ESSAYS ON RESPONSIBILITY AND PERFORMANCE IN INVESTMENTS

By

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Declaration

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

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Abstract

This thesis introduces four essays dedicated to the topics of responsible investment and reputation management. The first essay studies reputation management. This intangible asset is a strategic cornerstone for the company's success, however academics yet to provide firm evidence if the management practices bring desirable outcome. Another unresolved question is a power of reputation over time. This paper addresses these questions through exploring the connection between firms' concerns over reputation and performance, estimated according to *Fortune*'s "America's Most Admired Companies" (AMAC) rating. The findings of the study demonstrate a relationship between firms' concern over reputation management and performance in the rating system. Which provides evidence of reputation management to generate positive outcome for the company. The results also suggest that the power of positive reputation has a "lasting weekend", measured over period of time, proving its enduring effect. The second essay focuses survival on ethical and conventional funds. It implements a survival analysis to explore if ethical funds represent stronger survival capabilities. . The study implements ex ante method to generate dataset, which allows to study the survival, based on the dataset developed in the analysis of Kreander et al. (2005). The attained results indicate stronger survival capabilities of ethical funds. The third essay evaluated value generation capabilities of sell-side brokers through the introduction of the ESG ranking. Implementation of new MiFID II regulations interferes with the financial landscape and directly impact on brokers' business models and severely increase competition as brokerage firms are forced to disclose the fee information. The current study focuses on ESG ranking development as an alternative product a sell-side broker could offer to the client alongside the other research services. A portfolio of stocks was created on the basis of the ESG recommendations to evaluate value generation capability and its efficiency. Further, ESG rating based portfolio was created using the ASSET4 data. The portfolios were compared to the portfolios of SRI funds and European sustainable index. This approach allows comparing the competitiveness of developed ranking. Empirical analysis embedded CAPM (Capital Asset Pricing Model) and Fama–French (1993) models. The analysis revealed statistically strong results. Then recommendation and SRI-based portfolios demonstrated negative alpha. Ranking-based portfolio demonstrated positive and negative significant alpha. This evidence suggest the ESG

recommendations introduced by sell-side broker could withhold competition with similar products, however do not allow to generate consistent abnormal returns. The last essay explores the ESG framework in the context of the private equity sector. This topic has been significantly overlooked by the academic community due to the limited information available for in-depth empirical studies, as well as the only relatively recent interest from the perspective of investors, in comparison to the equity markets. This essay extends the existent research scale and explores the motivation, the issues and the barriers related to ESG framework in the private equity field. It provides evidence of a growing demand from institutional investors for the ESG however the existent scepticism and opaqueness of the industry hinders the growth of framework. This essay introduced an exploratory study of the relationship between negative ESG events and private equity multiples. The results proved the impact the events have, as companies involved in negative ESG events demonstrated weaker growth on the basis of multiple evaluations. This study introduces a firm base to further grow empirical insight to the potential benefits private equity sector could extract in association with ESG implementation to their investment.

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List of Abbreviations

AMAC America's Most Admired Companies Ranking

CAPM Capital Asset Pricing Model

CSR Corporate social responsibility

ESG Environmental, social and governance

GHG Greenhouse gas

GP General partner

GSIA Global Sustainable Investment Alliance

HML High minus low

IPO Initial Public Offer

LBO Leveraged buyouts

LP Limited partner

MiFID Markets in Financial Instruments Directive

MOM Momentum

OLS Ordinary least squares

PRI Principles for Responsible Investment

SMB Small minus big

SRI Socially responsible investment

UNPRI United Nations Principles for Responsible Investing

WLS Weighted least squares

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Introduction

I.1 Research Background

Responsible and sustainable investment has introduced significant change to the financial and investment industries in an unsuspected way, and encouraged a shift in the existing traditions and norms. The concept has brought a new vision, which encompasses classic perspectives on investment practices, and broadened investment horizons on a global scale. The responsible investment discipline has facilitated a new order, where economic development has become an important aspect of investors' activities, facilitated on a micro-level through the adaptation of environmental, social and governance (ESG) norms in the investment process, and through the encouragement of new norms and policies on a global scale. A new generation of professionals has brought investment opportunities, which provide a competitive edge and strong financial performance, as well as allowing such investment to create a positive impact and address complex environmental and social challenges. The range of investment strategies and financial products across asset classes is growing at a significant speed and is providing an extensive range of opportunities for both private and institutional investors.

The reinforcement of the responsible investment concept goes beyond financial markets, as it has gained strong support from governments, which encourage its further development through the implementation of new policies and regulations, as well as through non-governmental bodies that facilitate creation of a positive environment for the development of responsible investment practices.

Not only the financial industry, but also companies and society at large have benefitted from the implementation of ethical practices and are eager to collaborate with sustainable investors. Addressing human rights violations, climate change issues, the elimination of labour exploitation, the improvement of health and safety practices, the promotion of gender and racial equality, and the improvement of reporting practices are only a few of the positive changes accomplished through the introduction of ESG practice. An innovative and active approach of investors, and

their desire to engage, positively reflects on companies and communities, providing support for both environmental and social needs.

Responsible investment has a strong resonance within the academic community, as well as in industry: a relatively understudied subject is now inspiring a broad pool of academic literature. Existing studies are spread across multiple disciplines in an attempt to understand better the responsible investment framework, to explore its implications and to discover further opportunities for its evolution. This research eagerly joins with the efforts of the academic community through revisiting existing methodologies and practices, as well as introducing completely new angles on existing topics.

Religion played a central role in establishing and regulating norms and laws, which academics nowadays associate with responsible investment practices. The modern responsible investment framework places the individual investor and his or her beliefs as key to the decision-making process (Renneboog et al., 2008). The period of the 1960s was characterized by the significant rise of social movements against conflict activities and racial inequality, which drew the significant attention of politicians and investors, triggering the process of a re-establishment of ethical frameworks (Hutton et al., 1998). The countdown to the modern history of SRI investment began in 1971, when the Pax World Fund was founded in the USA. The fund focused on the elimination of any war-related stocks from its investment strategy, developed in response to the Vietnam War (Hutton et al., 1998). Since then, responsible investors have taken an active role in promoting their values. In the 1980s, SRI fund managers actively confronted the racist apartheid system of South Africa, advocating for the avoidance of investment in businesses associated with the regime. The environmental disasters and political turmoil that occurred throughout the 1980s made investors more aware of the risks related to ignoring ESG-related activities, and resulted in a significant rise in interest in them in the 1990s. The shift in consumption patterns, the rise of ethical and social awareness, the development of corporate governance in response to a succession of corporate scandals across the markets, and rising threats related to climate change are also considered to be factors that influenced the establishment of the modern responsible investment framework.

The establishment of United Nations-supported Principles for Responsible Investment (PRI)[1] in 2006 marked the initiation of a new era for ethical investment. The initiative was established as a network of investors dedicated to promoting ethical behaviour and sustainable practices across the global investment community. It introduced six key principles, encouraging investors to implement ESG practices in their investment and decision-making process, engage in active ownership practices, disclose information regarding ESG-related activity, promote PRI principles within the industry, collaborate with each other and follow organized reporting practices (PRI, 2016). The initiative became widely respected within the investment community: the number of signatories increased from 100 to over 1500 in 2016, accounting for investment managers, service providers and asset owners across the globe.

The initiation of PRI brought a structure to responsible investment, not only through setting clear goals for investors, but also in providing a range of reporting methodologies and definitions. In the definition provided by the initiative, responsible investment is presented as "an approach to investing that aims to incorporate environmental, social and governance (ESG) factors into investment decisions, to better manage risk and generate sustainable, long-term returns".[2] As the interpretation of the ESG framework significantly varies among investors due to differences in investment approach and asset class characteristics, PRI defines the vector of each dimension. The environmental aspect of the concept includes climate change, greenhouse gas (GHG) emissions, resource depletion – including water, waste and pollution – and deforestation. The social factor of ESG includes issues related to working conditions, including slavery and child labour, local communities – including indigenous communities – health and safety, employee relations, and diversity and conflict. Executive pay, bribery and corruption, political lobbying and donations, board diversity and structure, and tax strategy are topics related to the governance aspect of ESG.[3] These definitions anchor the ESG framework and provide a strong starting point for investors to shape their own understanding of the concept.

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[1] See www.unpri.org/, accessed 23 June 2016.

[2] See www.unpri.org/about/what-is-responsible-investment , accessed 23 June 2016.

[3] See ibid.

In literature and industry reports responsible investment is perceived as encompassing a multidimensional framework, which provides an opportunity to create a positive impact, gain competitive financial advantage and mitigate risks. Therefore its traces can be found in a majority of investment strategies, including those not purposely tailored to pursue it. It includes multiple angles, which reflect certain approaches and investment views. SRI, sustainable investment, ethical investment, impact investment and green investment are all angles under the umbrella of responsible investment, which identify with certain approaches and investors' views. Due to the lack of clear definition, some of these terms are applied interchangeably in both industry and academic papers.

Responsible investment as a framework has evolved across industries with a growing number of institutional and private investors. Value creation, investment strategy diversification, cost reduction, active engagement and opportunities to improve companies' business standards in the ethical way, creating a positive impact for people and communities, involvement in improvement and standardization of policies and regulations are among the most prominent features which attract investors who are willing to "do well by doing good".

Sustainable approach prove to positively impact the company's reputation as well. This intangible asset has grown to become of prime strategic importance. In the highly competitive environment and highest speed of information transfer, reputation could provide a wide range of benefits for a company, such as access to better quality of infrastructure as well as attract clients, as well as bed reputation could completely damage the company. As companies make a tremendous effort to improve reputation management, sustainability become an increasing popular framework companies rely on. As growing academic body links sustainability to reputation improvement, it could be suggested, that these to field of research go together hand by hand.

The multifaceted nature of the responsible investment approach has introduced a vast research field for academics to explore. Expansion of the framework and its application across various asset classes raises questions between both the academic and business communities. The existing pool of literature covers numerous domains related to responsible investment, such as the implementation of the ESG framework across various asset classes, ESG evaluation techniques, engagement and active

ownership, corporate governance, improvement in reporting practices, measuring the contribution from ESG implementation, and many others. Nevertheless, one of the most significant areas of academic attention is dedicated to the financial aspect of the framework, and its potential for value creation. Four decades of research have been dedicated to the performance evaluation of ethical portfolios, through the implementation of various methodologies and techniques. Despite the efforts of the academic and business community, many question related to responsible investment remain unresolved, and the research pool exposes a substantial number of gaps. This provides further challenges for researchers and creates an opportunity for a valuable contribution to the subject, which this study is dedicated to undertake.

I.2 Literature Overview

I.2.1 Development of Responsible Investing and Corporate Social Responsibility Frameworks

The significant shift in business dynamics in the direction of sustainability since the early 1990s (DB Climate Change Advisory, 2012) has encouraged changes across various sectors of the economy. Sustainability evolved as a complex concept, promoting changes in government regulations, fostering business ethics and increased business responsibility, and encouraging positive social trends. The framework found a profound reflection in the academic field, with a substantial amount of research dedicated to the topic.

Sustainability is rooted in the corporate social responsibility (CSR) framework, which was initiated in the nineteenth century (Katsoulakos et al., 2004). In the twentieth century, the growing prominence of consumers' rights and the stakeholders' role in a company's performance, alongside an increasing awareness of environmental issues, provided a further impulse, all of which shaped the CSR framework (Visser, 2010).

The ideas of Bowen (1953), McGuire (1963), Carroll (1979), Wartick and Cochran (1985) and Wood (1991) became the pillars of the modern CSR concept. The extensive work performed by these scholars defined the fundamentals of the framework – economic, legal, ethical and philanthropic responsibilities – and established practices for the framework's implementation within policies, principles

and practices. The CSR concept was gradually accepted in the business sphere; the adoption of stakeholder theory significantly encouraged the process, promoting the popularization of ethical approaches in management (Lee and Carroll, 2011).

Strategic engagement with CSR received a significant boost in the 1990s. Increasing media exposure facilitated companies becoming more open and paying more attention to their public reputation and reporting practices (Visser, 2010). Scholars acknowledge that the World Summit on Sustainable Development in Johannesburg, South Africa in 2002 anticipated a new era for sustainability, putting CSR in the spotlight (Visser, 2010; Lee and Carroll, 2011; Ioannou and Serafeim, 2014). Since the summit CSR has turned into a largely accepted and applied framework, and issuing non-financial reporting became a crucial part of reporting practices for many firms. With growing attention from governments and NGOs to sustainability and CSR, scholars suggest it has become an inseparable part of the strategy for a successful business (Galbreath, 2006; Lamberti and Lettieri, 2009).

I.2.2 Defining Responsible Investment

The definition of responsible investment is similar among both professionals and academics. Mercer (2007) and DB Climate Change Advisory (2013) define it as the process of the "integration of ESG criteria into [the] investment management process and ownership practices in the belief that these factors can have an impact on financial performance, in particular over the medium or longer term" (DB Climate Change Advisory, 2013, p. 19). They suggest that responsible investment could be "practiced across all asset classes" (ibid.). In the PWC report (2012) the accent is placed on the desire of investors to create value by implementing ESG-related factors in their investment portfolio. And MSCI (2014) highlights the potential for integrating ESG factors into the whole range of investment practice, including "investment analysis, allocation, risk measurement, security selection, and performance attribution process" (MSCI, 2013, p. 2). It should be noted that the existing definitions mostly depict the financial potential of an ESG framework implementation, which suggests that it has become a cornerstone of the existing sustainable investment strategies.

For a successful implementation of the ESG framework, it is important for both investors and companies to understand what defines each of the three ESG

factors. However, the definition of environmental, social and responsible issues is broad and, as suggested by the PRI guidance (2015), depends on the individual features of the asset class and business. Environmental issues address safety concerns and mechanisms of the ecosystem and natural world protection. PRI (2015) highlighted: biodiversity loss; greenhouse gas (GHG) emissions; climate change; renewable energy; energy efficiency; air, water or resource depletion or pollution; waste management; stratospheric ozone depletion; changes in land use; ocean acidification and changes to the nitrogen and phosphorus cycles. Issues related to human rights abuse and support of the well-being of society are incorporated in the social aspect, and cover such topics as: human rights; labour standards in the supply chain; child, slave and bonded labour; workplace health and safety; freedom of association and freedom of expression; human capital management and employee relations; diversity; relations with local communities; activities in conflict zones; health and access to medicine; consumer protection; and controversial weapons (PRI, 2013). Corporate governance-related issues may include "board structure, size, diversity, skills and independence; executive pay; shareholder rights; stakeholder interaction; disclosure of information; business ethics; bribery and corruption; internal controls and risk management; and, in general, issues dealing with the relationship between a company's management, its board, its shareholders and its other stakeholders".[4]

I.2.3 Responsible Investment and the Financial Sector

Sustainability found its reflection in the financial sector through the introduction of responsible investing practices, which were originally recognized as a "niche" alternative dominated by the socially responsible investment (SRI) funds which based their strategy on a negative screening approach (Commonfund, 2013; Crifo and Forget, 2013). For several decades after the appearance of the first SRI funds in the 1960s (Commonfund Institute, 2013), the industry grew at a slow pace. Its growth only accelerated in the 2000s, driven by the diversification of investment practices (BVCA, 2011; PRI, 2011).

[4] See www.unpri.org/wp-content/uploads/2013-14_PRI_RF_maindefinitions.pdf, accessed 21 April 2015.

Rather than focusing solely on negative screening, the new investment techniques allowed professionals to diversify investment strategies by addressing ESG-related issues from various angles (Eurosif, 2014). Incorporating ESG factors into the investment process permitted not only the enhancement of risk management, but also created an opportunity for future capital growth and improved investment performance, as suggested by many reports (PRI, 2011; Commonfund Institute, 2013; Eurosif, 2014).

One of the most significant steps that facilitated the establishment of the ESG framework across industries, including the financial markets, was the introduction of the Principles for Responsible Investment (PRI), supported by the United Nations in 2006. This framework was dedicated to promoting the integration of ESG factors into an investment process, which could be voluntarily adopted by investors. The creation of UN PRI encouraged the collaboration of like-minded institutions, companies and individuals who were committed to promoting a responsible approach in business through the introduction of ESG-related features into their financial reporting as well as implementing ESG-related activities in their investment targets (Malk, 2013). The number of signatories rose dramatically, from 20 institutional investors and $4 trillion worth of assets under management in 2006 (Commonfund Institute, 2013) up to 1376 signatories and $45 trillion of assets under management in 2015, including asset owners, investment managers and professional service partners (UN PRI, 2015). According to one of the latest reports by the Global Sustainable Investment Alliance (GSIA) (2014), where the geographical distribution of the ESG investment strategy implementation was presented, 64% of portfolio investments were allocated to European markets and, combined with the USA and Canada, accounted for 99% of the sustainable investment universe.

Despite the overall rising scope of ESG framework implementation across the financial markets, expansion has occurred unevenly. Public equity investors were the pioneers in the field (Commonfund Institute, 2013; Khan et al., 2015). The fixed income market was another to embrace the ESG framework. In comparison with the equity market, it provided a larger potential for the development of the ESG concept (MSCI, 2013). A recent development of fixed-income indices focused on ESG factors is a good illustration of the trend. In 2013, MSCI launched its first ESG fixed-income indices, together with Barclays (MSCI, 2013), followed by the announcement by S&P

Dow Jones Indices jointly with RobecoSAM of the launch of the S&P ESG Pan-Europe Developed Sovereign Bond Index (S&P Dow Jones Indices and RobecoSAM Press Release, 2015).

The most challenging asset classes in terms of the establishment of ESG practices remain alternative investments, which include hedge funds, venture capital, commodities, real estate, natural resources and private equity. More complex investment strategies, which lack transparency and detailed reporting and have relatively short-term investment horizons, could be seen as the key barriers to framework adoption (PWC, 2012; Commonfund Institute, 2013). Nevertheless, private equity industry has become involved in the recent growth of interest in the topics of sustainability and ESG.

A growing pool of studies dedicated to the sustainability and responsible investment topics suggests that there is evidence of potential for value creation and a positive financial impact generated by the implementation of the ESG framework. While some sectors have demonstrated a high interest and implemented the existing technique relatively quickly others, like alternative investments, appeared to be more sceptical, so the process of ESG concept implementation has made slower progress. The private equity sector appears to be one of the last to incorporate the ESG grid within an investment strategy, and progress in the field lacks any deep analysis from academics or industry professionals. This study is dedicated to bridging this gap, and providing an in-depth overview of the current theoretical and practical developments on the topic; it also aims to provide evidence of a significant financial potential of the ESG framework for the private equity sector.

I.2.4 Reputation and Responsibility

A broad pool or research praise sustainability, which found broad popularity across various industries. As this thesis majorly focuses on the financial implications, it also overlooks a sustainability in the context of corporate reputation. Reputation and reputation management attracts a strong academic attention, as it has vital strategic implications for the company and stakeholders (Rumelt et al., 1994; Hitt et al. 2004; Flanagan and O'Shaughnessy, 2005; Tischer and Hildebrandt, 2014).Reputation provides a range of financial benefits, as strong financial performance is associated

with reputation improvements Brown and Perry, 1994; Deephouse, 2000; Roberts and Dowling, 2002, Garzert, 2015; Weng and Chen, 2017). As well as a range of non-financial benefits, such as positive relationship with stakeholders (Weigelt and Camerer, 1988; Barney, 1991) and access to better infrastructure (; Roberts and Dowling, 2002; Gatzer, 2015).

Academics has undergone a big effort to define mechanism of reputation management. Mahon (2002) established two reputational pillars: substantive and symbolic actions. Substantive actions are the actual economic and social actions on which stakeholders base their valuation of a firm; whereas symbolic actions are the actions the firm takes to manage stakeholders' perception of the firm (Mahon, 2002). Firms actively engage in symbolic actions to manage their reputations, as demonstrated in papers by Fombrun and Shanley (1990) and Deephouse (2000).

Numerous studies highlighted companies to address sustainable business approach as method do improve its reputation. Researches revealed companies, to have a positive reputation in social responsibility protect themselves from shareholder losses (Epstein and Schneitz, 2002), it allows to improve stakeholders' perception (Robinson et al, 2011) and improve a protection from downside risk (Fombrun et al, 2000). Companies engage in sustainability and apply various methods to communicate its engagement in CSR and various sustainable practices in order to receive a positive feet back from stakeholder and competitors (Robinson et al, 2011). A growing evidence associates improved reputational benefits through these practices (Sarbutts, 2003; Adams, 2008, Robinson et al, 2011).

It could be seen in academic literature reputation and sustainability to often come hand in hand. And as one subject complements another, this thesis addressed both fields.

I.3 Summary and Contribution of Essays

Essay 1

The first essay studies if reputation management works and endurance of reputation management power. A company's reputation is a key communication point, which demonstrates the firm's strength and competitive advantages. It is a predominant intangible asset of the firm, as well as one of its key strategic priorities. Due to this reason firms actively engage in reputation management practices. Numerous studies dedicated to explore mechanisms to manage reputation, as well as to measure it.

In comparison, very few academics address the timeframe of reputation power. Shultz et al (2001) revealed ability of reputation to "stick" on the basis of Danish ranking evaluation, however the timeframe was not measured. Further Roberts and Dowling (2002) indicted, that firms are more likely to sustain superior performance if they sustain positive reputation. Ang and Wight (2009) indicated cumulative effort that reputation has and further supported the findings of Shultz et al. (2001), linking longevity of reputation to stronger financial performance over time

The task of measuring positive outcome and endurance proves challenging. It could be due to the intangible nature of the asset, therefore academic community is yet to develop robust approach.

This essay examines outcome of reputation management based on company's concern over reputation and its performance in the reputation ranking. Reputation ratings are one of the most widely respected mechanisms relied on by both academics and industry (Brown and Perry, 1994; Fombrun, 1998; Ali et al., 2015; Weng and Chen, 2017). Therefore, it could be perceived among the most reliable means to estimate reputation.

The analysis of this paper is focused on *Fortune*'s "America's Most Admired Companies" (AMAC) rating, which is highly respected in the industry. Due to the power of this rating, as well as its long history, it can be applied as a well-fitted sample to explore the connection between a company's interest in reputation and its performance. The model presented in this study depicts concerns expressed by firms

over reputation management and examines its impact on its performance in the ratings. The second aspect focuses on measuring the power of reputation over time, through analysing a company's performance over the time span of five years.

The results of the analysis establish a connection between firms' concerns over reputation and performance in the rating. These results could be interpreted as indication, that reputation management work as it positive outcome was reflected on in the ranking. This study also demonstrates a "lasting effect" of reputation management. The results of the investigation suggest that there are lasting effects of reputation management, as firms' concerns over reputation demonstrate an effect on their performance that could be detected over a t least two –year period.

These results contribute to the theoretical field of reputation management studies and suggest an alternative way to measure if reputation management works. It further expands the studies of Shultz et al (2001) and Ang and Wight (2009), indicated that reputation power lasts over two years, if accounting for firm fixed effects.

The practical contribution of the study could be useful for strategic planning and to promote the place of reputation management in it. Understanding of the power of reputation could facilitate the time-frame of reputation management activities more accurately.

Essay 2

The second essay is dedicated to the topics of fund survival and its implications for asset managers in the context of SRI and the performance of conventional funds. The existing pool of research can be divided into three categories: the studies which do not identify a difference between ethical and conventional fund performance, including Hamilton et al. (1993), Sauer (1997), Statman (2000), Bauer et al. (2005) and numerous others; the studies which found indications of ethical funds' underperformance, including Gregory et al. (1997), Tippet (2001) and Geczy et al. (2005); and the studies which indicated positive ethical portfolio performance, including Luther et al. (1992), Mallin et al. (1995) and Shank et al. (2005). Few Notably, as highlighted by Cherub (2010), despite some datasets to suffer from survivorship bias, the majority of these studies either ignored survivorship bias during

the analyses or did not tackle it in the methodology. On the other hand, the studies, which address it, indicated a strikingly higher survival rates of ethical funds (Bauer et al. (2005), Renneboog et al. (2008) and Kempf and Osthoff (2008)).

This study focuses on survival analysis ethical and non-ethical funds. Bauer et al. (2005) indicated higher survival rates amongst ethical funds. Renneboog et al. (2008) indicated a similar trend. This study takes a closer look at this trend and aims to identify whether ethical specification of the fund has an impact on the trend. In comparison to previous work, where survival was indicated in descriptive statistics, this study implements the survival analysis approach.

As this trend was majorly overlook in the academic literature dedicated to the performance of ethical and conventional funds, this study focuses on the topic and explores if the trend is related to a fund specification.

Apart from expanding the theoretical perspective on SRI and conventional funds, this study is insightful for asset management companies. Gil-Bazo et al. (2010) addressed the structure of fees, by searching for differences, in comparison to the size of fees in conventional funds; however no strong similarities were detected. As fees is a sole source for asset management companies to generate income, the funds, which demonstrate stronger survival could be preferred higher by asset managers.

In order to study survival, the crucial component of the analysis is the dataset, which would allow us to study survival over time. Therefore ex ante approach was taken. It was applied of the dataset of Kreander at al. (2005), which provided data matched on the basis of size, age, investment universe at the beginning of the dataset, as a prerequisite to ex ante dataset formation. The essay implemented survival analysis to study the survival of ethical and conventional funds, and the chi-squared test. It also implemented Carhrat model (1997) as part of robustness test to compare the performance of SRI and conventional portfolio of funds.

Analysis revealed stronger survival capabilities of ethical funds. Chi-squared analysis, supported by the survival analysis based on the Cox (1972) proportional hazard distribution, revealed ethical specification to have an impact on survival longevity. The funds were analysed separately and then allocated to an equally weighted portfolio of ethical and non-ethical funds. Despite negative performance, the coefficient did not significantly deviate from the market in the case of both ethical

and conventional funds. Overall, despite stronger survival abilities, investment approaches did not find indications of ethical funds' underperformance: both ethical and conventional funds demonstrated a positive risk mitigation capacity.

From a theoretical perspective this study further expands the methodological toolkit applied for fund performance, through introduction of survival analysis, adopted from the IPO (Initial Public Offer) survival studies, such as Carpentier and Suret (2011), Espenlaub et al (2012) and Espenlaub et al (2016). It also provides justification for the accountability of survivorship bias in the methodologies.

This study contributes to the literature dedicated to the asset management and fees structure, as was previously explored in the study Gil-Bazo et al. (2010). However, instead of exploring the size of the fees, it focuses on the timeline of fee payments. The results revealed stronger tendencies of SRI funds to survive. It could be argued that under the current structure of asset managers' performance, adaptation of ethical investment offers a secure inflow of fees over a longer period of time, which positively contributes to asset managers' earnings.

Essay 3

The third essay studies sell-side broker capability to generate value through adaptation of ESG practices, based on the example of the data provided by a French sell-side broker, which developed an ESG ranking. This is a rare attempt for a sell-side broker to go that length to develop an alternative service, however under the condition of changing regulatory landscape due to implementation of MiFID II, this approach, it is important for sell-side brokers to find the ways to adopt to the changing landscape.

Brokerage houses previously did not pay enough interest to the opportunities linked to responsible investing. Sell-side brokers have operated by relying on the same model for decades. The participants provided recommendations, forecasting, earnings predictions and execution services to the buy-side, charging clients fees upfront. Academic community drew attention to certain inconveniences related to this system, suggesting that it allows brokerage houses to hide information on costs and create a certain level of opaqueness in the market (Womack, 1996; Barber et al., 2001; Marber et al., 2014).

As new regulations take place in 2018, they are expected to challenge significantly the existent sell-side, broker-dealer operating model. New Markets in Financial Instruments Directive (MiFID II) regulations are devoted to improving market transparency. Under new conditions brokers are forced to separate and reveal the price for research and execution, as well as to charge the clients after the service has been delivered (Deloitte, 2014; PwC, 2016; Bloomberg, 2017). These changes established new standards for broker-dealers and increase the severity of competition, potentially jeopardizing the existence of market participants. Under turbulent market conditions brokerage houses face an important challenge in finding new ways to secure revenue and generate value. As alternatives vary, there is a rising demand for robust evidence of the most secure alternatives.

As sustainable investment theme rises across financial markets and is strongly supported by the staggering demand from both the sell and buy side, it could withhold prosperous opportunities from brokerage to find an alternative way to generate value.

Financial market participants apply ESG ratings and recommendations to develop ESG investment strategies. A number of agencies offer their services and provide publicly available ratings. However, numerous companies and funds choose to develop their own methodologies. The sector could be characterized as strongly dispersed, with staggering evidence of a lack of standardization approaches and transparency (Fowler and Hope, 2007; Chatterji et al., 2009), as many participants prefer not to disclose the rating methodologies. There is significant demand for ESG ranking on the market (Fowler and Hope 2007; Richardson and Cragg, 2009; Chatterji et al., 2009). There is no established regulations approach or standardized requirements for issuing ESG ranking. These factors create positive market opportunity for new entrants (Fowler and Hope 2007; Richardson and Cragg, 2009). Brokerage houses have extensive access to data and research capabilities, these factors provide them with strong prerequisites to implement ESG and develop ESG ranking in-house.

The current environment poses important questions regarding the future development and value generation opportunities for brokerage companies, as well as whether implementation of ESG solutions could provide a sustainable alternative. The current academic literature is yet to cover this subject, which provides an opportunity

for research. This study makes the attempt to fill the existing gap in the subject, and take the opportunity to suggest new alternatives for brokers through the prism of the ESG framework.

In order to estimate the value creation capability, two portfolios were generated: the one, which originated in Europe and the one originated specifically in France, as a French sell-side broker provided the dataset. CAPM and Fama-French models were applied for the analysis. ASSET4 data was applied to create an ESG ranking-based portfolio to compare the performance. Further, an alternative SRI fund –based portfolios were generated, as well as sustainability index-based portfolio to compare the performance of the results indicated the feasibility of the product. The results indicated broker capabilities to develop legitimate recommendations for the ESG-related investment opportunities, however the portfolios did not demonstrate strong positive alpha generation capabilities.

As this essay analyses the attempt to create an alternative product by a sell-side broker through development of an ESG ranking and issuing ESG recommendations for investors, it generates both practical and theoretical contributions. It explores opportunities for sell-side brokers to diversify and retain its competitive advantage amid the changing regulatory landscape. This is an important subject from a practical perspective, due to increasing pressure and tightening of competition (Bloomberg, 2017; KPMG, 2017). As brokers are obliged to develop prices in advance (Bloomberg, 2018), the competitive edge significantly narrows. This essay evaluates an alternative method of gaining competitive advantage, rather than focusing on the pricing.

From the theoretical perspective, this essay adds diversity to the literature dedicated to the ESG ranking. In Chatterji and Levine (2006), Chatterji et al. (2009), Escrig-Olmedo et al. (2010), Delmas and Blass (2010) and Dorfleitner et al. (2015) the authors explore the development and application of various sustainability rankings.

Essay 4

This essay is dedicated ESG framework in the context of private equity. In comparison to equity market, private equity implement ESG-related approach to the

investment process at a slower paste. The literature landscape appeared to be extremely scarce on the subject. Therefore there is no conclusive evidence of the reasons of the pace, or the motivating factors for private equity firms to implement ESG. The area, additionally, substantially lacks empirical background. This could be explained by the opaqueness of the sector.

This study represents a broad overview of the existent literature on the subject. It is highly characterised by the industry reports. It identifies key motivating factors and obstacles for ESG framework to penetrate and evolve in the private equity sector. In addition it introduces an exploratory study of ESG-related negative incidence and their relationship with private equity multiples. Thus study explores an early evidence of the relationship. As it could be used as the fundamental base for the further development of empirical framework.

The essay established, that the main impulses for ESG implementation are based on the growing evidence of value creation and portfolio risk minimization opportunities (Cronelli et al, 2015), and stimulated by institutional investors and LPs. Additionally, the changing environment of the financial markets creates a positive environment for framework development (Malk, 2014; PWC, 2015).

Literature review exposed measurement techniques to be the most problematic area, as suggested by reports (Doughty Hanson & Co. and WWF, 2012; Crifo and Forget, 2013). As there is no unified methodology available in the industry to guide ESG implementation. The lack of empirical evidence creates significant scepticism from some general partners (Commonfund Institute, 2013; PWC, 2014), and poor reporting standards hinder the transparency improvement (PRI 2013; 2015).

The results of the data, provided by the market participants and developed into a dataset through merging it with the RepRisk data on ESG-related negative events revealed a pattern, which indicates the relationship between negative ESG factor-related events and the investment multiples.

Overall, this study has provided an extensive overview of the relationship between the ESG framework and the private equity industry, demonstrating the growing potential for the framework to develop. It demonstrated the initial elements of the influence that the ESG framework can have on portfolio performance are also presented, this is an important theoretical contribution, which could serve a catalyst

for further empirical investigations on the subject. From a practical perspective, the evidence presented in the paper is an important signal for private equity sector to take the framework into serious consideration.

Overall, it should be noted, that the paper is significantly dominated by data-driven research. As responsible investment attract significant attention not only from academic, but also from the business community, a significant amount of data becomes available. This data reveal not only existent imperfections on the financial, market, but brings a strong incentive for academic investigation. Some of the data provided inspiration for the work, presented in the current thesis.

Summary Table

The table presented below summarizes each essay. It introduces the theme, the research question, the original contribution and the implication of the findings.

Overview of the four essays in this thesis on responsible investment, research output analysis and investment performance evaluation		
Essay number and title	**Essay 1: How Long Does Reputation Last? A Clinical Study of Fortune's "America's Most Admired Companies" Rating**	
Essay theme(s)	Clinical study: reputation management	
Contribution number	First contribution	Second contribution
Research task(s)/research question	Does reputation management work - examine relationship between firm's concern over reputation management and its performance in reputation ratings.	Estimate the capability of reputation to retain power over time
Original contribution(s)	Development methodology to measure if reputation management work through studying firm's concern/interest in reputation management expressed by the firm and its performance in the ranking. Strong connection between these two factors was found, suggesting reputation management works and offers better outcome for the firm.	Analysis of reputation. Reputation appeared to have long-lasting effect over a period of minimum of two years, in comparison to being subjected to yearly fluctuations.
Implications	This essay expands literature dedicated to reputation management and suggest a methodology to assess the outcome of reputation management activity.	This finding provides important insight for the strategic planning of reputation management.

Essay number and title	**Essay 2: Evaluating Performance of SRI Funds and Conventional Funds: Revisited**	**Essay 3: Do Sell-Side Brokers Add ESG Alpha? First Evidence From a European Leader.**	**Essay 4: Returns to Corporate Social Responsibility in Private Equity? A First Explanatory Study.**
Essay theme(s)	Responsible investments; SRI fund performance; fund performance analysis; matched pairs analysis.	Responsible investments; ESG rating practice; brokerage.	Explorative study: responsible investment and private equity.
Contribution number	Third contribution	Fourth contribution	Fifth contribution
Research task(s)/research question	Study the survival of SRI and conventional funds. Do the SRI funds have stronger survival capabilities in comparison to conventional funds?	Could sell-side broker generate value through introduction of ESG recommendations amid changing regulatory landscape dictated by the implementation of MiFID II.	What motivation and obstacles effect the slow process of ESG implementation in PE sector? Studies a relationship between ESG factors and PE multiples
Original contribution(s)	Introduction of survival analysis to study the survival of ethical and conventional funds. Introduction of evidence of ethical fund to have stronger survival capability than conventional funds.	It is the first paper to explore opportunities for brokers within ESG rating./recommendations framework. The study revealed, that adaptation of ESG recommendations generate a competitive alternative service.	Introduction of in-depth literature overview; constructive analysis of current motivation and obstacles for ESG tilt stages of development with private equity sector; exploratory study of negative ESG events and PE multiples.
Implications	Results expand further ethical literature. Positive implication for asset management companies. Longevity of SRI funds suggests increase in the time period of fees the manager charges.	ESG provided an alternative framework, sell-side broker could explore to generate value, as new regulations put standard value generating practices under pressure.	The study provides evidence of the relationship between negative ESG incidents and PE multiples, suggesting PE firms to consider ESG implications for portfolios. The study provides firm base to unfold empirical analysis of ESG implications for portfolio performance, which academics and practitioners could use.

I.4 Thesis Structure

The thesis is organized as follows. In the first essay I study one of the core assets, highly valued within the responsible investment framework – company reputation. The essay begins with introductory remarks and explores the process of the evolution of reputation over time. It examines the ways the company can benefit from reputation management and explores the mechanism of reputation management and measurement. The introductory sections are followed by the introduction of hypothesis formulation, focusing not only on the evolution of reputational effects but also on the strength of reputation over time. The data section introduces the AMAC rating, which is the key data source in this essay. The approach to the data analysis is presented in the methodology section, followed by an analysis of the results and completed with a discussion and concluding remarks.

The second essay explores ethical fund performance. I introduce a new approach to dataset construction, based on the *ex ante* approach. The sample is constructed from both ethical and non-ethical European funds, which are matched on the bases of the data and performance results available at the starting date of the analysis. The analysis is performed by implementation of the Carhart four-factor model. The literature review of the chapter considers the existing studies dedicated to the topic. The data section and methodology provide a detailed description of the analysis, followed by presentation of the results and concluding remarks.

The third essay explores the new opportunity for sell-side brokers amid the changing business environment due to the implementation of the new EU regulations MiFID II. It addresses ESG-related potential with a major focus on ESG ranking practice. The analysis is based on the unique dataset provided by the industry player. The literature overview is dedicated to revealing existing gaps in the academic material, and demonstrates a lack of comprehensive research in evaluating the rating technique of the market players. It also highlights the previous lack of attention to brokers as market intermediaries in the context of responsible investment. The data section provides characteristics of the analysed cross-section, followed by a methodology section, which explains the process of portfolio construction, which was

analysed through implementation of Capital Asset Pricing Model and the Fama–French model (Fama and French, 1993). The outcome is analysed in the results section, followed by concluding remarks.

