investment Alliance, 2016).

2.2 Previous Research Findings

Many different studies were conducted in order to detect whether impact investing achieves a significantly different performance compared to the broad market. Overall, the findings are inconclusive, ranging from underperforming to outperforming the market.

Statman & Glushkov (2009) investigated the returns of stocks rated as impact investing by KLD during the period of 1992-2007. With an naïve approach, a financial disadvantage is discovered, however, this can be avoided by only using an best-in-class approach to construct the social responsible portfolio (Statman & Glushkov, 2009). Moreover, their hypothesis of "doing good while doing well" is supported to some extent, but also the opposite hypothesis of "doing good but not well" can be confirmed, leaving the third hypothesis "no effect" as the net effect of the study (Statman & Glushkov, 2009).

Eccles et al. (2014) examined the impact of adopting sustainable policies on organizational process and performance. Over a sample of 180 US domiciled companies a significant outperformance compared to the stock market is determined from 1993-2009 (Eccles, Ioannou, & Serafeim, 2014).

Halbritter & Dorfleitner (2015) questioned whether there is a link between corporate social performance and financial performance, while using environmental, social and corporate governance (ESG) rating data provided byASSET4, Bloomberg and KLD for market in the US during 1991-2012. In contrast to previous research which illustrates a linkage between ESG ratings and returns, Halbritter & Dorfleitner (2015) find no evidence for a significant difference in returns when comparing companies with high and low ESG ratings. A few certain combinations of company samples and rating data provider hint towards an impact on financial performance, but no clear pattern can be detected and therefore no suggestion for investors to exploit these circumstances can be derived, hence no excessive returns can be expected when trading high vs. low rated portfolios (Halbritter & Dorfleitner, 2015).

A variety of findings regarding the performance of impact investing is discovered by Auer & Schuhmacher (2016). While examining the returns of investments following

recent ESG ratings a different outcome for geographical regions is revealed (Auer & Schuhmacher, 2016). In the United States, as well as the Asia-Pacific region, impact investing tends to perform similar like the market, on the contrary, in Europe impact investors tend to pay a price in form of worse stock performance for their engagement (Auer & Schuhmacher, 2016). This holds only for specific ESG-criteria and industry combinations, however, these need to be avoided in order not to cause financial disadvantages (Auer & Schuhmacher, 2016). Overall, regardless of industry, ESG criteria and region, no superior performance can be determined compared to investments in the passive stock market, indicating that SRI delivers no poorer financial return than conventional investments (Auer & Schuhmacher, 2016). These findings are supported by two other studies, conducted by Pintea et al (2014) and Scholtens (2003), each with a focus on one European country. In Romania no positive, nor negative correlation between environmental and financial performance can be detected (Pintea, Stanca, Achim, & Pop, 2014). For the Netherlands, no significant different performance can be detected, however, the risk is significantly greater, but due to a favorable tax treatment, the after-tax return compensates for the higher risk (Scholtens, 2005).

A very specific study for Australia determines for the years of 200-2005 a clear underperformance of ethical funds in comparison to the whole Australian market (Jones, Van Der Laan, Frost, & Loftus, 2008). In total 89 SRI funds where compared to four market benchmarks over 9 years, indicating the tendency that SRI funds underperform the benchmarks over the majority of the sample period (Jones et al., 2008). This findings are limited to the extent that the SRI funds composited of worldwide investments, but are then compared to benchmarks consisting only of Australian investments, where it has to be noted that during the investigated period the Australian market has clearly outperformed almost all other international market indices like the FTSE 100 and S&P 500 (Jones et al., 2008).

Magiera (2013) also studies the financial performance of impact investing, the main findings are ambiguous, since the performance depends on the level of investment: single corporations or indices. One major concern is that investment options are still in its infancy and therefore impact investors cannot benefit from the same extent of diversification than regular investors are able to (Magiera, 2013). Considering all

these aspects Magiera (2013) concludes that no general result can be derived, and further research is inevitable.

3 Background of the Thesis

3.1 TONIIC

The TONIIC institute, afterwards referred to as 'TONIIC', is a worldwide active public charity, based in San Francisco, California (TONIIC Institute, 2017). It was co-founded by Lisa and Charly Kleissner, two Austrian pioneers in impact investing, back in 2010 (Manhong, 2018; TONIIC Institute, 2017). As main feature it provides a network for investors who are committed to impact investing, either with a portion or 100% of their assets (TONIIC Institute, 2017). Overall, their network consists of over 160 members, who have in total more than $6 Billion committed to impact investing (TONIIC Institute, 2017). On a monthly basis, their members either meet in one of their seven offices (San Francisco, Seattle, London, Amsterdam, Oslo, Vancouver and Mumbai) or via video calls to discuss the recent developments and share their strategies and analyses (Chen, 2018; TONIIC Institute, 2017). Other than their members, also social entrepreneurs and managers of impact funds can benefit from their expertise (TONIIC Institute, 2017).