The last essay takes a step away from empirical analysis and represents an exploratory study dedicated to ESG implementation in an investment strategy of a private equity market. Adoption of the ESG framework occurs at a slower pace in comparison to the equity and fixed income markets. The opaqueness of the industry affects information availability, which hinders the development of a thorough analysis and has resulted in a significant lack of academic research. The study explores the steps that lead to a development of the framework in the context of financial markets as an initial step. It further highlights the path of framework evolution in the context of the equity market, in order to understand the process. A further section focuses on the processes, which occur in the private equity sector. This begins with a literature overview, characterized by the absence of empirical studies and a strong dominance of industry reports, followed by an exploration of the ESG framework's integration process in the private equity market, an analysis of the existing measurement and methodologies, and completed by an investigation of the hurdles and criticisms that have hindered development of the framework. The explorative approach is complemented by a clinical study, based on the unique dataset provided by the industry participant. This is composed of a short data introduction, comments on methodology, and results of the analysis. The study is summarized in the concluding remarks. An overall summary of the study and final conclusions are presented in the final section of the study.

Essay 1: How Long Does Reputation Last? A Clinical Study of *Fortune*'s "America's Most Admired Companies" Rating

Abstract

The rise of the intangible assets' role in investment decision making process, and investors' interest to implement ethical approaches transformed reputation into a key building block in a company's value chain. It is not only important to create a positive reputation, but also to retain it. This study investigates if management reputation work. It also evaluates firm's ranking over time, in order to gain notion about reputation strength over time. The analysis studies *Fortune*'s "America's Most Admired Companies" (AMAC). For decades it was an exemplary rating, respected across industries as a reliable source of reputational assessment. The results of the analysis suggest, that companies that manage reputation do better outcome, as demonstrated a discovered strong connection between a company's concerns over reputation and the scores it received in AMAC ranking. It was also established, that reputation management retain its power over two to four years.

1.1 Introductory Remarks and Reputation Management

Reputation management has attracted the attention of both the academic and the corporate world over the past three decades. Nevertheless, the subject was really put under the spotlight only at the beginning of the 2000s (Barnett et al., 2006), when the rules of industry competition started to be reshaped under the pressure of a changing economic climate. With the evolution of a new order on the markets, tangible assets no longer played a defining role in the competitive environment, as intangible assets took a leading position in strategic initiatives.

Reputation management in particular became a key asset and an invaluable aspect of strategic planning. It provided numerous benefits for the firm, including the opportunity for value creation, building and reinforcing relationships with various groups of stakeholders, and improving customers' and employees' loyalty (Hall, 1992; Flanagan and O'Shaughnessy, 2005; Tischer and Hildebrandt, 2014).

Despite the evident power of reputation management as a concept, and its growing popularity, the topic caused significant dispute in the academic community. Numerous studies named the complexity and opaqueness of corporate reputation among the main reasons behind the lack of comprehensive approaches in the field (Fombrun et al., 2000; Ali et al., 2015; Garzert, 2015). The debate on effectiveness of reputation remains ongoing. And the question if reputation works and proves beneficial is of significant relevance In the meantime, the absence of systemized approaches offered a significant potential for further research.

Among numerous unresolved questions, a significant dispute arose around measuring corporate reputation. With various approaches available for academics and practitioners, the efficiency of each is still a subject of debate. Some regard brand equity measurement as interchangeable with reputation estimation (Caruana and Chircop, 2000); another methodology involves comparison of firm position in the industry with an estimated "ideal" position (Hatch and Schultz, 1997). However, the most sought-after approach is reputation evaluation through a ranking system presented by the media (Fryxell and Wang, 1994; Fombrun, 1998). For decades influential business media publications have provided their own interpretation of

firms' reputation expressed in their reputation rankings. Each rating is based on a unique approach. *Fortune*'s AMAC rating remains the most prominent and well respected in the academic and business community.

This study further extends reputation management literature. It provides alternative methodology, through application of reputation ranking to estimate if reputation management proves beneficial. Papers of Shultz et al. (2001) discovered, that reputation management efforts appear to "stick" to a company. Another evidence of financial performance longevity to be linked to reputation strength was revealed in the study of Roberts and Dowling (2002). Further research associated longevity of reputation power over time and indicated it influence on company's financial performance (Ang and Wight, 2009). This research further examines the time effect of reputation power. The study follows Fortune's AMAC ranking to study the impact of firm's concern over reputation and its performance in the ranking. The results revealed the relationship between firm's interest tin reputation ranking and its performance. This evidence signalises of positive outcome of reputation management effort. Empirical investigation revealed mixed evidence, which suggests reputation power to last over a period of time, however the period appeared to be significant over two years.

It is important to study reputation management effectiveness and the power reputation over time, as it helps to shed light on the horizon of the strategic planning when it comes to reputation management. Which, in return could further encourage to improve reputation management practices.

The rest of the essay organised as follows. The background section presents a broad literature review, which reflects the key corresponding topics with reputation management. It is followed by the development of hypothesis. Data section reveals the process of data preparation for the analysis. Followed by methodology, which introduces two empirical strategy of the analysis. The result section is followed by a brief discussion and concluding remarks.

1.2 Background

1.2.1 Defining Reputation

Reputation is a complex multidimensional framework, reflected in numerous domains of research, including management, economics, accounting, sociology and marketing (Fombrun and Van Riel, 1997). Such a variety of disciplines have facilitated a diversity of academic research dedicated to the subject. In the domain of economics, reputation is analysed from the game theory and signal theory perspectives. Game theory represents reputation as a unique set of traits, which allows differentiation between companies through a developed typology (Fombrun and Van Riel, 1997). Signal theory considers reputation as a means to communicate information, and to create a certain perception of the company to an outside audience (Turban and Greening, 1997; Basedo et al., 2006).

From the strategic point of view, reputation is considered as one of the key assets of the firm. It introduces the potential for a company to gain competitive advantage (Fombrun and Shanley, 1990 Tischer and Hildebrandt, 2014), as well as providing an opportunity for value creation (Roberts and Dowling, 2002; Rindova et al., 2005). Studies suggest that reputation could be acquired through a distinctive set of company characteristics and reflected in public perception (Freeman, 1984; Rindova and Fombrun, 1997).

Reputation within the marketing framework is often referred to as “image”; and there is an extensive range of available studies dedicated to the construction of strong positive brand equity and development of branding strategies (Brown et al., 2006). A strong positive reputation plays an important role in the organizational context. It encourages the development of a strong sense of identity among managers, as well as positively affecting corporate culture (Cable and Graham, 2000; Highhouse and Hoffman, 2001). A substantial amount of work has also been conducted by sociologists, who have highlighted the importance of reputation within a social context and presented it as a validation mechanism for a firm (Shapiro, 1987; Abrahamson and Fombrun, 1992).

The academic community has engaged in numerous attempts to find an omnibus definition of corporate reputation. However, due to its multilayered and

multidisciplinary nature, this task has appeared to impose a challenge, and none of the definitions have so far been widely accepted (Barnett et al., 2006).

Various cross-field reviews of the existing research on the subject suggest that reputation as a concept has numerous basic characteristics, which provide multiple angles for academic research (Chun, 2005; Barnett, et al., 2006; Lange et al., 2011); as Ali et al. (2015) highlighted, this factor explains the lack of coordination in the efforts to produce a complete definition.

In a paper published in 2011 Lange et al. provided an extensive overview of the work accomplished on the subject of reputation. The authors applied the prism of reputation characteristics to define the key dimensions of the research, which were perception of reputation as "being known", "being known for something" (ibid., p. 157) and "generalized favourability" (ibid., p. 159).

Studies that regard corporate reputation as a concept of "being known" mostly concentrate on the general perception of the firm. Rindova et al. (2005, p. 1035) associate reputation with "prominence". The key aspect of this dimension is accurately defined in the paper of Barnett et al. (2006), where the authors suggest recognition of a company without judgement from stakeholders to be among the main criteria. It is worth presenting several existing definitions that fall within this conceptualization.

Rindova et al. define reputation as "stakeholder perceptions with regard to an organization's ability to deliver valuable outcome" (2005, p. 610). Bromley provides a similar definition in the paper, where reputation is defined as "the way key external stakeholder groups or other interested parties actually conceptualize the organizations" (2000, p. 241). Whetten and Mackey define reputation as "a particular type of feedback received by an organization from its stakeholders, concerning the credibility of the organization's identity claims" (2002, p. 9). These definitions highlight the generalized role of other parties' perception of reputation.

As opposed to "being known", authors that associate reputation with "being known for something" perceive a certain prominent feature to be central in defining reputation or, as depicted by Lange et al. (2006), a notion of quality. This attribute is present in the definition presented by Mahon (2002, p. 439): "reputation is an asset in relation to a specific context or process, specific issue, specific stakeholders, and

expectations of organizational behaviour based on past action and situations". This definition highlights the importance of communicating and reflecting certain unique traits of organization and formalizing a certain judgement in a certain stakeholder group. This concept is also well described in the paper by Rindova et al. (2005, p. 54), which defines reputation as "beliefs of various stakeholders regarding the likelihood that the firm will deliver value along key dimensions of performance" (Lange et al., 2006).

A group of studies that perceive reputation from the angle of "generalized favourability" depict a general cumulative perception of a firm based on the overall quality of its attributes to be at the core of the definition. Lange et al. (2006) specifically highlight Fombrun's definition of reputation, which is often referenced in the academic literature: "a perceptual representation of a company's past actions and future prospects that describe the firm's overall appeal to all its key constituents when compared to other leading rival[s]" (Fombrun, 1996, p. 72). This concept provides views on a reputation as a cumulative judgement based on multiple attributes (Barnett et al., 2006), with a stress on the relativity of its features (Fischer and Reuber, 2007). Or, as Boyd et al. present reputation: "an organizational attribute and depicted as a broad, multidimensional single construct whose value is determined through the interactions interrelationships among multiple attributes, both internal and external to the firm" (2010, p. 590).

As can be seen from the review above, despite a wide range of definitions, perception and value remain the major attributes. Reputation is portrayed as a key communication tool between the company and its stakeholders, which puts it in the prime position in the strategic management practices of the present competitive business environment.

1.2.2 Reputational Benefits

Despite extensive alternative interpretations of corporate reputation, academics have agreed on its benefits for the company. Reputation has gained significant acknowledgement from academics through the years, and often been approached as one of the key elements for a modern company's successful performance (Rumelt et al., 1994; Hitt et al. 2004; Tischer and Hildebrandt, 2014). Re-evaluation of its role in

corporate strategy contributed to the shift in the perception of a strong reputation as one of the crucial steps towards building strong competitive advantage. Numerous studies agree that reputation has become one of the key strategic assets and provides a wide range of benefits for the company (Fombrun and Shanley, 1990; Hall, 1992; Flanagan and O'Shaughnessy, 2005).

Financial benefits and value creation are some of the most widely discussed topics in the academic community. An extensive range of papers recognizes the positive relationship between a strong reputation and a firm's financial performance (Brown and Perry, 1994; Deephouse, 2000; Roberts and Dowling, 2002, Gatzert, 2015; Weng and Chen, 2017). This interdependence can be perceived as one of the strongest motivations for the growing attention to corporate reputation from both academics and practitioners. Fryxell and Wang (1994) demonstrate the connection between a positive corporate reputation and an inflow of financial investments. Later studies supported early evidence and highlighted that the reputation of appointed CEOs further impacted on financial performance (Tischer and Hildebrandt, 2014; Weng and Chen, 2017).

The non-financially related benefits are also important. Tischer and Hildebrandt (2014) highlighted that intangible attributes are hard to mimic, which allows a company to gain competitive advantage. Reputation allows the firm to build a trustworthy relationship with clients (Weigelt and Camerer, 1988). A strong reputation equips a firm with advantages over competitors, as well as affecting information distribution within the sector (Fombrun and Shanley, 1990). To be more precise, a positive reputation signals one of the unique features of the company and provides information regarding product quality (Shapiro, 1983; Fombrun and Shanley, 1990). In return, reputation facilitates a strong relationship with suppliers and customers, as well as improving pricing policies (Barney, 1991; Roberts and Dowling, 2002; Gatzer, 2015). Reputation is also seen to affect the image of the company as perceived by its employees, and facilitates it in gaining the strongest candidates (Flanagan and O'Shaughnessy, 2005; Walker, 2010).

1.2.3 Mechanisms of Reputation Management

Growing evidence of the undeniable benefits derived from corporate reputation has encouraged companies to put more effort into its improvement and support. However, this task appears to be challenging due to the complexity of the theoretical background for reputation management mechanisms, as well as lack of real-world examples. One of the main approaches to conceptualizing reputation management mechanisms came from the work of Mahon (2002), where the author established two reputational pillars: substantive and symbolic actions. Substantive actions are the actual economic and social actions on which stakeholders base their valuation of a firm; whereas symbolic actions are the actions the firm takes to manage stakeholders' perception of the firm (Mahon, 2002). Firms actively engage in symbolic actions to manage their reputations, as demonstrated in papers by Fombrun and Shanley (1990) and Deephouse (2000). For example, firms routinely utilize public relations and the mass media to improve how they are perceived (Deephouse, 2000). Such actions are intended both to maintain and to enhance the firm's reputation among stakeholders and the general public. Nevertheless, due to the complexity of the concept, it appears to be challenging for managers to determine the correct pathway to reputation management (Barnett and Pollock, 2012). Moreover, even where the path forward is clear, the actions necessary to improve reputation may be too costly to the firm or too burdensome for management to undertake, as several authors have highlighted (Barnett and Pollock, 2012). Management may therefore seek another way to influence reputation, one that requires neither a change in substantive behaviour nor the need to engage in complex and uncertain symbolic management practices.

1.2.4 Reputation Measurements

In order to be able to detect the influence of reputation and manage it efficiently, it is important to have a firm measurement technique. This task has proved to be challenging for both academics and practitioners due to the ambiguity of the definition of management practices. The variety of measuring approaches has been criticized for the lack compatibility, subjectivity and being subjected to a number of limitations power and scrutinised under the accuracy of applied methodologies.

The work of Ali et al. (2015) marked measurement amongst three key moderators in the process. Other "moderators" identified were country of origin and stakeholder group. The authors suggested that these moderators have a crucial impact on two major groups of factors related to reputation: the first includes financial performance, firm size, firm age, media visibility, corporate social performance and long term institutional ownership. The second includes financial performance, customer trust, customer loyalty and customer commitment. Ali et al. highlighted the fact that ability to measure reputation is the key to understanding and managing these two factors.

Among the multiple approaches to measuring reputation, evaluation through the ranking system presented by the media is significant (Brown and Perry, 1994; Fombrun, 1998; Ali et al., 2015; Weng and Chen, 2017). As Fryxell and Wang (1994) noted in their paper that since a social component remains one of the dominating factors in reputation composition, social and media reputation monitoring systems can be a representative source of reputation evaluation.

A number of rankings presented by the media focus on corporate evaluation. One of them is the *Financial Times*'s annual "World's Most Respected Companies", which is based on an interview with over 4000 CEOs from 70 countries (Chun, 2005). Another ranking is provided by *Barron's* magazine.[5] The "World's Most Respected Companies" list is based on an evaluation of 100 companies which scored highest on the basis of stock market capitalization and were reviewed by institutional investors. Given the assessment methodology, this ranking places a higher stress on the financial aspect of reputation. The Management Today magazine – "Britain's Most Admired Companies", presents the British alternative, with the focus on the UK market.[6]

Looking at the available data on reputation management, it could be stated without doubt that *Fortune*'s AMAC rating stands out in both the academic and the business worlds. As reported in the study by Ali et al. (2015), *Fortune*'s AMAC ranking *Management Today* are the most featured ratings in the academic community. This is one of the oldest and most widely respected rankings in the academic world

[5] See www.barrons.com, accessed 25 July 2016.
[6] See www.managementtoday.co.uk/bmac, accessed 25 Jul 2016.

and business community. It was introduced in 1983 and based on a survey of industry representatives. The ranking is based on a score ranging from 1 (the lowest) to 10 (the highest). The survey is conducted with the help of the Hay Group management-consulting agency.[7] It is introduced in more detail in Section 1.7.

This ranking is widely applied across a vast pool of studies dedicated to understanding the role and structure of the corporate reputation concept, as well as being applied in various comparative studies and investigations of single companies.

1.3 Hypothesis Development

A vast pool of studies has been dedicated to exploring the topic of reputation management. A group of studies focused on positive financial angle when exploring corporate reputation (Brown and Perry, 1994; Roberts and Dowling, 2002; Rindova et al., 2005). For example, Brwon and Perry (1994) focused on financial hailo, which was associated with reputation rating. Fryxell and Wang (1994) linked inflow of financial investment with positive corporate reputation. Another group of studies explores reputation in a media and communication context (Shultz and Ervorder, 1998; Argenti and Forman, 2000; Deephouse, 2000; Fombrun and Rindova, 2000). Deephpuse (2000) demonstrated evidence of media reputation to increase performance of commercial banks. Other group of studies focust on overall strategic implications Fombrun and Shanley (1990) in their famous work highlighted how the known company brand allows company to be competitive in comparison to the peers. Tischer and Hildebarndt (2014) presented further support to the link reputation has to competitive advantage.

It is clear from the literature that the majority of the studies focus on the reputation's implications for a company's performance using reputation ranking as a tool of the analysis. However, the studies do not focus on assessing if reputation management works and creates positive implications for firm's corporate reputation. As reputation ranking remain a prominent measure of reputation, addressing the

[7] See www.haygroup.com/, accessed 25 July 2016.

connection between reputation concern and a firm's performance in the popular reputation ranking AMAC is the first step to constructing the hypothesis of this study.

Another step in the hypothesis formation is to address the time factor. Building reputation requires a substantial amount of resources and proves to be a costly activity. Under these circumstances, understanding the time frame of reputation power could provide a strong justification for required investments.

Shultz et al. (2001) addressed this question by introducing the analysis when the mechanism behind the Danish reputation ranking was – as the authors' suggested – identical to *Fortune*'s AMAC ranking. They found that a high reputation evaluation has a tendency to "stick" to the company over the years, as well as detecting a fragility of the methodology behind reputation evaluation (Shultz et al., 2001). Robert and Dowling (2002) studies firm's superior financial performance linked to reputation. The results revealed a connection between the endurance of superior performance and positive reputation associated with the firm. Similarly, Ang and Wight (2009) noted the cumulative effort that reputation has and further supported the findings of Shultz et al. (2001), linking longevity of reputation to stronger financial performance over time. The rising evidence form the academic literature indicates lasting implications and effects connected to the reputation, however, no attempt to measure longevity, or the power of reputation over time.

This study is dedicated to further exploring a firm's interest in encouraging reputation growth through establishing itself in media rankings, and exploring the link between ranking scores and a company's involvement in its reputation. It takes the prism of a five-year time frame, in order to assess the power of reputation over time. On these grounds, the hypothesis of this study could be formulated in the following way:

Hypothesis: Reputation scores are positively related to a firm's current concern for its reputation. And this relationship holds for a period of up to five years.

1.4 Data

1.4.1 Dependant Variable Construction and Fortune's Ranking

The analysis represented in this study is based on the information gained from multiple sources: Fortune's AMAC reputation ranking; the COMPUSTAT database, which provided accounting-related information; and the ProQuest dataset, which supplied information for building a variable to reflect a reputation concern. The rest of the data, necessary to grasp any potential geographical effect, was coded manually.

Since the AMAC rating is highly regarded among both the academic community and business practitioners, there is a probability that the scores of the ranking would reflect the effort and concern to manage reputation. The survey takes place on a yearly basis, which allows for estimating the strength of the reputation on the basis of the firm's yearly performance.

The survey has been published every February since 1983 and started with approximately 1400 companies: the Fortune 1000, the 1000 largest US companies ranked by revenue; and non-US companies in *Fortune*'s global 500 database with revenues of $10 billion or more. Then the 15 largest were selected for each international industry and the ten largest for each US industry, which surveys a total of 687 companies from 30 countries. In 2003, the ranking comprised 57 industry lists. The survey itself takes place from July until October. The questionnaire is customized to the industry. Ten CEOs, seven outside board directors and a group of financial analysts rank each company within the industry. For example, in 2013, 3800 respondents were reported to have participated in the survey (Hay Group, 2013). They were asked to select the ten companies they admired most, from a list made up of the companies that ranked in the top 25% in the previous year's survey, plus those that finished in the top 20% of their industry. Anyone could vote for any company in any industry, which is why some results may seem anomalous. For example, BMW is in the top 15 of Most Admired Companies and second in the motor vehicles industry, behind Toyota Motor (ranked 29th in the top 50).

The survey comprises nine dimensions: (1) quality of management; (2) quality of products/services offered; (3) innovativeness; (4) value as a long-term investment; (5) soundness of financial position; (6) ability to attract, develop and keep talented people; (7) responsibility to the community and/or the environment; (8) wise use of

corporate assets; (9) effectiveness in conducting its business globally (Hay Group, 2013). The dimensions themselves were developed in the early 1980s by *Fortune* magazine with the assistance of executives and analysts from the industry. All the participants are asked to rank each company from the industry on a scale from 0 (the lowest) to 10 (the highest). They are left free to interpret the meaning of the attributes on the basis of their own understanding and provide ranking according to their personal knowledge about the companies. Then the total score is calculated as a simple average of the scores of each dimension separately. Companies can access the preliminary information about the employees from the particular company and who participate in the survey. The survey is held in collaboration with the Hay Group management consulting agency (Hay Group, 2013).

For example, in 2010 Apple was ranked first in the "Top 10" ranking. It is classified under the "computers" industry, and scored 7.95. Western Digital was ranked eighth in the list and scored 5.67. The list only contained ten companies. In comparison, in 2009 Apple was also ranked first in the "Top 10 list". However, it was ranked second under the "computers" industry, scoring 7.07, whereas Xerxo was ranked first with a 7.28 scoring. Dell was in last place with 5.62 points; however, the industry only included six companies in 2009. Alternatively, in the same year, in the "financial data services" industry, ten companies were included in the ranking: the top performing Dun and Bradstreet received 6.98, whereas Fidelity National Info Service received 5.25 points and was ranked the last.[8]

To detect any visible affects from a firm's expression of particular interest about its reputation, and test its persistence over time, scores presented in the AMAC annual ranking were subjected to analysis. The data for the analyses was collected over a 25-year period (1985–2010). The period 1985–2005 was available in the printed copies of magazines; data for the later years of the annual review were available online, which resulted in 11,239 firm-year observations.

Data availability, partly caused by the industries with too few representatives in a given year, enforced a further reduction of the dataset. This affected the statistical

[8] The example is built on the basis of *Fortune*'s AMAC ranking published in 2009 and 2010. The data, applied in the example, was provided by *Fortune*'s AMAC webpage: http://fortune.com/worlds-most-admired-companies/, accessed 20 November 2017.

power of the model. Since reputation management practices could be implemented and adjusted in any given year at the industry level, small industries with only a few firms in a certain year could distort the analysis.

This exclusion criterion forced the exclusion of all firms in 2005, as *Fortune* used an unusual industry classification in this particular year, which they subsequently revised. This was due to the overall extensive time frame of the dataset; to keep consistency, it was decided against implementing an alternative classification for that year. As the AMAC firm selection, their industry sizes and their industry definitions were found to vary somewhat over time, it would not be conservative research practice to consider the dataset an unbalanced panel.[9] Hence, all the observations are pooled, and treated as a pooled dataset.

Net Income, Book Value per Share, Total Revenue, Employees and Total Liabilities were applied as standard control variables, the latter three variables being logged in order to account for their approximately lognormal distribution. The COMPUSTAT accounting database was used to retrieve the relevant information. This was integrated into the dataset through matching the accounting data from the previous year with the pooled sample of firms with an AMAC rating.

The introduction of accounting variables is a step shared by numerous studies, such as in Fryxell and Wang (1994), Brown and Perry (1995), Roberts and Dowling (2002) and Schwaiger (2004), which relied on accounting variables during reputation analysis. Fombrun and Shanley (1990) incorporated accounting variables in their early study, arguing that certain market information impacts on the perception of the firm. Roberts and Dowling (2002) supported the evidence that positive contribution accounting parameters play in reputation formation and included it in the model. The importance of accounting and financial indicators in the formation of reputation was further supported by the evidence provided in Schwaiger (2004). This was particularly important, as financial performance drivers were previously marked to have a strong impact on AMC ranking (Brown and Perry, 1994).

A similar case is applicable for the Employee variable. Helm (2011) emphasized in her study the role employees' play in reputation management. She

[9] Unbalanced panel datasets are characterized by missing observations, but these missing observations are usually considered to result from data series starting late or ending early.

portrayed the positive impact that employee awareness has on reputation. Earlier Flanagan and O'Shaughnessy (2005) and Walker (2010) indicated the importance of employees as an influential group of stakeholders. Additionally, Flanagan and O'Shaughnessy (2005) provided evidence of employee retention linked to positive reputation, suggesting that it could be an important factor which would impact on reputational performance and subsequently reflect on scores.

Additional control variables are the number of companies in a certain industry in a given year and year dummies. Year dummies were added as the event is time fixed, and the scoring approach could vary over time, as it is conducted on the basis of a survey of industry representatives. The variation is predefined by the qualitative nature of the survey.

1.4.2 Independent variables

To create the independent variable, an additional dataset was developed. This was sourced from a less conventional reference, which is not usually applied in the academic literature. The first batch of data was acquired through the ProQuest Historical Annual Reports database. This provides full text access to annual corporate reports starting from 1983. This data was applied to construct a variable that reflects an interest in reputation. The assumption that firms mentioning the AMAC rating in their annual report have a greater interest in reputation management (and so a greater motivation to collude) than those not mentioning it, underlined the creation of the variable. The focus of the search was made specifically on the AMAC ranking, as it was chosen for the analysis, as well as it being by far the most significant one which covers all the industries. Therefore, including other rankings, which are more industry-focused, would create bias across industries. A search for "America's most admired" in annual reports after 1983 identifies the 238 firms that highlight their AMAC ratings to their investors and the wider public.[10] Thus, the first independent variable, REPINTEREST, measures a firm's stated interest in its reputation. It is coded as 1 if a company mentions its AMAC score in its annual report in the previous year, and zero otherwise.

[10] It is not possible to conceive of any ambiguity of the search term "America's most admired", but we did manually cross-check a sample of these annual reports and found the search to be fully accurate.

The second group of independent variables was constructed to capture the strength of a firm's reputation concerns over time. The REPINTEREST variable provided the basis to construct another set of variables, with similar principles applied. The set incorporated four new variables to test the strength of reputation concerns over two, three, four and five years. The variables were accordingly named REPINTEREST (t-2), REPINTEREST (t-3), REPINTEREST (t-4) and REPINTEREST (t-5). REPINTEREST (t-2) was coded as 1 if a company mentions its AMAC score in its annual report over the two years, and zero otherwise. In the case of REPINTEREST (t-3), 1 was coded if the AMAC rating was mentioned in the annual reports over the three years. A similar principle applied to capture the four and five-year period.

The ProQuest database did not cover the complete list of the companies presented in the AMAC sample. To avoid reducing our sample further, another control variable was defined – "ProQuestAvailability" – that is 1 for all firms covered in ProQuest, and zero otherwise. This control variable was included in any regression specification.

The second part of data involved in the analysis was gathered manually. The AMAC ranking is based on the survey conducted amongst industry representatives. The nature of the methodology could suggest that a firm's opportunity to manage reputation is related to its geographic proximity to those it aims to impress. . Barnett and Hoffman (2008) indicated in the paper the implications that geographical proximity of riving companies could facilitate the spillover effect, when studying CSR approach in companies within one industry. Therefore, this study assumes that if the geographic distance between firms increases, the opportunity for the firms' managers to interact and impress decreases

To reflect that in the variable construction, for each firm in the sample, and for each year, the percentage of competitors with the headquarters in the same state was coded manually. Each company in the ranking was then allocated a percentage to eliminate double counting. The distribution of these percentages is approximately lognormal, since companies are more likely to be in a different state instead of the same state. Thus, another independent variable was presented in the form of logged

percentages.[11] The variable was given the name GEOPROX to reflect the measurement of the geographical element's potential impact.

Over the analysed period a crucial event – the introduction of the Internet – occurred in the information world. This fact motivated the introduction of the "Pre-Internet-Age Dummy" variable. The number 1 was related to the years prior to the Internet – 1985 to 1991 – 0 was related to the years afterwards.[12] Logic, which motivated the introduction of this variable, is based on the assumption that the increased transparency encouraged by the Internet might potentially hinder a firm's score manipulation. In addition, the encouragement of information spread caused by the Internet might potentially compromise the role of the geographic location of the firm.[13]

In the final stage of data preparation, final rearrangements were applied. At this stage firms that did not indicate interest in an AMAC rating were excluded from the dataset, in order to focus the analyses on the firms with an interest in corporate reputation. Due to this change, the amount of observations reduced to 2,859 firms; however this facilitated the strength of the results.

1.5 Methodology

1.5.1 Empirical strategies

The methodology contains two empirical strategies. The first empirical strategy based on the treatment of data as pooled cross-section. Therefore the ordinary least squares (OLS) method was implemented. This is one of the most extensively applied methods in regression analysis, which helps to diminish the sum of distance squares (Balestar, 1970). The application of such a method assumes the presence of homoscedasticity in the errors, which is one of the key conditions to "keep false rejections at the nominal

[11] In the analysis, the natural logarithm of the percentage point plus 1 and divide the result by 100, for three reasons. First, logging the percentage points plus 1 (e.g. 24 instead of 0.24) ensures that all values stay positive, which allows us to use the variable in an interaction term (e.g. variables with changing signs need a very clear meaning of 0 to be employed in an interaction term). Second, adding 1 ensures that the value or 0 can be processed and remains at 0, which does not distort the scale in any meaningful way. The result was divided by 100 to obtain this variable on the same 0 to 1 scale as the first independent variable.

[12] Tim Berners-Lee invented the Internet in 1989 with the world's first website being launched in 1991. Hence, we consider the Internet age to start in 1992, as we lack a more decisive measure of the start of this era.

[13] Since the "Pre-Internet-Age" control variable essentially is a sum of year dummies, separate year dummies for 1985–1991 were not used.

level, or confidence intervals that are either too narrow or too wide" (Hayes, 2003, p. 3). The violation of such a condition yields the appearance of heteroscedasticity in the errors, which leads to the inaccurate and biased results of the variance of the coefficients in least squared measurements (Hayes, 2003). To avoid violation of the results, a White estimator (White, 1980), implemented for the cross-sectional dataset, was used. OLS method was applied as it priorities the power of independent variables and allows more freedom to explore their power. Year dummy variables were introduced to account for the time effects.

OLS estimator often get scrutinized in the panel data regressions, as it bears a high risk of the coefficients to be correlated with the error term, leading to the biasness of the estimates. In addition, under OLS estimations the risk of omitted variables arises. To resolve this problem, the second empirical strategy was introduced.

The second empirical strategy treated the dataset as unbalanced panel data. Firstly, the Housman test was perform to define fixed or random effects firm effects. Hausman test (1978) was performed over data indicating fixed effects.

Fixed effect analysis revealed further results. Hausman test (1978) indicated Chi-Sq (8) = 222.5, with Probability > Chi-Sq = 0. These results revealed systematic difference in coefficients, indicating Fixed effects.

On the basis of Hausman test (1978) results, second empirical strategy, which evaluated panel data, accounted for firm fixed effects in the model. The model similarly included five specifications to study the power of reputation over time. The specifications were added one by one step, as demonstrated in the next paragraph.

15.2 Empirical Model

In order to evaluate the connection between a firm's interest in its reputation, the potential influence it has on the AMAC scores, and its power over time, the model evolved through five stages; independent variables were added gradually to the base model and extended through control variables. Ten types of model specification were developed for this purpose. Five model specifications explored the link between a firm's interest in reputation and the AMAC rating scores. Another five equations explore the strength of this link through time. The adjustment of the model took place during the robustness tests.

The baseline model with a first key independent variable can be written as in equation (1):

$$AMAC_{c,t} = \alpha + \beta_1 REPINTEREST_{c,t-1} + \gamma_1 CONTROLS_{C,T-1} + \varepsilon_{C,T} \quad (1)$$

where $AMAC_{c,t}$ represents the AMAC score of company (c) in year (t); $REPINTEREST_{c,t-1}$ represents the reputation interest of the company in the previous year, with β_1 being its coefficient; $CONTROLS_{c,t-1}$ is a column vector of standard controls (Net Income, Book Value per Share, ln (Total Revenue), ln(Employees), ln(Total Liabilities) and ProQuestAvailability), with γ_1 being the respective row vector of coefficients; α represents the intercept; and $\varepsilon_{c,t}$ the random disturbance term.

Stepwise we now add the key independent variable $GEOPROX_{c,t}$ to assess the potential impact from the geographic proximity of certain ranking participants:

$$AMAC_{c,t} = \alpha + \beta_1 REPINTEREST_{c,t-1} + \beta_2 GEOPROX_{c,t} + +\gamma_1 CONTROLS_{c,t-1} + \varepsilon_{c,t} \quad (2)$$

The $PREINTERNET_{c,t}$ dummy is set to reflect shift in information distribution, which, allegedly, might create complications for companies seeking to protect their reputation. This effect is grasped by the positive coefficient of this variable, which does not account for variations that occurred on a daily basis. The relationship between independent variables and the AMAC scores are analysed by stepwise adding them to the advanced model, as shown in equation (3):

$$AMAC_{c,t} = \alpha + \beta_1 REPINTEREST_{c,t-1} + \beta_2 GEOPROX_{c,t} + \beta_3 PREINTERNET_{c,t} + \gamma_1 CONTROLS_{c,t-1} + \varepsilon_{c,t} \quad (3)$$

The year dummies are added in the further extension of the model, represented by the column vector $YEARS_{c,t}$. This model can be written as in equation (4):

$$AMAC_{c,t} = \alpha + \beta_1 REPINTEREST_{c,t-1} + \beta_2 GEOPROX_{c,t} + \beta_3 PREINTERNET_{c,t} + \gamma_1 CONTROLS_{c,t-1} + \gamma_2 YEARS_{c,t} + \varepsilon_{c,t} \quad (4)$$

Where γ_2 is the row vectors of year dummy coefficients, while the remaining symbols can be interpreted as in equation (2). In the final step of the model the $FIRMPERIND_{c,t}$ variable was introduced to capture any industry-specific effects, related to the number of firms associated with each industry.[14] The model is displayed in equation (5), with γ_3 being the coefficient of the newly introduced variable and the remaining symbols interpreted as in equation (4),

$$AMAC_{c,t} = \alpha + \beta_1 REPINTEREST_{c,t-1} + \beta_2 GEOPROX_{c,t} + \beta_3 PREINTERNET_{c,t} + \gamma_1 CONTROLS_{c,t-1} + \gamma_2 YEARS_{c,t} + \gamma_3 FIRMPERIND_{c,t} + \varepsilon_{c,t} \quad (5)$$

This advanced model was applied to estimation specifications that include up to five further lags of reputation interest.

Another range of regressions was created to track the power of reputation over a five-year period. The same variables and regression model were applied, with a few alterations. The baseline model in the second set of regressions was constructed to reflect the link between scores and reputation concerns in the two-year period, therefore a $REPINTEREST_{c,t-2}$ variable was added to $REPINTEREST_{c,t-1}$ and $GEOPROX_{c,t}$ in the formula, where all the coefficients could be interpreted similarly to the formulas in the first set of regressions, as in equation (6):

$$AMAC_{c,t} = \alpha + \beta_1 REPINTEREST_{c,t-1} + \beta_2 GEOPROX_{c,t} + \beta_3 REPINTEREST_{c,t-2} + \gamma_1 CONTROLS_{c,t-1} + \varepsilon_{c,t} \quad (6)$$

[14] Since $FIRMPERIND_{c,t}$ correlates strongly with industry dummies but, in contrast to those dummies, also controls for the possible effects resulting from the number of firms that *Fortune* assessed in each industry, we consider this variable superior to industry dummies.

In the second specification the $PREINTERNET_{c,t,}$ dummy variable was added to see if changes in information distribution had an impact on the behaviour of $REPINTEREST_{c,t-2}$. Industry-specific effects presented by the $FIRMPERIND_{c,t}$ variable and the vector of year dummy coefficients $YEARS_{c,t}$ were added as well, as in equation (7):

$$AMAC_{c,t} = \alpha + \beta_1 REPINTEREST_{c,t-1} + \beta_2 GEOPROX_{c,t} + \beta_3 REPINTEREST_{c,t-2} + \beta_4 PREINTERNET_{c,t} + \gamma_1 CONTROLS_{c,t-1} + \gamma_2 YEARS_{c,t} + \gamma_3 FIRMPERIND_{c,t} + \varepsilon_{c,t} \quad (7)$$

In the third specification the firm's interest in reputation over the period of three years, presented by the variable $REPINTEREST_{c,t-3}$, was introduced to the equation, on the side of $REPINTEREST_{c,t-2,}$ which was added before, as in equation (8):

$$AMAC_{c,t} = \alpha + \beta_1 REPINTEREST_{c,t-1} + \beta_2 GEOPROX_{c,t} + \beta_3 REPINTEREST_{c,t-2} + \beta_4 REPINTEREST_{c,t-3} + \beta_5 PREINTERNET_{c,t} + \gamma_1 CONTROLS_{c,t-1} + \gamma_2 YEARS_{c,t} + \gamma_3 FIRMPERIND_{c,t} + \varepsilon_{c,t} \quad (8)$$

The fourth specification was tailored to capture changes in the relationship between scores and reputation interest, with the addition of the $REPINTEREST_{c,t-4}$ variable, which represents interest in the reputation captured four years ago, as in equation (9):

$$AMAC_{c,t} = \alpha + \beta_1 REPINTEREST_{c,t-1} + \beta_2 GEOPROX_{c,t} + \beta_3 REPINTEREST_{c,t-2} + \beta_4 REPINTEREST_{c,t-3} + \beta_5 REPINTEREST_{c,t-4} + \beta_6 PREINTERNET_{c,t} + \gamma_1 CONTROLS_{c,t-1} + \gamma_2 YEARS_{c,t} + \gamma_3 FIRMPERIND_{c,t} + \varepsilon_{c,t} \quad (9)$$

In a similar style, the last specification represents similar coefficients, as before, with the addition of the variable $REPINTEREST_{c,t-5}$, which captures interest in reputation, registered five years ago, as in equation (10):

$$\begin{aligned} AMAC_{c,t} = {} & \alpha + \beta_1 REPINTEREST_{c,t-1} + \beta_2 GEOPROX_{c,t} \\ & + \beta_3 REPINTEREST_{c,t-2} + \beta_4 REPINTEREST_{c,t-3} \\ & + \beta_5 REPINTEREST_{c,t-4} + \beta_6 REPINTEREST_{c,t-5} \\ & + \beta_7 PREINTERNET_{c,t} + \gamma_1 CONTROLS_{c,t-1} \\ & + \gamma_2 YEARS_{c,t} + \gamma_3 FIRMPERIND_{c,t} + \varepsilon_{c,t} \end{aligned} \quad (10)$$

The equations above were estimated through the OLS method with a White (1980) heteroscedasticity consistent covariance matrix estimator. This simplistic well-known method allows evaluating precisely the regression results for the dependent variable, which is defined by the scores' range between 1 and 10.