Since 2016, TONIIC publishes their *T100 Powered Ascent: Insights from the Frontiers of Impact Investing* report every year and discloses a directory of all investments, which are considered as impact investing including their affiliation to one or more of the UN's Sustainable Development Goals, which can be accessed freely via their webpage (www.toniic.com). Previously, TONIIC members used more than 66 different impact themes, which had to be restructured to comply with the 17 SDGs (TONIIC Institute, 2018).

3.2 UN Sustainable Development Goals (SDGs)

The United Nations had established Millennium Development Goals (MDGs) for the period of 2000 to 2015 and with this timeframe coming to an end, there was a demand to formulate successors. In 2012, during the Rio+ 20 summit, the governments agreed to develop further goals which should be achieved between 2015 and 2030 (Griggs, 2013). The result were the Sustainable Development Goals (SDGs), which were proposed in 2014 (Blanc, 2015; TONIIC Institute, 2018). The main difference between the MDGs and the SDGs as the interconnection between the

different goals, they are no longer a set of independent goals, but rather have a complex network behind them (Blanc, 2015; TONIIC Institute, 2018; United Nations Development Programme, 2019). Furthermore, the new SDGs are meant to be applicable to all countries of this world and should guide through the challenging transition towards sustainable development (Blanc, 2015; TONIIC Institute, 2018). The United Nations Development Programme (2019) lists and defines the 17 goals for sustainable development as following:

1. **No Poverty**: The international poverty line is at a daily budget of $1.90 and in developing regions one out of ten is still living below that. Poverty goes beyond a low income, it includes malnutrition, missing access to education and many aspects more.
2. **Zero Hunger:** People living in rural areas can no longer cultivate their land and have to move to cities, this is fostered by climate change and exploitation of natural resources.
3. **Good Health and Well-Being:** Efforts is necessary to further eliminate diseases and persistent health issues. Ensuring healthy lives and well-being is crucial to increase life expectancy.
4. **Quality Education:** To foster the development of innovations concerning our planet's biggest issues an education of high quality is vital.
5. **Gender Equality:** Female empowerment was already part of the MDGs, but gender equality, next to being a major human right, continues to be of upmost importance regarding the development of a sustainable society.
6. **Clean Water and Sanitation:** Overall, the world has enough clean water at disposal, but due to factors like bad infrastructure and economies, not everyone on this plant has access.
7. **Affordable and Clean Energy:** Without achieving this goal, many other SDGs will not be achievable either. Energy is essential to our modern worlds developments and renewable sources are pivotal to ensuring a sustainable development.
8. **Decent Work and Economic Growth:** Policies to ensure a decent and steady economic growth rate are required to provide the people of developing countries with the chance to evolve into developed democratic societies.

9. **Industry, Innovation and Infrastructure:** This SDG has to sides, firstly innovations and infrastructure, with all its aspects, need to be improved to lead towards equal opportunities. Secondly, our world's industry must be decarbonized to keep this planet inhabitable.
10. **Reduced Inequalities:** Economic growth alone cannot lift countries out of poverty, it rather needs a balanced development of the economic, social and environmental dimensions.
11. **Sustainable Cities and Communities:** The dramatically increasing number of people living in cities requires adequate policies regarding urban planning and urbanization management.
12. **Responsible Consumption and Production:** The current consumption patterns are conflicting with all means of sustainability. Especially with more people gaining a larger purchasing power, responsible consumption and production is inevitable.
13. **Climate Action:** Climate change affects every region, society and economy, the changes are already feasible and therefore require clear action against global warming.
14. **Life Below Water:** The sea is at the core of our fragile ecosystem, without protecting the sea life, the planet, and therefore humanity, will face dramatic changes.
15. **Life On Land:** Forests are of similar importance like the seas. Nutrition, stable climate and biodiversity depend fundamentally on sufficient woodlands.
16. **Peace, Justice and Strong Institutions:** Without efficient policies and independent law enforcement agencies, the world cannot overcome violence against children, women and minorities.
17. **Partnerships for the Goals:** There is no chance to achieve any of the above-mentioned goals without collaboration between governments, (private) economy and civil society, only co-operations on from global down to local levels can make sustainable development possible.

On basis of these SDGs 107 targets where defined, which need to be achieved in order to reach all mentioned goals (Blanc, 2015). 60 out of these 107 refer to more than one goal, 19 have even a link to at least three different goals or more (Blanc, 2015). Blanc, 2015, finds that seven out of 16 goals (#17 is not considered for this

regard) are connected to at least eight other SDGs, with a maximum of 14 reached by SDG #12. On the one hand, this underlines the interconnection between the 17 goals and on the other hand it secures that failures of the previous MDGs, where policies in favor of one could harm another one, are eliminated (Blanc, 2015; United Nations Development Programme, 2019).