The AMAC survey scores can be understood as being equivalent to the percentages in any kind of approval survey (e.g. a presidential approval rating), whose default mean is one-half. Statistically, three issues should be considered when dealing with such a dependent variable. First, such percentage scores tend to experience substantially more variability in the middle of the distribution than at its extremes. In other words, it is much harder to increase an approval rating from 97 to 99% than from 52 to 54%. Second, changes in potential determinants of a percentage-based dependent variable (i.e. independent of control variables) will more likely have an effect on values in the middle of the distribution than on extreme values. Third, these percentage distributions are limited in their variability, which can have a distorting effect on confidence intervals.

These problems were addressed in the first empirical strategy. To address these three issues and analyse the percentage-based dependent variable as accurately as possible, the second method is to follow the approach suggested by Wrigley (1973). To increase the variability of the dependent variable and effectively stretch the scores at the extremes, Wrigley (1973) suggests a logit transformation that can be

written as shown in equation (11) for our case with a dependent variable ranging from 1 to 10:

$$TAMAC_{C,T} = ln\left(\frac{AMAC_{C,T}}{(10 - AMAC_{C,T})}\right) \qquad (11)$$

Where $TAMAC_{c,t}$ represents the logit transformed AMAC score. The bracketed term in this transformation can be understood as the odds of the appearance of the best possible event (i.e. an AMAC score of 10) in relation to the odds of the worst possible event (i.e. an AMAC score of 1), whereas the natural logarithm is applied to increase the symmetry of the distribution[15].

To analyse the transformed dependent variable in a way that focuses more on the variability in the centre of the percentage distribution than at its extremes, Wrigley (1973) suggests a weighted least squares (WLS) approach, whereby the weights are a positive function of the relevance of an observation and the distance of its value from the extreme. As all observations are of equivalent value, Wrigley's weighting function is used in the analysis, as shown in equation (12):

$$WEIGHT_{c,t} = AMAC_{c,t}(10 - AMAC_{c,t}) \qquad (12)$$

Where $WEIGHT_{c,t}$ represents the weighting function used in our analysis. We also extend Wrigley's (1973) method by applying White's (1980) heteroscedasticity consistent covariance matrix estimator.

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[15] Wrigley (1973) presented alternative interpretation of the equation, expressed in raw numbers $TAMAC_{C,T} = log_e\left(\frac{R_j}{(n_j - R_j)}\right)$, w here $TAMAC_{c,t}$ represents the logit transformed AMAC score. R_j represents the absolute best score for company *j*. n_j is the overall number of scores. Wrigley (1973) additionally applied Cox (1970) approach to overcome the fact, that logit score is undefined at $R_j = 0$ or n_j, as presented in the following equation. $TAMAC_{C,T} = log_e\left(\frac{R_j - \frac{1}{2}}{(n_j - R_j - \frac{1}{2})}\right)$,where logit is placed in a regression equation $L = X_\beta + \varepsilon$, where L is a column vector, defines what is termed the linear logit model (Wrigley, 1973).

1.6 Results

The results of the analysis are summarized and developed in three tables. Prior to a detailed examination of the results, a correlation matrix (Appendix 1) and descriptive statistics (Appendix 2) are introduced to indicate that all the important correlations are significant and positive.

1.6.1 First Empirical Strategy. Immediate Effects of Reputation Management[16]

Table 1.2 represents the results of a relationship between current reputation concerns and scores from the AMAC ranking evaluation. The first OLS model specification demonstrates a strong positive casual relation between firms' interest in reputation and the AMAC score ($p < 0.001$). According to the results, the AMAC scores of the companies, which indicated interest in corporate reputation, had coefficient by 0.69 higher, compared to those for companies that did not express any particular concern about reputation. These results could be considered strong, as they indicate a significant boost (approximately two-thirds) of the standard deviation. Positive results for this model specification also hold when the WLS method is applied.

The geographic factor, included at the next step of the analysis, adds further strength to the model. The factor itself is defined by statistically strong positive significance. The indicator of firms' interest in reputation also strengthened by 0.02 points. This evidence suggests that another link might potentially facilitate the connection between a firm's interest and its performance in the ranking. In other words, it could be assumed that geographic factors empower communication between firms and allow them to coordinate their efforts.

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[16] Due to the specification of the REPINTEREST independent variable (dummy variable), it is important to tackle the potentially rising endogeneity issue. In order to study the direction of causation between AMAC raking performance scores and firms' reputation concerns, a Granger causality test was implemented. The analysis was performed with the standard controls, similar to the model applied in the study. REPINTEREST (t-1) variable was used as the dependent variable. $AMAC_{c,t}$ variable replaced the independent one. The basic model was presented as $REPINTEREST_{c,t-1} = \alpha + \beta_1 AMAC_{c,t-2} + \beta_2 REPINTEREST_{c,t-1} + \gamma_1 CONTROLS_{C,t-1} + \varepsilon_{c,t}$. The variable was lagged accordingly. The result revealed a positive coefficient at 0.044; however, the P value appeared insignificant, with R squared at 16%, similar to the previous results. These results suggest the acceptance of the null hypothesis. No reverse causality was found, proving the interest in reputation to have an effect on the performance of a firm in *Fortune*'s AMAC ranking.

In the next step of the model, the Pre-Internet-Age variable was introduced. This carries strong statistical significance, which proves that firms had more opportunity to manipulate scores in the AMAC ranking and affect their reputation before the introduction of the Internet, which significantly increased information accessibility. The introduction of this variable did not affect the strength of the model. This evidence suggests that firms that prioritize reputation are still influenced by it, despite any complications imposed by the Internet.

In order to capture potential yearly effects, the year dummies were introduced as the next step. As a result, the power of the Pre-Internet-Age dummy significantly grew from 0.32 to 0.43. This proves the significant role the Internet played in complicating firms' influence on the reputation scores. Nevertheless, the casual relation between firms' concern about reputation and score indicators remains strong. It gradually increased through the extension of the model and gained 0.09 points, which signals the effort that companies can contribute to the impact of reputation scores. The geographic factor appeared to lose its relevance. With the introduction of the Pre-Internet-Age variable, its power dropped from 0.67 to 0.45, despite having a high statistical significance.

Table 1.1 Immediate Effects of Reputation Management

Regression specification	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)
Regression algorithm	OLS	WLS	OLS	WLS	OLS	WLS	OLS	WLS	OLS	WLS
Dependent variable	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score
Constant	5.89**** (32.49)	0.14**** (4.64)	5.71**** (30.83)	0.11**** (3.52)	5.34**** (28.49)	0.07** (2.16)	5.18**** (26.45)	0.02 (0.61)	5.37**** (23.18)	0.04 (1.01)
Control variables										
Net Income	0.01**** (7.91)	1.95E-05**** (6.82)	0.01**** (7.83)	1.90E-05**** (6.76)	0.01**** (7.79)	1.86E-05**** (6.734518)	0.01**** (8.02)	1.91E-05**** (6.999757)	0.01**** (7.93)	1.90E-05**** (6.961100)
Ln (Total Revenue)	0.19**** (5.70)	0.03**** (5.14)	0.21**** (6.21)	0.03**** (5.67)	0.24**** (7.03)	0.04**** (6.40)	0.26**** (7.49)	0.04**** (7.01)	0.26**** (7.63)	0.04**** (7.05)
Ln (Employees)	0.02 (1.19)	0.01 (0.93)	0.02 (1.09)	0.01 (0.84)	0.01 (0.04)	-0.01 (-0.07)	-0.01 (-0.34)	-0.01 (-0.63)	-0.01 (-0.48)	-0.01 (-0.71)
Book Value per Share	8.27E-05 (0.86)	1.02E-05 (0.63)	9.09E-05 (0.92)	1.15E-05 (0.70)	9.23E-05 (0.93)	1.15E-05 (0.70)	8.19E-05 (0.89)	1.01E-05 (0.66)	8.39E-05 (0.92)	1.03E-05 (0.68)
Ln (Total Liabilities)	-0.21**** (-9.24)	-0.03**** (-8.29)	-0.21**** (-9.52)	-0.03**** (-8.57)	-0.21**** (-9.34)	-0.03**** (-8.44)	-0.20**** (-8.77)	-0.03**** (-7.87)	-0.19**** (-8.66)	-0.03**** (-7.82)
Number of Companies per Industry	No	No	No	No	No	No	No	No	-0.02 (-1.59)	-0.01 (-0.95)
Year Dummies	No	No	No	No	No	No	Yes	Yes	Yes	Yes
ProQuest Availability Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Regression algorithm	OLS	WLS	OLS	WLS	OLS	WLS	OLS	WLS	OLS	WLS
Dependent variable	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score
Key independent variables										
REPINTEREST (*t-1*)	0.69**** (7.42)	0.12**** (6.35)	0.71**** (7.29)	0.12**** (6.56)	0.72**** (7.89)	0.12**** (6.76)	0.78**** (8.72)	0.14**** (6.73)	0.78**** (8.63)	0.14**** (7.58)
GEOPROX			0.67**** (5.82)	0.12**** (6.11)	0.62**** (5.33)	0.12**** (5.71)	0.45**** (3.85)	0.09**** (4.21)	0.45**** (3.86)	0.09**** (4.21)
Pre-Internet-Age Dummy					0.32**** (5.16)	0.05**** (4.59)	0.43**** (6.06)	0.07**** (5.68)	0.41**** (5.40)	0.07**** (5.22)
Adjusted R-squared	0.12	0.09	0.12	0.10	0.13	0.11	0.15	0.14	0.15	0.14
No. of Observations	2859	2859	2859	2859	2859	2859	2859	2859	2859	2859

Notes: This table represents the results of regression analysis, which was performed to identify the connection between a firm's interest in reputation and the scores presented in *Fortune*'s AMAC rating. The score was used as a dependent variable in the model. Net Income, Total Revenue, Number of Employees, Book Value per Share and Total Liabilities were used as control variables. A number of dummy variables were also added in the model. The ProQuest Availability Dummy variable was presented in every specification, the Pre-Internet-Age variable was introduced in the third specification to depict potential changes introduced by the shift in information. Year Dummies were added in the fourth specification. In the final specification the Number of Companies per Industry variable was introduced to capture the potential effect from industry-specific differences, potentially caused by the variation in the number of firms. REPINTEREST (t-1) was an independent variable, which introduced the firm's interest in corporate reputation. GEOPROX was an independent variable, which addressed the potential effect caused by geographic location of the firms interested in corporate reputation. This table represents a combination of regressions run by using two methods: the OLS method was applied in all uneven-numbered specifications; the WLS method was applied in all even-numbered specifications. Significance levels estimated: p****<0.001, p***<0.01, p** < 0.05, p* < 0.1.

The model demonstrates significant strong statistical power throughout every step. The overall regressions demonstrate a reasonably strong adjusted R-squared in the range of 12 to 15%. In the last step, the model tests the role of industry size. The results appear insignificant. This demonstrates that a firm's interest is the main predisposition to affect the score and it is possible to accomplish this despite industry size.

1.6.2 First Empirical Strategy. Reputation Management over Time

The next set of regressions is dedicated to evaluating whether concerns about reputation transfer over time.

The first specification of the model is similar to the second specification in Table 1.2. It comprises the Reputation Interest and Geographic Proximity variables. However, adding Reputation Interest over a two-year time span expands the set of dependent variables. The model appears to be statistically significant. The Reputation Interest coefficients are slightly smaller compared to the case of a single year, 0.54 against 0.69. Nevertheless, it appears that even in the case of a firm expressing strong concerns about reputation over two years, it still has a significant connection to the performance of the scores appearing in the AMAC rating.

The second stage of model development is indicated by the introduction of a Pre-Internet-Age variable alongside the year effects. The results demonstrate a significant contribution of the appearance of the Internet. It indicates that the increase of transparency, facilitated by growing information accessibility, has an impact on potential opportunity score manipulation. In the same specification of the model, potential industry size effects were tested. However, as in the case considered above, this feature appears to have no impact on score variability, as it appeared statistically insignificant. The geographic proximity coefficients are statistically significant in both the first and the second specification. This leads to the assumption that firms with a similar location could potentially negotiate with or motivate each other to engage in certain activities targeted to supporting performance in the ranking (managing reputation in a certain manner).

The third specification of the model grasps the prolonged effects of a company's interest in reputation. This variable, which represents reputation interest

expressed over three years, was added at this stage. A strong statistical significance holds in the specification of this model ($p < 0.001$). It appears that Interest expressed in its reputation by a firm has a strong impact on the AMAC scores even throughout a three-year period. It raises the suggestion that firms with high concerns about their reputation also make a better effort to invest in its support. Stronger involvement in reputation management has a tendency to have longer-term effects, which in the current case found a reflection in performance on the AMAC ratings.

The final two specifications of the model were designed to examine the strength of reputation interest expressed over four and five years, respectively. The introduction of a fourth year does not affect overall strength of the model; however, it can be seen that the strength of the reputation interest impact tends to weakens over this period of time. The coefficient of the fourth-year variable is less, compared to the third year, by 10%. The relationship between reputation concerns expressed over a four-year period statistically loses its strength ($p < 0.01$). The reputation interest expressed over five years appeared statistically insignificant. This brings us to the conclusion that even though a high interest in reputation has a tendency to last, the effect is more of a mid-term nature. This raises the suggestion that for a strong and long-term performance, the firm is required constantly to take relevant actions.

The WLS method supports the results presented above, and demonstrates a strong statistical significance throughout all the specifications. The pool of regressions also was supported by a strong adjusted R-squared between 13 and 17%.

Table 1.2 Reputation Management over Time

Regression specification	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)
Regression algorithm	OLS	WLS	OLS	WLS	OLS	WLS	OLS	WLS	OLS	WLS
Dependent variable	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score
Constant	5.71**** (30.97)	0.11**** (3.59)	5.37**** (23.22)	0.04 (1.00)	5.39**** (23.23)	0.04 (1.05)	5.39 (23.24)	0.04 (1.09)	5.40**** (23.24)	0.04 (1.11)
Control variables										
Net Income	0.01**** (7.79)	1.88E-05**** (6.73)	0.01**** (7.88)	1.88E-05**** (6.94)	0.01**** (7.75)	1.85E-05**** (6.87)	0.01**** (7.66)	1.84E-05**** (6.79)	0.01**** (7.59)	1.82E-05**** (6.76)
Ln (Total Revenue)	0.21**** (6.17)	0.03**** (5.62)	0.262932**** (7.56)	0.04**** (7.01)	0.26**** (7.50)	0.04**** (6.97)	0.26**** (7.52)	0.04**** (7.00)	0.26**** (7.51)	0.04**** (7.00)
Ln (Employees)	0.02 (0.97)	0.01 (0.76)	-0.01 (-0.60)	-0.01 (-0.82)	-0.01 (-0.55)	-0.01**** (-0.78)	-0.01 (-0.55)	-0.01 (-0.79)	-0.01 (-0.58)	-0.01 (-0.81)
Book Value per Share	9.89E-05 (1.03)	1.29E-05 (0.80)	9.17E-05 (1.03)	1.17E-05 (0.79)	9.45E-05 (1.07)	1.22E-05 (0.82)	9.59E-05 (1.09)	1.24E-05 (0.84)	9.63E-05 (1.09)	1.25E-05 (0.84)
Ln (Total Liabilities)	-0.21**** (-9.50)	-0.03**** (-8.56)	-0.19**** (-8.63)	-0.03**** (-7.80)	-0.19**** (-8.62)	-0.03**** (-7.81)	-0.19**** (-8.67)	-0.03**** (-7.87)	-0.19**** (-8.67)	-0.03**** (-7.89)
Number of Companies per Industry			-0.02 (-1.49)	-0.01 (-0.84)	-0.02 (-1.51)	-0.03**** (-0.85)	-0.02 (-1.56)	-0.01 (-0.89)	-0.02 (-1.57)	-0.01 (-0.91)
Year Dummies	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ProQuest Availability Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Regression specification	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)
Regression algorithm	OLS	WLS	OLS	WLS	OLS	WLS	OLS	WLS	OLS	WLS
Dependent variable	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score	Fortune Score	Logit Fortune Score
Key independent variables										
REPINTEREST (t-1)	0.54**** (5.68)	0.10**** (4.96)	0.61**** (6.59)	0.11**** (5.87)	0.57**** (4.28)	0.10**** (5.55)	0.55**** (6.05)	0.11**** (5.39)	0.55**** (6.05)	0.11**** (5.39)
GEOPROX	0.68**** (5.96)	0.13**** (6.19)	0.47**** (3.99)	0.09**** (4.29)	0.47**** (4.03)	0.09**** (4.29)	0.47**** (4.01)	0.09**** (4.26)	0.47**** (4.03)	0.09**** (4.26)
Pre-Internet-Age Dummy			0.41**** (5.51)	0.07**** (5.33)	0.41**** (5.54)	0.07**** (5.40)	0.41**** (5.57)	0.07**** (5.41)	0.41**** (5.60)	0.07**** (5.42)
REPINTEREST (t-2)	0.54**** (4.93)	0.09**** (4.15)	0.57**** (3.99)	0.10**** (4.78)	0.45**** (3.73)	0.08**** (3.81)	0.44**** (4.28)	0.08**** (3.68)	0.43**** (4.21)	0.08**** (3.64)
REPINTEREST (t-3)					0.53**** (2.51)	0.09**** (4.46)	0.42**** (3.73)	0.08**** (3.47)	0.42**** (3.70)	0.08**** (3.44)
REPINTEREST (t-4)							0.32** (2.51)	0.05*** (2.04)	0.6** (1.97)	0.04* (1.71)
REPINTEREST (t-5)									0.22 (1.58)	0.03 (0.95)
Adjusted r-squared	0.13	0.11	0.16	0.14	0.17	0.14	0.17	0.15	0.17	0.15
No. of observations	2859	2859	2859	2859	2859	2859	2859	2859	2859	2859

Notes: This table represents the results of a regression analysis which was performed to explore the correlation between the reputation scores presented in *Fortune*'s AMAC ranking and a firm's interest in its corporate reputation over a two, three, -four and five-year time frame. The score was used as a dependent variable in the model. Net income, Total Revenue, Number of Employees, Book Value per Share and Total Liabilities were used as control variables. A number of dummy variables were also added in the model. The ProQuest Availability Dummy variable was present in every specification, the Pre-Internet-Age variable was introduced in the third specification to depict the potential changes introduced by the shift in information. Year Dummies were added in the fourth specification. In the final specification the Number of Companies per Industry variable was introduced to capture the potential effect from industry-specific differences, potentially caused by the variation in the number of firms. REPINTEREST (t-1) was an independent variable, which introduced the firm's interest in its corporate reputation; REPINTEREST (t-2) was the same but for a two-year period; REPINTEREST (t-3) for a three-year period; REPINTEREST (t-4) for a four-year period; and REPINTEREST(t-5) for a five-year period. GEOPROX was an independent variable, which addressed the potential effect caused by the geographic location of the firms interested in their corporate reputation. This table represents a combination of regressions run by using two methods: the OLS method was applied in all uneven-numbered specifications; the WLS method was applied in all even-numbered specifications. Significance levels estimated: p****<0.001, p***<0.01, p** < 0.05, p* < 0.1.

1.6.3. Second Empirical Strategy. Fixed Effect Model

The data was further analyzed with the implementation of Fixed effects model to study firm fixed effects. This approach helped to eliminate omitted variables and further withdraw potential endogenity issue. Results reported in Table 1.3. The control variables' coefficients remained highly significant. However, the behaviors of independent variables have shifted. Geographic proximity of industry player, involved in AMAC ranking appeared not to have an impact on company's performance in the ranking. The introduction of the Internet additionally does not appear to affect company's performance. However the relationship between company's interests in reputation remain statistically strong and positive. The analysis indicated reputation to lose the power faster over time, in comparison to the first empirical assessment. However, it still indicated it ability to hold over a two-year period. Therefore, it could be suggested, that company should priorities the role of reputation. As practical implication, this evidence suggests, that reputation management effort pay off. And since the reputation power last over few years, it justifies the investment in the management process.

Table 1.3: Reputation Management Over Time, Fixed Effects

Regression Specification	(1a)	(2a)	(3a)	(4a)	(5a)
Regression Algorithm	Fixed Effects Model	Fixed Effects Model	Fixed Effects Model	Fixed Effects Model	Fixed Effects Model
Dependent Variable	Fortune Score	Fortune Score	Fortune Score	Fortune Score	Fortune Score
Constant	7.7501***	7.2304***	7.2303***	7.2105***	7.2337***
	(24.18)	(18.78)	(18.78)	(18.72)	(18.74)
Control Variables					
Net Income	0.0000375	0.000036***	3.60E-05***	3.65E-05***	0.000037***
	(5.34)***	(5.17)	(5.17)	(5.23)	(5.28)
Ln(Total Revenue)	0.282092***	0.37621***	0.376278***	0.382597***	0.377922***
	(3.74)	(4.81)	(4.78)	(4.86)	(4.78)
Ln(Employees)	0.2266393***	0.206301***	2.06E-01***	0.206469***	0.20865***
	(3.97)	(3.34)	(3.34)	(3.35)	(3.38)
Book Value per Share	-0.000154**	-0.00014**	-0.00014**	-0.00014*	-0.00014**
	(-2.09)	(-1.96)	(-1.96)	(-1.96)	(-1.96)
Ln(Total Liabilities)	-0.55247***	-0.53345***	-0.53351***	-0.5369***	-0.53677***
	(-11.62)	(-10.88)	(-10.87)	(-10.94)	(-10.94)
Number of Companies per Industry		-0.04882***	-0.04881***	-0.04892***	-0.04844***
		(-3.7)	(-3.7)	(-3.7)	(-3.67)
Year Dummies	No	Yes	Yes	Yes	Yes
ProQuest AvailabilityDummy	Yes	Yes	Yes	Yes	Yes

Regression Specification	(1a)	(2a)	(3a)	(4a)	(5a)
Regression Algorithm	Fixed Effects Model	Fixed Effects Model	Fixed Effects Model	Fixed Effects Model	Fixed Effects Model
Dependent Variable	Fortune Score	Fortune Score	Fortune Score	Fortune Score	Fortune Score
Key Independent Variables					
REPINTEREST (t-1)	0.2094077*** (2.61)	0.244952*** (3.1)	0.244751*** (3.1)	0.234452*** (2.69)	0.238821*** (3.01)
GEOPROX	-0.125793*** (-1.24)	-0.15581 (-1.56)	-0.15575 (-1.56)	-0.15871 (-1.59)	-0.15853 (-1.59)
Pre-Internet-Age Dummy		0.1401* (1.89)	0.1402* (1.89)	0.1289* (1.86)	0.1291* (1.86)
REPINTEREST (t-2)	0.2261*** (2.64)	0.216321*** (2.56)	0.218062** (2.52)	0.20768** (2.39)	0.20696** (2.38)
REPINTEREST (t-3)			-0.0078 (-0.09)	0.020004 (0.23)	0.023108 (0.26)
REPINTEREST (t-4)				-0.15042* (-1.37)	-0.16593** (-1.87)
REPINTEREST (t-5)					0.0792 (0.85)
Adjusted r-Squared	10.56%	14.89%	14.89%	15%	15.03%
N of Observations	2859	2859	2859	2859	2859

Notes: This table represents the results of a regression analysis which was performed to explore the correlation between the reputation scores presented in *Fortune*'s AMAC ranking and a firm's interest in its corporate reputation over a two-, three-, -four-, and five-year timeframe. The score was used as a dependent variable in the model. Net income, Total Revenue, Number of Employees, Book Value per Share, and Total Liabilities were used as control variables. A number of dummy variables were also added in the model. The ProQuest Availability Dummy variable was present in every specification, the Pre-Internet-Age variable was introduced in the third specification to depict the potential changes introduced by the shift in information. Year Dummies were added in the fourth specification. In the final specification the Number of Companies per Industry variable was introduced to capture the potential effect from industry-specific differences, potentially caused by the variation in the number of firms. REPINTEREST (t-1) was an independent variable, which introduced the firm's interest in its corporate reputation. REPINTEREST(t-2) was an independent variable, which introduced the firm's interest in its corporate reputation over a two-year period, REPINTEREST(t-3) was an independent variable, which introduced the firm's interest in its corporate reputation over three years' time, REPINTEREST(t-4) was an independent variable, which introduces firm's interest in corporate reputation over four years' time, REPINTEREST(t-5) is an independent variable, which introduced the firm's interest in its corporate reputation over a five-year time span. GEOPROX was an independent variable, which addressed the potential effect caused by the geographic location of the firms interested in their corporate reputation. This table represented a combination of regressions run by using two methods: the OLS method was applied in all uneven-numbered specifications; the WLS method was applied in all even-numbered specifications. Significance levels estimated: p****<0.001, p***<0.01, p** < 0.05, p* < 0.1.

1.7 Discussion

The results presented in this essay demonstrate the connection and relationship between firm concern over reputation and its performance ranking. This finding fills the missing gap by providing supporting evidence of reputation ranking to be a valid methodology of reputation measurement, as pointed out by Ali et al. (2015). However, due to the nature of the survey it was not possible to identify the financial contribution, as was previously addressed by Fryxell and Wang (1994), Fombrun et al. (2000) and so on.

Further, the evidence presented in this essay provides strong support to the studies of Shultz et al. (2001) and Ang and Wight (2009) on the stickiness of reputation. The analysis of reputation over time not only shows that effort to manage reputation efficiently pays off, but suggests that the effect tends to last over a time frame of at least three years. This evidence is a strong encouraging factor for taking reputation management strategy into serious consideration, as well as justifying the investment.

1. 8 Conclusion

Corporate reputation has gained recognition as a cornerstone of a firm's strategy to gain competitive advantage by both academics and practitioners in recent years. This intangible asset provides a prime opportunity for a company to communicate its value to the outside world (Tischer and Hildebrandt, 2014). The benefits of corporate reputation spread beyond the company's positive image in stakeholders' eyes. It is linked to higher investment attractiveness, easier access to capital resources, an increase in returns, partnership with the best suppliers and industry representatives, and much more, as has been argued by academics over the years (Fombrun and Shanley, 1990; Flanagan and O'Shaughnessy, 2005; Ali et al., 2015).

As numerous studies provide evidence of the benefits related to corporate reputation, it became an important intangible asset, which, if managed properly, could bring strong strategic benefits. A significant research studied mechanism of reputation management and measurement, this study diversifies the research focusing on

outcome of reputation management, which signalize it works, and examines reputation endurance over time.

Without an explicit framework, evaluating reputation becomes problematic. Reputation ranking plays a definitive role in reputation evaluation, remaining one of the most respectable information sources (Tischer and Hildebrandt, 2014; Gatzer, 2015). Its reliability is confirmed by much evidence from academic and industry sources. *Fortune*'s AMAC rating appears to be one of the most powerful reputation estimators (Ali et al., 2015), as it remains the most popular amongst academics and practitioners.

The results of the analysis revealed evidence of the interrelation between a firm's concerns about reputation management and its performance in the AMAC ranking. These results seem logical. To put it in perspective, the AMAC ranking is the strongest outside estimator of corporate reputation. Therefore firms, who invest in reputation management, would be extremely concerned over performance captured by such a powerful reputation measurement as AMAC ranking. The results revealed such connection, which suggests evidence that reputation management works.

Another significant question tackled in this study is how strongly the power of reputation management hold over a time perspective. As reputation is an intangible asset, it becomes complicated to determine its "expiry date". Nevertheless, Schultz et al. (2000) and Ang and Wight (2009) have argued that reputation sticks to the company. Two strategies were used to measure the power of reputation. The results both revealed the power of reputation to demonstrate lasting effect. However the "expire date" results indicated endurance of reputation. Two empirical strategies reviled the power of reputation to hold over at least two years. These findings contribute to the literature dedicated to corporate reputation, through providing new evidence of reputation management to work. It further develops the discussion over reputation "stickiness" or its power over time in the theoretical investigations.

The results bring positive practical implication, encouraging reputation management practices. This paper provides new evidence, which suggests, investment in strategic reputation management pays off. The evidence of reputation endurance supports the strategically important role of the asset. As reputation power demonstrated a lasting effect, the management mechanism could have lasting strategic implications.

It is important to develop further alternative methodology to measure the impact of reputation management, which could provide a toolkit for companies to improve the strategic approach to reputation management. Additionally, it is important to further improve suggested model through finding more empirically strong independent variable.

Appendix 1. Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Fortune Score	**1**	1.00															
Fortune Score (Log)	**2**	1.00***	1.00														
Net Income	**3**	0.25***	0.25***	1.00													
Total Revenue	**4**	0.12***	0.12***	0.49***	1.00												
Ln (Employees)	**5**	0.09***	0.10***	0.34***	0.87***	1.00											
Book Value Per Share	**6**	0.03**	0.03**	0.00	-0.01*	-0.01*	1.00										
Ln (Total Liabilities)	**7**	0.00	0.00	0.30***	0.40***	0.17***	0.00	1.00									
FIRMPERIND	**8**	-0.08***	-0.08***	0.09**	0.20**	0.06	0.01	0.21*	1.00								

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ProQuest Availability	**9**	0.11***	0.11***	0.04***	-0.02***	-0.03***	0.02***	0.04***	0.05***	1.00							
REPINTEREST	**10**	0.15***	0.16***	0.08***	0.04***	0.05***	0.07***	0.03***	-0.02***	0.11***	1.00						
GEOPROX	**11**	0.08*	0.07***	0.01**	-0.04**	-0.04**	-0.03**	-0.01*	-0.08***	-0.09***	-0.04***	1.00					
PREINTERNET	**12**	0.09***	0.10***	-0.04**	-0.08	-0.02***	0.00***	-0.05**	-0.19**	0.00***	-0.04***	0.10***	1.00				
REPINTEREST t-2	**13**	0.14***	0.15***	0.09**	0.06*	0.06***	-0.01***	0.05***	0.02***	0.08***	0.18***	-0.03***	-0.03	1.00			
REPINTEREST t-3	**14**	0.11***	0.12***	0.10**	0.05*	0.03***	-0.01***	0.08***	0.05***	0.08***	0.16***	-0.02***	-0.03***	0.36***	1.00		
REPINTEREST t-4	**15**	0.10**	0.11**	0.14**	0.10*	0.08**	-0.01**	0.09**	0.05**	0.07**	0.08**	-0.03**	-0.05**	0.15**	0.33**	1.00	
REPINTEREST t-5	**16**	0.08**	0.09**	0.07*	0.12*	0.11*	-0.01**	0.09*	0.05**	0.07*	0.05**	-0.02**	-0.05**	0.14**	0.16**	0.34**	1.00

Notes: This table represents the results of correlation analysis conducted between the key variables, which are included in the subsequent model of regression analysis. Score and Logit Score are dependent variables. Net Income (Loss), Total Revenue, Number of Employees, Book Value per Share and Total Liabilities are control variables in the model. FIRMPERIND, ProQuest Availability and PREINTERNET are dummy variables. Key independent variables are REPINTEREST, GEOPROX and REPINTEREST with time effects t-2, t-3, t-4, t-5. Logarithmic interpretation of the Peers in State variable was also presented. Significance levels estimated: p***<0.001, p**<0.01, p* < 0.05.

Appendix 2 Descriptive Statistics

	Mean	St. Dev.	Median	Max	Min	Average-Min	Average-Max
Score	6.258381	1.040039	6.37	9.02	1.64	4.618381	-2.76162
Logitscore	0.233586	0.200684	0.244233	0.96398	-0.70736	0.940949	-0.73039
Net Income	757.4145	2331.115	266.623	24589	-27684	28441.41	-23831.6
Total Revenue	14517.71	26501.15	7094.619	406103	7.252	14510.46	-391585
Employees	69.08595	133.4002	34	2100	0.015	69.07095	-2030.91
Book Value per Share	29.04473	349.8825	13.492	14419.68	-1164.23	1193.272	-14390.6
Total Liabilities	24818.89	140539.5	3321.5	2074033	1.797	24817.1	-204921.4
Geoprox	0.106479	0.147187	0	0.625	0	0.106479	-0.51852

Notes: This table represents descriptive statistics for the key variables implemented in the analysis of firm's interest in reputation management and relationship with it performance in the AMAC ranking.

Essay 2: Revisiting the Evaluation of the Performance of SRI Funds and Conventional Funds

Abstract

This essay explores the survival capabilities of ethical and conventional funds. Numerous studies, which addressed survivorship bias, indicated that SRI funds display stronger survival capabilities; however, academics did not address the evidence in sufficient depth. This essay provides new evidence of SRI funds to have stronger survival capabilities. Understanding the effects that ethical specifications have on the length of a fund's life would allow the further extending of the notion of ethical investment capabilities. It would also bring positive practical implications for asset management companies, since strong survival capabilities of funds would positively affect the income, which is fully fee-based in the case of asset managers.

2.1 Introduction

Over the decades sophistication and diversity arose amongst sustainable approaches across financial disciplines. The introduction of socially responsible investing (SRI) funds became an important step for asset owners and investors to embrace sustainable practices. It offered a range of new opportunities for investors to diversify their strategies, and granted asset managers with the means to attract new clients, introducing new ways to generate profits in a responsible manner.

Academics have conducted intense work dedicated to the exploration of various ethical investing related practices. Interest in asset owners and fund performance notably dominated the research pool, leaving the implications of SRI practices for asset management companies visibly understudied.

Another subject, which did not receive significant attention, is the survival of the funds. Significant academic interest is directed towards performance of ethical and non-ethical funds. In the empirical studies, numerous papers indicated a strikingly higher survival rate of ethical funds, when addressing survivorship bias (Bauer et al. (2005), Renneboog et al. (2008) and Kempf and Osthoff (2008)). However, the studies notably did not perform a survival analysis to take a closer look on the trend.

This study focuses on fund survival and explores if the survival is attributed to the ethical specification of the fund. And become the first to introduce a profound survival analysis. Methodology is rooted to the medical research and found wide application in the work dedicated to the IPO (Carpentier and Suret (2011), Espenlaub et al (2012) and Espenlaub et al (2016)). The findings of the paper diversify theoretical outlook on the ethical and conventional funds. It extends methodological base through adopting an approach, which did not find wide application in the sustainability research before. From practical perspective, these finding would provide new outlook on SRI-related opportunities for asset management companies, as stronger survival would provide a robust fee structure for asset managers.

The first group of literature, considered in this paper explores the performance abilities of ethical funds. Luther et al. (1992) pioneered academic work dedicated to the comparative study of SRI fund performance. Matched pair analysis, which was introduced in the study of Mallin (1995), spread across papers as an efficient

mechanism to gain accurate performance evaluation, implementing various criteria to develop compatible datasets, based on size, age and a fund's country of origin. Gregory et al. (1997) and Kreander et al. (2005) questioned applied methods, and introduced more sophisticated empirical methodology, through further development of Jensen's (1976) performance measurement and accounting for the small size of bias, which was suggested to disrupt the results (Fletcher, 1995). Further methodology development undermined implementation of the four-factor model, which allows the accurate evaluation of the impact that investment styles have on fund performance (Gregory and Whittaker, 1997). Despite the scale of the studies, academics could not come to a conclusion over the capabilities of SRI fund outperformance. The lack of strong evidence divided fund management companies into those which focus on conventional products and those, which offer opportunities for ethical and mixed investment.

Numerous academics reported survivorship bias presence in the research (Gregory et al., 1997; Bauer et al. 2005; Kreander et al. 2005; Gregory and Whittaker, 2007). Chegut et al. (2011) reported in their research overview that there has been no unified recognition or methodology to treat the bias. Studies, which acknowledged survivorship bias, revealed the common trend of SRI fund capabilities as surviving better than conventional funds. Gregory and Whittaker (2007) revealed a 17.43% higher survival rate of SRI funds; Kempf and Osthoff (2008) reported even lower survival rates of conventional funds at 19% lower compared to ethical funds. It is important to note, that the academic attention was reported in the descriptive statistics of survival rates, however, now in-depth analysis was performed.

Common survival trends depicted by several research papers did not receive wide academic attention. However, it could be argued that the trend is not coincidental, but rather attributable to the ethical specifications of the funds. As the evidence reported in academic paper became the motivation for this study, it is important to notify the data-driven nature of it. Nevertheless, the subject matter finds a strong reflection not only in academia, but also in the practical subject matter.

Existent studies indicated the presence of effect that the ethical specification of funds make on survival capabilities, as presented in the works dedicated to investors' behaviour. Bollen (2007) carried out a study, which evaluated investors'

behaviour, as it has a strong impact on a fund's viability and the variability of its operating costs. The author applied fund–flow volatility as a measure of investors' behaviour; his finding demonstrated lower cash flow volatility in sustainable funds, suggesting higher investor loyalty to ethical funds. Renneboog (2008) showed evidence that social investors are less likely to move investments from one fund to another and more inclined to stay with an SRI fund. If ethical attributes encourage investors' loyalty, it could be suggested it also has an impact on the survival of the fund itself.

This increasing evidence encouraged in this study to take a closer look at the link between ethical investing and fund survival. Espenlaub et al. (2016) defined survival as the "continued trading of newly listed stocks on the stock market" (p. 99), when examining the subject in the context of IPOs. Following this definition, this study refers to the "survival" of funds as the continued fund operation on the market. Studying survival in the context of SRI funds could make a valuable contribution to the theoretical literature through further expanding the understanding that the sustainability of effects has on fund performance. Additionally, the research would contribute to the further exploration of fund management companies' financial benefits associated with SRI funds.

Another dimension of studies questioned the interrelation of the fee size and the ethical specifications of the fund. In 2005 two papers addressed the role that management fees play in the assessment of SRI fund performance. Kreander et al. (2005) showcased the positive relationship between managers' performance and the size of the fees, demonstrating its effects on alpha. Whereas Bauer et al. (2005) suggested the size of the fees SRI fund managers charge could interfere with performance evaluation results. Gil-Bazo et al. (2010) argued that these findings provided robust evidence of no difference in the size of the fees charged for SRI and conventional funds, with the sole exception of when asset managers focused on SRI investment.

This study addresses the survivorship bias presented and survival capabilities of the funds, as well as exploring opportunities arising for asset managers. It suggests, that survival capabilities of the funds could bring positive implications for asset

management, as it would introduce a longer fee generation opportunity, in case ethical specification is linked to the stronger survival rates.

This study is built on the dataset presented in the study of Kreander et al. (2005), which highlights its data-divineness. Researchers provided an optimal dataset as the analysis covered the European market, rather than purely focusing on the UK or the US, and the time frame would allow analysing the framework on an *ex ante* basis, which is crucial to study funds' survival capabilities. Additional robustness tests were included to evaluate the performance of the funds through the Carhart (1997) four-factor implementation.

The results indicated a strong survival capability of ethical funds. Further analysis demonstrated the survival capabilities to be attributed to the ethical specification of the funds.

These results contribute to the theoretical approach of SRI and the evaluation of conventional funds. They address the question raised by Chegut et al. (2011), and provide further evidence of survivorship bias to be a significant part of fund performance evaluation and which will be addressed in this study. They further indicate that not only survivorship bias exists, but that the survival is attributed to the ethical specification of the fund, which further contributes to the study of the ethical investment approach. The results confirm the findings of Bollen (200& and Renneboog (2008) linking ethical specification to survival. It further expands evidence reflected in descriptive statistics and studies of in the studies of Gregory et al., 1997; Bauer et al. 2005; Kreander et al. 2005; Gregory and Whittaker, 2007.

From a practical perspective, the current study further expands the discussion on the benefits associated with ethical investment and brings light to the issues related to survivorship bias. Additionally, the fact that SRI is positively connected to longer fund survival highlights an opportunity for asset managers, who are severely dependent on management fees, as the survival of ethical funds offers longevity of management fees.

In the rest of this essay, an overview of the existing literature dedicated to ethical mutual fund performance is first presented, followed by a description of the methodological steps and a detailed introduction to the data. The results attained are analysed before some concluding remarks.

2.2 Literature Overview

The growing relevance of the ethical movement sparked a development in extensive research dedicated to understanding the implications associated with responsible investment for asset owners and fund managers. As a majority of studies took the perspective of asset owners, relatively few took an in-depth interest in studying the ethical investing implications for asset management companies.

The first evidence of ethical unit trust outperformance capabilities against general market indices was registered in the study of Luther et al. (1992). As the first verification appeared weak, Luther and Matatko (1994) revisited the research introducing a small cap benchmark in 1994. The evidence corroborated the small cap bias suggested in previous studies. Mallin et al. (1995) addressed this issue through the introduction of matched pairs of funds, rather than analysing the performance against the benchmark. Fund size criteria were used for pair matching (Mallin et al., 1995). Gregory et al. (1997) argued that the criteria suggested by Mallin et al. (1995) were not sufficient, as the methodology failed to control for the type of the fund. Therefore further variables were implemented, on the basis of the extended CAPM model, which accounts for the difference between returns on high and low capitalization stocks, represented as "size premium" (Gregory et al., 1997). The authors did not find SRI funds to demonstrate better performance than other funds. In addition, the study indicated that the age of the fund to be an important factor.

The matched pair analysis was established as the dominant framework for fund performance evaluation following Gregory et al. (1997). Statman (2000) was the first to implement the method by applying it to US funds. The author used the Jensen and Sharpe measure, which indicated the stronger performance of ethical funds. A significant research body appeals to the match pair analysis methodology, as was highlighted by Rathner (2013), as alternatively it is hard to predict whether a fund's performance results are consequences attributed to ethics, or to other factors such as size and age difference.

Kreander et al. (2005) continued exploring the performance potential of SRI funds with a significantly expanded dataset, which incorporated four European

countries as well as four benchmarks. The study covered the markets of the UK, Germany, Sweden and the Netherlands; 30 SRI funds were depicted in the evaluation. Both funds, which invested locally and internationally, were included in the dataset, and compared against conventional funds. The funds were matched on the basis of four factors: age, size, and country of origin and investment universe.

The data was analysed for the period from 1995 to 2001. Following earlier published papers, Kreander et al. (1995) extended the depth of the analysis through the implementation of additional factors, such as management fee and load charge. Despite the growing complexity of the analysis, Kreander et al. (2005) did not demonstrate the outperformance of either SRI or conventional funds against the market benchmarks. However, the results contributed to the evidence that proves SRI funds' capacity to perform equally well as non-ethical funds. In the same year Derwall et al. (2005) indicated strong outperformance in ethical versus non-ethical stock portfolios, which they evaluated from 1995 to 2003. Bauer et al. (2007) implemented the Carhart model for the analysis in 2005, accounting for size, book to market and momentum factors. The study suggested the risk of ethical portfolios to be lower, and ethical portfolios as facing larger exposure to growth stocks.

As the research progressed, more studies evolved that criticized the responsible investing approach. A popular academic outlook, facilitated by the study of Rudd (1981), suggested that the restriction of the investment universe due to additional limitations could negatively affect returns. Kurtz (1997) and Michelson et al. (2004) suggested a potential increase in the risk burden related to the adoption of an ethical framework, whereas, Geczy et al. (2005) linked a weaker performance of mutual funds to the increased costs due to the selection process and imposed limitations. However, the analysis was conducted at a less-than-five-year time period.

Over a period of time, several academics drew attention to the survivorship bias presented in their studies. Chegut et al. (2011) in the overview of SRI fund performance research indicated that only 49% of the studies acknowledged its presence. In the study from 1992, Brown et al. suggested survivorship bias could impact on the final performance outcomes. Some studies, such as Kreander et al. (2005), did not tackle the bias in the dataset, whereas Bauer et al. (2005), Kempf and Osthoff (2008) and Renneboog et al. (2008) addressed the issue and adjusted the data

accordingly. Interestingly, all the studies, which addressed the survivorship bias, indicated significantly higher survival rates amongst SRI funds in comparison to the conventional ones. Gregory and Whittaker (2007) reported the death rates of conventional funds against sustainable funds to be 29.93 to 12.50%. Similarly, Bauer et al. (2005), Renneboog et al. (2008) and Kempf and Osthoff (2008) reported significantly higher attrition rates amongst conventional funds.

The presented evidence suggests the potential positive effect that ethical specification could have on the survival strength of the fund. However, the evidence remained anecdotal with a lack of profound research to support it. Bollen (2007) presented indirect confirmation of the SRI factor impacting on survival strength. The author presented strong evidence of investors' dedication to SRI funds, which was signalled by lower volatility and an increase in investors' utility associated with it. Pasewark and Riley (2009) positively indicated that investors see an opportunity to make social change through SRI investing. Renneboog et al. (2011) supported the evidence presented in Bollen (2007) and indicated in his work, that past returns of SRI funds have a weak impact on investors' behaviour.Papers of Gregory et al., 1997; Bauer et al. 2005; Kreander et al. 2005; Gregory and Whittaker, 2007: Chegut et al, 2011 reviewed above indicate the existence of survivorship biasness and indication of strong ethical fund survival. Previous studies addressed the issue by representing the descriptive statistics of survival rates, yet not introducing a study of survival. Indirect indication of link between survival strength and ethical specification was reported in the works by Bollen (2007) and Renneboog (2008).

The lack of work dedicated to examining fund survival and the growing indirect evidence presented in the literature gives a unique research opportunity to enlarge the existent pool of theoretical studies dedicated to ethical investment. Addressing survivorship bias is crucial to providing accurate empirical results. The understanding of funds' survival capabilities would raise awareness of the survival issue and bring positive implications for the quality of the studies.

The study of the survival of funds brings a strong practical contribution to the research dedicated to asset management companies. Asset management companies operate according to the fee-based structure. To draw a parallel, the structure of the income of hedge funds not only includes management fees, represented as a

percentage share of the fund's net asset value, but also additionally charges an incentive fee of 20% on the fund's profits. Therefore fees remain the sole income source for the asset management company. This study is challenged the findings of Gil_Bazo et al (2010) and further explores the ethical fund related opportunities for asset managers. It suggests, the potential increase in fee size related to SRI funds could be a strong incentive for asset managers.

Bauer et al. (2005) suggested the size of the fees to be higher for SRI funds in the analysis, based on the evidence attained through expense ratio coefficients. Gil-Bazo et al. (2010) took a closer look at the implications that ethical consideration has on fees. The author developed a counter-argument, showing no evidence of higher fees charged for SRI funds, with the one exception of fund management companies, which solely focus on ethical investments. This evidence suggests the size of the fee does not provide an opportunity for fund managers.

As neither fund performance nor fee size significantly differentiates between SRI and conventional funds, fund survival could secure longer fees inflow for asset management at longer terms. In other words, if the analysis confirms ethical specification improves fund survival capabilities it would mean that the choice of portfolio allocation towards SRI would secure a management fee flow at a longer-term perspective, which is beneficial for fund management companies.

2.3 Methods Applied

The methodology developed in this study is explores the survival capabilities of ethical and non-ethical funds. It is tailored to answer whether SRI funds demonstrate stronger survival rates.

In order to study the survival of the fund, the dataset requires an *ex ante* approach. This approach was previously overlooked in the current analysis presented in the literature. Research in the past applied various criteria to match funds. For example Malin et al. (1995) and Gregory et al. (1997) used formation date and size criteria. However, the dataset was matched on an *ex post* basis, which arguably failed to capture the criteria variation over time, which hence could distort the results. Kreander et al. (2005) improved the framework through matching on the size factor

basis in the middle of the analysis time line; however, the analysis did not address survivorship bias presented in the dataset. Despite this fact, the dataset presented in the study was used as a starting point of the analysis, as Kreander et al. (2005) develop one of the most solid databases of European funds.

The funds from the dataset were studied throughout the period of 2002 to 2015. Hence, the dataset that was matched by Kreander et al. (2005) was used. The application of the previously used dataset introduces a required starting point of the data for *ex ante* analysis. This allows establishing the number of survived funds in both the ethical and non-ethical lists. Each fund was tracked during the period in order to explore the reasons why it ceased to exist in order to get a fuller picture. This subject is further explored in the "data" section of this essay. Additionally, matched pairs of funds presented in Gregory et al. (1997) was compared to the Kreander et al. (2005) dataset to establish if certain SRI or non-SRI funds revealed attrition tendencies.

A Pearson's Chi-squared test (Pearson, 1900) was applied to examine the data. This is a widely recognized statistical tool to study the relationship and establish the likelihood of chance to determine particular observations between two categorical variables:

$$x_c^2 = \sum \frac{(O_i - E_i)^2}{E_i} \qquad (13)$$

Where x is the expected value, c represents the degree of freedom, O represents the observed value and E represents the expected value.

Further, the data on the fund closure was summarised to identify average closure year. This was a preliminary step to further introduce the survival analysis.

Survival analysis came as the next step. Cox (1972) Proportional Hazard distribution was implemented to study survival. The model is non-parametric, and it requires no assumption about the failure distribution (Cox, 1972).

The application of this approach could be found in IPO survival literature, as featured in papers of Carpentier and Suret (2011), Espenlaub et al (2012) and Espenlaub et al (2016). It is originated in the medical field; where statistical methodology was developed to study the survival and length of patience survival, in other words, the factors are likely to lead to the positive outcome. This statistical method could be applied across fields of studies when circumstances are similar (Hosmer and Lemeshow, 2008). Despite that, the method did not receive significant attention in the ethical-related topics.

The dependant variable in the survival analysis measures risk of failure. In the Cox (1972) model the marginal effect of independent variable is measured by the hazard ratio (calculated as the exponential coefficient from the Cox (1972) model). A positive (negative) coefficient implies a hazard ratio of greater (less) than one and indicates that an increase in the covariates increases (decreases) the failure rate (Hosmer and Lemeshow, 2008).

The general equation for the model could be presented, following Cox (1972) methodology:

$$r(x, \beta) = \exp(\beta_1 x_1 + \cdots + \beta_p x_p) \qquad (14)$$

Where, the covariates, $x1 + \cdots + x_p$, include regulative, normative and culture-cognitive institutional variables and control variables, and $\beta 1 + \cdots + \beta p$ are the model parameters describing the effect of the covariates.

In current essay, Cox (1972) distribution tests, which factors contribute to the survival of the fund, or, in case of survival analysis setting, which factors are associated with the hazardous event, such as fund attrition in this case. Therefore, the dependant variable is the hazard rate, in form of probability, that event of fund's closure takes place at a particular time interval (between 2002 and 2015) (Hosmer and Lemeshaw, 2008). The variable is treated as unobservable, which allows to control for the timing of event as well as the occurrence.

The fund closure dataset is characterised by missing data. In order to follow the assumption of hazard rate to be consistent over time Cox (1972), the funds with no reported closure date were deleted from the framework. However, a robustness

tests were introduced to challenge the conservative approach, and further explore the effects factors have on funds' survival. The distribution was measure on the basis of assumption, that closed funds with missing data were closed in the beginning of the timeline, in the middle, or at the end of time line.

The next step is to evaluate fund performance, as this is still a driving determinant in the asset managers' fund choice Therefore it could be suggested that managers would not take the SRI fund into consideration without the funds demonstrating better or similar performance to conventional funds. For this reason this paper incorporated classic risk-adjusted Sharpe, Treynor ratios and Jensen measure.

The Sharpe ratio (Sharpe, 1966), shown in equation (15), is one of the most widely applicable estimates for risk-adjusted performance, as supported by the extensive evidence from the academic literature, including Bello (2005), Geczy et al. (2005) and Sauer (1997). It studies average return' relation to standard deviation of fund returns:

$$Sharpe = \frac{\overline{r}_i - \overline{r}_f}{\sigma_i} \qquad (15)$$

Where $\overline{r}_i$ is the average monthly return of fund i, $\overline{r}_f$ is the average return of the risk-free asset, with the local one-month T-Bill rate for UK and Swedish funds and the euro for the one-month interbank rates for German and Dutch funds. σ_i represents the standard deviation.

Unlike the Sharpe ratio, which measures the return of the portfolio or a stock on one unit of the risk-free rate of return, the Treynor ratio reflects the measurement of performance against the equity market as a whole. Therefore it is used as an addition to the Sharpe ratio in performance measurement (Mueller, 1991; Mallin et al., 1995; Hill et al., 2007) as in equation (16),

$$Treynor = \frac{\overline{r}_i - \overline{r}_f}{\beta_i} \qquad (16)$$

Where β_i is the Beta of fund i.

Equation (17) showcases the Jensen measure. It reflects a fund's capability to out or underperform the market through the difference between the fund's return and the return on the single-factor benchmark according to an estimated CAPM. This indicator is placed amongst the most applicable tools to assess fund performance (Gregory et al., 1997; 2007; Kreander et al. 2005; Bauer et al., 2005):

$$r_{it} - r_{ft} = \alpha_i + \beta_i(r_{mt} - r_{ft}) + \mu_{it} \qquad (17)$$

Where μ_{it} is the random error in the equation.

For robustness purposes an extended multi-factor model was additionally applied in order to gain a better explanation of fund behaviour, following the recent studies of Bauer et al. (2005), Gregory and Whittaker (2007) and Derwall et al. (2011).

Small size bias played an important role in the evaluation of SRI fund performance. The first concern over the issue was expressed in the findings of Mallin et al. (1995). Small-size stocks are believed to distort performance results, having an impact on ethical fund performance. Gregory et al. (1997) suggested the implementation of a Fama–French model, as a method to tackle size-related issues, by controlling for the size factor. Since then the approach has gained strong appreciation in the field of fund performance evaluation.

The study published by Wallis and Klein (2015) is dedicated to evaluating the stages of academic advances in the area of SRI fund performance. Notably, the majority of existing papers focus on the Jensen, Traynor and Sharpe estimates when it comes to the investigation of fund performance, with controls for the "size" factor. The work of Bauer et al. (2005) and Fletcher and Marshall (2005) were amongst the first to implement the Carhart (1997) four-factor model. This performance attribution model uses the coefficient and premium on the factor-mimicking portfolio to indicate the proportion of mean return attributable to four investment strategies (Bauer et al.,

2005). Bauer et al. also suggested it could allow the tracking of market cycles and style preferences effects on returns of ethical and non-ethical investments.

The Carhart (1997) four-factor model estimates fund performance through the addition of the investment style indicators, as estimated by equation (18). The momentum factor was formed by ranking all stocks on their prior 12 month return. The momentum factor return is calculated as the difference between the stocks with the top 30% market capitalisation and the return of the stocks with the bottom 30% The calculation is performed on a monthly basis to obtain rolling momentum:

$$(r_{p,t} - r_{f,t-1}) = \alpha_p + \beta_p(r_{m,t} - r_{f,t-1}) + \gamma_p SMB_t + \delta_p HML_t + \lambda_p MOM_t + \varepsilon_{p,t} \quad (18)$$

Where β_p is described in equation (16); $(r_{m,t} - r_{f,t-1})$ is the continuously compounded return of portfolio *p* at time *t* in excess of the continuously compounded risk-free rate of return; α_p represents portfolio p's systematic return component not captured by the independent variables of the model; SMB_t is the continuously compounded return of small-cap stocks in excess of the continuously compounded return large-cap stocks at time *t;* HML_t is the continuously compounded return of value stocks in excess of the continuously compounded return of growth stocks at time t; MOM_t represents the difference in the returns of the winning and losing portfolios over a 12-month period; while γ_p and δ_p represent portfolio p's exposure to small-cap and value investment styles respectively; $\varepsilon_{p,t}$ is a random disturbance term.

The methodology presented above reveals fund survival abilities and allows the detailed evaluation of funds' performance. It explores if fund survival is an attribute of the ethical approach and reveals the exposure of funds to market risk and various investment styles, in order to comprehend the behaviour of returns.

2.4 Data

Interestingly, during the analysis it was established that not all funds were matched accurately according to "age" criteria. Kreander et al. (2005) did not indicate significant difference in the performance of SRI and non-SRI portfolios. The current study requires a solid dataset, which would combine ethical and non-ethical funds with similar performance, otherwise asset managers would not consider choosing between ethical and non-ethical funds. This cross-section introduces a firm base to develop the dataset for this essay's empirical analysis.

The Kreander et al. (2005) dataset reviewed in Table 2.2, and summary of the funds state at 2015 is presented as well. The dataset included 60 funds: 30 ethical and 30 conventional. Funds in the dataset predominantly originated from the UK, with a few funds from Germany, Sweden and the Netherlands. All funds apart from one were open-ended equity funds. As might be suggested, the dataset could suffer from survivorship bias. However, it was deliberately used to reveal its effects throughout the analysis period.

It is important to draw attention to the fact that Kreander et al. (2005) suggested that as the dataset affects both the ethical and the non-ethical funds, it does not distort the matched pair analysis. It could overstate the performance of all funds on average, but Grinblatt and Titman (1989) and Brown and Goetzmann (1995) estimated that the survivorship bias was not substantial in their investigations; it was only about 0.5% per year.

After following the performance of each fund back to 2002, the final dataset revealed an obvious attrition of the funds: 18 ethical funds survived until 2015, as against only 10 in non-ethical ones. SRI funds demonstrated a stronger pattern of survival, at 60%. This represents a good background for further investigation of whether the results are connected to the ethical settings of the funds.

It is important to state that despite the funds being initially matched on the basis of age, size, and country of origin and investment universe (Kreander et al., 2005), only eight pairs of funds survived. For the accuracy of research, the history of each fund was examined. A summary of the fund list is presented in Table 2.3, where the attempt was made to trace the circumstance under which the funds were closed;

however, information availability was limited. Datastream, [17] Bloomberg [18] and Morningstar [19] were used as the main sources of information. The final dataset subjected to analysis included 169 observations. The analysis was performed on a monthly basis.

[17] Thomson Reuters Datastream: <datastream.com>, accessed 16 August 2016.
[18] Bloomberg L.P.: <Bloomberg.com>, accessed 16 August 2016.
[19] Morningstar: <morningtar.com>, accessed 16 August 2016.

Table 2.1 Fund overview

Name of fund	Country	Size (1998), £	Size (2016), £	Fund growth (%)	Survived funds	Name of fund	Country	Size (1998), £	Size (2016), £	Fund growth (%)	Survived funds
Abbey Ethical Trust	UK	40.4	20.5179		*	Sovereign Income	UK	39			
Aberdeen Ethical	UK	6.7	140.1986	1992.52	*	Cavendish Worldwide	UK	5.4	117.1375	2069.21	*
ABF Andere Beleggingsfond	Netherlands	35	133.77	282.20	*	Ing Bank Global	Netherlands	128.1	1494.16	1066.40	*
Allchurches Amity	UK	35.3	137.6344		*	Credit Suisse Growth Portfolio	UK	59.5			
ASN Aandelensfonds	Netherlands	68.2	437.28		*	Postbank Aandelenfonds	Netherlands	223.2			
Banco Hjalpfond	Sweden	11.3				Alfred Berg Sverige	Sweden	56.6			
Banco Ideella Miljofond	Sweden	24.9				Lansforsakringar Wasa Allemansfonden	Sweden	34.6			
Banco Miljofond	Sweden	5.7				HQ Select	Sweden	18.5			
CIS Environ Trust	UK	146.3	471.5405	222.31	*	HSBC European Growth Fund	UK	129.6	242.2249	86.90	*
City Acom Ethical	UK	3.9				City Financial International Fund	UK	3.3			
Clerical Medical Evergreen	UK	18.3	20.3637		*	Sunlife of Canada Worldwide Growth	UK	16.6			
Equitable Ethical	UK	17.7	1.5803		*	Dresdner RCM European Small Cos	UK	21.6			
Family Charities Ethical	UK	9.5	131.1		*	Abbey National Smaller Cos Fund	UK	10.5			
Focus Umweltechnologie	Germany	2.1	17.07		*	Nordinvest Wekanord	Germany	9.3			
Framlington Health Fund	UK	71.4	573.6708	703.46	*	Old Mutual Worldwide Trust	UK	82.2	395.35	380.96	*
Friends Provident Stewardship Income Trust	UK	73.6				Henderson UK Capital Growth Fund	UK	76.8	463.3567		*

Friends Provident Stewardship Unit Trust	UK	473	193.5921	-59.07	*	Equitable High Income Trust	UK	426.7	74.6628	-82.50	*
Hypobank Ecotech	Germany	18.2				Walser Aktien International	Germany	49.9			
Jupiter Ecology	UK	61.2	506.2003	727.12	*	Scottish Life Worldwide	UK	60.3	29.29466	-51.42	*
KD Fonds Okoinvest	Germany	2.8	35.13		*	Nordglobal	Germany	17.8			
Luxinter Oekolux	Germany	37.2	26.88		*	ADIG Fondiro	Germany	23			
NPI Global Care Income	UK	31	88.1		*	Scottish Amicable Equity Strategy	UK	25.4			
NPI Global Care Pension	UK	45.4				Scottish Mutual Int. Growth	UK	34.4	52.25		*
Scottish Equitable Ethical	UK	44.9	764.2	1602.00	*	Rathbone Income & Growth Fund	UK	25.4	77.29112	204.30	*
SEB Miljofond	Sweden	37.5				Lansforsakringar Wasa Globalfonden	Sweden	39.6	201.93		*
Sovereign Ethical Fund	UK	19.8				Hill Samuel Ex. Umbrella Fund	UK	16.3			
TSB Environmental	UK	21.8	181.3148		*	Martin Currie UK Growth	UK	22			
Varldsnaturfonden	Sweden	20.9				Banco Smabolagsfond	Sweden	27.7			
Wasa Miljofond	Sweden	10.4				Banco Global	Sweden	12.5			
Wasa U Hja¨lpsfond	Sweden	5.5				Handelsbanken Seniorbofond Aktie	Sweden	5			
No of survived funds					18						10
Active Funds (%)					60						33.32

Notes: This table summarizes information about the funds analysed in Kreander et al. (2005) as well as in the current study. It presents a full list, which is similar to the list provided by Kreander et al. (2005). It provides information on the country of the fund's origin. Further it shows the initial fund size, and the last reported fund size, followed by a column which demonstrates the growth indicator. Finally, this table provides detailed information on the current stages of the fund's operation, exploring the reasons for its closure.

Table 2.2 Fund Closure, Explained

Fund name	Country	Reasons
		Ethical
Banco Hjalpfond	Sweden	Liquidated, January 2009
Banco Ideella Miljofond	Sweden	Merged, 2012
Banco Miljofond	Sweden	Notice in a press of a merger in 2010. No further information found. Potentially liquidated.
City Acom Ethical	UK	No information found
Friends Provident Stewardship Income Trust	UK	No information found, 2003
Hypobank Ecotech	Germany	Liquidated, date not specified
NPI Global Care Pension	UK	Liquidated, 2003
SEB Miljofond	Sweden	No information found, 2015
Sovereign Ethical Fund	UK	Changed to Standard Life Investments UK Ethical, February 1998. Followed by closure in 2015.
Varldsnaturfonden	Sweden	No information found
Wasa Miljofond	Sweden	No information found
Wasa U Hja¨lpsfond	Sweden	No information found

Fund name	Country	Reasons
		Non-Ethical
Sovereign Income	UK	Merged
Credit Suisse Growth Portfolio	UK	Liquidated, 2002
Postbank Aandelenfonds	Netherlands	Liquidated, 2008
Alfred Berg Sverige	Sweden	Liquidated, 2001
Lansforsakringar Wasa Allemansfonden	Sweden	No information found
HQ Select	Sweden	No information found
City Financial International Fund	UK	No information found
Sunlife of Canada Worldwide Growth	UK	No information found
Dresdner RCM European Small Cos	UK	No information found. Potentially liquidated
Abbey National Smaller Cos Fund	UK	Liquidated, June 2012
Nordinvest Wekanord	Germany	Liquidated, December 2008
Walser Aktien International	Germany	Liquidated, December 2005
Nordglobal	Germany	Liquidated, September 2013
ADIG Fondiro	Germany	Liquidated, May 2011
Scottish Amicable Equity Strategy	UK	Liquidated, data not specified
Hill Samuel Ex. Umbrella Fund	UK	Relaunched by Scottish Widows in 2003. Further details not found
Martin Currie UK Growth	UK	Liquidated, 2010
Banco Smabolagsfond	Sweden	Liquidated, November 2011
Banco Global	Sweden	Liquidated, date not specified
Handelsbanken Seniorbofond Aktie	Sweden	Liquidated, date not specified

Notes: This table represents a summary of the fund list, emphasizing the funds that did not exist by the time of the analysis, and providing information on the potential reasons for the fund's closure. An in-depth research took place in order to identify the history of each fund. The information availability appeared to be limited. This could be linked to the length of the time period passed since closure. In addition, the majority of closed funds are European, therefore most related news and reports were available in foreign languages. Funds with available contact information were contacted; however none of them replied to the request.

Table 2.2 shows the UK to take a dominating position in the list. In order to overcome exchange rate fluctuation effects, the analysis was carried out in British currency, with the major focus on the British market.

To define the portfolios' excess returns and create benchmark returns, the total return indices were transformed through the application of continuously compounded rates of return to the return index, as in equation (19):

$$r_{i,t} = ln(p_{i,t}/p_{i,t-1}) \qquad (19)$$

Where $p_{i,t}$ is the total return of firm or index *i* at time *t*, $p_{i,t-1}$ is the total return of firm or index *i* at time *t-1*, and $r_{i,t}$ is the continuously compounded rate of return of stock or index *i* at time *t*. To construct the excess market returns or excess firm returns, the weekly risk-free rate of return at time *t*–1 is subtracted from the continuously compounded rate of return of stock or index *i* at time *t*.

The benchmark was constructed on the basis of information obtained from Datastream and the online research and data provider Style Research Ltd.[20] In order to assess a fund's exposure to the market, a respective variable was created on the basis of the FTSE All Share Total Return Index.[21] The index is widely applied in the academic literature, and can be found in Bello (2005), Bauer et al (2005).

It could be argued that application of social indices, as a benchmark would provide more accurate explanatory power to empirical outcomes, when estimating SRI funds' performance. Statman (2000) suggests that due to the difference in investment strategies of SRI and conventional funds, application of conventional indices could distort the performance outcome. However, further investigation did not reveal any evidence to support the assumption. The findings of Bauer et al. (2005) indicated ethical fund returns to be stronger and explained by conventional indices. These findings were later supported by Cortez et al. (2012). Therefore this study used

[20] StyleResearch: <www.styleresearch.com./ >, accessed 16 August 2016.

[21] FTSE All Share Index: < www.londonstockexchange.com/exchange/prices-and-markets/stocks/indices/summary/summary-indices.html?index=ASX. >, accessed 16 August 2016.

the conventional index – the FTSE All Share Total Index. The index covers the UK market, as all the remaining funds subjected to the analysis were originated in the UK. The index chosen was the same as the one applied in the analysis of Kreander et al. (2005).

Investment style indexes were developed in accordance with Carhart (1997) models. They were based on returns' information retrieved from Style Research Ltd. Investment styles captured the exposure of the evaluated portfolio to certain equity traits, such as size, book-to-market and momentum. The SMB (small minus big) factor reflects the exposure to small-capitalization stocks, and is constructed as the difference between the lower half of the market capitalization of stocks returns and the upper half of the market capitalization of stock returns. The HML (high minus low) factor reflects the exposure to the value stocks, which is calculated as the difference between the returns of the top 30% and the lowest 30% stock universe, calculated according to the book-to-market value ratio. The ranking performance of each stock in the universe over a 12-month period is followed by calculating the difference between the winning 30% and the 30% of stocks that demonstrated the weakest period, which is the procedure behind constructing a MOM (momentum) factor.

As a risk-free rate for the UK market, the three-month London Interbank Offered Rate (LIBOR) was implemented. As the performance evaluation is carried out on a monthly basis, the three-month LIBOR was calculated as in equation (20):

$$r_{f,t.1w} = ln\left[\left(1 + sr_{f,1y}/100\right)^{30.4375/91}\right] \qquad (20)$$

Where $sr_{f,t,1y}$ is the annualised three-month Euribor rate at time t and $r_{f,t.1w}$ is the monthly risk-free rate of return at time t.

As the majority of funds originate from the UK and estimations are performed in the British currency, the implementation of the UK risk-free rate should not hinder an appropriate evaluation of the performance of all the funds, including those outside of the UK, against the benchmark.

A continuously compounded monthly return for each fund was calculated. The data collected for fund analysis demonstrated the existence of multiple asset classes in the case of several funds. In that case, the overall fund return was presented as a return on the equally weighted portfolio, calculated on a monthly basis. The monthly logged returns were applied in the model in order to overcome any skewness in the returns' distribution.

2.5 Results

First step of analysis was to incorporated Chi-squared. This test was chosen to evaluate if the trend could be attributed to ethical specification. Table 2.3 demonstrates result with significant levels of probability.

Table 2.3 Chi-Squared Test Results

Chi-Sq	DF	P-Value
18.3	1	0.00003

Notes: This table represents the result of Chi-Squared test, with one degree of freedom and P-value

These results demonstrate strong level of significance with probability below 1%. These results indicate the results not to be independent from the ethical or non-ethical factors. In other words, the ethical style of the fund encourages its capacity for survival.

Results presented above support previous indication of stronger survival capabilities of ethical funds. Survival analysis allows further testing empirical findings. Prior to the survival analysis, further step compared the closure dates of the funds. It not possible to analyse the complete list of closed ethical and non-ethical funds, as some information was not available, as was previously indicated. Available data was used to estimate the average life expectancy on the basis of information about the closure of the funds. The results indicated the average closure date for SRI funds to be 2009, against conventional funds with the closing year 2008. The evidence supports stronger survival capabilities for SRI funds was presented in Table 2.4. These results dictated the shape of survival analysis

2.4 Average Year of Closure of Ethical and Conventional Funds

Fund name	Open	Final year
	Ethical	
Banco Hjalpfond	1995	2009
Banco Ideella Miljofond	1992	2012
Banco Miljofond	1996	2010
City Acom Ethical		
Friends Provident Stewardship Income Trust	1987	2003
Hypobank Ecotech		
NPI Global Care Pension	1994	2000
SEB Miljofond	1991	2015
Sovereign Ethical Fund		
Varldsnaturfonden		
Wasa Miljofond		
Wasa U Hja¨lpsfond		
Average		2008.17
	Conventional	
Sovereign Income		
Credit Suisse Growth Portfolio	1988	2002
Postbank Aandelenfonds	1992	2008
Alfred Berg Sverige	1994	2001
Lansforsakringar Wasa Allemansfonden		
HQ Select		
City Financial International Fund		
Sunlife of Canada Worldwide Growth		
Dresdner RCM European Small Cos		
Abbey National Smaller Cos Fund	1988	2012
Nordinvest Wekanord	1969	2008
Walser Aktien International	1992	2005
Nordglobal	1991	2013
ADIG Fondiro	1987	2011
Scottish Amicable Equity Strategy		
Hill Samuel Ex. Umbrella Fund	1992	2003
Martin Currie UK Growth	1988	2010
Banco Smabolagsfond	1993	2011
Banco Global		
Average End Year		2007.63

Notes: This Table represents a list of ethical and conventional funds, which did not survive throughout the analyses, showing the final years of the existence of funds and analyses the average closure year for both groups

The results of survival analysis are summarised in Table 2.5.

Table 2.5. Survival Analysis

Variables	Excluded the funds with missing year data time to event (1)	Funds' closure a second to first year time to event (2)	Fund closure in the middle of the timeframe time to event (3)	Funds' closure second to last year time to event (4)
SRI	-1.995**	-0.921**	-0.887**	-0.832*
	(-2.423)	(-2.030)	(-1.990)	(-1.902)
Age	0.0357	0.00445	0.0505	0.0240
	(0.539)	(0.101)	(0.887)	(0.366)
Size	-0.0145	-0.0129*	-0.0124*	-0.0113
	(-1.308)	(-1.827)	(-1.756)	(-1.592)
Sharpe ratio	-1.094	3.539	4.637	2.618
	(-0.149)	(0.718)	(0.949)	(0.503)
Observations	453	481	565	635

Notes: This table represents the survival analysis, with Cox (1972) parametric distribution test. It studies the effect of a set of factors, such as SRI, age of the fund, size of the fund and abnormal returns on the event of fund closure (death) in the period between 2002 and 2015. The test was set in one main specifications. Due to lack of the closure year information, additional three specifications represent. The first column represents the event, when all the funds with no available closure information were excluded. The second, third and fourth specification a robustness tests, that funds with missing closing dates, were closed in the beginning, in the middle, or in the end of the framework specification was constructed using the average age of the fund added to it starting date. Significance level: *** p<0.01, ** p<0.05, * p<0.1

The results of the analysis suggest ethical factor to have an impact on survival. SRI is a dummy variable, which takes the meaning of 1, if the fund was ethical, otherwise 0. The age and size of the fund were tested. The data in the beginning of the framework was used – in 2002. Abnormal performance effects were used in the form of Sharpe ratio. As some data on the year of fund's closure is not available, the test was performed under specification, when all the funds with no available closure information were excluded. The robustness results presented in column two three and four. Three scenarios were suggested: when the funds with missing dates were closed a year after the beginning of dataset, when they were closed in the middle or in the end of the period. The results demonstrate the SRI configuration to have lower prediction power for the fund closure, suggesting this configuration to be associated with survival capability. The results remained statistically significant across three robustness variations.

Table 2.6 shows the descriptive statistics of the existing funds. The average monthly returns of both ethical and non-ethical funds appeared to be negative, with the ethical funds having a higher variation in coefficients. Risk, measured by standard deviation, appeared to be higher for the conventional funds, with 0.15 differences. These results also appear to be similar to those presented by Kreander et al. (2005), as well as Mallin et al. (1995) and Gregory et al. (1997), where lower risk indicators

consistently appear to be attributed to ethical funds (Bauer and Smeets, 2015). Table 2.7 presents the risk-adjusted performance measured by the Sharpe and Treynor ratios. Sharpe ratio estimates of the average risk-adjusted performance of ethical funds were similar to non-ethical funds, with coefficients of 0.5379 and 0.5388 respectively. Individually, ethical funds demonstrated higher variation of the risk-adjusted performance indicator, with funds reaching the coefficient 0.6034, compared to that of the conventional funds at 0.5880. As the Sharpe ratio is often criticized for accounting for the normal distribution, which often does not appear to be the case for stock returns, the Treynor ratio is widely applied for performance evaluation as it measures performance against the market. It was notably favoured in the literature dedicated to SRI fund performance evaluation (Mueller, 1991; Travers, 1997; Tippet, 2001; Hill, 2007).

The average performance of the ethical funds measured by the Treynor ratio appeared to be higher in comparison to the conventional funds, 0.0261 against 0.0246, respectively. The highest performance results achieved by the ethical funds have a coefficient of 0.0394, which is higher than the coefficient of the non-ethical funds (0.0272).