4 Methodology

4.1 Naïve Strategy

The naïve investment strategy is also known as of 1/N asset allocation rule, which hints towards its mathematical background. If the 1/N allocation rule is followed, then the total investment is divided by the number of assets considered (N) and the subsequent amount is invested into every single of the N assets (DeMiguel, Garlappi, & Uppal, 2005). This leads to one universal weight ($w = {}^{1}/_{N}$), which is allocated to every single asset (DeMiguel et al., 2005). Furthermore, the investor is provided with an equally-weighted portfolio, which is not as naïve as it may seem (DeMiguel et al., 2005). The allocation across all N assets provides some extent of diversification, clearly not the best one possible, but for the required effort quite notable (DeMiguel et al., 2005).

A further segmentation of the naïve investment strategy introduces (a) a "buy-and-hold" version, where the initial investment remains unchanged until the maturity is reached, or (b) a rebalancing version, in which the investment is adjusted after a certain rebalancing period, in order to comply with the 1/N rule (DeMiguel et al., 2005). For the purpose of this study only version A will be implemented, due to the fact that the dataset will only consist of investments that were available over the entire timeframe.

The reasons why this strategy is used are as following: Firstly, as mentioned by DeMiguel (2005), this allocation rule is very simple to implement considering that no estimations or optimizations are necessary. Secondly, although numerous sophisticated alternatives have been introduced over the last decades, the 1/n rule is still commonly used for decisions concerning the allocation of wealth across investment options (Benartzi & Thaler, 2001; DeMiguel et al., 2005). Thirdly, already the absence of one risk factor can cause the rather complex and therefore resource consuming models to be inaccurate, leaving a high probability that the 1/N rule achieves similar results (DeMiguel et al., 2005).

After all, DeMiguel et al. (2005) find that the 1/N allocation repeatedly has a better sharpe ratio and turnover compared to both, static and dynamic models of optimal asset allocation. This is due to the fact that the performance advantage of optimizing models over the naïve strategy is smaller than the loss arising from estimation errors concerning the input variables for the static or dynamic models (DeMiguel et al., 2005). Further, the better sharpe-ratio is achieved out-of-sample, when analyzing the data in-sample the optimizing models perform better. Out-of-sample the estimation errors offsets the gains of optimizing models. Another crucial fact is the timeframe required for other allocation decision tools to significantly outperform the 1/N rule. As an example, the increase from four to 100 assets under consideration, all with an average annual volatility of 20%, requires an increase from 50 to over 1000 years (DeMiguel et al., 2005).

4.2 Value-Weighted Portfolio

Value-weighting is one of the traditional ways of investment allocation for stock market indices, such as the S&P 500 (S&P Dow Jones Indices, 2019). The company's or asset's market value is used in order to set the available investment possibilities in relation to each other (Hsu, 2006; McKee, 2016). The market value is computed by multiplying the number of shares outstanding with the value of each single share, hence the stock price:

$$market\ value = current\ stock\ price * \#\ shares\ outstanding$$

The proportion of the market values to each other is rebalanced periodically, implying that the value-weighted portfolio's composition is readjusted accordingly.

Hsu (2006) names the following three main benefits of a market value strategy:

1. The costs of managing a value-weighted portfolio are rather low, since it is a passive strategy, hence few actions are necessary.

The benefit of the passive strategy over active strategies does not apply for a comparison of the naïve and the value-weighted strategy, as both are passive strategies. A passive strategy, in contrast to an active strategy, does not require a fund manager taking care of the portfolio. However, a passive portfolio can still be

rebalanced, such as the value-weighted portfolio. Passive strategies create lower fees and transactions costs, making them a good way for market comparisons.

In contrast to the naïve strategy, the portfolio is automatically rebalanced according to the development of the market. As bigger firms are larger represented in the portfolio and accordingly represent the state of the market.

2. The most valuable assets are dominantly represented in the portfolio; as such tend to be highly liquid, the transaction costs are comparably low.

4.3 Data Analysis

The results are computed based on monthly returns and will be reported in terms of annualized results. The return shows the percentage gain or loss made on a specific investment, compared to the initial investment and is computed as follows:

$$r_i = \frac{x_i - x_{i-1}}{x_{i-1}} * 100\%$$

Furthermore, the cumulative return is reported to compare the final value of an initial 1 Dollar investment over the total investment period. It is shown as a descriptive chart illustrating the development of the portfolio's values of the different strategies and benchmarks.