Table 2.6: Descriptive Statistics

	Ethical Funds							
	Mean	St.Dev	Median	Skewness	Maximum	Minimum	Average-Min	Max-Average
Abbey Ethical Trust	-0.0070	0.0416	-0.0022	-1.1707	0.1290	-0.2079	0.2010	0.1360
Aberdeen Ethical	-0.0052	0.0461	0.0021	-0.6589	0.1105	-0.1721	0.1669	0.1157
ABF Andere Beleggingsfond	-0.0044	0.0293	-0.0037	0.4411	0.1411	-0.0940	0.0896	0.1455
Allchurches Amity	-0.0032	0.0419	0.0024	-0.7875	0.1111	-0.1552	0.1520	0.1143
ASN Aandelensfonds	-0.0046	0.0492	-0.0020	-0.8678	0.1121	-0.1869	0.1823	0.1166
CIS Environ Trust	-0.0039	0.0424	0.0006	-0.9701	0.1183	-0.1963	0.1924	0.1222
Clerical Medical Evergreen	-0.0053	0.0457	-0.0007	-1.0811	0.0971	-0.1755	0.1702	0.1024
Equitable Ethical	-0.0054	0.0406	-0.0010	-0.8770	0.0898	-0.1548	0.1494	0.0952
N Family Charities Ethical	-0.0074	0.0469	0.0019	-1.5051	0.0958	-0.2557	0.2483	0.1032
Focus Umweltechnologie	-0.0075	0.0466	0.0018	-0.8438	0.0906	-0.1656	0.1581	0.0981
Framlington Health Fund	-0.0038	0.0497	0.0026	-0.6573	0.1026	-0.1506	0.1467	0.1064
Friends Provident Stewardship Unit Trust	-0.0048	0.0423	0.0013	-1.0242	0.1313	-0.1940	0.1892	0.1361
Jupiter Ecology	-0.0048	0.0456	0.0040	-1.1963	0.1138	-0.2320	0.2272	0.1186
KD Fonds Okoinvest	-0.0072	0.0565	0.0015	-1.0648	0.1352	-0.2371	0.2299	0.1424
Luxinter Oekolux	-0.0077	0.0524	-0.0008	-1.4488	0.1037	-0.2540	0.2463	0.1114
NPI Global Care Income	-0.0060	0.0465	-0.0019	-0.8886	0.0971	-0.1818	0.1758	0.1031
Scottish Equitable Ethical	-0.0018	0.0441	0.0046	-1.0214	0.0907	-0.1939	0.1921	0.0926
TSB Environmental	-0.0064	0.0446	-0.0017	-0.8829	0.1443	-0.2156	0.2092	0.1507

Conventional Funds								
Cavendish Worldwide	-0.0040	0.0427	-0.0007	-0.9097	0.0971	-0.1668	0.1627	0.1011
Ing Bank Global	-0.0056	0.0477	-0.0005	-0.7251	0.0987	-0.1584	0.1527	0.1043
HSBC European Growth Fund	-0.0044	0.0570	0.0052	-0.7702	0.1597	-0.2189	0.2146	0.1641
Old Mutual Worldwide Trust	-0.0029	0.0471	0.0051	-0.9604	0.0820	-0.1843	0.1814	0.0848
Henderson UK Capital Growth Fund	-0.0025	0.0497	0.0040	-1.3007	0.1868	-0.2864	0.2838	0.1893
Equitable High Income Trust	-0.0043	0.0428	0.0000	-0.7999	0.1173	-0.1513	0.1470	0.1216
Scottish Life Worldwide	-0.0055	0.0426	-0.0020	-0.6533	0.0864	-0.1292	0.1237	0.0919
Scottish Mutual Int. Growth	-0.0052	0.0506	0.0009	-0.7476	0.1425	-0.2099	0.2047	0.1477
Rathbone Income & Growth Fund	-0.0032	0.0400	0.0045	-0.9555	0.1184	-0.1485	0.1453	0.1215
Lansforsakringar Wasa Globalfonden	-0.0064	0.0456	-0.0004	-0.7537	0.0908	-0.1612	0.1548	0.0973

Notes: This table represents the descriptive statistics of both ethical and non-ethical funds that existed during the timeframe of the analysis from 2002 to 2015. It demonstrates data that describe mean, median, standard deviation, skewness, maximum, and minimum of equity funds.

Table 2.7 Financial Performance of SRI and Conventional Funds

	Sharpe	Treynor		Sharpe	Treynor
Abbey Ethical Trust	0.4857	0.0228			
Aberdeen Ethical	0.5612	0.0258	Cavendish Worldwide	0.5355	0.0254
ABF Andere Beleggingsfond	0.4248	0.0248	Ing Bank Global	0.5517	0.0252
Allchurches Amity	0.5267	0.0232			
ASN Aandelensfonds	0.5506	0.0262			
CIS Environ Trust	0.5361	0.0244	HSBC European Growth Fund	0.5880	0.0272
Clerical Medical Evergreen	0.5405	0.0253			
Equitable Ethical	0.5185	0.0243			
Family Charities Ethical	0.5450	0.0241			
Focus Umweltechnologie	0.5694	0.0265			
Framlington Health Fund	0.6034	0.0394	Old Mutual Worldwide Trust	0.5661	0.0263
			Henderson UK Capital Growth Fund	0.4698	0.0216
Friends Provident Stewardship Unit Trust	0.4847	0.0223	Equitable High Income Trust	0.5261	0.0222

	Sharpe	Treynor		Sharpe	Treynor
Jupiter Ecology	0.5690	0.0278	Scottish Life Worldwide	0.5188	0.0235
KD Fonds Okoinvest	0.5912	0.0305			
Luxinter Oekolux	0.5392	0.0261			
NPI Global Care Income	0.5606	0.0269			
			Scottish Mutual Int. Growth	0.5541	0.0259
Scottish Equitable Ethical	0.5483	0.0248	Rathbone Income & Growth Fund	0.5275	0.0235
			Lansforsakringar Wasa Globalfonden	0.5509	0.0250
TSB Environmental	0.5273	0.0244			

Notes: This table represents the results of a risk-adjusted performance evaluation of both ethical and non-ethical funds, estimated on the basis of the Sharpe and Treynor ratios. The table is divided into two parts. The first three columns represent the ethical funds, and the other three the non-ethical funds. They are combined in order to match those pairs of funds that survived since the analysis presented in Kreander et al. (2005).

2.6 Robustness Test

Tables 2.8 and 2.9 show the results for the Carhart four-factor model (Carhart, 1997), which evaluated ethical and non-ethical fund performance accounts for the potential exposure to various investment styles. The t-statistics were corrected for the effects of heteroscedasticity and serial correlation for up to four lags using the method of Newy and West (1987).

Similarly to previous studies, analysis presented mixed evidence of funds' abnormal performance. The range of alpha coefficients fluctuates between 0.0004 and 0.0034, with six funds showing statistical significance. Ethical funds presented opportunity of risk reduction, with the majority of them demonstrating lower risk in comparison to the market. ABF Andere Beleggingsfond fund's beta indicator was an impressive 0.4840, the Framlington Health fund had a beta indicator at 0.7897, and the beta of the Equitable Ethical fund was 0.8530. The beta of the other SRI funds ranged between 0.9877 and 0.8630. These results could potentially be a signal of an SRI-related risk mitigation effect, as well as being linked to the type of investment fund adopted.

An analysis of the investment styles demonstrated exposure to the small-cap companies for all the ethical funds apart from ABF Andere Beleggingsfond and ASN Aandelensfonds, which are exposed to the large-cap companies according to the negative coefficients. However, only the coefficient of ABF Andere Beleggingsfond appeared to be statistically significant; nine funds exposed to the small-cap companies showed a high statistical significance of the measurements. This trend was reviewed in previous academic studies (Luther and Matatko, 1994; Mallin et al., 1995). Value stocks appear to impact on the fund returns more than growth stocks; ABF Andere Beleggingsfond, Focus Umweltechnologie, Framlington Health Fund and Luxinter Oekolux were the funds exposed to growth stocks, but none of the coefficients indicated statistical significance. In contrast, six of the funds exposed to a value stocks impact had indicators significant at the 1% level.

Table 2.8 Performance of Ethical Funds

Fund name	Intercept	Market exposure	SMB exposure	HML exposure	MOM exposure	Adjusted R-squared	Number of observations
Abbey Ethical Trust	-0.0020	0.8630	0.2186	0.1816	-0.0433	0.8031	169
	-1.7164*	18.9147***	5.5024***	2.9768***	-1.2777		
Aberdeen Ethical	-0.0009	0.9630	-0.0004	0.0800	-0.0029	0.8036	169
	-0.7099	25.9616***	-0.0063	1.1551	-0.0663		
ABF Andere Beleggingsfond	-0.0031	0.4840	-0.1752	-0.0698	0.0281	0.5668	169
	-1.4232**	15.5021***	-1.9343*	-0.8420	0.8558		
Allchurches Amity	0.0016	0.9078	0.2003	0.1746	-0.0095	0.8780	169
	1.5212	34.9941***	4.9679***	2.5842**	-0.2984		
ASN Aandelensfonds	-0.0006	1.0091	-0.0854	0.0253	0.0516	0.7639	169
	-0.3919	16.8022***	-1.0007	0.2133	1.0870		
CIS Environ Trust	0.0006	0.9234	0.1203	0.1394	0.0238	0.8326	169
	0.4681	25.6567***	3.0180***	2.1536**	0.5819		
Clerical Medical Evergreen	-0.0011	0.9708	0.0374	0.1019	0.0626	0.7829	169
	-0.7437	21.7507***	0.6686	1.2540	1.5657		
Equitable Ethical	-0.0017	0.8530	0.0226	0.0243	0.0226	0.7749	169
	-1.3390	23.8808***	0.4069	0.3274	0.6492		
Family Charities Ethical	-0.0020	1.0610	0.1870	0.1595	0.0332	0.8849	169
	-1.0436**	17.2603***	4.0129***	2.4288**	1.4134		

Fund name	Intercept	Market exposure	SMB exposure	HML exposure	MOM exposure	Adjusted R-squared	Number of observations
Focus Umweltechnologie	-0.0033	0.9877	0.0192	-0.0267	0.0162	0.7883	169
	-2.1663**	18.5886***	0.2746	-0.2576	0.3486		
Framlington Health Fund	-0.0008	0.7897	0.0086	-0.1414	0.0346	0.4184	169
	-0.2671	10.2745***	0.0922	-1.1332	0.3856		
Friends Provident Stewardship Unit Trust	0.0006	0.9277	0.2702	0.2316	-0.0031	0.8635	169
	0.6001	29.1010***	7.4919***	3.6644***	-0.0986		
Jupiter Ecology	0.0004	0.9660	0.2880	0.1307	0.0317	0.7568	169
	0.2447	20.8541***	4.8634***	1.6200	0.6378		
KD Fonds Okoinvest	-0.0016	1.1046	0.2094	0.0717	0.0108	0.6499	169
	-0.6287	13.7359***	2.4975**	0.5853	0.1719		
Luxinter Oekolux	-0.0032	1.0965	0.0570	-0.0320	0.0705	0.7335	169
	-1.7258*	12.9110***	0.8846	-0.2877	1.1099		
NPI Global Care Income	-0.0016	0.9702	0.0747	0.0694	0.0436	0.7462	169
	-0.9935	21.8910***	1.3147	0.7391	0.8044		
Scottish Equitable Ethical	0.0034	1.0208	0.2839	0.0725	0.0544	0.8284	169
	0.9414***	32.0859***	7.6511***	1.2468	1.7347*		
TSB Environmental	-0.0011	0.9493	0.1932	0.1737	-0.0366	0.8284	169
	-0.7666	23.4949***	4.9647***	2.3182**	-1.0283		

Notes: The table represents results for performance analysis of ethical funds. The analysis was performed through the implementation of the Carhart model (1997). All the funds which survived over the analysed period were subjected to examination. Each column represents a coefficient for alpha, beta measurements, exposure to small-capitalization stocks, growth stocks and momentum, followed by R-squared indicator and number of observations. *** 1% significance level; ** 5% significance level; * 10% significance level.

Table 2.9 Performance of Conventional Funds

Fund name	Intercept	Market exposure	SMB exposure	HML exposure	MOM exposure	Adjusted R-squared	No of observations
Cavendish Worldwide	0.0002	0.9183	0.1363	0.0547	0.0464	0.7736	169
	0.1991	16.5173***	2.4931**	0.5611	0.9502		
Ing Bank Global	-0.0014	0.9904	-0.0802	0.0311	-0.0114	0.8206	169
	-1.1869	20.9668***	-1.1835	0.3634	-0.2629		
HSBC European Growth Fund	0.0011	1.1992	0.0582	-0.0045	-0.0148	0.7870	169
	0.7320	25.1077***	0.5971	-0.0402	-0.2527		
Old Mutual Worldwide Trust	0.0014	1.0274	0.0582	0.0738	0.1007	0.7986	169
	0.9872	26.9325***	0.9967	0.9208	2.2697**		
Henderson UK Capital Growth Fund	0.0040	1.0583	0.2925	0.3701	-0.0452	0.8752	169
	1.3246***	15.9042***	5.5672***	5.2794***	-1.1057		
Equitable High Income Trust	0.0002	0.9798	0.0265	0.0454	-0.0028	0.9500	169
	0.2835	49.9631***	1.0311	1.2785	-0.1230		
Scottish Life Worldwide	-0.0016	0.9045	-0.0358	0.0498	0.0093	0.8329	169
	-1.4761	19.9031***	-0.5463	0.7539	0.2562		
Scottish Mutual Int. Growth	0.0002	1.0147	0.0445	0.1513	-0.0880	0.7971	169
	0.1523	28.2132***	0.7083	1.6597*	-1.7254*		
Rathbone Income & Growth Fund	0.0009	0.9141	0.1172	0.0378	0.0588	0.8725	169
	0.8373	29.6498***	3.3577***	0.8402	1.4444		
Lansforsakringar Wasa Globalfonden	-0.0023	0.9597	-0.0552	0.0509	0.0049	0.8263	169
	-1.8840*	19.8983***	-1.1354	0.5859	0.1216		

Notes: This table represents results of the ethical and non-ethical fund performance evaluation through implementation of the four-factor model. The funds were taken from the list composed and published in Kreander et al. (2005). Only funds which were open during the overall period of the analysis were included in the list. The first column represents the name of the fund, follow by the intercept, risk exposure results, followed by the evaluation of small-cap stock exposure, growth stocks exposure, momentum estimates, as well as R-squared and the number of observations. *** 1% significance level; ** 5% significance level; * 10% significance level.

Overall, the model applied to analyse the performance of the ethical funds appeared to have a strong explanatory power, with only three cases of indicators dropping below the 70% level. Funds appeared to be exposed to high-performing stocks, apart from five. The momentum indicator appeared to be statistically insignificant for all the funds expect the Scottish Mutual Int. Growth, which was positively related to the factor at a 5% significance level. The model retained a strong explanatory power when applied to the conventional funds, with the weakest indicator remaining above 70%.

Conventional funds did not demonstrate statistically significant abnormal performance. The Henderson UK Capital Growth Fund demonstrated the highest alpha coefficient of 0.0040 at the 1% significance level. The rest of the alpha indicators did not demonstrate a statistically significant performance. Another statistically significant performance coefficient belonged to these funds, in which alpha appeared negative at the 10% level. Despite fewer non-ethical funds demonstrating lower survival rates, positive alpha indicators occurred more often in the dataset. In comparison to the ethical funds, a larger number of conventional funds demonstrated higher exposure to market risk, with the beta coefficient rising above 1 in 40% of cases. Risk indicator of funds remained close to the market at a range between 0.9904 and 0.9045. Similar to the SRI funds, the risk-adjusted returns of only three conventional funds were exposed to large-cap companies' stocks, with no coefficients appearing statistically significant. However, the sample size of the conventional funds is significantly smaller, therefore it could be suggested that a larger part of the funds was subjected to large-cap stocks' exposure.

A statistically significant exposure to small-stock companies at the 5%, 1% and 1% levels was demonstrated by the Cavendish Worldwide, Henderson UK Capital Growth Fund, and Rathbone Income & Growth Fund, respectively. Apart from the HSBC European Growth Fund, no other fund in the group showed exposure to growth stocks. The coefficient of the Henderson UK Capital Growth Fund and the Scottish Mutual Int. Growth had statistically strong results. The results appear to be similar to those of the ethical funds, taking sample size differences into consideration.

The influence of the momentum of fund performance varies strongly, with no statistically significant coefficients. The loading on the MOM factor appeared insignificant for most of the funds. The coefficients presented mixed results, with equally positive and negative exposure to the MOM factor. Nevertheless, given the relatively smaller size of the sample, in comparison to the ethical funds, a negative momentum coefficient occurs more frequently in the case of the conventional funds.

Ethical funds showed weaker performance in comparison to the benchmark, unlike the conventional funds. However, the risk-adjusted returns of the non-ethical funds also appeared to be exposed to higher levels of risk. The results of this analysis could be compared to those presented in Kreander et al. (2005), both portfolios performing evenly.

In order to take a closer look at the performance of ethical and non-ethical funds, ethical and conventional portfolios were constructed, which included stocks with small, medium or large capitalisation. In addition, performance of the long-short portfolio of the remaining pairs of funds was estimated, similar to methodology, presented in the work of Kempf and Osthoff (2007). Table 2.10 represents the results of a long-short portfolio evaluation of fund pairs, matched according to the cross-section presented in Kreander et al. (2005). Only one case of outperformance was market with a statistically significant coefficient. Overall, the difference in coefficient did not appear significant. Long – short portfolio did not reveal prevalence in the performance strength of one particular type of portfolio.

The robustness tests did not reveal abnormal performance of ethical or conventional portfolios. These results suggest the academic discussion over abnormal performance associated with ethical fund specification to remain open.

Table 2.10 Long-Short Portfolio of Matched Funds

Name of paired funds	Intercept	Market exposure	SMB exposure	HML exposure	MOM exposure	Adjusted R-squared	No of observations
Aberdeen Ethical - Cavendish Worldwide	-0.0011	0.0447	-0.1367	0.0252	-0.0493	0.1131	169
T-Stats	(-0.9506)	(0.9839)	(-2.9897)**	(0.4083)	(-1.2293)		
ABF Andere Beleggingsfond - Ing Bank Global	-0.0017	-0.5064	-0.0950	-0.1009	0.0395	0.5691	169
T-Stats	(-1.4262)	(-1.1116)***	(-1.9629)*	(-1.4984)	(1.2616)		
CIS Environ Trust - HSBC European Growth Fund	-0.0005	-0.2759	0.0621	0.1438	0.0386	0.1553	169
T-Stats	(-0.2219)	(-5.4348)***	(0.6160)	(1.1185)	(0.6061)		
Framlington Health Fund - Old Mutual Worldwide Trust	-0.0023	-0.2377	-0.0497	-0.2152	-0.0660	0.1015	169
T-Stats	(-0.9550)	(-3.1031)***	(-0.6791)	(-2.1085)**	(-0.8456)		
Friends Provident Stewardship Unit Trustl - Equitable High Income Trust	0.0005	-0.0521	0.2437	0.1861	-0.0003	0.2817	169
T-Stats	(0.4078)	(-1.2975)	(6.7248)***	(3.7699)***	(-0.0101)		
Jupiter Ecology - Scottish Life Worldwide	0.0020	0.0615	0.3239	0.0809	0.0224	0.2152	169
T-Stats	(1.3552)	(1.1626)	(5.6467)***	(1.2556)	(0.5686)		
Scottish Equitable Ethicalt - Rathbone Income & Growth Fund	0.0024	0.1067	0.1666	0.0347	-0.0044	0.1045	169
T-Stats	(1.7119)**	(2.8217)***	(3.9108)***	(0.5755)	(-0.0804)		

Notes: This table showcases the results of the long-short portfolio evaluation. The funds were paired according to the practice presented in Kreander et al. (2005). Only pairs where both funds "survived" over the period subjected to the analysis were evaluated. The pairs are represented in the first column. A four-factor analysis was applied, with a cross-section of 169 observations. *** 1% significance level; ** 5% significance level; * 10% significance level.

2.7 Concluding Remarks

The ethical approach to investment practices grants extensive opportunities to investors and fund managers to diversify and account for responsibility. It has generated significant interest from the academic community. Despite the growing body of literature, the argument over financial benefits, attributed to ethical settings in funds, has not been settled yet. In contrast, academics appear to agree more on behavioural aspects which show evidence of investors' loyalty to the SRI practices (Bollen, 2007).

A number of studies indicated the presence of survivorship bias (Bauer et al, 2005; Gregory and Whittaker, 2007). Despite growing examples of SRI funds to demonstrate stronger survival capabilities, academics have not thoroughly explored the potential effect that ethical characteristics could impose on funds' survival capabilities. This essay represents a deep assessment of the survival of the funds and the impact the ethical investment approach could have on it. In addition, it has reviewed the opportunities for asset managers to improve earnings in association with sustainable investing, through exploration of fund survival capability, which further expands the work of Gil-Bazo et al. (2010).

The dataset developed in the study conducted by Kreander et al. (2005) was used as the foundation for the empirical evaluation. The majority of available studies ground the analyses on an *ex post* basis, where survivorship bias could arise (Chegut et al., 2011). This analysis was made *ex ante* in order to address funds' potential survival issues. The Chi-squared test allowed the detection of whether the SRI specification had a direct impact on the survival rates. The Cox (1972) proportional hazard model further supported the effect that ethical specification has on survival capabilities of the fund. The Carhart (1997) four-factor model was introduced as an analytical tool.

SRI funds demonstrate stronger survival rates over time. Analysis suggests it to be linked to the ethical specifications. Robustness tests did not indicate significant abnormal performance of both, ethical and conventional funds, supporting previously presented evidence in the work of Kreander et al. (2006), Renneboog et al. (2006) and many others.

Evidence demonstrated in this essay further expands methodological tool-kit applied to study ethical funds, and implements survival analysis, translated from IPO and survival literature (Carpentier and Suret (2011), Espenlaub et al (2012) and Espenlaub et al (2016)).

From a practical perspective, it expands studies of Bollen (2007) and Gil-Bazo et al (2010), as the evidence brings bring positive implications for asset management firms and their fee structure. The accumulating evidence from previous studies suggest ethical and non-ethical funds perform on a similar level, which would indicates ethical investment to be the choice of managers who are willing to reflect their values in the investment process. Arguably, SRI fund development has not signalled an opportunity to improve income for asset management companies, as the size of the fees does not differentiate amongst studies of fund types (Gil-Bazo et al, 2010). New results might suggest the opportunity for investment managers to secure a steady fee-based income, as SRI funds would provide longer-term fee inflows.

The finding that positive ethical specifications impact on fund survival opens a further discussion, which requires a wider dataset. It is important to continue the exploration of potential benefits, which asset managers could extrapolate through applying ethical methods in investment in order for the industry to prosper. Since the study was mainly focused in the European region and the UK, it is important to develop a larger framework in order to continue its expansion across the USA. The evidence of strong survival capabilities suggests taking survivorship bias very seriously in future analysis.

Essay 3: Do Sell-Side Analysts Generate Value through ESG?

First Evidence from European Brokerage Firms

Abstract

In 2018 firms, which provide services to clients linked to financial instruments will be subjected to new legislation: the Markets in Financial Instrument Directives II. Updated legislation is expected to affect significantly the operating processes of sell-side brokers. As new regulations encourage increase in fees transparency, it has a strong impact on the commission factor for brokerage, which would require a significant change in the operational structure to survive. This essay focuses on examining broker value generation ability, based on the example of a French sell-side brokerage house. The firm developed an in-house ESG rating and recommendations as a means to diversify the services it offers to clients. The essay analyses the recommendation-based and ESG-ranking based portfolios of French and European stocks. The results indicated value generation capabilities linked to the introduction of recommendations by the broker within ESG universe, however no ability to generate consistent outperformance.

3.1 Introduction

Services provided by brokerage houses could be seen as the vascular system of the financial markets. The companies issue stock recommendations for buy-side clients and execute deals. The implementation of the new Markets in Financial Investments Directives (MiFID II) will jeopardize the established operational model of brokers, which could lead to many participants leaving the market for good. This essay explores new value creation opportunities for sell-side brokers, focusing on the example of the French brokerage house and investment firm Oddo and Cie.[22]

Brokerage houses hold established sell-side positions on financial markets. Broker dealers' services comprise trade execution as well as research, which include recommendations and forecasting. These services represent the value generation channel for brokers. The buy-side, represented by fund managers, vastly relies on the information provided by sell-side research, as information access remains a source of competitive advantage. In the majority of cases, as highlighted Maber et al. (2014), the buy-side pays for the brokers' services on the basis of trading commission ("soft dollars"). As brokerage houses execute trading in addition to research, the commission charge combines the research and trade execution.

Broker deals, for fees charged for services, are the key source of income. Despite long-standing attention to the accuracy of the services, including recommendations and the ability to generate value, brokers have been operating on a commission basis for decades. Academics and professionals have pointed to certain inconveniences related to this system, suggesting that it allows brokerage houses to hide information on costs and create a certain level of opaqueness in the market (Womack, 1996; Barber et al., 2001; Marber et al., 2014). As indicated in Ioannou and Serafeim (2015), the existent commission-based system gives full control over pricing for research to brokers.

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[22] In 2016 Oddo and Cie accomplished the acquisition of the Belgian financial services group BHF Kleinwort Benson Group. This led to the formation of a Franco-German financial group Oddo BHF. In this essay the firm is still referred to in accordance with the previous name. Source: < https://www.bhf-bank.com/privatbank/oddo-cie-becomes-oddo-bhf-and-presents-the-first-integrated-results-and-its-new-organisation-00254-en/index.en.jsp>, accessed 12 June 2017.

The changes in the European legislation through implementation of MiFID II strongly affects existent practices and, as predicted by market players and industry reports (Deloitte, 2014; PwC, 2016; Bloomberg, 2017), will irrevocably transform financial markets and sell-side and buy-side relationships. New regulations designed to facilitate transparency, and enable buy-side to access services based on the quality standards.

However, with the new regulations traders in the European Union will have to report a host of information to demonstrate they are executing clients' trade at the best prices and in the right venues. These innovations are expected to boost the implementation of machines to replace certain functions, as highlighted in the PWC report (2016). The new regulations are expected to have an impact on retail banks and asset managers; however, brokers might be affected the most.

An overview of MiFID II implications on sell-side brokers are summarized in Table 3.1.

Under new regulations price, transactions costs, speed of execution and likelihood of execution are amongst the aspects of brokers' activities to undergo drastic changes, as brokers will be required to provide full transparency and demonstrate best execution (EY, 2015). The new regulations will tighten the control over soft-dollar commission for research, and are expected to influence strongly brokers' value generation capabilities (PwC, 2016). Under the new rules, brokers are expected to separate execution and research fees, and disclose prices prior to the execution of services. These changes will eliminate relationship-based interaction, and allow clients to access products of the highest quality. However, from the brokerage perspective, the new regulations will jeopardize their competitiveness and negatively impact value creation opportunities. Industry reports (PWC, 2016; Bloomberg, 2017) predict that the biggest players will be capable of holding on in the new competitive environment, whilst boutique and smaller players will be at high risk of disappearing from the market.

The changing landscape of the financial markets sends a strong signal to players to revaluate existing strategies in order to survive. Under these changing circumstances, it could be argued, the growing area of the ESG approach might introduce new opportunities for brokers that have been previously ignored. A variety of techniques affiliated to the concept allow market participants to advance new improved long-term strategies and develop new range of products to target existent and attract new clients. Brokerage houses' access to data

combined with rising demand for quality ESG-related information introduces a new path for profitability.

Table 3.1 Implications of MIFID II Introduction and Comparison of the Buy-Side and Sell-Side

Category	Buy-side	Sell-side before MIFID II introduction	Sell-side after MIFID II introduction
Fees	Fees charged for the service provided by sell-side	Charge fees as a part of the product bundle: blended advisory and execution rate	Execution-only rate charged above; advisory budget is pre-agreed with the buy side
Fees2	Broker voting practices	"Consume now – pay later"	"Pay now – consume later"
Competition		"Relationship" based	Based on the price and quality of services
Content	Fully rely on content provided by the sell-side/establish in-house analyst teams	Duplicating offering with content overlap	Reduction of content overlap
Trade reporting and market access	Issues with assessing and quantifying sell-side contribution	Prices not revealed in advance; prices not divided; closed trading platforms	Brokers to post prices and trades for a broad range of securities; open trading platforms
Products	Use reports provided by sell-side analysts; additionally develop own research, which is not available to the general public	Provide recommendations; issue reports available to public	Provide exclusive rating structure not available to general public; provide recommendations; report availability limited to the type of access chosen by client and general public

Notes: This table shows the potential changes in the activity of sell-side companies in response to MiFID II implementation. In addition it draws a parallel with buy-side activity, highlighting the opportunities for the sell-side to implement some of the buy-side characteristics.

As brokerage houses interest towards ESG themes was narrow, existent research dedicated to exploring ESG and brokerage activities is very limited and rooted in CSR topics. The existent literature demonstrates growing evidence of material benefits linked to sustainability. Ioannou and Serafeim (2010) revealed that CSR has a positive effect on value creation and indicated that firms' CSR strategy encourages more favourable recommendations from sell-side brokers. Khan et al. (2015) introduced material and non-material sustainability issues and suggested none of the categories to have a destructive influence on value creation, as well as linked positive performance on material sustainability issues. Luo et al. (2014) suggested brokers play an important role in removing ambiguity and inventors' uncertainty towards CSR and ESG, through improved recommendations.

As the rise of voluntary ESG implementation across financial services generates a vast amount of questions regarding the procedures and criteria, the demand for the ESG ranking system has significantly risen. Lack of a regulatory body represents an opportunity for a company to develop an independent ESG ranking system. Brokers have a wide access to the information thought-out it research services. Therefore the houses could have an alleged advantage when adopting ESG research and recommendation practices. Current study reviews brokerage attempt to take advantage of its research strengths through creation of the ESG ranking, which the company attempted to do to withstand market competition and attract new clients seeking to adopt ESG.

As studies by Loue et al (2014) indicated beneficial role of broker in developing CSR and ESG-related recommendations for investors. And Escrig-Olmedo et al. (2010) raise attention towards the growing role of ranking and recommendations for investors. And market conditions enforce brokers to find new value generation capabilities, this essay explores further value generation opportunities for brokerage services with a focus on recommendations in relation to ESG. The angle of the research was determined by the data, provided by the sell-side broker. Data availability stands as a hurdle for research development in the area. Therefore, a unique opportunity to explore a dataset provided by the industry player was used to maximum advantage.

In order to study the value generation opportunity of brokerage recommendations, a portfolio analysis was implemented. The Oddo provided limited information regarding the ranking, without actual scale. The recommendations were used to generate European and French-based portfolios, using the universe, provided by Oddo. Further the data was used to

create a portfolio based on the ESG ranking of each company, using the ASSSET4 database. Further, alternative portfolio based on the European and French SRI fund data were created, as well as Sustainability Index data, to compare the results. Long-Short portfolio strategy was presented as robustness test. The results appeared inconsistent across portfolios, with prevalence of negative alpha, with high significance.

As this essay analyses the attempt to create a service, previously not supplied by a sell-side broker through development of an ESG ranking and providing ESG recommendations, it generates both practical and theoretical contributions. It explores opportunities for sell-side brokers to diversify and retain its competitive advantage amid the changing regulatory landscape. This is an important subject from a practical perspective, due to increasing pressure and tightening of competition (Bloomberg, 2017; KPMG, 2017). As brokers are obliged to develop prices in advance (Bloomberg, 2018), the competitive edge significantly narrows. This essay evaluates an alternative method of gaining competitive advantage, rather than focusing on the pricing.

From the theoretical perspective, this essay adds diversity to the literature dedicated to ESG ranking. In Chatterji and Levine (2006), Escrig-Olmedo et al. (2010), Delmas and Blass (2010) and Dorfleitner et al. (2015) the authors explore the development and application of various sustainability rankings. Escrig-Olmedo et al. (2010) highlighted the rising importance of sustainability rankings as an instrument to encourage investors to adopt sustainable investment approaches. Chatterji et al (2009) highlighted the diversity of ranking systems and the criteria applied, linking it to compatibility issues and investor confusion. Regardless, the rising trend for ESG implementation encourages investors to seek for a reliable ranking system. Due to the costs of the procedure, many investors are looking to outsource the operation (Dorflietner et al., 2015). However, studies are mostly focused on the rating agencies' services. This study overviews the brokerage company as an alternative player in the sector.

The rest of this essay is structured as follows. The next section provides an overview of the existing literature, which offers insight into the current state of research as well as an understanding of the issue in the industry. The following section introduces the methodology, which is applied to the analysis of the European and French portfolios, created to evaluate the potential of implementing an ESG rating, which can shed light on the opportunities for brokers in a changing financial climate. This is followed by a detailed introduction of the

data, which provides a unique opportunity for analysing the broker and exploring ESG-related opportunities. Next, the results, robustness tests are presented and the findings summarized.

3.2 Literature Review

Gathering and analysing financial information is known to be a costly activity. The buy-side values high quality information and prioritizes prime access to it, as it is linked to generating excess returns opportunities (Gilson et al., 2001). Investors seek to expand their in-house ability to do research. However, due to high expenses and limited information outreach, the key source of information comes from the relationship with broker dealers, who are able to provide an extensive amount of information covering various markets as well as providing the trade execution service (Groysberg et al., 2013).

3.2.1 Sell-Side Brokers' and Financial Markets

The academic community has been closely watching brokers' activities and their implications for capital markets, focusing on the quality of recommendations, value generation ability and the dynamic of the relationship with clients.

Numerous academics supported the importance of the broker dealers' role in information transfer across the markets (Gilson et al., 2001; Gleason and Lee, 2003). The quality of recommendations draws academics' attention. They link it directly to the value generation capabilities of sell-side brokers, as suggested in Womack (1996). The author provided evidence of stock picking and market timing abilities as expressed by research analysts (Womack, 1996). The following research papers provided further evidence of sell-side ability to affect stock process and trading volumes (Francis and Soffer, 1997; Barber et al., 2001). Jegadeesh et al. (2004) suggested two alternative ways of value creation. One through developing recommendations on the basis of certain criteria associated with future returns predictions. The second is derived from analysts' information processing ability, which would allow identifying over and undervalued stocks. Due to the broker priority of value creation, certain studies have confronted the quality of recommendations. Eames et al. (1999) argued that research analysts suffering from "objectivity illusion" (p. 102), as well as the research of Mola and Guidolin (2009), produced evidence of recommendations being overly positive. Rising evidence suggested an interpersonal relation impacts on the

recommendations settings. Mola and Guidolin (2009) revealed ties between the degree of recommendation and the affiliation between brokers and funds. Cohen et al. (2010) demonstrated that former educational ties between the buy and sell-sides play a role in the quality of recommendations. Additionally Green et al. (2014) presented evidence of dependencies of analyst advantage on the information access gained through interpersonal communication.

Brokerage houses function on a commission basis. The compensation system remains highly opaque in the industry, as brokers are not obliged to disclose detailed information on the structure of the commission, and service exchange rarely takes place through direct transaction (Brennan and Chrodia, 1993). Buy-side clients pay a fixed commission fee, which combines research fees and execution rates. Researchers could not provide clear evidence of brokers' compensation dependency on the quality of recommendations. Groysberg et al. (2010) indicated that analysts' popularity and recognition as an "All-Star", or as ranking amongst the top stock pickers, affects remuneration.

3.2.2 MiFID II Implications

The new regulations (MiFID II), which are introduced in 2018, are expected to bring significant changes to the operational model of sell-side brokers. Very little information is available which reflects the potential changes associated with MiFID II, and there are no analytics available on the issue either.

Change driven by effort to improve market transparency would directly impact on the opaque broker dealer fee structure, enforcing the revealing and separating of charges for research and execution. These measures would enforce brokers to improve the quality of research as a matter of tighter competition, as the clients will be able to estimate the value and compare the prices of research, as suggested by the repost published by Bloomberg.[23] However, such factors as the expanding number of in-house research analysts, rising costs, the natural reduction of clients and rising competition create an extremely unfavourable environment for brokers, where the majority of weaker industry players are predicted to withdraw from the market (D'Antona, 2017).

In the changing environment sell-side brokers are looking for the opportunity to find an alternative way to generate value. The current essay focuses on the example of a brokerage

[23]Bloomberg: MiFID II. Intake. < https://www.bloomberg.com/quicktake/mifid-making-markets-fair>, accessed 1 September 2016.

firm attempting to generate value through suggesting an alternative product. In response to the growing demand for the ESG-related product, Oddo and Cie developed its own sustainability rating. It is important to overview the trajectory of sustainable rating developments, to estimate its potential.

It is important to note that this is the first attempt of a broker dealer to develop an ESG product. Therefore no academic studies were conducted on the subject of an ESG framework and brokerage. However, there are studies available, which focus on sell-side brokers' capabilities to add value. Ryan and Taffler (2006) could be highlighted, as these authors drew attention to the growing market consolidation and initial rise of research costs, which were predicted to have a negative impact on brokerage services. These findings indicate an additional burden, which falls on the brokers under changing market circumstances.

3.2.3 Sell-Side Broker and ESG

ESG is becoming a popular research subject amongst brokers, which is reflected in the growing number of reports. In late 2013 the report of Novethic drew attention to emerging brokers who were attempting to introduce non-financial analysis into their practices. Among these were SG CIB (Société Générale Corporate and Investment Banking), [24] Kepler Cheuvreux[25] and Oddo Securities, which take a central place in the analysis of the current study. The report suggested that brokers were seeking potential benefits and attracting new clients through the adoption of ESG-related practices (Novethic, 2013). The direction of the broker's interest towards ESG was initially directed towards research opportunities. In-house development of ESG ranking is a novel approach, explored in the current study.

The demand for sustainability ratings and ESG recommendations has significantly grown. The rise is determined by companies, which search for a comprehensive ESG evaluation methodology, which could be implemented in the investment process (Richardson and Cragg, 2009; Scalet and Kelly, 2007). The potential benefits, which ratings bring for financial performance, were noted in the meta-analysis presented in Orlitzky et al. (2003) and Chatterji et al. (2009). Originally the practice was implemented as part of the CSR. The ratings and indices were applied as part of the evaluation of CSR benefits and the investigation of its connection to corporate financial performance (Fowler and Hope, 2007).

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[24] SG CIB: https://cib.societegenerale.com/en/,accessed 2 September 2016.

[25] Kepler Cheuvreux: <www.keplercheuvreux.com/index2.aspx>, accessed 2 September 2016.

However, recently ESG assessment became an independent process more engaged with the investment process. Agencies provide a range of products, which are tailored to the customer's demands. A norm-based analysis implies evaluation of issues in accordance with international conventions and standards (Orlitzky et al., 2003; Chatterji et al., 2009).