The results are represented in terms of annualized returns calculated as follows:

$$r_{i,a} = (1 + r_i)^{12} - 1$$

The volatility is a measurement of the dispersion of return for an investment and represents the standard risk measure for investments. It is computed as follows:

$$\sigma_{p.m.} = \sqrt{\frac{\Sigma(x_i - \mu)^2}{N}}$$

The annualized volatility is then given by:

$$\sigma_{p.a.} = \sigma_{p,m} * \sqrt{12}$$

The sharpe ratio is used to analyze the return of an investment in relation to its risk (Sharpe, 1994). As the calculation of any sharpe ratio requires a risk-free rate, the one used for this study is the 1-month US treasury bill rate. Since the majority of investments in the dataset is US domiciled (shown later in section 4.2 and by table 3) and there is no global risk-free rate available the 1-month US treasury bill rate is chosen as the most appropriate one. The sharpe ratio is calculated by dividing the excess return of an investment by the standard deviation of this excess return (Sharpe, 1994).

$$sharpe\ ratio = \frac{R_i - R_{risk-free}}{\sigma_i}$$

All the required values have been annualized, conclusively the sharpe ratio is also reported as annualized result.

The portfolios are compared to the broad market, which represents alternative investments that are competing against the evaluated investment strategies. In order to draw a conclusive comparison between the performance of the investigated portfolios and the market, a broad index is required. For this reason, the first benchmark is the S&P 500, also known as the United States major market index. As such it covers only US domiciled corporations but consists of the 500 most valuable US firms (S&P Dow Jones Indices, 2019). The composition of assets is based on value-weighting and is re-assessed every quarter. This implies that all assets are represented according to their market values relative to each other. The S&P 500 covers approximately 80% of the total market capitalization in the United States (S&P Dow Jones Indices, 2019). It is the most commonly used index when comparing an investment or portfolio to the broad market (S&P Dow Jones Indices, 2019).

The second benchmark used is the MSCI World Index, since it covers equities from the global market, including 23 developed countries (MSCI Inc., 2019). Furthermore, it covers almost 85% of the free float-adjusted market capitalization within the covered markets (MSCI Inc., 2019). This Index is explicitly constructed to be used to monitor portfolios and at the same time to avoid a benchmark misfit alongside a false risk compensation (MSCI Inc., 2019).

5 Data

5.1 Data Collection

The initial list of investments considered for this research are all public equity investments, which are listed in the publicly available TONIIC directory[1] and are marked to fulfill at least one of the 17 UN Sustainable Development Goals.

For constructing the portfolios and assessing their financial performance the adjusted monthly closing prices and the market capitalization are retrieved from Yahoo Finance and Datastream. The timeframe for this study is seven years from March 2012 to March 2019 with a total of 84 monthly observations. This ensures the most recent developments are covered, but short-term effects are prevented from interfering with the results. Furthermore, to ensure the integrity of this study, only assets that where publicly traded over the whole period are considered.

5.2 Data Structure

The TONIIC directory has in total 179 entries which are connected to at least one UN Sustainable Development Goal, but only 46 fulfill all other necessary requirements and are therefore part of the dataset. The other 133 investments had to be excluded, the main reasons why entries had to be removed are threefold. First, no distinct International Securities Identification Number (ISIN) could be retrieved or associated and therefore no data could be gathered. Second, a great number of investments where not publicly traded for the entire period investigated. Third, for 39 investments which met all other requirements, the market capitalization could not be retrieved for the entire period by all means available.

When analyzing the data for the number of investments per UN SDG, as shown in Table 1, a remarkable overrepresentation of the SDGs #7 and #9 is detected, with 10 and 20 allocations respectively. SDGs #2, #3, #6, #8, #11, #12 and #13 are represented at an average level. In total, eight out of 17, or 47% of the UN

[1] https://www.toniic.com/toniicd/#__p%7B%22page%22%3A1%2C%22perPage%22%3A100%2C%22sortBy%22%3A%22investment_name%22%2C%22sortOrder%22%3A%22ASC%22%2C%22keywords%22%3A%22%22%2C%22columnFilters%22%3A%7B%7D%2C%22searchActive%22%3Afalse%7D

Sustainable Development Goals are not represented in the dataset at all. This includes the following: #1, #4, #5, #10, #14, #15, #16 and #17. The quantity of 50 (when all investments per SDG are aggregated) is due to the fact that two investments are associated with more than one SDG. In fact, one is related to four different goals and the other one to two, which leads to additional four allocations, compared to the total number of 46 investments.