There are different types of information and providers available to investors, namely social indices and rating agencies. Social indices track the performance of the companies, which satisfy ESG criteria. There are two indices currently on the market, the Domini 400 Social Index,[26] which is a value-weighted index that tracks companies in the USA, and the MSCI KLD 400 Social Index,[27] another market participant that provides a wide range of financial and non-financial data and actively participates in the further development of responsible investment. Agencies such as EIRIS Ltd (UK), MSCI ESG Research (USA), Sustainalytics (Netherlands) and Rep Risk (Switzerland) are among the leading and most active market participants. According to the report of Novethic (2013), traditional financial analysis providers, such as brokers, have begun to express interest in ESG ratings and providing non-financial analytics as an additional part of their business, with SGCIB (Société Generale Corporate and Investment Banking), Natixis and Oddo Securities among the leading agents.

ESG rating agencies and rankings were criticized for low transparency, standardization and objectivity (Fowler and Hope, 2007; Chatterji et al., 2009). The lack of a standardized approach in addition to a high level of privacy can impact on the accuracy of the ESG rating, which raises concerns and undermines the trust of investors. The report provided by Novethic (2013) characterized the ESG rating agencies' market as highly competitive and dynamic, yet concentrated. However, as was noted by Fowler and Hope (2007), the ESG ratings industry has a growth potential which suggests opportunities for new entrants. Therefore, it could be suggested, that Oddo and Cie have an opportunity for the product to succeed in the market, if it demonstrates competitive performance results.

[26] Domini Social Investments: <http://domini.com/>, accessed 10 September 2016.
[27] MSCI: www.msci.com/resources/factsheets/index_fact_sheet/msci-kld-400-social-index.pdf>,accessed 10 September 2016.

3.3 Methodology

The methodology applied in this study aims to evaluate value generation opportunity through the development of ESG recommendations as the new product and diversification opportunity for a sell-side broker. For the accuracy of the analysis it consists of two parts.

Firstly, the focus was made on assessment of the ESG recommendations developed by Oddo and Cie. The examination is performed through the empirical analysis of European and French equally and value-weighted portfolios built on the basis of data provided by the broker. Further, the data was analysed through the creation of ESG ranking-based portfolio using the ASSET4 data.

The second part includes evaluation of the alternative SRI French and European portfolio performances. Additionally a European sustainable benchmark was added to the analysis, developed to provide more in-depth evaluation of the accuracy of Oddo's database portfolio. As financial players are not prone to disclose the information regarding ESG factor evaluation methodologies, ASSET4 rating data was used to create ESG ranking based portfolio.

To study the ESG ranking-based portfolio, the analysis followed methodology presented in the study of Kempf and Osthoff (2007). Using the ASSET 4 ranking, equally and value-weighted portfolio were created. ASSET4 reports stock rating every April of the t-1 year. On the basis of the rating the portfolios are formed. Each portfolio is held till the next year. It is rebalanced every May of the year t, using the newly issued data to construct the portfolio for the following year (t+1). The procedure was repeated annually with similar time structure. This approach resulted in the times series of weekly returns data.

The portfolios were created following environmental, governance and social themes, as well as overall ESG scores, given by the rating provider. Each portfolio included companies provided by the Oddo and Cie. After the rating of companies issued each year, the portfolio companies were ranked in accordance with data. The top-ranked companies were included in the high-ranked portfolio; companies with the lowest ranking were included in the low-rated portfolio. Portfolio with consisted of 10%, 15% and 20% high and low rated stock scenarios. The portfolios are formed separately on the basis of each screen. The long-short portfolio represents a trading strategy, when long position is taken with the high-rated and going short position is in low-rated portfolio

Additionally, SRI-fund stocks based portfolios were introduced in order to compare the alpha generation capabilities to Oddo and Cie recommendations – based portfolio. Two

equally weighted based portfolios were introduced: the one, which represented European and French market. Introduction of European Sustainability index-based portfolio introduced another alternative to compare Oddo-based portfolio. Data for French sustainability index was not available.

Long-Short portfolio strategies were implemented as robustness tests, following Kempf and Osthoff (2007) methodology, which allow analysing if investor could generate positive alpha through alternating long and short positions. In addition, Oddo-based European and French small-medium and large stock – based portfolio were created to evaluate, if various market capitalisation of various stocks could impact portfolio's abnormal performance.

The CAPM is one of the most respected models applied within financial theory to evaluate the performance of portfolios and individual stocks. This model investigates the links between an asset's rerun fluctuation and the systematic risk the asset is bearing (Sharpe, 1964). The simplistic nature of the model allowed it to gain wide recognition; however, it cannot be applied as a universal evaluation tool.

Jensen addressed the forecasting abilities of the CAPM model in 1967. He modified the existing model by including the portfolio's beta and average market return, which allowed him to determine the portfolio or individual stock return over and above the ones predicted by CAPM.

As this study focuses on estimating the potential gains from the implementation of ESG criteria in the investment process, Jensen's CAPM model is an efficient instrument. It serves as an indicator of a portfolio's ability to generate excessive returns, as well as allowing comparison between the performances of different portfolios, as in equations (21) and (22):

$$\alpha_p = R_p - [\bar{R}_f + \beta_p(\bar{R}_m - R_f)] \qquad (21)$$

$$(r_{p,t} - r_{f,t-1}) = \alpha_p + \beta_p(r_{m,t} - r_{f,t-1}) + \varepsilon_{p,t} \qquad (22)$$

Where $(r_{p,t} - r_{f,t-1})$ is the continuously compounded return of portfolio *p* at time *t* in excess of the continuously compounded risk-free rate of return; α_p is the previously discussed Jensen's alpha; $(r_{m,t} - r_{f,t-1})$ is the continuously compounded return of the market *m* at time *t* in excess of the continuously compounded risk-free rate of return; the systematic risk exposure of portfolio *p* to the market over the sample period is represented by the coefficient β_p; and, last, $\varepsilon_{p,t}$ is a random disturbance term, implemented to seize the deviation of a fund's return variation, overlooked by the OLS regression.

The CAPM model was put under scrutiny when Banz (1981, p. 3) suggested it to be "misspecified" and provided evidence of smaller firms' tendency to generate higher risk-adjusted returns on average in comparison to larger firms. This phenomenon was called a "size effect". Fama and French (1993) also described another phenomenon related to stock returns. They provided evidence of book-to-market values and market capitalization factors that could influence expected returns. Fama and French (1993) reported in their paper that companies with a large market capitalization outperformed companies with a small market capitalization. In the same way, they demonstrated the evidence of stocks with a high book-to-market ratio outperforming in contrast with stocks with a low book-to-market ratio. In other words, value stocks have a tendency to outperform growth stocks. As a result, the authors presented a modified version of the CAPM model in their paper in 1993. Fama and French introduced the SMB factor, to control for the small-firm effect, and the HML factor, to control for the value premium (Fama and French, 1993); see equation (23):

$$(r_{p,t} - r_{f,t-1}) = \alpha_p + \beta_p(r_{m,t} - r_{f,t-1}) + \gamma_p SMB_t + \delta_p HML_t + \varepsilon_{p,t} \quad (23)$$

Where β_p and $(r_{m,t} - r_{f,t-1})$ are described as in equation (2); α_p represents portfolio *p*'s systematic return component not captured by the independent variables of the model; SMB_t is the continuously compounded return of small-cap stocks in excess of the continuously compounded return large-cap stocks at time *t*; HML_t is the continuously compounded return of value stocks in excess of the continuously compounded return of growth stocks at time *t*; γ_p and δ_p represent portfolio *p*'s exposure to small-cap and value investment styles, respectively; and $\varepsilon_{p,t}$ is a random disturbance term.

The Fama–French model was also applied in the analysis of the portfolio based on the Oddo & Cie data. Equally-weighted and value-weighted portfolios were subjected to the analysis, with one portfolio representing the European stock universe, and the other the French stock universe. A Newey–West (Newey and West, 1987) estimator was applied in the regression analysis to avoid autocorrelation and heteroscedasticity.

In order to perform an analysis with more depth, robustness tests were introduced to look more closely at the risk-adjusted performance by dividing the portfolio according to the market capitalization of the stocks. CAPM and Fama and French models were applied to the European and French stock universes. Each of the equally-weighted and value-weighted portfolios was divided according to company size. Stocks with a top 33.33% market capitalization calculated yearly were allocated to the portfolio with large market capitalization companies, followed by medium-sized stocks (66.66–33.33%), and small-cap firms (33.33–0.00%).

3.4 Data Description

3.4.1 Oddo and Cie ESG Approach

This study is constructed on the basis of data provided by the investment banking and capital management company Oddo and Cie. The company has been operating in the European market for over a century. It is placed amongst the strongest industry players, with brokerage business accounting for its substantial share. As new regulations were due to come into power in 2018, the company took a new approach to tackle the changing market conditions and the rise of competition, through diversifying the brokerage business. With the growing popularity of ESG-related products and rising investors demand for it, the company developed its ESG ranking. As developing the service in house becomes a heavy financial burden for a substantial amount of buy-side companies, Oddo provides leverage for this challenging task. The company has developed a growing ESG ranking since 2007. Exclusive access to the dataset allows investigating the product and assessing it as an alternative solution for sell-side market participants. The data, provided by the broker represented ESG recommendations, as the scale for the rating was not provide.

Oddo and Cie[28] revealed a strong positive attitude to the future of ESG development: "the 2010–2020 decade in terms of ESG integration and it may become the rule, with the practical merger of two main themes and sector best-in class" (SRI Convictions, ESG Integration – Just do it, p. 7). The company has developed a recommendation approach: an ESG model, which allows selecting stocks on the basis of the upstream test of information relevance and transparency, followed by integration of the best in class analysis. The ESG model of Oddo focuses on the business model, management quality and the financial statement as the prime criteria for evaluation. It characterizes the approach by the concentration of long-term ESG themes that contribute to sustainable development solutions (ageing populations, alternative energy, reducing exposure to the risk of corruption, etc.).

The model is constantly evolving as the industry diversifies. The original one-step approach was best in class on an industry-by-industry basis. It was further evolved into a two-step methodology: sector allocation in absolute terms and relative best-in class analysis sector by sector. This approach, as indicated Oddo and Cie, allowed addressing certain sectors that are highly intensive and ESG opportunities and risk.

At the first stage, the strategy team issues a rating of the stocks. The review and scoring is based on of 20 long-term ESG themes, such as energy efficiency, corruption or population ageing. The sectors that contribute (positive sector scores) more to sustainable development solutions than problems are thereby overweighed. Conversely, sectors that we find contribute more to sustainable development problems than solutions (negative sector scores) are underweighted. On the basis of the sum of market capitalization data, overweighed sectors balance out the underweighted sectors (the "market neutral" approach). This allows identifying the sector with the optimal risk/opportunity pairing.

At the second stage, a sector-by-sector best in class analysis is implemented. The ESG factors are assessed in absolute terms.

[28] Oddo and Cie provided equity report "SRI Conviction – ESG Integration, Just DO it", issued for investors in addition to the dataset. It introduced its methodological approach. However, the report did not provide in-depth details of the methodology, apart from the one translated in this paper.

3.4.2 Data Sample

The data provided by the company, in addition to the overview of its methodology, included its yearly ESG forecast for the period from December 2007 to December 2016. The data contained the company name as well as the matching international securities' identification numbers (ISINs). Oddo provided a list with the companies; however it did not provide a detailed methodology applied for the selection. Due to this reason the focus was on the quantitative evaluation. The ESG investment universe contained 380 companies in 2016. The number of companies has increased over the years, with the dataset accounting for 89 companies in 2008, 120 in 2009, and 140, 170, 200, 220, 250 and 255 in 2010, 2011, 2012, 2013, 2014 and 2015, respectively. Companies were represented by 11 industries, including basic materials, communication services, consumer cyclical, consumer defensive, energy, financial services, healthcare, industrials, real estate, technology and utilities. Companies, which represent the industrial sector, have a dominating presence in the universe, accounting for a quarter of it. Technology and consumer cyclical follow, accounting for the second quarter of the cross-section.

Fifteen European countries were present in the list of ESG companies. The majority of those on the list were in France and the UK, followed by Switzerland, Sweden, Spain, Norway, the Netherlands, Italy, Germany, Finland, Denmark, Belgium and Austria; Ireland and Portugal only had four representatives each. The dataset was used to create two different portfolios. A complete list of companies was used as the basis of a European portfolio, whereas the data on French companies' returns were additionally used separately to create a French portfolio.

The market data for the ESG companies was retrieved from Datastream. The Total Return Index and Market Value data was downloaded for the period from December 2007 to December 2015. The data were downloaded in local and euro currencies in order to verify the accuracy of the Datastream data. The European currency was used as the main one for the analysis. Weekly data were collated for the dataset that provided the larger number of observations, allowing us to perform an empirical analysis at a deeper level, as well as to align the calculations to the calendar of the trading days on the markets.

To create ESG rating-based portfolio, Thomson Reuter's ASSET4 rating[29] was used to collect ESG-related data. The rating has an established reputation in the academic community and has a wide range of application; dedicated to study sustainability and ESG-related events (Wimmer, 2013; Halbritter and Dorfleitner, 2015).

The rating was created to evaluate ESG performance of the companies; and tailored to eliminate assessment biases. ASSET4 rating provides a global coverage, with the universe accounting for over 7000 companies. The rating incorporates over 400 ESG measures, which are separated in accordance with 10 themes and is based on the information provided by the companies. ASSET4 uses information provided in the company reports. The data is grouped under 10 categories, which covers three key scores: Environmental (Resource use, Emission, Innovation), Governance (Management, Shareholders, CSR Strategy) and Social (Workforce, Human Rights, Community, Responsibility). There is also a joined ESG score, ESG Controversies Score and ESG combined score, which incorporates ESG score and ESG controversies score. 10 categories were applied to create portfolios and measure the performance.

3.4.3 Portfolio Construction

For the comparative analysis the portfolio of European and the portfolio of French SRI funds were created. The Total Return Index data were downloaded for the period December 2007 to December 2015 from Bloomberg. As Market Value data were not available, the analysis was narrowed to the creation of an equally weighted portfolio only.

The European Stoxx Europe 600 index[30] and the French SBF 120 index[31] were used to create a market benchmark for the European and French portfolios. The total return index data were retrieved on a weekly basis. Stoxx Europe 600 and SBF 120 are value-weighted indexes, composed of small, medium and large-cap companies. Stoxx Europe 600 includes companies from the UK, France, Switzerland, Germany, Sweden, Spain, the Netherlands, Italy, Denmark and Belgium, whereas the SBF 120 tracks 120 French companies. The Stoxx Sustainability 40 Return Index[32] was used to create a sustainable benchmark for the European

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[29] Thomson Reuters ASSET4:https://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/financial/esg-scores-methodology.pdf, accessed July, 10

[30] Stoxx Digital:< www.stoxx.com>, accessed 10 September 2016.

[31] EURONEXT: <www.euronext.com>, accessed 10 September 2016.

[32] Stoxx Sustainability 40 ReturnIndex:https://www.stoxx.com/document/Bookmarks/CurrentFactsheets/SUBU.pdf>, access 10 Sept 2016

market. The total return index data were retrieved on a weekly basis. An important discovery was made during the process. No sustainability index was detected in France. The importance of this finding derives from the fact that France is the leading market for responsible investment; therefore the lack of a sustainability market index stands out significantly and should be addressed in the future. This imposed a further limitation on the analysis.

The risk-free rate of return applied in the model was created on the basis of the three-month Euribor rate.

The investment style benchmark was generated on the basis of weekly return data from the MSCI Europe Small Cap index, the MSCI Europe Large Cap index, the MSCI Europe Value index, the MSCI Europe Growth index, the MSCI French Small Cap index, the MSCI French Large Cap index, the MSCI French Value index and the MSCI French Growth index. The MSCI Europe indexes are spread over 15 developed markets. The Small Cap index covers around 14% of the free float-adjusted market cap of the European equity universe, whereas the Large Cap index covers 70%. The value and growth indexes are built on the basis of large and mid-cap securities, which align with value and growth style characteristics, respectively.[33]

All the collected data were adjusted to the weekly based observations and transformed to fit the model.

The three-month Euribor rate of return was collected on an annual basis and transformed to fit the weekly-based timeframe, as in equation (24):

$$r_{f,t.1w} = ln\left[\left(1 + sr_{f,1y}/100\right)^{7/365.25}\right] \qquad (24)$$

Where $sr_{f,t,1y}$ is the annualized three-month Euribor rate at time t and $r_{f,t.1w}$ is the weekly risk-free rate of return at time t.

[33] MSCI: < www.msci.com>, accessed 10 September 2016.

To define the portfolio's excess returns and create benchmark returns, the total return indices were transformed through the application of continuously compounded rates of return to the return index, as in equation (25):

$$r_{i,t} = ln(p_{i,t}/p_{i,t-1}) \qquad (25)$$

Where $p_{i,t}$ is the total return of firm or index *i* at time *t*, $p_{i,t-1}$ is the total return of firm or index *i* at time *t*–1, and $r_{i,t}$ is the continuously compounded rate of return of stock or index *i* at time *t*. To construct the excess market returns or excess firm returns, the weekly risk-free rate of return at time *t*–1 is subtracted from the continuously compounded rate of return of stock or index *i* at time *t*.

Both equally and value-weighted portfolios were constructed for the regression analysis. To construct the continuously compounded rates of return for an equally weighted portfolio we employ equation (26):

$$r_{pt} = \ln\left[\frac{1}{N}\left(\frac{p_{i,1,t}}{p_{i,1,t-1}} + \frac{p_{i,2,t}}{p_{i,2,t-1}} + \cdots + \frac{p_{i,N,t}}{p_{i,N,t-1}}\right)\right] \qquad (26)$$

Where the simple returns of each stock are first summed and then divided by the number of stocks contained in the portfolio, represented by N, at time *t*. The continuously compounded rate of return (r_{pt}) for portfolio *p* at time *t* is the natural logarithm of the previously mentioned calculations.

The continuously compounded rate of return for a value-weighted portfolio *p* at time *t* is the natural logarithm of the weighted sums of each stock's simple return at time *t* where each stock is weighted by its market capitalization in proportion to the overall portfolio at time *t*–1, as in equation (27):

$$r_{pt} = \ln\left[\left(w_{i,1,t-1}x\frac{p_{i,1,t}}{p_{i,1,t-1}} + w_{i,2,t-1}x\frac{p_{i,2,t}}{p_{i,2,t-1}} + \cdots + w_{i,N,t-1}x\frac{p_{i,N,t}}{p_{i,N,t-1}}\right)\right] \qquad (27)$$

To calculate the excess returns of either portfolio, the weekly risk-free rate of return at time *t*–1 is subtracted from the continuously compounded rate of return of the chosen portfolio.

MSCI indexes were used to construct the investment style SMB and HML factors for the European and French equally-weighted and value-weighted portfolios. The SMB factor was created on the basis of the MSCI European Small Cap index, the MSCI European Large Cap index, the MSCI French Small Cap index and the MSCI French Large Cap index returns. The premium was calculated as the difference between the continuously compounded rate of return of the small-cap index at time *t* and the continuously compounded return of the large-cap index at time *t*. The HML factor was constructed in a similar way. The continuously compounded rates of return were calculated for the growth and value indices. The continuously compounded rates of return of the growth index were then deducted from the return of the value index, to define the premium.

The methodology described above was applied to the database of the complete European investment universe and solely French equities from the provided list of ESG companies. In order to analyse the impact of small, mid and large-cap companies on the portfolio's risk-adjusted performance, the three cases were then analysed separately by applying a similar methodology.

3.5 Results and Discussion

The results of the analysis provide an overview of European and French portfolio performance constructed on the basis of an ESG best-in-class equity universe provided by Oddo & Cie.

Table 3.2 represents the results for the regression analysis of European equally-weighted and value-weighted portfolios.

Table 3.2 European Portfolio

	CAPM model		Fama–French model					
Portfolio weights	Alpha	Beta	Alpha	Beta	SMB	HML	Adj R^2 CAPM	Adj R^2 FF
Equally weighted	-0.0033*** (-3.91)	1.0123*** (49.94)	-0.0040*** (-5.22)	0.9978*** (71.84)	0.4445*** (8.69)	0.1013** (2.12)	0.912	0.938
Value-weighted	0.0011*** (2.92)	0.9958*** (67.77)	0.0008*** (2.93)	0.9715*** (94.62)	-0.0467*** (-1.39)	0.1233*** (3.33)	0.976	0.979

Notes: This table represents the analysis results of a European equally weighted and value-weighted portfolio evaluation. The table combined results for two methodologies: the CAPM model and the Fama–French model. The second and third column represents the results for the alpha and risk indicators of the CAPM model. Results for both equally and value-weighted portfolios are presented. The next set of columns represents the Fama–French model, including alpha, beta indicators, small-cap stock exposure, and growth stock exposure. The adjusted R-squared indicators are listed in the two final columns. *** 1% significance level; ** 5% significance level; * 10% significance level.

The results of the regression analysis appear to demonstrate strong statistical significance. In the equally weighted portfolio assessment with the application of the CAPM model, alpha appeared to be negative. The market coefficient under the CAPM model appeared significant estimated.. In contrast to the equally weighted portfolio, the value-weighted portfolio generated a statistically significant positive alpha with a coefficient of 0.0011, measured on a weekly basis. In both variations, the CAPM model appeared to have a strong exploratory power of 91% for the equally weighted portfolio, and a stronger power of over 97% in the setting of the value-weighted portfolio.

In the Fama–French results, appeared significant estimated demonstrated a weaker risk-adjusted performance of the equally weighted portfolio against the benchmark, with a negative, yet strongly significant alpha coefficient of 0.004. In the context of the value-weighted portfolio, alpha appeared positive with a strong statistical significance. The systematic risk of the equally weighted portfolio appeared to be less volatile than the market. Exposure to the different investment styles portrays small-cap stocks to have an impact on the performance as well as the value of stocks in the case of the equally weighted portfolio. In the case of the value-weighted ESG portfolio, the performance is exposed to the large-cap stock, with a 0.0467 coefficient. The value-weighted portfolio has an exposure to value stocks under a 1% significance level. The Fama–French model demonstrates a strong explanatory power for the risk-adjusted performance of the equally and value-weighted portfolios.

Table 3.3 combines the results from the analysis of the French ESG portfolio.

Table 3.3 French Portfolio

	CAPM model		Fama–French model					
Portfolio weights	Alpha	Beta	Alpha	Beta	SMB	HML	Adj R^2 CAPM	Adj R^2 FF
Equally weighted	-0.0047*** (-3.72)	0.9009*** (34.47)	-0.0048*** (-4.50)	0.9373*** (52.94)	0.5078*** (11.62)	-0.0385 (-1.01)	0.831	0.895
Value-weighted	-0.0005 (1.48)	0.9645*** (56.01)	0.0008* (1.78)	0.9704*** (51.85)	-0.0272 (-1.15)	-0.0580** (-1.98)	0.968	0.969

Notes: This table represents the analysis results of the French equally weighted and value-weighted portfolio evaluation. The table combines results for two methodologies: the CAPM model and the Fama–French model. The second and third columns represent the results for the alpha and risk indicators of the CAPM model. The results for both equally and value-weighted portfolios are presented. The next set of columns represents the Fama–French model, including alpha, beta indicators, small-cap stock exposure and growth stock exposure. The adjusted R-squared indicators are listed in the two final columns. *** 1% significance level; ** 5% significance level; * 10% significance level.

The regression analysis of the French portfolio provided statistically significant results. The performance of the equally weighted portfolio assessed through the implementation of the CAPM model is characterized by a negative alpha with a coefficient of 0.0026 with a significance of 1%. The alpha of the value-weighted portfolio demonstrated risk-adjusted outperformance; however, it appeared statistically insignificant. Market, size and book-to-market value appeared to have strong significance for abnormal returns. In the case of both portfolios, the equations, applied for the evaluation, demonstrated strong explanatory power. However, the adjusted R-squared of the value-weighted portfolio demonstrated a weaker power by 13.7%.

An application of the Fama–French model to the equally weighted portfolio demonstrated a similar negative alpha, as in the cases examined above, giving a similar coefficient as in the case of the CAPM model application. The risk-adjusted performance of the value-weighted portfolio demonstrated a minor positive outperformance; however, the statistical strength of the results declined in comparison to the equally weighted portfolio. In the case of the equally and value-weighted portfolio, the former was exposed to the small-cap stocks, with a coefficient characterized by a strong statistical significance. As both the benchmark and the value-weighted portfolio were constructed on the basis of the market capitalization weights, it could be considered an explanation of the value-weighted portfolio's exposure to the large-cap stocks. However, the result is not statistically significant. Unlike the European portfolio, the performance of the French portfolio appeared to be impacted on by growth stocks. However, the results appear to be significant solely for the value-weighted portfolio, with a coefficient of 0.058 at a 5% significance level. The Fama–French model implemented for the portfolio analysis demonstrated a strong explanatory power, with an adjusted R-squared at the 89.5 % and 96.9% level.

The summary of the analysis presented in the tables (3.4-3.9) demonstrates results of Fama-French model (1993) for portfolios based on the screens presented by the ASSET4 ranking. The tables contain the results for high-rated and low-rated portfolios, which consists of three specifications: top 10%, 15% and 20%, bottom 10%, 15% and 20%, as well as long-short strategy. Across all specifications market risk appeared to have a strong impact on portfolio's alphas, as indicated by high significance rate across all specifications for equally and value-weighted portfolios. Overall significance of SMB and HML factors appears strong, however, the strength varies across factors. The

results suggest the importance to control for the market, size and book-to-market factors when evaluating high (low) rated portfolios, as was highlighted in the paper of Kempf and Osthoff (2007).

Table 3.4 Value-Weighted Portfolios with 10% Stock

		Alpha	Market	SMB	HML	R-sq
Resource Use						
	High-rated	0.0015***	1.0155***	0.0227	0.1885***	0.9274
	Low-rated	0.0007	0.9959***	0.4511***	-0.1521**	0.8481
	Long-short	0.0008	0.0196	-0.4284***	0.3406***	0.1741
Emission Score						
	High-rated	0.0004	0.9603***	-0.0219	0.3179***	0.9229
	Low-rated	0.0002	0.9399***	0.0116	-0.1951*	0.7926
	Long-short	0.0002	0.0204	-0.0336	0.5130***	0.1642
Environmental Innovation						
	High-rated	0.0022***	1.1002***	0.1093**	0.3910***	0.9179
	Low-rated	0.0013**	0.9771***	0.1748***	-0.6487***	0.8595
	Long-short	0.0009	0.1231***	-0.0656	1.0397***	0.5131
CSR Strategy						
	High-rated	0.0014**	1.0403***	-0.0726	0.2401***	0.9307
	Low-rated	0.0009	0.9541***	0.2643***	-0.5091***	0.8777
	Long-short	0.0005	0.0862	-0.3369***	0.7491***	0.4046
Management						
	High-rated	0.0018***	1.0561***	-0.0390	0.1573**	0.9252
	Low-rated	0.0010*	0.9999***	0.1806**	-0.1810**	0.8484
	Long-short	0.0008	0.0561	-0.2195***	0.3383***	0.1321
Shareholder Score						
	High-rated	0.0013**	0.9909***	-0.1339**	0.0644	0.9031
	Low-rated	0.0006	0.9290***	0.0859*	-0.3796***	0.8977
	Long-short	0.0007	0.0619**	-0.2198***	0.4440***	0.2471
Community Score						
	High-rated	-0.0001	0.9344***	-0.1588***	0.0184	0.9265
	Low-rated	0.0013**	0.9974***	0.3729***	-0.2719***	0.8704
	Long-short	-0.0014*	-0.0630***	-0.5317***	0.2902***	0.2334

Table 3.4 Value-Weighted Portfolios with 10% Stock (Continued)

		Alpha	Market	SMB	HML	R-sq
Human Rights Score						
	High-rated	-0.0002	0.9247***	-0.1422***	-0.0304	0.9106
	Low-rated	0.0013**	0.9812***	0.3009***	-0.4042***	0.8781
	Long-short	-0.0015**	-0.0565**	-0.4431***	0.3738***	0.2291
Product Responsibility Score						
	High-rated	0.0001	0.9341***	-0.2002***	0.0944*	0.9180
	Low-rated	0.0023***	1.0550***	0.4993***	-0.0104	0.8701
	Long-short	-0.0023**	-0.1209***	-0.6996***	0.1048	0.2546
Workforce Score						
	High-rated	0.0017***	0.9982***	-0.0613	-0.0375	0.9300
	Low-rated	0.0004	0.9466***	0.3802***	-0.2352***	0.8704
	Long-short	0.0013*	0.0516**	-0.4414***	0.1976**	0.2050
ESG Score						
	High-rated	0.0016***	1.0042***	-0.0858	0.3989***	0.9386
	Low-rated	0.0015**	0.9838***	0.4307***	-0.4945***	0.8751
	Long-short	0.0001	0.0203	-0.5165***	0.8933***	0.5173
Combined ESG Score						
	High-rated	0.0020***	1.0457***	0.1122**	0.1809***	0.9110
	Low-rated	0.0019***	1.0555***	0.3504***	-0.1172	0.8766
	Long-short	0.0002	-0.0097	-0.2381***	0.2982***	0.0966
ESG Controversies						
	High-rated	-0.0018***	0.8093***	-0.0225	-0.3296***	0.8107
	Low-rated	0.0016***	1.0293***	-0.1359***	0.2771***	0.9382
	Long-short	-0.0034***	-0.2200***	0.1134	-0.6066***	0.3910

Notes: This table represents a summary for annual abnormal returns, factor loading and adjusted R-Sq for a set of Environmental Social and Governance factors represented in ASSET4. The portfolio generated using Fama French model. The high-rated (low-rated) portfolio consists of 10% of all stocks with the highest (lowest) ratings. The portfolios are value-weighted. The long-short portfolio represents a trading strategy, when long position is taken with the high-rated and going short position is in low-rated portfolio. The observation timeframe is 2008-2015. New-West method implemented to compute standard errors. The significance levels: p***<0.01; p**<0.05, p*<0.1Description:

Table 3.5 Equally-Weighted Portfolio with 10% Stock

		Alpha	Market	SMB	HML	R-sq
Resource Use						
	High-rated	0.0015***	1.0474***	0.2601***	0.3085***	0.9447
	Low-rated	-0.0007	1.0420***	0.7071***	-0.2096***	0.8550
	Long-short	0.0022*	0.0054	-0.4470***	0.5182***	0.2655
Emission Score						
	High-rated	0.0008	1.0215***	0.2596***	0.3331***	0.9296
	Low-rated	-0.0015	1.0127***	0.5768***	-0.1626**	0.8099
	Long-short	0.0022	0.0088	-0.3172***	0.4956***	0.1770
Environmental Innovation						
	High-rated	0.0009**	1.0825***	0.4321***	0.4270***	0.9384
	Low-rated	-0.0133***	1.1620***	0.3912*	-0.6015***	0.5046
	Long-short	0.0142***	-0.0795	0.0409	1.0285***	0.1036
CSR Strategy						
	High-rated	-0.0196***	1.0032***	0.2031**	0.1668*	0.6829
	Low-rated	-0.0041**	1.0093***	0.4866***	-0.3337***	0.7386
	Long-short	-0.0155***	-0.0061	-0.2835**	0.5004***	0.0528
Management						
	High-rated	0.0013**	1.0553***	0.2082***	0.1190	0.9473
	Low-rated	0.0001	1.0045***	0.5683***	-0.0466	0.9180
	Long-short	0.0011*	0.0508*	-0.3600***	0.1655**	0.1953
Shareholder Score						
	High-rated	-0.0055***	1.1250***	0.4735***	0.1484*	0.7928
	Low-rated	-0.0100***	0.9134***	0.2210***	-0.3346***	0.6506
	Long-short	0.0045	0.2116***	0.2525	0.4831***	0.1190
Community Score						
	High-rated	-0.0002	1.0680***	0.2067***	0.0825	0.8940
	Low-rated	-0.0002	0.9834***	0.4802***	-0.2300***	0.8938
	Long-short	-0.0001	0.0846***	-0.2735***	0.3125***	0.1702

Table 3.5 Equally-Weighted Portfolio with 10% Stock (Continued)

		Alpha	Market	SMB	HML	R-sq
Human Rights Score						
	High-rated	-0.0049***	0.9733***	0.2445***	0.2044*	0.7975
	Low-rated	0.0007	0.9959***	0.5724***	-0.2377***	0.8957
	Long-short	-0.0056***	-0.0226	-0.3280***	0.4420***	0.1394
Product Responsibility Score						
	High-rated	-0.0004	0.9569***	0.1098**	0.1460**	0.9267
	Low-rated	-0.0038**	1.1502***	0.6314***	-0.1315	0.7999
	Long-short	0.0034**	-0.1933***	-0.5216***	0.2775**	0.1504
Workforce Score						
	High-rated	0.0007	1.0409***	0.2172***	0.0787	0.9196
	Low-rated	0.0008	1.0037***	0.5000***	-0.1385**	0.8806
	Long-short	-0.0001	0.0371	-0.2829***	0.2172**	0.1159
ESG Score						
	High-rated	0.0017***	1.0759***	0.2152***	0.4977***	0.9415
	Low-rated	-0.0009	1.0098***	0.5857***	-0.2931***	0.8401
	Long-short	0.0025*	0.0661**	-0.3705***	0.7908***	0.3870
Combined ESG Score						
	High-rated	-0.0005	1.0827***	0.3657***	0.1535*	0.8811
	Low-rated	-0.0049**	0.9843***	0.4906***	-0.1458*	0.7440
	Long-short	0.0044*	0.0984**	-0.1249	0.2993***	0.0721
ESG Controversies						
	High-rated	-0.0007*	0.9371***	0.2371***	-0.2485***	0.8687
	Low-rated	0.0013***	1.0811***	0.1922***	0.2741***	0.9473
	Long-short	-0.0020**	-0.1440***	0.0449	-0.5226***	0.3318

Notes: This table represents a summary for annual abnormal returns, factor loading and adjusted R-Sq for a set of Environmental Social and Governance factors represented in ASSET4. The portfolio generated using Fama French model. The high-rated (low-rated) portfolio consists of 10% of all stocks with the highest (lowest) ratings. The portfolios are equally-weighted. The long-short portfolio represents a trading strategy, when long position is taken with the high-rated and going short position is in low-rated portfolio. The observation timeframe is 2008-2015. New-West method implemented to compute standard errors. The significance levels: p***<0.01; p**<0.05, p*<0.1

The result for the value and equally weighted portfolios of 10% top (bottom) stocks demonstrated significant impact market beta size and book-to-market to impact the alpha. Resource use-based portfolio yielded positive significant alpha for both equally a value-weighted portfolios. The results vary for the environmental innovation- based portfolio, CSR strategy shareholder score, product r and ESG score, where alpha coefficients of equally-value portfolios appeared negative, in comparison to value-weighted. ESG Controversies rating portfolio includes companies involved companies with negative connotation. The high rated portfolios represent most controversial companies, whereas the lowest-ranked portfolios represent the least. The top-rated portfolios consistently yielded negative excess return, opposed to low-rated portfolios, which generated positive alpha. In case of equally-weighted portfolio, the top-rated scenario appeared less significant. The explanatory power of the model appeared to be ranked in the 90%-80% rates apart from Shareholder management and CSR strategy score-based equally weighted portfolios.

Kempf and Osthoff (2007) highlighted in the paper the importance of long-short strategy. Authors presented it as opportunity to generate abnormal returns, if investor takes a long position with high-rated portfolio stocks and short with low-rated portfolio stocks. Resource emission, environmental innovation, management and shareholder score, ESG score demonstrated positive long-short portfolio alphas, however the results appear insignificant.