SDG No.	SDG Definition	No. Of Investments
1	No Poverty	0
2	Zero Hunger	3
3	Good Health and Well-Being	4
4	Quality Education	0
5	Gender Equality	0
6	Clean Water & Sanitation	4
7	Affordable and Clean Energy	10
8	Decent Work and Economic Growth	2
9	Indstry, Innovation and Infrastructure	20
10	Reduced Inequalities	0
11	Sustainable Cities and Communities	1
12	Responsible Consumption and Production	2
13	Climate Action	4
14	Life Below Water	0
15	Life on Land	0
16	Peace, Justice and Strong Institutions	0
17	Partnerships for Goals	0

Table 1 Number of Investments per UN SDG

In order to cover the considerably maladjusted distribution two separate portfolios where constructed, covering only either SDG #7 or SDG #9, later also referred to as single-SDG portfolio. For enhanced comparability, these additional investment portfolios where built according to the value-weighted method explained in section 4.2 oben (Value-weighted portfolio).

Regarding the distribution related to the size of the market capitalization the following categorization was used: small-size includes investments under the limit of 2 billion dollars, medium-size are investments between 2 billion and 10 billion

dollars, large-size are all investments with a total market capitalization above 10 billion dollars (Financial Wellness and Education Center, 2019). A clear overrepresentation of large-cap investments is detected and shown in Figure 1. Small-sized investments have only a share of 13%, indicating a significant underrepresentation. Medium-sized corporations are averagely included in the dataset with an allotment of 24%. In clear contrast, large-sized corporations are substantially overrepresented with a share of 63%. These proportions are especially important concerning the evaluation of the value-weighted portfolio, since this could affect the performance. Furthermore, this composition is also of relevance when comparing the portfolio performance to the benchmark S&P 500, since the latter's only requirement is market capitalization and accordingly consists of the 500 largest US companies.

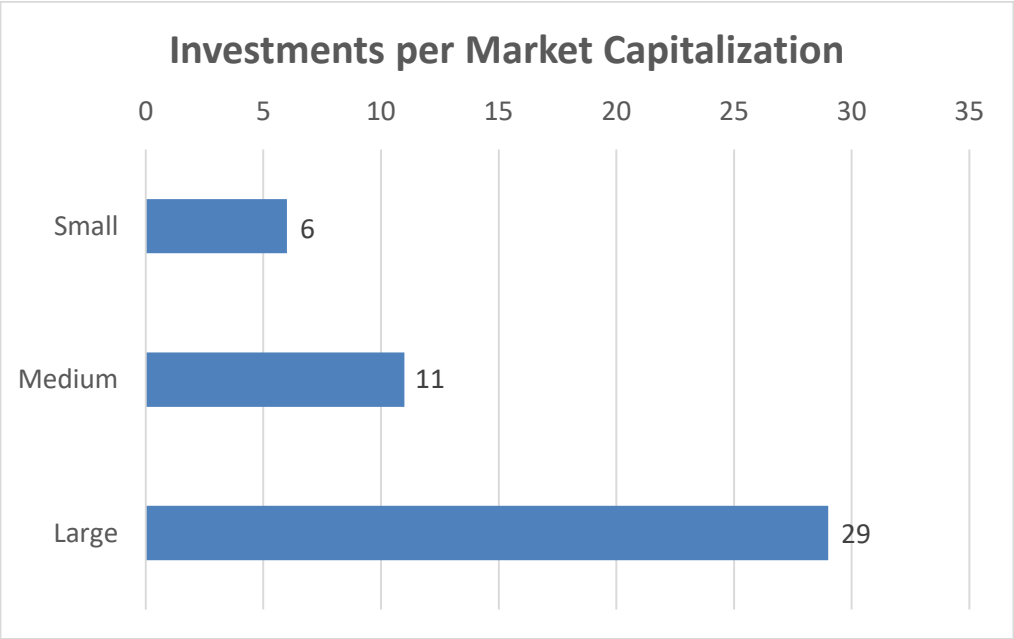

Figure 1 Number of Investments per Market Capitalization

Furthermore, the dataset was analyzed in terms of the distribution geographical regions. This analysis was made according to the United Nations standard area codes for statistical use, using the region's level, including the following: Africa, Americas, Asia, Europe and Oceania (UN Policy Analysis - Statistics Divison, 1996). Only two of these regions appear in the dataset evaluated, namely Americas (UN code 019) and Europe (UN code 150). As the investments based in America are only from the United States and Canada, the next level of regional separation can be used: North

America (UN code 003) (UN Policy Analysis - Statistics Divison, 1996). Regarding Europe, the investments are more spread and no further regional separation is considered.

Figure 2 shows that North America is overrepresented with a share of 76%, compared to only 24% of the investments being based in Europe. This proportion has no direct impact on the evaluation but justifies the selection of both, the S&P 500 and the MSCI World as benchmarks. Concerning the MSCI World, which is in nature broader, the extent of the correlation between the compositions is favorable. Furthermore, both covering no emerging markets excludes the risk of any potential disruptions caused by these.