Table 3.6 Value – weighted portfolios with 15% stocks

		Alpha	Market	SMB	HML	R-sq
Resource Use						
	High-rated	0.0017***	1.0243***	0.0135	0.3028***	0.9416
	Low-rated	0.0008	0.9981***	0.4327***	-0.2863***	0.8962
	Long-short	0.0010	0.0263	-0.4191***	0.5891***	0.3576
Emission Score						
	High-rated	0.0009**	0.9832***	-0.0124	0.2908***	0.9388
	Low-rated	0.0004	0.9618***	0.1153	-0.2789***	0.8497
	Long-short	0.0005	0.0214	-0.1276	0.5697***	0.2561
Environmental Innovation						
	High-rated	0.0015***	1.0652***	0.0510	0.4035***	0.9185
	Low-rated	0.0013***	0.9667***	-0.0099	-0.1164*	0.9053
	Long-short	0.0003	0.0985***	0.0609	0.5199***	0.2535
CSR Strategy						
	High-rated	0.0015***	1.0353***	-0.0855**	0.0991**	0.9606
	Low-rated	0.0013**	0.9582***	0.3424***	-0.3840***	0.9048
	Long-short	0.0002	0.0771**	-0.4279***	0.4831***	0.4059
Management						
	High-rated	0.0020***	1.0532***	-0.0253	0.2705***	0.9442
	Low-rated	0.0018***	1.0229	0.1570*	-0.1475**	0.8922
	Long-short	0.0001	0.0303	-0.1823	0.4180***	0.1632
Shareholder Score						
	High-rated	0.0016***	1.0034***	-0.0597	0.1771***	0.9340
	Low-rated	0.0007	0.9400***	0.0526	-0.2270***	0.9271
	Long-short	0.0009	0.0634***	-0.1122*	0.4041***	0.2682
Community Score						
	High-rated	0.0008***	0.9721***	-0.1256***	-0.0345	0.9559
	Low-rated	0.0017***	0.9911***	0.2620***	-0.0219	0.8966
	Long-short	-0.0009	-0.0190	-0.3876***	-0.0126	0.1252

Table 3.6 Value – weighted portfolios with 15% stocks (Continued)

		Alpha	Market	SMB	HML	R-sq
Human Rights Score						
	High-rated	0.0003	0.9539***	-0.1382***	0.1677***	0.9468
	Low-rated	0.0016***	0.9914***	0.3163***	-0.3508***	0.9253
	Long-short	-0.0012**	-0.0376*	-0.4545***	0.5184***	0.4120
Product Responsibility Score						
	High-rated	-0.0006	0.9148***	-0.2045***	0.1308**	0.9385
	Low-rated	0.0019***	1.0370***	0.3322***	-0.2360***	0.9251
	Long-short	-0.0025***	-0.1223***	-0.5366***	0.3668***	0.3735
Workforce Score						
	High-rated	0.0008***	0.9617***	-0.0617	-0.0338	0.9508
	Low-rated	0.0013***	1.0197***	0.4419***	-0.1287**	0.8983
	Long-short	-0.0005	-0.0580**	-0.5036***	0.0949	0.2073
ESG Score						
	High-rated	0.0019***	1.0334***	-0.0917**	0.3534***	0.9559
	Low-rated	4.2003***	1.0151***	0.4809***	-0.3944***	0.9160
	Long-short	-0.0001	0.0183	-0.5726***	0.7478***	0.5564
Combined ESG Score						
	High-rated	0.0018***	1.0151***	0.1092***	0.1416***	0.9372
	Low-rated	0.0001	0.9667***	-0.0622	-0.1125*	0.9011
	Long-short	0.0018***	0.0484**	0.1713***	0.2541***	0.0974
ESG Controversies						
	High-rated	-0.0018***	0.8138***	0.0548	-0.3069***	0.8547
	Low-rated	0.0011***	1.0014***	-0.1655***	0.2341***	0.9683
	Long-short	-0.0029***	-0.1875***	0.2203***	-0.5410***	0.4800

Notes: This table represents a summary for annual abnormal returns, factor loading and adjusted R-sq for a set of Environmental Social and Governance factors represented in ASSET4. The portfolio generated using Fama French model. The high-rated (low-rated) portfolio consists of 15% of all stocks with the highest (lowest) ratings. The portfolios are value-weighted. The long-short portfolio represents a trading strategy, when long position is taken with the high-rated and going short position is in low-rated portfolio. The observation timeframe is 2008-2015. New-West method implemented to compute standard errors. The significance levels: p***<0.01; p**<0.05, p*<0.1

Table 3.7 Equally-Weighted Portfolios with 15% Stocks

		Alpha	Market	SMB	HML	R-sq
Resource Use						
	High-rated	0.0017***	1.0565***	0.2616***	0.2892***	0.9578
	Low-rated	-0.0002	1.0372***	0.6832***	-0.2376***	0.8977
	Long-short	0.0019**	0.0193	-0.4216***	0.5268***	0.3592
Emission Score						
	High-rated	0.0013***	1.0673***	0.2874***	0.3104***	0.9462
	Low-rated	-0.0027*	1.0148***	0.6374***	-0.1754***	0.7993
	Long-short	0.0040**	0.0525*	-0.3500***	0.4858***	0.2028
Environmental Innovation						
	High-rated	-0.0002***	1.1087***	0.4313***	0.3648***	0.9172
	Low-rated	-0.0126***	1.0778***	0.3834***	-0.0748	0.7213
	Long-short	0.0124***	0.0310	0.0479	0.4396***	0.0550
CSR Strategy						
	High-rated	-0.0163***	0.9877***	0.1421*	0.0969	0.8118
	Low-rated	-0.0037**	1.0190***	0.5150***	-0.2238***	0.8101
	Long-short	-0.0126***	-0.0313	-0.3729***	0.3207***	0.1040
Management						
	High-rated	0.0001	1.0794***	0.2655***	0.1982**	0.9196
	Low-rated	-0.0023*	1.0285***	0.4957***	-0.0145	0.8688
	Long-short	0.0023	0.0509*	-0.2303***	0.2127***	0.0824
Shareholder Score						
	High-rated	-0.0047***	1.1394***	0.4980***	0.1943**	0.8124
	Low-rated	-0.0096***	0.9590***	0.3209***	-0.2452***	0.7724
	Long-short	0.0049*	0.1804***	0.1771	0.4395***	0.1124
Community Score						
	High-rated	0.0007	1.0711***	0.2272***	0.0623*	0.9335
	Low-rated	-0.0011	0.9889***	0.4738***	-0.1703***	0.9017
	Long-short	0.0018	0.0822***	-0.2465***	0.2326***	0.1647

Table 3.7 Equally-Weighted Portfolios with 15% Stocks (Continued)

		Alpha	Market	SMB	HML	R-sq
Human Rights Score						
	High-rated	-0.0079***	1.0041***	0.1752***	0.3112***	0.8293
	Low-rated	0.0015***	1.0238***	0.5653***	-0.2047***	0.9353
	Long-short	-0.0094***	-0.0196	-0.3901***	0.5159***	0.2184
Product Responsibility Score						
	High-rated	-0.0105***	0.9619***	0.1750**	0.1023	0.7883
	Low-rated	-0.0237***	1.0833***	0.6201***	-0.0874	0.8125
	Long-short	0.0133***	-0.1214***	-0.4451***	0.1896*	0.0643
Workforce Score						
	High-rated	0.0009*	1.0410***	0.2662***	0.0875	0.9464
	Low-rated	0.0014***	1.0471***	0.5677***	-0.1232**	0.9219
	Long-short	-0.0006	-0.0061	-0.3015***	0.2107***	0.1532
ESG Score						
	High-rated	0.0005	1.0828***	0.1707***	0.3435***	0.9297
	Low-rated	0.0001	1.0534***	0.5992***	-0.2572***	0.8967
	Long-short	0.0005	0.0294	-0.4286***	0.6007***	0.3801
Combined ESG Score						
	High-rated	0.0006	1.0830***	0.3576***	0.0961*	0.9276
	Low-rated	-0.0033**	0.9835***	0.3947***	-0.0336	0.8464
	Long-short	0.0038***	0.0995***	-0.0371	0.1297*	0.0608
ESG Controversies						
	High-rated	-0.0049***	0.8931***	0.3184***	-0.1834***	0.8131
	Low-rated	0.0008**	1.0501***	0.1740***	0.2249***	0.9649
	Long-short	-0.0057***	-0.1570***	0.1444	-0.4083***	0.2881

Notes: Description: This table represents a summary for annual abnormal returns, factor loading and adjusted R-Sq for a set of Environmental Social and Governance factors represented in ASSET4. The portfolio generated using Fama French model. The high-rated (low-rated) portfolio consists of 15% of all stocks with the highest (lowest) ratings. The portfolios are equally-weighted. The long-short portfolio represents a trading strategy, when long position is taken with the high-rated and going short position is in low-rated portfolio. The observation timeframe is 2008-2015. New-West method implemented to compute standard errors. The significance levels: p***<0.01; p**<0.05, p*<0.1

The results of the top (bottom) 15% high (low) rated stocks appear inconsistent. ESG scores and ESG controversies-based portfolio demonstrated consistent results, with high significant level for ESG controversies high and low-rated scenarios. The high-rated portfolios across resource use, emission score, management score, community score, workforce indicator, combined ESG score generated positive abnormal returns, however alphas do not tend to hold similar significance level. Long-short strategy generated strong positive abnormal return for the product responsibility score-based portfolio. The R-squared coefficients have strengthened further in comparison to the portfolios of 10% stocks.

Table3. 8 Value-Weighted Portfolios with 20% Stocks

		Alpha	Market	SMB	HML	R-sq
Resource Use						
	High-rated	0.0016***	1.0069***	-0.0131	0.2687***	0.9492
	Low-rated	0.0011***	1.0006***	0.4013***	-0.3101***	0.9335
	Long-short	0.0005	0.0062	-0.4143***	0.5788***	0.4269
Emission Score						
	High-rated	0.0013***	0.9908***	0.0090	0.3567***	0.9553
	Low-rated	0.0004	0.9625***	0.1352**	-0.2383***	0.8845
	Long-short	0.0008	0.0283	-0.1262*	0.5950***	0.3230
Environmental Innovation						
	High-rated	0.0023***	1.0832***	0.0630	0.7125***	0.9454
	Low-rated	0.0038	1.1380**	0.2482	-0.4095	0.9243
	Long-short	-0.0015*	-0.0548**	-0.1852***	1.1219***	0.5469
CSR Strategy						
	High-rated	0.0014***	1.0099***	-0.1260***	0.0089	0.9720
	Low-rated	0.0014***	0.9740***	0.3720***	-0.3644***	0.9236
	Long-short	0.0002*	0.0358	-0.4981***	0.3733***	0.4245
Management						
	High-rated	0.0020***	1.0507***	-0.0187	0.2674***	0.9555
	Low-rated	0.0015***	1.0132***	0.1466**	-0.0570	0.9310
	Long-short	0.0004	0.0375	-0.1653	0.3244***	0.1698
Shareholder Score						
	High-rated	0.0017***	1.0193***	0.0194	0.1005**	0.9556
	Low-rated	0.0006	0.9442***	0.0601	-0.1525***	0.9460
	Long-short	0.0011**	0.0751***	-0.0407	0.2530***	0.2166
Community Score						
	High-rated	0.0013***	1.0007***	-0.1134***	-0.0106	0.9706
	Low-rated	0.0017***	1.0041***	0.2589***	0.1017	0.9205
	Long-short	0.0152***	1.0131***	-0.2262	-0.3020*	0.4616

Table3. 8 Value-Weighted Portfolios with 20% Stocks (Continued)

		Alpha	Market	SMB	HML	R-sq
Human Rights Score						
	High-rated	0.0004	0.9628***	-0.1346***	0.1551***	0.9571
	Low-rated	0.0016***	1.0032***	0.3035***	-0.3118***	0.9314
	Long-short	-0.0012**	-0.0404**	-0.4381***	0.4669***	0.4164
Product Responsibility Score						
	High-rated	-0.0003	0.9082***	-0.2077***	0.1055**	0.9522
	Low-rated	0.0022***	1.0797***	0.4339***	0.0618	0.9247
	Long-short	-0.0025***	-0.1714***	-0.6416***	0.0438	0.3849
Workforce Score						
	High-rated	0.0008**	0.9582***	-0.0950***	-0.0374	0.9596
	Low-rated	0.0007	0.9900***	0.3819***	-0.0929	0.9200
	Long-short	0.0001	-0.0318	-0.4770***	0.0554	0.2413
ESG Score						
	High-rated	0.0011***	0.9875***	-0.1309***	0.2347***	0.9689
	Low-rated	0.0022***	1.0470***	0.5570***	-0.3184***	0.9181
	Long-short	-0.0011*	-0.0595***	-0.6879***	0.5530***	0.5297
Combined ESG Score						
	High-rated	0.0020***	1.0208***	0.1372***	0.1214**	0.9440
	Low-rated	0.0008*	0.9955***	-0.0933**	0.0675*	0.9509
	Long-short	0.0013**	0.0253	0.2304***	0.0540	0.0625
ESG Controversies						
	High-rated	-0.0013***	0.8534***	0.1222**	-0.2474***	0.8904
	Low-rated	0.0009***	0.9815***	-0.1641***	0.1933***	0.9763
	Long-short	-0.0022***	-0.1281***	0.2863***	-0.4407***	0.4639

Notes: Description: This table represents a summary for annual abnormal returns, factor loading and adjusted R-Sq for a set of Environmental Social and Governance factors represented in ASSET4. The portfolio generated using Fama French model. The high-rated (low-rated) portfolio consists of 20% of all stocks with the highest (lowest) ratings. The portfolios are value-weighted. The long-short portfolio represents a trading strategy, when long position is taken with the high-rated and going short position is in low-rated portfolio. The observation timeframe is 2008-2015. New-West method implemented to compute standard errors. The significance levels: p***<0.01; p**<0.05, p*<0.1

Table 3.9 Equally Weighted Portfolios with 20% Stocks

		Alpha	Market	SMB	HML	R-sq
Resource Use						
	High-rated	-0.0045***	1.0457***	0.2655***	0.2601***	0.8968
	Low-rated	0.0001	1.0448***	0.6367***	-0.2423***	0.9177
	Long-short	-0.0044***	0.0009	-0.3713***	0.5024***	0.3021
Emission Score						
	High-rated	0.0014***	1.0585***	0.2826***	0.3154***	0.9595
	Low-rated	-0.0072***	1.0419***	0.6420***	-0.1591***	0.8387
	Long-short	0.0085***	0.0167	-0.3594***	0.4744***	0.2198
Environmental Innovation						
	High-rated	0.0008	1.1211***	0.4254***	0.5056***	0.9474
	Low-rated	-0.0091***	1.1445***	0.4833***	-0.3080***	0.7815
	Long-short	0.0099***	-0.0234	-0.0580	0.8136***	0.2306
CSR Strategy						
	High-rated	-0.0124***	0.9825***	0.1477***	0.0105	0.8720
	Low-rated	-0.0035***	1.0297***	0.5443***	-0.2069***	0.8668
	Long-short	-0.0089***	-0.0472	-0.3966***	0.2174***	0.1201
Management						
	High-rated	0.0005	1.0829***	0.2941***	0.1936***	0.9444
	Low-rated	-0.0020**	1.0248***	0.5072***	0.0379	0.9068
	Long-short	0.0025**	0.0580***	-0.2130***	0.1556***	0.1011
Shareholder Score						
	High-rated	-0.0032**	1.1161***	0.5008***	0.1412**	0.8748
	Low-rated	-0.0068***	0.9836***	0.3828***	-0.1651**	0.8553
	Long-short	0.0011**	0.0751***	-0.0407	0.2530***	0.2166
Community Score						
	High-rated	0.0010	1.0656***	0.2137***	0.1082***	0.9541
	Low-rated	-0.0007	0.9927***	0.5058***	-0.0905**	0.9349
	Long-short	0.0036*	0.1325***	0.1180	0.3063***	0.0990

Table 3.9 Equally Weighted Portfolios with 20% Stocks (Continued)

		Alpha	Market	SMB	HML	R-sq
Human Rights Score						
	High-rated	-0.0094***	1.0033***	0.1921***	0.2067**	0.8760
	Low-rated	-0.0040***	1.0687***	0.5532***	-0.2247***	0.8483
	Long-short	-0.0054***	-0.0654*	-0.3612***	0.4314***	0.1394
Product Responsibility Score						
	High-rated	-0.0102***	0.9727***	0.2115***	0.1594**	0.8600
	Low-rated	-0.0056***	1.0936***	0.5599***	-0.0316	0.8464
	Long-short	-0.0046**	-0.1208***	-0.3484***	0.1910*	0.0570
Workforce Score						
	High-rated	-0.0001	1.0352***	0.2450***	0.0703	0.9409
	Low-rated	-0.0006	1.0277***	0.5518***	-0.1241**	0.9156
	Long-short	0.0005	0.0075	-0.3068***	0.1944***	0.1612
ESG Score						
	High-rated	0.0002	1.0520***	0.1426***	0.2424***	0.9507
	Low-rated	-0.0063***	1.0798***	0.6445***	-0.2572***	0.8472
	Long-short	0.0065***	-0.0279	-0.5019***	0.4995***	0.2632
Combined ESG Score						
	High-rated	0.0011*	1.0798***	0.3676***	0.0817*	0.9438
	Low-rated	-0.0019*	1.0085***	0.3522***	-0.0100	0.9041
	Long-short	0.0030**	0.0713**	0.0154	0.0917*	0.0453
ESG Controversies						
	High-rated	-0.0036***	0.9199***	0.3452***	-0.1686***	0.8761
	Low-rated	-0.0020**	1.0154***	0.1202***	0.2515***	0.9207
	Long-short	-0.0016***	-0.0955***	0.2250***	-0.4201***	0.3980

Notes: Description: This table represents a summary for annual abnormal returns, factor loading and adjusted R-Sq for a set of Environmental Social and Governance factors represented in ASSET4. The portfolio generated using Fama French model. The high-rated (low-rated) portfolio consists of 20% of all stocks with the highest (lowest) ratings. The portfolios are equally-weighted. The long-short portfolio represents a trading strategy, when long position is taken with the high-rated and going short position is in low-rated portfolio. The observation timeframe is 2008-2015. New-West method implemented to compute standard errors. The significance levels: p***<0.01; p**<0.05, p*<0.1

The results for the equally and value-based portfolios for the 20% specification did not generate consistent results. Positive alpha generation ability did not hold across various factors. Long-Short strategy demonstrated alpha –generation capability for the shareholder score and ESG-score based portfolio.

Overall, the analysis of ranking based equally and value-weighted European portfolios did not demonstrate clear tendency of the high-rated and low-rated portfolio performance. Portfolio alphas behaved differently depending on the % consistency of the portfolio with varying significance level. As certain portfolio performance result demonstrated consist performance in value and equally weighted portfolios, as "Environmental Innovation", "CSR Strategy" or "ESG Controversies", it could be suggested, that portfolio performance is dependent on the individual factor and the portfolio construction characteristics, rather represents a trend. The results were supported strong explanatory power of the model, the R-squared in the long-short strategy. Similar coefficients were presented in the work by Kempf and Osthoff (2007).

In order to further explore the potential of ESG recommendations provided by Oddo and Cie broker, the performance of European and French portfolios was evaluated against portfolios of European and French funds, as well as Index portfolio.

In Table 3.10, the performance of equally weighted French SRI and European SRI funds' portfolios is presented, as well as the Sustainable European benchmark portfolio based on the Stoxx Sustainability Index.

Table 3.10 Fund and Index Portfolios: Europe and France

	CAPM model		Fama–French model					
Portfolio weights	Alpha	Beta	Alpha	Beta	SMB	HML	Adj R^2 CAPM	Adj R^2 FF
Equally-weighted European Fund portfolio	-0.0071*** (-20.39)	0.6067*** (56.69)	-0.0072*** (-20.03)	0.6213*** (45.61)	0.1828*** (5.36)	-0.0652 (-1.86)	0.889	0.902
Equally weighted French Fund portfolio	-0.0082*** (-20.36)	0.5916*** (52.36)	-0.0084*** (-19.46)	0.5937*** (50.18)	0.0952*** (3.97)	0.0288 (1.08)	0.894	0.899
Index portfolio	-0.0053*** (-0.01)*	0.6771*** (13.61)	0.0063*** (-6.51)	0.6201*** (16.71)	0.2563 (1.22)	0.3121 (1.96)	0.467	0.484

Notes: This table represents the combined results of a European equally weighted fund portfolio and an equally weighted portfolio of French funds, focused on the European universe. The table combines results for two methodologies: the CAPM model and the Fama–French model. The second and third columns represent the results for the alpha and risk indicators of the CAPM model. The results for both equally and value-weighted portfolios are presented. The next set of columns represents the Fama–French model, including alpha, beta indicators, small-cap stock exposure and growth stock exposure. The adjusted R-squared indicators are listed in the two final columns. *** 1% significance level; ** 5% significance level; * 10% significance level.

Results reveal that neither European nor French SRI fund portfolios were able to generate abnormal performance. However the alpha coefficients appeared strongly significant for the CAPM and Fama French Models. Both portfolios have statistically significant beta characteristics. When controlling for the size and value exposure, both European and French portfolio performance appeared to be influenced by small-cap stocks. The results are statistically significant, with the impact having an almost double strength on the European fund's portfolio, at 0.1828. Growth stock portfolio exposure was detected for the European portfolio, whereas the French portfolio is not exposed to the influence of growth stocks. However, the results were not significant. The CAPM model appeared to have strong explanatory power for European and French portfolios at 88.9% and 90.2% respectively. Similar evidence applies for the Fama–French model, with 84.4% and 89.9% of adjusted R-squared indicators.

The explanatory power of the model dropped down to 46.7% and 48.8% in the case of the performance of the Stoxx Sustainability Index-based portfolio, which demonstrated stronger performance when controlling for the size and growth effects, with the positive alpha coefficient at 0.0063. It could be suggested that the ESG implementation pioneers are relatively smaller growth-oriented companies.

Table 3.11 was generated to represent the comparison of Oddo's data based portfolio performance and the European and French SRI fund portfolios.

Table 3.11 Results Overview

	CAPM model		Fama–French model					
Portfolio weights	Alpha	Beta	Alpha	Beta	SMB	HML	Adj R^2 CAPM	Adj R^2 FF
Equally weighted European Oddo portfolio	-0.0033*** (-3.91)	1.0123*** (49.94)	-0.0040*** (-5.22)	0.9978*** (71.84)	0.4445*** (8.69)	0.1013** (2.12)	0.912	0.938
Equally weighted French Oddo portfolio	-0.0047*** (-3.72)	0.9009*** (34.47)	-0.0048*** (-4.50)	0.9373*** (52.94)	0.5078*** (11.62)	-0.0385 (-1.01)	0.831	0.895
Equally weighted European fund portfolio	-0.0071*** (-20.39)	0.6067*** (56.69)	-0.0072*** (-20.03)	0.6213*** (45.61)	0.1828*** (5.36)	-0.0652 (-1.86)	0.889	0.902
Equally weighted French fund portfolio	-0.0082*** (-20.36)	0.5916*** (52.36)	-0.0084*** (-19.46)	0.5937*** (50.18)	0.0952*** (3.97)	0.028811 (1.08)	0.894	0.899
Equally weighted index portfolio	-0.0053*** (-0.01)	0.6771*** (13.61)	0.0063*** (-6.51)	0.6201*** (16.71)	0.2563 (1.22)	0.3121 (1.96)	0.467	0.484

Notes: This table presents comparative results of European and French portfolios based on the data provided by Oddo and Cie against portfolios composed of European and French SRI funds as well as sustainable benchmark performance. All portfolios are equally weighted. The second and third columns represent results for the CAPM model evaluation. The next set of columns demonstrates the results of the Fama–French model. The table is completed with the adjusted squared data for the CAPM and Fama–French models. *** 1% significance level; ** 5% significance level; * 10% significance level.

The analysis demonstrated strong statistically-significant results.. Portfolios combined on the basis of Oddo's ESG recommendations– generated significant negative alpha coefficients, with 0.0032 differences in coefficients for European portfolios, adjusted for the size and value effects, and 0.0036 differences for French portfolios. European and French SR fund-based portfolios similarly underperformed the market with coefficients to be statistically significant. Market and size indicators appear to have significant impact in case of Oddo recommendations and SRI fund – based portfolios, however book-to-market exposure turned insignificant. Notably, market indicator coefficients are lower for the SRI fund-based portfolio in comparison to Oddo-based. Index-based portfolio demonstrated abnormal significant outperformance estimated with Fama-French model (1993).CAPM-estimated alpha appeared negative but statistically significant.

Overall performance of Oddo recommendation -based European and French portfolios characterised by negative abnormal returns with high statistical significance. As the ESG ranking scale was not provided, it performance was compared to the ASSET4 ESG-based rating, SRI-based European and French portfolios and Index-based portfolio. In case of ESG-weighted portfolios, returned appeared inconsistent, yet with specific themes to demonstrate abnormal performance with statistically significant coefficients.. SRI-based portfolios demonstrated negative alpha coefficients with strong statistical significance for both European and French markets. Index-based portfolio generated positive alpha indicator estimated by Fama French model (1993). Further robustness tests were implemented to analyse the results.

3.6 Robustness Test

Robustness tests were performed for a deeper investigation of portfolio performance and the rating efficiency of the broker. Similarly to Kempf and Osthoff (2007), who implemented the long-short portfolio strategy to compare performance, this section applies a similar methodology to examine if the Oddo ESG index based portfolio generates better returns in comparison to the SRI fund portfolio alternative. Similarly to the analysis presented above, in this case Oddo-based European portfolio was long, and short portfolio consisted of European SRI funds. Same approach was implemented for French – based Oddo-based and fund-based portfolio.

Table 3.12 Long-Short Portfolios

	CAPM model		Fama–French model					
Portfolio weights	Alpha	Beta	Alpha	Beta	SMB	HML	Adj R^2 CAPM	Adj R^2 FF
European Long-Short Portfolio	0.1226*** (9.7867)	0.5428*** (3.1574)	0.1226*** (9.6117)	0.5876*** (3.1285)	0.4878 (0.9896)	-0.2042 (-0.4681)	0.022	0.021
French Long-Short Portfolio	0.1141*** (8.0262)	0.4497** (2.7657)	0.1139*** (7.9121)	0.4997** (2.9975)	0.6443* (1.7678)	-0.0771 (-0.1960)	0.021	0.016
Sustainable Index Long-Short Portfolios	0.0021 (1.5162)	0.3352*** (6.4145)	0.0024* (1.8498)	0.3778*** (9.0356)	0.1882 (0.8163)	-0.2197 (-1.1647)	0.149	0.164

Notes: This table summarizes long-short strategy analytics. The methodology was applied as a robustness test in order to examine the performance of portfolios constructed on the basis of Oddo and Cie ranking versus portfolios constructed on the basis of SRI fund performance. The fourth row represents results of a European Oddo and Cie-based long and SRI fund-based short portfolio performance estimated according to the CAPM model and Fama–French model. The following column represents similar results for the French region. The next column represents long-short results with the European Sustainability index to substitute for the SRI European funds. The two final columns represent adjusted squared results. *** 1% significance level; ** 5% significance level; * 10% significance level.

The long-short strategy (Table 3.12) allows looking closer on the capabilities to generate an abnormal return by the Oddo and Cie-based portfolio. The test considers the scenario of Oddo and Cie's long portfolio and short with the SRI fund-based portfolio. The first scenario was considered for European portfolios. The second one was for the French – based portfolios. The third scenario, long European stocks Oddo-based portfolio was analysed against European region, the STOXX Sustainability 40 return index (short strategy). As no specific sustainability index for the French market was identified, it was not possible to perform analysis for the French Oddo portfolio (long strategy) and French sustainability index.

The overall results indicated long-short strategy provides an opportunity for investor to generate abnormal returns with the long position in the Oddo recommendation-based generated portfolio and short in the SRI fund-based portfolio for both European and French market. Similar results are indicated for the long in Oddo-based portfolio and short in Index-based portfolio. Although in CAPM-estimated scenario alpha results loose significance, in Fama-French case significance drops to 1%. These results suggest recommendations to be a valid information source for ESS recommendations.

Additional leg of analysis studies performance of small, medium and large-capitalisation European and French Oddo's information based portfolios. As suggested by empirical evidence, information distribution for companies with small capitalisation creates opportunity for abnormal performance due to lower analytics coverage. This was tested though implementation of CAPM and Fama–French models. Further, the long-short portfolios were introduced to continue the investigation of the performance of Oddo's portfolios and SRI fund portfolios.

Table 3.13 represents results for the equally weighted European portfolio.The equally weighted small-cap portfolio estimated through implementation of the CAPM model demonstrated a positive coefficient; however no statistical significance supported the results. Application of the Fama–French model revealed a positive alpha coefficient with statistical significance. The medium-cap portfolio did not demonstrate a strong risk-adjusted performance. Estimated with both CAPM and Fama and French models, the coefficients appeared negative in both cases, with the results for the medium-cap portfolio having no statistical significance. The model carries a strong explanatory power for small, mid and large-cap specifications.

Table 3.13 Equally Weighted European Portfolio

	Portfolio weights	Portfolio capitalization		
Model		Small	Medium	Large
CAPM	Alpha	0.0003*	-0.0005	0.0011***
		(0.38)	(-0.56)	(2.78)
	Beta	0.9108***	1.0413***	1.0655***
		(24.75)	(41.65)	(73.04)
	Adj R2 CAPM	0.841	0.906	0.974
Fama–French	Alpha	-0.0005	-0.0009	0.0006**
		(-1.22)	(-1.28)	(1.96)
	Beta	0.9048	1.0555	1.0465
		(41.98)***	(63.92)***	(100.62)***
	SMB	0.8001***	0.5727***	0.1689***
		(23.82)	(13.07)	(5.75)
	HML	0.0787**	-0.0402	0.1085***
		(2.01)	(-0.78)	(2.83)
	Adj R2 FF	0.938	0.950	0.978

Notes: This table represents the results of the equally weighted portfolio analysis. The table represents the results for small, medium and large-cap portfolio composition. Two methodologies were applied for the evaluation: the first section represents the results for the CAPM model implementation and the second section introduces the Fama–French model. The adjusted R-squared indicators are presented after each model specification. *** 1% significance level; ** 5% significance level; * 10% significance level.

Table 3.14 Value-Weighted European Portfolio

	Portfolio weights	Portfolio capitalization		
Model		Small	Medium	Large
CAPM	Alpha	0.0021**	0.0029***	0.0014***
		(2.28)	(5.12)	(5.21)
	Beta	0.9718***	1.0136***	1.0165***
		(31.38)	(50.54)	(100.58)
	Adj R2 CAPM	0.853	0.931	0.986
Fama–French	Alpha	0.0012**	0.0027***	0.0012***
		(1.91)	(6.70)	(-6.34)
	Beta	0.9635***	1.0311***	0.9961***
		(51.07)	(83.62)	(142.18)
	SMB	0.7897***	0.4816***	-0.0741***
		(20.39)	(16.17)	(-4.63)
	HML	0.0885**	-0.06312	0.1013***
		(2.11)	(-1.11)	(4.21)
	Adj R2 FF	0.938	0.964	0.988

Notes: This table represents the results of the value-weighted European portfolio analysis. The table represents the results for small, medium and large-cap portfolio composition. Two methodologies were applied for the evaluation: the first section represents the results for the CAPM model implementation and the second section introduces the Fama–French model. The adjusted R-squared indicators are presented after each model specification. *** 1% significance level; ** 5% significance level; * 10% significance level

In the case of large-cap portfolios, a statistically significant positive alpha was estimated through the implementation of CAPM and Fama–French models.

The results from implementing the Fama–French model demonstrated similarity in the case of market exposure. The risk volatility coefficient reduced by 0.0106 points in the case of the small-cap portfolio. The market indicator remained above 1 in the case of the medium or large-cap portfolios. The SMB factor estimator demonstrated a statistically significant exposure to small-cap stocks. Interestingly, the portfolio of medium-cap stocks signalled value stock exposure in comparison to the small and medium-cap portfolios. However, the results appeared not to carry statistical significance. The explanatory power of the model increased with market capitalization improvement, with the R-squared indicator at 88.4% in the case of small-cap companies, rising to 97.8% in the case of the large-cap portfolio.

The value-weighted portfolios (Table 3.14) demonstrated a stronger risk-adjusted performance in comparison to the equally weighted portfolios. The results attained through the implementation of the CAPM analysis estimated a statistically significant positive alpha, with the small-cap portfolio's coefficient the strongest at 0.002 and the large cap portfolio's alpha coefficient at 0.014. The results do not demonstrate significant outperformance; however, the small-cap portfolio appears statistically strong. The pattern of beta performance remains similar to that of the equally weighted portfolio, with only the small-cap portfolio coefficient demonstrating volatility slightly less in comparison to the market. The model demonstrated a strong explanatory power, with all specifications apart from the small-cap portfolio at above 96%.

The alpha for the three portfolio specifications remained positive under the Fama–French model-based analysis. The alpha coefficient of the small-cap portfolio dropped by 0.0009 points; however, it is important to mention that overall, despite statistical support, the alpha indicators did not demonstrate notably strong results, and remained close to the market. Interestingly, both the small and large-cap portfolios demonstrated an influence from growth stock, whereas the medium-cap portfolio showcased a value-stock impact; however, the impact was not statistically supported. An r-squared indicator above 90% demonstrated the strong explanatory power of the model.

In the case of the French portfolio, the accuracy in predictions and rating system could be assumed to portray stronger results. As the analysed data belonging to the broker

originated in France, a prime access to information could potentially provide an opportunity for analysis and prediction capabilities of the highest accuracy (Table 3.15).

The performance of the equally weighted French portfolio (Table 3.15) indicated a stronger risk-adjusted performance, generating a negative alpha only in the case of the mid-cap portfolio, as discovered after the implementation of both the CAPM and Fama–French models. However, these results did not demonstrate either positive or negative deviation from the market, according to the weak alpha coefficient. In addition, it should be emphasized that only the alpha performance of the small-cap portfolio appeared to be statistically significant.

Table 3.15 Equally Weighted French Portfolio

Model	Portfolio weights	Portfolio capitalization		
		Small	Medium	Large
CAPM	Alpha	-0.0040***	-0.0001	0.0005**
		(-3.51)	(-0.12)	(-1.48)
	Beta	0.6614**	0.972***	1.0024***
		(15.35)	(26.33)	(71.91)
	Adj R2 CAPM	0.642	0.84	0.957
Fama–French	Alpha	- 0.0048***	-0.0004	0.0007**
		(-5.59)	(-0.77)	(2.13)
	Beta	0.6558*	1.0157***	1.0258***
		(18.11)	(35.60)	(83.39)
	SMB	0.7782***	0.6953***	0.1452***
		(12.57)	(13.32)	(7.05)
	HML	0.1122***	-0.0049	-0.1097***
		(1.69)	(-0.11)	(-2.92)
	Adj R2 FF	0.753	0.941	0.967

Notes: This table represents the results of the equally weighted French portfolio analysis and the results for small, medium and large-cap portfolio composition. Two methodologies were applied for the evaluation: the first section represents results for the CAPM model implementation and the second section introduces the Fama–French model. The adjusted r-squared indicators are presented after each model specification. *** 1% significance level; ** 5% significance level; * 10% significance level.

Three portfolio specifications appeared to be exposed to small-cap stocks, indicated through the statistically significant positive coefficients. The medium and large-cap portfolios also appeared to be influenced by value stocks.

The strength of the model's explanatory power significantly decreased in comparison to the case of the European small-cap portfolio's performance evaluation, which dropped down to 61.9%, although it still allows us to accept the outcome. In case of the medium and

large-cap portfolios, the explanatory power remained strong. The results of the Fama–French portfolio implementation appeared to be stronger, with 79.2% explanatory power.

Table 3.16 Value-Weighted French Portfolio

	Portfolio Weights	Portfolio Capitalization		
Model		Small	Medium	Large
CAPM	Alpha	-0.0023**	0.0011	0.0007**
		(-1.75)	(-1.41)	(1.01)
	Beta	0.6991***	0.9791***	1.0084***
		(13.46)	(23.12)	(52.06)
	Adj R2 CAPM	0.59	0.842	0.962
Fama Frech	Alpha	-0.0028**	0.0009*	0.0007
		(-2.78)	(1.72)	(1.54)
	Beta	0.7243***	1.0244***	1.0064***
		(19.38)	(27.74)	(52.29)
	SMB	0.6883****	0.651***	-0.0444*
		(10.02)	(3.08)	(-1.77)
	HML	0.1319**	-0.0387	-0.0058
		(2.05)	(-0.68)	(-0.18)
	Adj R2 FF	0.711	0.932	0.962

Notes: This table represents the results of the value-weighted French portfolio analysis and the results for the small, medium and large-cap portfolio composition. Two methodologies were applied for the evaluation: the first section represents the results for the CAPM model implementation and the second section introduces the Fama–French model. The adjusted r-squared indicators are presented after each model specification. *** 1% significance level; ** 5% significance level; * 10% significance level.

The results for value-weighted portfolio are demonstrated in table 3.16. In contrast with the equally weighted portfolio, the value-weighted portfolio's alphas of the small-cap portfolio in both the CAPM and Fama–French settings appears negative. It is also the only statistically significant alpha measurement in the value-weighted method setting, with another low-significant alpha indicator belonging to the medium-cap portfolio estimated through the Fama–French model. The beta indicators mimic the results estimated through the equally weighted portfolio, which suggests that the geographic aspect might have a potential contribution to make to the risk minimization process. Unlike the case of the equally weighted portfolio, the value-weighted large-cap portfolio demonstrates the expected exposure to large-cap stocks. The small-cap portfolio also demonstrates a statistically significant exposure to growth stocks.

Overall analysis indicated the results and alpha coefficients to remain statistically significant across stocks' size variations, with large-cap stocks to demonstrate abnormal return generation capabilities for European and French Portfolios.

3.7 Conclusion

The current study addresses issues, which broker dealers are facing due to implementation of MiFID II. New regulations, which are dedicated to improve transparency in the market, will have a strong impact on the operating model of sell-side brokers. Brokerage houses operate on the commission basis where clients are charged with fees after services are provided. The fees combine research and execution fees, which makes the structure not transparent. As new regulations come into power, brokerage houses are requested to disclose fee structure and separate research and execution fees. The research fees are required to be announced upfront. These measures would significantly increase competition and put the existence of small boutique firms under jeopardy. Therefore it is important for brokerage houses to find alternative ways generate value and to secure demand from the clients.

This study evaluates ESG-related value creation opportunities for brokers following the example of the French broker and investment firm Oddo and Cie. The company developed an alternative ESG rating and issued stock recommendations in response to growing demand from French and European investors. Opportunities for brokers within an ESG framework as a subject are yet to be deeply explored by academics. Growing evidence demonstrates significant interest from the buy-side as suggested in Dorflietner (2015), as well as positive evidence of value creation opportunities associated with ESG (Ioannou and Serafeim, 2010; Luo et al., 2014), making the framework a promising opportunity worth exploring for the sell-side broker.

To estimate the value-generating capability of the ESG recommendations issued by Oddo and Cie broker, methodology based on portfolio analysis was implemented. Two geography-based portfolio were generated on the basis of provided recommendations: European and French one. As the broker did not disclose the metrics used to develop ESG rating and recommendations, ASSET4 data was used to create alternative ESG rating-based portfolio and evaluate performance of high and low – rated stocks on the bases of the thirteen chosen factors, which reflect environmental, social and governmental features. Equally weighted portfolio performance was further compared to the portfolio generated on the basis of European and French SRI funds, as well as European sustainability index-based portfolio. The introduction of SRI fund-based portfolios allowed the comparison of the value generation capability of Oddo's portfolio in the perspective of the alternatives available. Long-Short portfolio strategy was implemented for robustness tests.

The results revealed the ESG recommendations developed by Oddo and Cie provide data, which allow generating statistically significant return, however the generated alpha indicator appeared negative. ESG-rating based portfolios represented similar strong significant result. The portfolios indicated positive and negative abnormal returns, suggesting, the performance results are indicator-specific. The only alternative, which indicated positive abnormal return, was index-based portfolio, however the results were not consistent. The SRI-based portfolio demonstrated statistically significant results with negative alpha. The robustness test revealed ability to generate abnormal portfolio returns through implementation of long-short strategy with Oddo-based portfolio in long position. From the analysis results, it could be suggested; recommendations provided by Oddo to have relevance, when implemented within ESG investment framework, and could be taken into consideration by investors. In other words, the study demonstrates, how brokerage through the implementation of vast data resource could implement ESG framework to generate alternative product for a responsible investment universe. However, the recommendation-based portfolios did not deliver abnormal outperformance. This suggests further improvement could be introduced, to upgrade its competitive advantage characteristics.