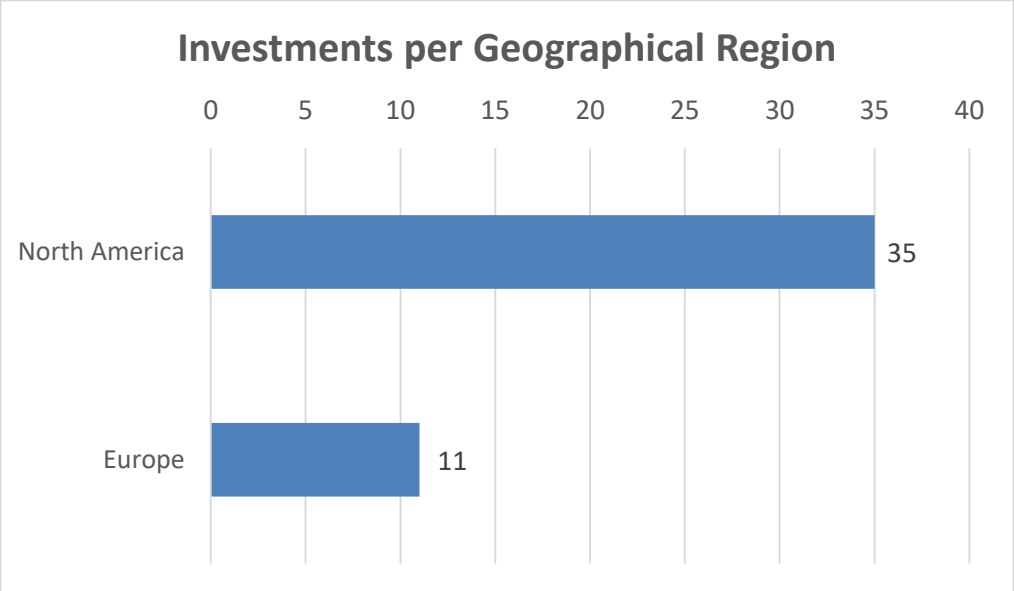

Figure 2 Number of Investments per Geographical Region

Regarding the correlation of the individual investments within the dataset, the average is 0.623. The majority of 77.3% are strong positive correlations (>0.5), only 0.6% are strong negative (<-0.5), 10.9% are moderate positive and 11.2% are moderate negative. This indicates a rather similar performance among the considered investments.

6 Results

6.1 Cumulative Monthly Returns

As described in section 5.2 oben (Data structure), the final dataset is composed of 46 individual publicly traded stocks of corporations. Based on these investments originally two different portfolios where compiled, one following the naïve strategy and one is following the market-value strategy. Moreover, as also mentioned in section 5.2 oben and due to the distribution among the different UN SDGs, two additional portfolios where assembled. Each of these two portfolios is built using the value-weighted strategy and covers only investments concerning one specific UN SDG, namely #7 (Affordable and Clean Energy) and #9 (Industry, Innovation and Infrastructure). Finally, the two benchmarks, S&P 500 and MSCI World, are also evaluated in the interest of broad market comparison.

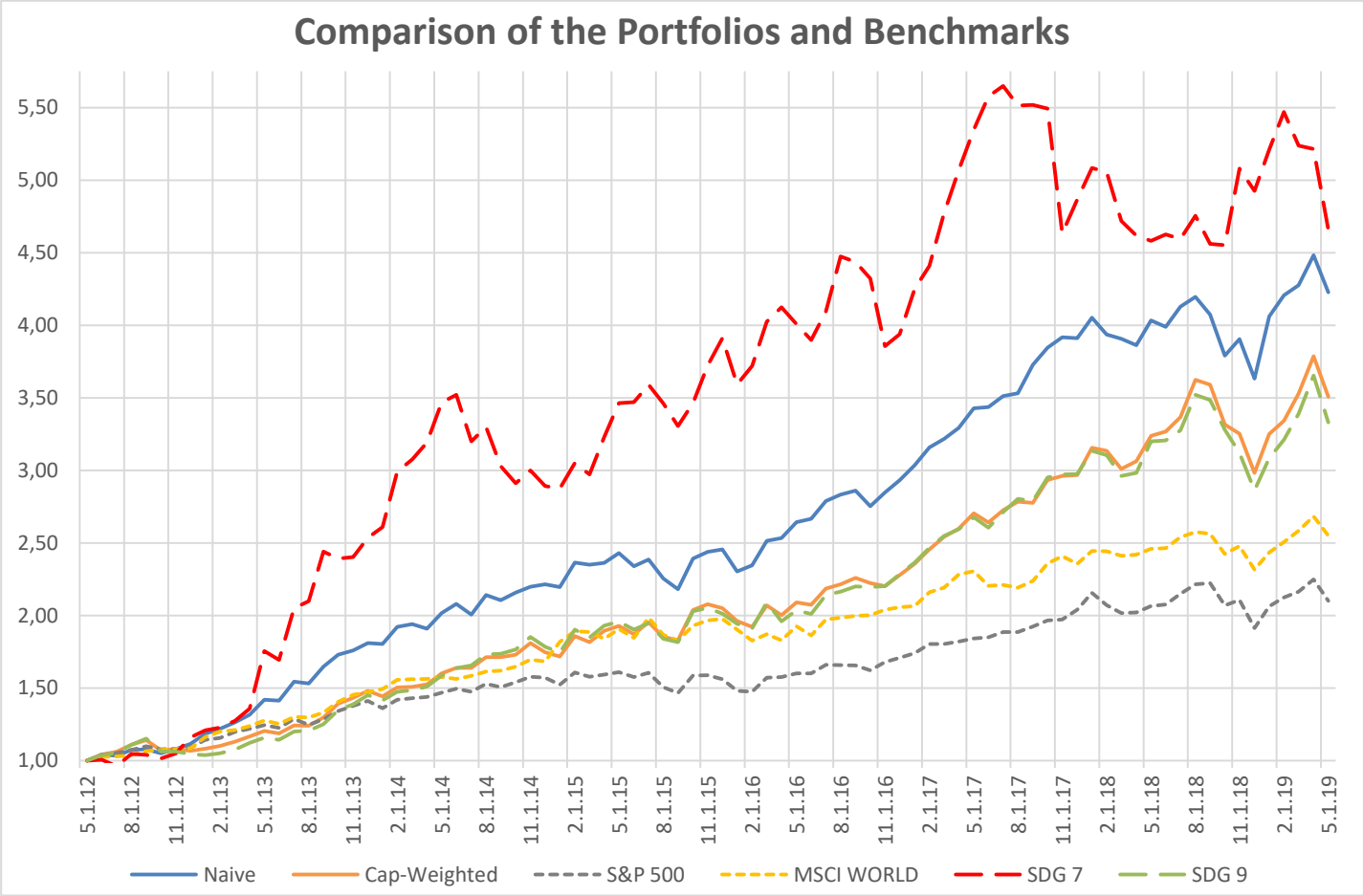

Figure 3 Chart of Cumulative Monthly Returns

Figure 3 plots the cumulative return of all four portfolios and the two benchmarks over the entire time investigated (May 2012 – May 2019). The two SDG portfolios are depicted by solid lines, the benchmarks by dotted lines and the two additional single-SDG portfolios by dashed lines. The most noticeable fact is that all four portfolios significantly outperform the two benchmarks. When considering the two SDG portfolios, the naïve strategy steadily exceeds the value-weighted one. The performance of the single-SDG #9 portfolio is almost identical to the value-weighted portfolio, but the single-SDG #7 portfolio outperforms all other portfolios and benchmarks. Arising thereby, the more diversified the portfolios gets, it experiences a development closer to one of the benchmarks.

For the first eight months, until December 2012, the comparison of the two SDG portfolios shows an almost identical development of the return at a rather low level. Followed by a period where the naïve portfolio significantly outperforms the value-weighted portfolio. From September 2018 onwards the performance is rather similar again. However, the overall correlation of 0.991 indicates a similar performance throughout the whole timeframe. The comparison of the value-weighted portfolio with the two benchmarks shows a similar development for the first period, lasting until December 2014, succeeded by an outperformance, before it aligns again in 2019. Further, the average correlation between the portfolio and the two benchmarks is 0.979, still indicating a consistent shape. The naïve portfolio, however, constantly outperforms the two benchmarks. Analogously, the average correlation of 0.988 demonstrates an almost identical development, simply at a higher pace. The single-SDG #9 portfolio has an almost identical cumulative return as the value-weighted portfolio, underlined by a correlation value of 0.999, the highest one throughout the dataset. The ingle-SDG #7 portfolio can be identified as the clearest outlier in this comparison. It is the only one where at one point in time, particularly in July 2012, the cumulative return falls below one, indicating a loss if the investment would have been sold at this point. This contrary shape of its cumulative return is further confirmed by the average correlation of 0.923, which is clearly the lowest one encountered.

If compared to benchmark average, the final value of the naïve portfolio is 82% higher and with the value- weighted portfolio a 51% higher outcome is achieved. The

single-SDG 9 portfolio gains an advantage of 44% and the single-SDG #7 portfolio outperforms the benchmarks by 100% for the period investigated.

6.2 Annualized Results

Alongside the cumulative return the annualized mean returns, volatility and sharpe ratio are reported in Table 2:

p.a.	Mean Return	Volatility	Sharpe ratio
SDG Naive	23.85%	12.82%	1.81
SDG Value-Weighted	20.66%	13.23%	1.52
S&P 500	11.84%	10.84%	1.04
MSCI WORLD	14.91%	10.34%	1.38
SDG 7	27.77%	23.18%	1.17
SDG 9	19.93%	14.18%	1.37

Table 2 Annualized Return, Volatility and Sharpe Ratio

The annualized return figures are in line with the cumulative returns described above. Between the two SDG portfolios, the naïve portfolio outperforms the value-weighted one, with 23.85% and 20.66% respectively. Still, both outperform the two benchmarks, with the S&P 500 delivering the lowest return of all with 11.84% and the MSCI World the second lowest with 14.91%. Again, as with the cumulative return, the single-SDG #9 portfolio performs just below the value-weighted portfolio with a marginal yearly delta of 0.73%. The highest return during the 84 months investigated was achieved by the single-SDG #7 portfolio with 27.77%, which is in line with the results given in Table 4. However, this remarkable performance goes along with a volatility of 23.18%, the highest of all portfolios. This combination coincides with the classic financial market view, that greater return comes mostly with greater risk. The volatilities of the benchmarks are very close with 10.84% and 10.34%, besides being at the bottom of the spectrum. Further notable is that the naïve and the value-weighted portfolio's volatility delta of 0.49% is almost identical to the benchmarks' gap. Overall, there volatility is slightly higher, but still in a more reasonable range compared to the single-SDG #7 one's.

The annual sharpe ratios for the four portfolios and the two benchmarks range from ~1.00 to ~1.80. The S&P 500 with 1.04 as well as the single-SDG #7 portfolio with 1.17 have the lowest sharpe ratios among the studied data. For the S&P 500 this is due to the rather low return, which is not entirely compensated since its risk is not proportionally lower. For the single-SDG #7, however, this is due to its great risk, which does not compensate its superior return. The value-weighted portfolio (1.52), the MSCI World (1.38) and the single-SDG #9 portfolio (1.37) have a balanced risk – return proportion according to the sharpe ratio. A superior result is only achieved by the naïve portfolio with 1.81 making it the best choice out of all analyzed strategies. The better result compared to the value-weighted portfolio comes from both, a greater return and a lower risk.

The results described above provide evidence for an at least similar, but mostly superior investment performance achieved by SDG investing compared to the broad market. Especially when investing passively among all SDGs and no focusing on one particular SDG, a financial outperformance is realized. The findings of Statman & Glushkov (2008) reveal some support for the hypothesis of "doing good while doing well", the results of this thesis strongly support their argument. Moreover, as the results fully support this thesis it appears that the superior performance of impact investing has increased since their study's timeframe (1992-2007) ends before the beginning of this one. Further, also the findings of Eccles et al. (2014), of improved performance compared to the stock market is in line with the results of this study. As Eccles et al. (2014) investigated only US domiciled organizations and the majority of investments in this dataset is also US domiciled it appears that the US financial market provides superior performance for impact investing.

7 Conclusion

The aim of this study was to determine whether an investor experiences a significantly different performance when pursuing impact investing compared to the broad market. This research question arises from the inconclusive results of previous studies. In order to establish an investment portfolio, the TONIIC directory in combination with the United Nations Sustainable Development Goals was used. The timeframe for this study lasts from May 2012 until May 2019. The performance is evaluated on a monthly basis considering stock prices. Only public equity investments are considered, and the necessary data is gathered from Yahoo finance and Datastream. The S&P 500, as well as the MSCI World, are chosen to represent the broad market and are as a consequence used for the comparison. Overall, the dataset consists of 46 individual investments, with the majority being US domiciled, as well as having a large market capitalization. Two investment portfolios are generated using the naïve strategy and the value-weighted strategy. The latter one being rebalanced after every period according to the market value changes. The investments show a high concentration of two out of all 17 UN SDGs. Therefore, two additional portfolios are created, each covering one single SDG.

The cumulative monthly return and the annualized results for return, volatility and the sharpe ratio are evaluated. The cumulative return of the two market benchmarks are the lowest ones, showing a superior performance of all four SDG portfolios, independent from their composition. When analyzing the annualized results, still all four portfolios achieve a higher mean return compared to the benchmarks. However, in combination with their volatility the sharpe ratio reveals that the naïve SDG portfolio performs best, followed by the value-weighted SDG portfolio, clearly ahead of the market benchmarks. For the single-SDG portfolios this does not hold true. Consequently, a passive investment strategy spread over all UN SDGs provides a significantly positive performance compared to the broad financial market.

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