During the data analysis it was discovered that the French market does not employ a French sustainability index. This issue has not been addressed by the literature or the industry. However, as France holds the position of the leading player on the ESG investment market, creating such could provide benefits for market players as well as offering a market opportunity for others.

Essay 4: Returns to Corporate Social Responsibility in Private Equity? A First Exploratory Study

Abstract

Private equity is the industry where responsible investment practices, and the ESG framework in particular, have been adopted at a slower pace in comparison to other asset classes. The opaque nature of the industry makes it complicated to access the necessary information to examine thoroughly the ESG-related issues and opportunities. The author takes a further step to examine the factors, which hinders the process. Additionally, she presents an exploratory study of the connection between ESG-driven events and private equity multiples, which is based on the data exclusively provided by the industry participant. The study establishes that institutional investors and limited partners drive the interest in ESG, with tendencies to implement framework at the due diligence, investment decision-making stage. Through a thorough evaluation of the existent literature the study identifies investor scepticism, the investment time frame, the lack of reporting practices and overall opaqueness to be amongst the major obstacles. The results of the explorative study demonstrate insightful information on the potential positive implications from ESG framework implementation for the investment portfolios of private equity firms.

4.1 Introduction

The implementation of environmental, social and governance practices into the investment process has been accompanied by a steep rise amongst financial market participants. Over the decade 2006 to 2016 the amount of assets under management by PRI signatories has grown from $6.5 trillion to $64 trillion as reported by Intertrust (2017). The equity is the leading asset class within the scope of ESG and has a strong presence of European funds in the market, evolving a variety of investment strategies to attract new investors (MSCI, 2015).

In contrast ESG adaptation in the private equity sector has moved at a visibly slower pace and investors are reluctant to utilize the new framework. Information availability, cost and resource constraint remain serious obstacles to the path of ESG adaptation, despite strong demand from institutional investors, as has been highlighted in numerous reports (e.g. Intertrust, 2017; Mercer, 2015). Despite the existing problems, some private equity firms have embraced an ESG perspective, motivated by the potential for improvements in risk-adjusted returns and benefits for reputation risk management (Mercer, 2015).

As ESG became a central topic to a growing body of academics, the lack of research dedicated to the process and practices of ESG integration within the private equity sector is distinctively noticeable. This could be due to the opaque nature of the sector's activity, predefined by the lack of public reporting. In order to promote ESG implementation in the investment process of private equity firms, it is important to equip general partners (GPs) with efficient tools to do that and raise overall awareness of related methodologies and processes.

This essay explores motivation, methodologies and constraints for ESG practice implementation within the private equity context to discover the key factors, which influence the framework's development in the sector. The research is presented in the form of an explorative study focusing on the publicly available research and literature. It provides a wide overview of the current practices of ESG implementation applied by general partners and explores methodologies, motivation and obstacles. ESG-related practices on the equity market are presented as a comparison in order to identify the factors, which slow the process in private equity. In addition, the essay introduces a clinical study of the impacts that ESG considerations have on a company's portfolio. This became possible due to the exclusive

accessibility to the data provided by the industry player. The study explored the impact that negative ESG-related events have on the portfolios.

The results of this study provide further support for the evidence generated in the work of Cornelli et al (2015) that investors (limited partners (LPs) are the key sources that motivate ESG implementation, as they are links between ESG integration and risk mitigation and value creation. In addition, ESG is linked to a reputational strength. It was also found that the methodological aspect is characterized by a low development linked to poor information compatibility and the lack of publicly accessible data. The tendency of GPs to ignore the exit and hold stages during the investment process has been indicated in a few studies. Strong obstacles were revealed through an analysis of the literature. In comparison to the equity market, where information transparency and improving reporting standards facilitate the development of methodologies, private equity industry remains reluctant to the reviewing of reporting standards. Low information availability hinders methodological development, and the positive value creation implications are harder to notice due to the prolonged investment horizon. It could be suggested that, on the basis of evidence presented by the equity industry, reporting and information availability require a switch in the investor's approach to create a positive environment for ESG implementation.

The explorative study developed steps towards studying the connection between private equity and ESG on the basis of the evolution of the relationship between private equity multiples and ESG-related negative events. The analysis became possible due to accessing the information provided by the industry representative. Results revealed positive evidence of a connection between the two.

The literature overview reveals a strong lack of academic work featuring extensive empirical analysis.[34] The majority of the available data was available through industry reports. As information distribution is limited in the sector, it hinders the growth of substantial academic background.

The study introduces a step further towards the theoretical landscape development. It provides an extensive overview of existent methodologies and obstacles, as well as drawing

[34] It is important to note that after the second overview dedicated to the updated literature no new academic publications were available after the year 2015. PRI and Interstrust provided the only prominent overview on the subject available for 2017.

parallels to the equity sector to underline accurately the hurdles for ESG framework development. From a practical perspective, the empirical element of the essay represents evidence of a connection between PE multiples and ESG-related incidents. This is a strong indicator of a relationship, which could have a positive or negative impact on portfolio performance.

The rest of the essay is organized as follows. Section 4.2 explores the rise of the ESG framework in the context of the equity market, overlooking the motivation factor, applied methodologies and a review of the existent barriers. Section 4.3 introduces the ESG framework in the private sector. It explores the framework from different angles through the prism of the existent literature. It focuses on similar factors to explain why an ESG framework does not have a similar speed of growth in private equity. Section 4.4 presents an explorative study to determine the links between the ESG framework and portfolio performance, based on exclusive data provided by an industry participant. The essay is completed with a concluding summary.

4.2 Evolvement of a Sustainable Investment Approach: The Equity Market and the ESG Framework[35]

As mentioned, the equity market was one of the first sectors where investors addressed the material benefits of the implementation of the ESG concept. Therefore, it is worth taking a look at how the framework evolved within the sector, which might provide a better understanding of the way the process is being incorporated within the private equity market.

4.2.1 Motivation for ESG Implementation

Since the introduction of the UN PRI initiative in 2005, investors' attention towards the ESG framework has increased dramatically. This was significantly fuelled by the growing evidence of material benefits provided by several reports and academic studies (PWC, 2012b; Khan et al., 2015; MSCI, 2015).

[35] The literature and industry reports, which were analysed on the literature overview are summarised and presented separately in the Appendix 3.

Existing reports highlight two main motivation factors for ESG adoption relevant to the equity market. The first is the growing demand from asset owners. According to the report issued by PRI (2015), asset owners are the most likely to incorporate ESG factors, as confirmed by 96.7% of respondents. They also expressed the expectations of managers to implement similar policies, as asset owners have a tendency to withdraw from managing assets directly, as was also indicated in the PRI report. Among asset owners, the pension funds and insurance companies, whose investment strategies tend to be distributed over a long-term perspective, appeared to show the highest interest in ESG implementation (BSR, 2013; PRI, 2015).

The second important driver for the expansion of interest within the investors' community has been the growth of financial opportunities provided by ESG. For the past three decades a substantial transformation in the structure of companies' market value has occurred, making intangible assets accountable for 80% of such value, as reported by the International Integrated Reporting Council (2011). Under these circumstances ESG indicators can be perceived as one of the most reliable techniques for the evaluation of intangible assets. The study for Deutsche Bank (2012) demonstrated evidence that a higher change adoption capability, a lower cost of capital and lower capital constraints were among the attributes of companies with reportedly strong ESG performance. Moreover, more evidence has now emerged which links long-term positive financial performance with the adoption of ESG concepts by investors (Mercer, 2012). This case is particularly strong for companies for which intangible assets, such as brand and reputation, have led to a competitive advantage (Eccles et al., 2011).

The growing evidence of material benefits from the implementation of the ESG framework has motivated more and more investors who seek ways to improve the portfolio's alpha by incorporating the methodologies analysed above. Two studies, by MSCI (2015) and Khan et al. (2015), have provided robust positive feedback on the financial potential of the ESG framework; particularly good results were achieved through the implementation of the ESG Tilt and ESG Momentum strategies, which both demonstrated outperformance against the benchmark in the study (MSCI, 2015). In comparison to these results, a significantly smaller pool of studies has covered the private equity field. The progress that private equity investors have so far made in the responsible investment domain is analysed in subsequent sections.

4.2.2 Mechanisms and Methodologies for ESG Integration within the Equity Market

There are a number of mechanisms available for investors' adoption. The choice of a particular mechanism is usually driven by investors' motives. Quitinet (2012) suggested that the willingness to concentrate on either value creation or financial performance improvement lies behind the methodology of choice. However, on the basis of newly presented evidence, both aims could be embodied in one strategy. In practice, most of the companies tend to rely primarily on personal experience and combine several available methodologies, making each case of ESG framework implementation unique (Allianz, 2015).

Deep research and due diligence is the first methodological part of ESG implementation. Therefore ESG-related research and a precise evaluation of value generation potential is an important first step for investors. Involvement of sell-side research in the process positively accelerated the speed of this step (Intertrust, 2017).

As the ESG framework is mainly dedicated to reflecting the intangible aspect of business, quantification of the framework is an exceedingly complicated task for the investors. This is therefore a critical second step towards the implementation process. As highlighted in PRI (2017) quantification of the process through the improved data science approach and the ability to prioritize the impact of various factors in portfolio performance quickly resolved the efficiency issue.

After acquiring important information and developing the valuation method, further investment steps vary depending on the investor's desire to engage in the management process. Amongst the first method to be adopted by equity investors was ESG screening (MSCI, 2011; Deutche Bank, 2012). This involves stock-picking practice, and is motivated by excluding the companies with a negative ESG record, or including the companies that have demonstrated a strong positive ESG performance. This approach has recently been largely abandoned as a central one, and is now mostly applied in connection with other methods (BSR, 2012).

Another approach was defined as an ESG tilt in multiple reports (MSCI, 2011, 2013, 2015; BSR, 2012). The concept suggests the use of a portfolio rebalancing practice, where the portfolio is overweighed with the company's stocks granted a high ranking in the ESG rating of choice (such as the MSCI ESG, Thomson Reuters or Bloomberg ratings), as well as minimizing the weight of the stocks at the bottom of the ESG rating. The ESG rating is used

as a benchmark in this case. The methodology aims to grasp the return, while minimizing the risk exposure, through limiting the number of poorly performing stocks.

An approach dedicated to a focus on companies that have demonstrated a significant improvement in their ESG ranking within a 12-month time frame is the ESG Momentum strategy introduced in the MSCI reports (2011, 2013 and 2015). The application of this strategy requires the investor to overweight the portfolio stocks of companies which have demonstrated a strong positive growth in the ESG rankings over the past 12 months, and underweight the stocks which have dropped in the rankings over the same period of time (MSCI, 2013, 2015). This strategy allows investors with a short-term approach to grasp any ESG-related opportunities, as it allows them to take advantage of any trends occurring in the market over a limited period of time.

From available sources, it is seen how the techniques vary across different cases. A descriptive case is demonstrated in the report of the Itaú Company (2013), which developed a wide range of activities dedicated to the quantification of ESG-related information, both quantitative and qualitative. The range of activities implemented by Itaú include: an evaluation of the time estimation of factors, which could enforce cash flow generation; a quantification of social and environmental impact; an estimation of the time horizon for a potential event to have an impact on the target company's performance; and the ESG-related activities engaged in or considered by the target company. The results of these steps allow the investor to choose the most appropriate ESG implementation approach.

One of the approaches, active ownership, is based on the investor's engagement in the management processes of the companies, which allows them to facilitate changes within the company's structure with a potentially positive financial outcome. This is usually realized through tools such as voting, direct engagement in the management processes or engagement in a public activity related to promoting ESG-related policies. This set of activities goes beyond standard portfolio management practices, allowing investors to gain a better control over the company in order to secure its long-term dedication to ESG-related practices (MSCI, 2011; BSR, 2012). In the equity sector active ownership is more accessible for large institutional investors, as smaller investors have a relatively minor stake within the company, which creates a limitation on their actions; in addition, active ownership undermines the long-term commitment on the investors' side, which is not particularly common in the equity sector (Institute for Responsible Investment, 2012). This practice has gained a wider

popularity within private equity investors, as demonstrated later in the essay.

4.2.3 Barriers to ESG Implementation in the Equity Market

One of the key components of the successful integration of ESG concepts within the equity market, as highlighted in the report of the Sustainalytics agency (2012), is the availability and compatibility of the related data, as the investors' decision-making process is severely dependent on such factors. A few reports have demonstrated significant improvements in data availability over the period between 2005 and 2017 (BSR, 2009; Kahn et al., 2015; PRI, 2015, 2016). Companies' reporting practices have become more structured and open, and there are also now several ESG data providers on the market, such as Thomson Reuters, Bloomberg ESG Analytics AG and MSCI. The reports are strongly performance-driven. However, the voluntary nature of information disclosure hampers the data verification process (Itau, 2013). It is important to note that the context in which this data is incorporated by the investors has a significant impact on the type of investment approach, which is applied.

The integration practice has become more sophisticated over time as techniques of factor quantification became more widespread (PRI, 2017). The practice has become more systematized as well. Finally reports increase investment in resource development, which allows improving the quality of existing methodologies (Intertrust, 2017).

As highlighted in the reports, the equity market has strong drivers to grow ESG practices with no powerful impeding barriers, which explains the high rate of framework development within the sector.

4.3 Private Equity and ESG Framework: Review of the Existent Literature

The aim of the literature review of private equity is to identify which factors motivate and which slow down the process of ESG implementation.

4.3.1 Concept Development and First Implementation Steps

As the subject of the implementation of ESG factors within the investment strategy of private

equity funds is relatively new, the availability of studies and reports dedicated to this topic is very limited. Most of the existing reports provide either an overview of the existing methodologies and motivation factors for the implementation of ESG-related strategies, or guidelines for limited partners or general partners; only a very few studies provide analytics and statistics, most of which have been acquired through conducted surveys. A more detailed list of available reports is presented in Appendix 3.

It can immediately be seen in Appendix 2 that industry reports prevail in the available information pool. The majority provide a reflection of the latest trends or implement recommendations and guidelines for investors, rather than performing any in-depth data analyses. One of the first attempts to analyse the economic impact of joining the PRI initiative was made in Teti et al. (2012), where the authors used the data from US private equity funds and demonstrated a positive financial impact from ESG engagement. Despite being one of the first data-oriented studies in the field, it provides limited results, connecting positive to neutral revenue growth to the participation of the funds in the PRI initiative.

The majority of the available reports are based on the qualitative information gathered through interviews and interaction with industry representatives, which is in line with data shortage and the lack of reporting practices. Companies like Malk (2012, 2013, and 2015) introduce annual reports on ESG development in the industry and the trends amongst the LPs and GPs. Other reports, like those issued by PWC, focus on conceptual development.

One of the biggest trends in the research and reporting practices became an issue of methodologies and guidelines to support ESG integration. MSCI and PRI are major data providers in this field, with companies issuing up-to-date reports on the progress and introducing case studies (MSCI, 2013; PRI 2013, 2015, 2016). Despite the consistency of the reports and the theoretical insights, the representativeness of the data could be argued to be limited because of the few respondents in comparison to the market size (e.g., the number of PRI signatories was 936; PRI, 2015). Interestingly, reporting systems were not systematized and general partners' communication over progress in the ESG grid implementation domain remained unstructured (Malk 2012, 2015).

The existing pool of literature represents an interesting overview of the work performed on the topic of the ESG framework within private equity. Investors' positive attitudes and a growing recognition of the potential for value creation produce strong potential for further investigation. Despite some limited partners, as well as investors at large

who express a certain scepticism over ESG potential, others provide encouragement; risk mitigation also provides a strong stimulus for further development of the framework. However, a lack of empirical evidence leaves some investors reluctant to embrace the concept further. In the following sections, this study conducts a further in-depth analysis of the current stage of ESG grid integration into private equity.

4.3.2 Motivation for ESG Adoption within Private Equity

The acceleration of interest from private equity funds could be linked to multiple changes in the financial markets, such as increasing environmental concerns, governmental initiatives, enhanced regulations, growing demand from limited partners, the appearance of new sectors of investment interest, such as renewable energy, and the growing evidence of potential financial benefits (Teti et al., 2012; BVCA, 2013, 2014; Doughty Hanson & Co. and WWF, 2013; Cornelli et al., 2015).

Firstly, Cornelli et al. (2015) highlighted the demand from investors to be one of the key sources of motivation for general partners to take ESG strategies into consideration: 73% of small-sized funds (less than $1 billion), 67% of mid-sized funds ($1–10 billion) and 85% of large-sized (more than $10 billion) reported the pressure of limited partners to be the strongest motivation. A similar factor was featured as the key motivation for ESG development in the equity market. The authors provided evidence of value creation opportunities, which positively affected GP's interest. This trend is also supported by the PWC (2015) and Malk (2014) reports. The fiduciary duty of limited partners to their clients to provide high-quality services aligned with recognized standards also adds to the pressure on them (BSR, 2012); in return, they also seek an improvement in standards of fund reports as a key tool to communicate the process of ESG integration.

Secondly, risk mitigation, return growth and value creation opportunities, featured in multiple reports (Doughty Hanson & Co. and WWF, 2012; PRI, 2014; Mercer and Capital Partners, 2015; PWC, 2015), became a strong motivation factor. The report by Mercer and LGT Capital (2015, p. 10) indicated that 57% of respondents acknowledged the implementation of ESG factors as a positive influence on risk-adjusted returns.

Additionally, reputation benefits related to ESG implementation were indicated as another motivational factor. In a highly competitive industry, a corporate reputation is one of the key intangible assets that can contribute to the creation of a firm's advantage. A fund

could benefit from a positive ESG profile as there are greater chances to attract potential investments and funding, and a positive image facilitates the creation of a positive profile in the media (Mercer and LGT Capital Partners, 2015; PWC, 2015). In comparison, in the case of the equity market reputation did not come as a leading motivational factor, which could be attributed to differences in the investment time frame. In the case of private equity improved reputation is an important factor impacting on the value.

Finally, it is worth mentioning that external sources of encouragement for ESG grid adoption can come from government, the media and NGOs (Malk, 2014). The foundation of the UN PRI and similar initiatives (BVCA, 2012; PWC, 2015) has created an extra pressure on peers to address ESG-related issues in order not to lose a competitive edge. There are also growing environmental concerns and rising demand for ethical behaviour from society at large (BSR, 2012; BVCA, 2012; US SIF Foundation, 2013).

With these multiple sources of motivation for ESG strategy implementation, it is worth mentioning that, despite pressure from institutional investors, society and regulatory bodies, as well as the necessity to mitigate risk, these factors do not necessarily provide enough stimulus for the implementation of responsible investing practices. It could be suggested that the growth potential for value creation could soon change views on ESG and add a positive drive for its integration with investors' strategy; however, another reason could be stronger obstacles, in comparison to the equity market.

4.3.3 ESG Integration Process within the Private Equity Context

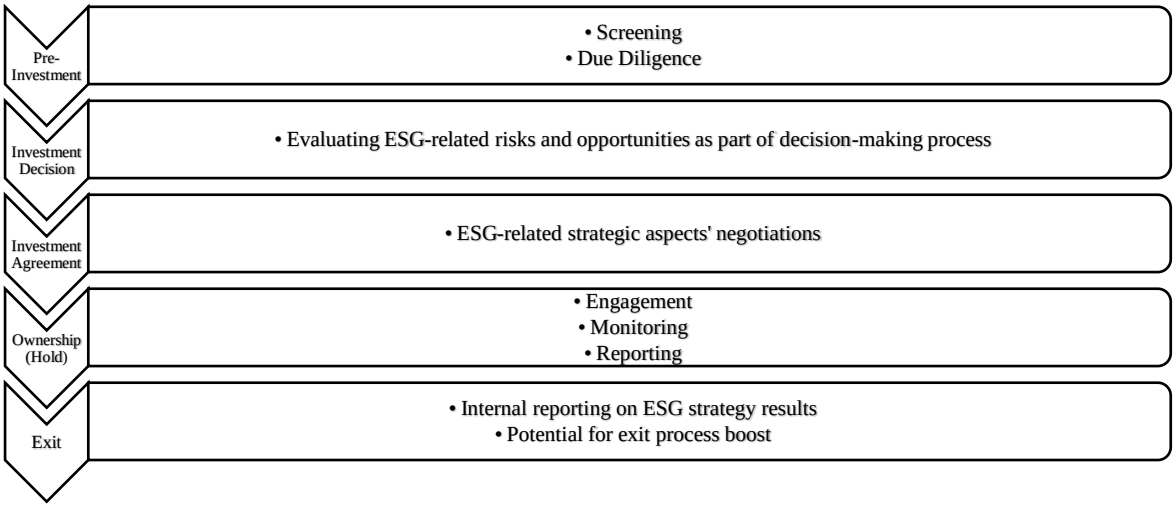
The recent move of the ESG framework from being a factor in compliance to taking a central place within investment strategy development could be regarded as a signal of a positive attitude shift within the industry (Cornelli et al., 2015). The role of general partners in this process has played an important role, as pointed out in PRI (2014), as their commitment has a direct impact on each step of the ESG framework implementation process, from motivation and communication with the team to the success of an adequate technique development and evaluation process.

Each private equity investment strategy initially comprises three basic steps: pre-investment, hold period and exit. The possibilities for ESG implementation evolve in every step of the process; however, numerous reports have suggested the integration of ESG factors in the earliest investment stage as an opportunity to gain the most benefits from the ESG

framework (PWC, 2012; BVCA 2012, 2013; PRI, 2014).

The scheme of an ESG implementation process within a private equity context is presented in Figure 4.1, which is based on the information provided by company reports.

Figure 4.1 Private Equity Investment Process and Opportunities for ESG Framework Implementation



Source: Data for the Private Equity Investment Process and Opportunities for ESG Framework from BVCA (2012), PWC (2012), PRI (2014).

At the pre-investment stage, the ESG framework is applied as a supporting technique to identify potential investment opportunities. During the screening process, which is the first step in the analysis, the ESG factors' grid could be applied in order to assess the investment target for compatibility with the values of the investors, as well as to estimate any ESG-related risk factors. Due diligence is another part of the pre-investment stage, and represents an in-depth evaluation of the potential investment candidate. This activity is often outsourced to specialist companies that provide a narrow range of specialized expertise, some of which focuses solely on ESG practice. The ESG-related due diligence phase allows the investor to assess company performance with respect to ESG practices, in order to identify any potential risks and predict any opportunities for value creation.

The next important step, which links the pre-investment and holding periods, is the investment decision. At this stage, the results of screening and due diligence are reviewed. As suggested in the investors' guidelines presented by PRI (2014), ESG-related risks and opportunities can play an important role in the decision-making process, and come into

consideration alongside the financial forecasts. The results of the ESG surveys could also be used as comparative metrics when the private equity house explores different investment alternatives (PRI, 2014).

PRI (2014) also indicated that the investment agreement should be a separate stage, suggesting it as an opportunity to negotiate and develop further an ESG strategy with the management of the portfolio company.

The ownership stage is a central phase of value creation. At this stage, general partners take a significant part in the managerial practices of the portfolio companies, and focus on strategy implementation, which corresponds with the investment goals. Depending on the strategy dimension, ESG framework implication could potentially make a significant contribution. The responsibility for communicating ESG principles to the management of portfolio companies falls on the general partners, who are the key communication point in the process of framework implementation. The higher the level of engagement within portfolio companies, the more opportunities for ESG integration evolve. This practice is identified as active ownership in the private equity field, and has gained popularity among investors in recent years.

Monitoring portfolio companies is another phase of engagement during the ownership phase. This activity allows investors to control the process of the implementation of ESG indicators. At this stage, the key considerations for investors include the quality of the process, the prioritizing of the ESG framework elements, the development of an appropriate toolkit for assisting in framework integration, the monitoring of related issues and the development of appropriate solutions, among other things.

It is equally important for general partners to be able to communicate the progress and results with the stakeholders. This can be delivered through reporting practices. The demand for detailed reports by limited partners on sustainability and ESG activity has increased significantly over recent years. (BVCA, 2013; PRI, 2014). This trend, as suggested by some available reports, has stimulated the development of new reporting standards for general partners, which can be used as a prior communication method for demonstrating the progress achieved (BVCA, 2013; PWC, 2014).

The final round of the investment cycle is the exit stage. In BVCA (2012) it was suggested that a predetermined exit strategy could influence the ESG integration levels throughout the investment cycle. Taking exit through an initial public offering (IPO) as an

example, public scrutiny can play an encouraging role as an element of pressure on investors to provide more detailed reports, and in general to create a stronger reporting system. In this case, closer implementation of ESG factors could be even more beneficial for investors (BVCA, 2012). Nonetheless, no matter which type of exit is chosen by the investors, a detailed inside report on the ESG activity could become a useful source of insight on the chosen management trajectory.

The lack of robust empirical evidence linking ESG implementation and financial performance is not a unique case for the exit stage of the investment circle, as was indicated in the previous section, but a common issue for the private equity sector. Some surveys suggest that introducing ESG factors for evaluation in the earlier stages of investment consideration and strategy development could potentially accelerate higher value creation in the long run (PWC, 2012; PRI, 2014; Cornelli et al., 2015). However, existent practices showcase GPs to be more prone to include ESG practices at the due diligence and investment decision stage, and less during the hold period.

4.3.4 Methodologies of ESG Implementation in Private Equity

Currently, a standardized set of tools for estimating the ESG-related contribution does not exist, and the majority of available techniques have been independently developed by agencies, such as MSCI (MSCI, 2013) or by the companies themselves, like the KKR Green portfolio (KKR, 2015) or Goldman Sachs's programme GS Sustain (2015). In comparison, the equity sector demonstrated strong progress on quantifying the ESG factors, which facilitated methodologies.

Investors often associate ESG factors with an intangible aspect of business (Doughty Hanson & Co. and WWF, 2012; PWC 2012). The physical nature of the factors that might cause ESG-related problems, such as carbon emissions, global warming, climate change, human rights violation, child labour, bribery, corruption and others, clearly have a strong negative impact on companies and generate high risks for investors. However, most of private equity industry associates risks with the reputational aspect of business, which falls under the intangible factor definition. Therefore, the line between an actual contribution to financial value and intangible benefits, such as improved brand, reputation and stakeholders' perception, becomes very thin, and appears to create a certain challenge for the private equity houses.

Due to the diversity of evaluation techniques among the investment companies, it becomes hard to develop an approach to quantify them. However, a report by Doughty Hanson & Co. and WWF (2012) suggested two main forms of typology.

The first set of methods is based on the development of a metric system and indices. The purpose of these approaches is to identify and measure which ESG-related factors have a potential influence on shareholder values, and how strong the influence is within a certain set of companies over a certain time frame. This is achieved through the application of econometric analyses in order to detect the metric, or set of metrics, which can demonstrate the degree of correlation with stock price performance, the indicator of shareholders' value. The higher levels of correlation represent the stronger influence of sustainability factors on shareholders' value; even though the method appears very accessible, the main issue remains how to discover which of the existing metrics is most suitable for a specific case and portfolio.

Another range of methodologies is based on the bottom-up approach. This method implies finding a particular influence, created through the implementation of the ESG factors into investment strategy, on a specific element of financial performance metrics, such as cash flow or earnings. In other words, these methods are tailored to identifying specific ESG-related drivers of value creation. This methodology is based on the implementation of accounting data. The level of ESG framework complexity limits the effectiveness of this range of methodologies; with every additional ESG factor, it becomes harder to estimate the programme's effectiveness in the context of tangible and intangible business assets (Doughty Hanson & Co. and WWF, 2012, p. 23).

The methodologies described above represent a more generalized view on potential strategies, which could be considered by private equity houses, depending on their views.

Another interpretation of evaluation methodologies was presented in the report by Novethic (2009), which suggested the implementation of a thematic approach. This is characterized by establishing the portfolio construction process around companies with an environmental focus (renewable energy, climate change, water management, or waste management), sustainability approaches (agriculture or fair trade) or a focus on social prosperity (healthcare services). It is important to note that certain issues arise with this approach, as it encourages a narrow-angled view on the company's activities, with the potential risk of overlooking any negative ESG impact caused by other important practices,

such as the company's behaviour towards employees, management practices and shareholder relations.

The practices that were previously reviewed in this essay reflect a significant progress, which has put private equity funds on the path to adopting ESG practices. However, the lack of data compatibility and slow development of quantifying the ESG factors impede the development of the framework within the sector.

4.3.5 Barriers and Criticism

The slow growth of the engagement of private equity funds with responsible investment could be linked to a discrepancy in their investment horizons, as the investment cycle within the industry is arguably short, in order to see the rapid beneficial gains that occur with ESG-related investment strategies (Chertok and Braendel, 2010; Crifo and Forget, 2013). The lack of rapidly generated evidence facilitates further investor scepticism towards the potential for value creation through the implementation of the ESG grid (PWC, 2013, 2015).

Due to the lack of empirical evidence, the process of ESG criteria implementation in financial analytics has been limited. In addition, some investors have suggested, on the basis of the market efficiency hypothesis, that if such potential financial gains were possible then the ESG sector would have developed at a faster pace (Commonfund Institute, 2013).

Another significant issue is the lack of standardized evaluation approaches. As strong financial performance is one of the key priorities for private equity houses, they practise the development of the framework in-house, according to surveys reflected in the report by Malk Sustainability Partners with EDF, Environmental Defence Fund (2013). This issue leads to significant discrepancies amongst data. Moreover, the variation in the provided information increases across different sectors and geographic markets, often making it highly incompatible. The survey carried out by Mercer and LGT Capital Partners (2015) suggests that institutional investors are not aware of the absence of clear assessment techniques, which complicates the process of evidence detection for value creation potential, and impedes a more in-depth adoption of ESG practices.

Information disclosure is another significant barrier in the sector. The agencies, which promote responsible investment approaches, have encouraged the systematization of evaluation and reporting standards. The UN PRI or Sustainability Accounting Standards

Board introduced and are constantly updating their metric systems and guidelines available for investors to apply in their financial strategies (PRI, 2013, 2015). However, the voluntary nature of the framework leaves investors to make a personal choice (RobecoSAM 2012; Malk, 2015). Moreover, despite the growing demand for the sector to become more transparent, a substantial number of funds still chooses not to disclose information regarding their investment activity.

Finally, Cornelli et al. (2015) suggested in their study that the growth of the ESG concept and the quality of its implementation within the business environment has been hindered by the misallocation of ESG-related responsibilities to lower managerial levels, such as the compliance and risk management departments.

We now look at the strong barriers which clearly impact on the speed of ESG implementation in the sector. Equity sector investors do not share the same level of scepticism; this is conditioned upon the faster speed of value generation visible for the market players as well as the longer history of practice implementation. Another strong barrier is information disclosure, which decelerates empirical investigation and the development of methodologies. The evidence suggests it to be crucial to encourage industry transparency and reporting practices to accelerate the adoption of ESG practices.

4.4 Explorative Study of the Relationship between Private Equity Multiples and ESG Incidents

4.4.1 Data Description

As has been pointed out by numerous reports, the opaqueness of private equity houses' activities is considered to be one of the biggest obstacles to research development (Doughty Hanson, 2012; PWC, 2013; Mercer, 2015). The opportunity for making a contribution to the scarce pool of research on the topic became possible due to access to the unique data sources provided by industry representatives and research bodies.

RepRisk[2] is one of the largest providers of ESG-related data in its class, starting from 2006, with an extensive pool of information on non-publicly traded companies. The dataset provided by the company includes a full list of ESG-related incidents, organized by company name and year. RepRisk leverages a proprietary solution to monitor more than 80,000 online

information sources in 15 languages for controversial news items relating to ESG. Information sources include research firms, think tanks, government agencies, NGOs, regulatory agencies, Internet blogs, news websites and more. RepRisk's solution searches for news items on controversial products and services, health and environmental issues, violations of international standards, violations of national legislation and supply chain issues.

Another section of the data was presented by one of the largest industry players. The dataset was acquired from a private equity firm with an extensive coverage of three geographical regions: Asia, Europe and the USA. The available dataset represented information on portfolio companies with both realized and unrealized assets. Company, fund and management names were reflected in the dataset, with details on basic financial data, including costs, proceeds, net asset value, total value and multiples. The data covered information on deals at the start and close points, including data on enterprise value, equity, net debt, current revenue, EBITDA and net income. As a real-life dataset was provided for the evaluation, some parameters from the set lack availability, which had an impact on the analysis scale. Each investment was also ranked according to the internally developed system.

The dataset was constructed by matching the RepRisk data with the information provided by the private equity firm. The results of merging the two datasets and transforming them into the cross-section prepared for the analysis is summarized in Table 4.1. The time frame was set between 2007 and 2012. With regard to the regulations and restrictions on data availability within the private equity sector, all the data with the potential to fall under the no disclosure policy and classified as secret were hidden through a system of codes. The final overall dataset included over 7500 portfolio companies, of which 847 originated from Asia, 2025 from Europe and 4672 from the US region.

Table 4.1 Data Summary

Geography	US	Europe	Asia

	overall	%	overall	%	overall	%
Observations	4672		2025		847	
Companies matching the “RepRisk” database	1129	24.15	491	24.25	174	20.53
Total amount of funds	185		149		76	
General managers	91		70		47	

Notes: This table represents the summary of the dataset, which was created on the basis of paring data from the PE fund and Rep Risk.

4.4.2 Methodology

Due to the novelty of the study, a substantial amount of work was performed manually. The first step included the merger of two data files in order to create a new dataset which would capture the ESG concept, expressed through the reflection of RepRisk data on the information obtained from the fund. In other words, all the ESG-related incidents indicated in the RepRisk dataset were transferred to the new dataset. The new file contains information about the incidents, source of information and date, and was also ranked according to “novelty”, “severity” and “sourcereach”. The dataset was constructed in a way to allow us to grasp the impact of negative ESG-related scenarios on the performance of portfolio companies presented in both initial datasets. Therefore only the events that occurred before or during the investment cycle were considered in the dataset.

The dataset preparation was accomplished in several phases:

- Manual data coding and matching to the initial RepRisk dataset separately for each region.
- The datasets were then merged in order to create one spreadsheet covering all the regions.
- Information on ESG-related incidents provided by RepRisk was added to the dataset. The file contained a description of the incident, with information source and data, and was ranked according to novelty, severity and sourcereach.
- The dataset was rearranged according to the event information. All the events were divided into those that happened prior to the investment, and those prior to the exit date.

The choice of methodology for the analysis was driven by the limitations caused by data availability. Despite the lack of variables to perform an in-depth examination, the dataset provided an opportunity to perform a preliminary analysis to detect the impact of ESG-

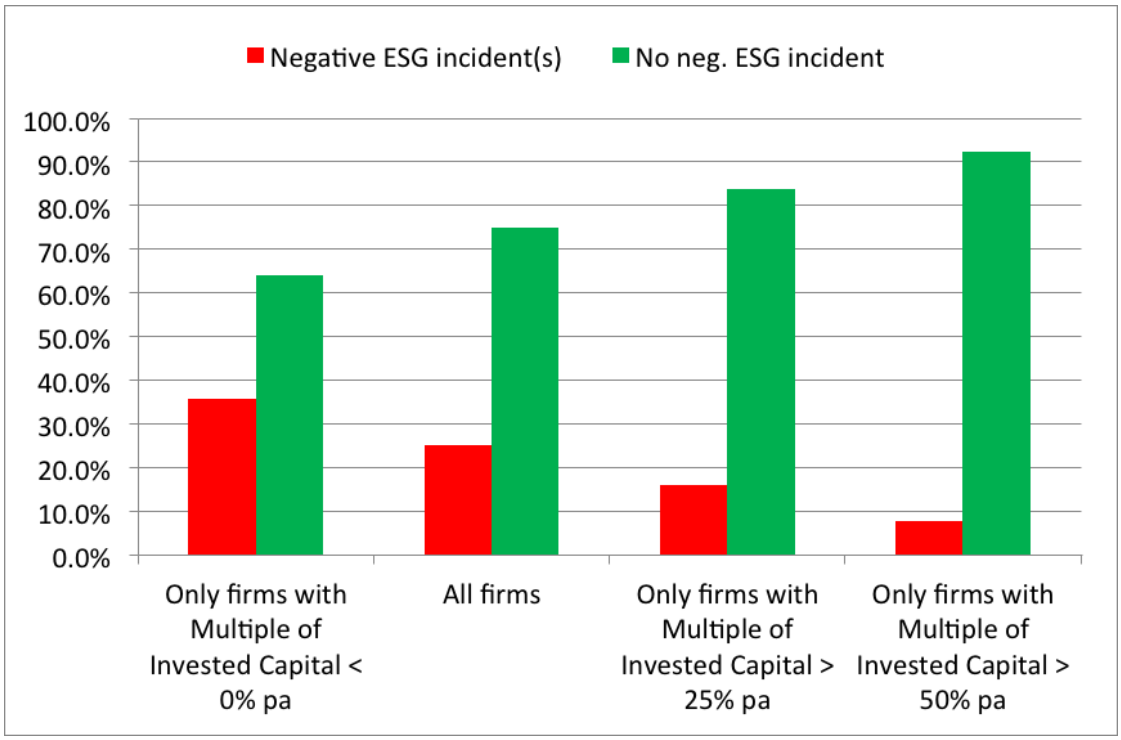
related trends on the portfolio companies. The dataset was constructed in a form that reflected the impact of negative ESG-related events. Therefore, it was possible to perform a comparative analysis in order to detect any potential relationship. The limitations also do not allow making a conclusive judgement about the influence of the ESG factors, but only revealing the existence of interrelation. The evaluation was performed with the application of performance indicators from Invested Capital multiple, Revenue Growth and EBITDA. The companies were divided according to two scenarios: the companies which featured a negative ESG event (matched on the basis of RepRisk information); and the companies with no featured negative ESG event. To test the strength of the relationship the size factor was implemented. Four size specifications were applied: all companies; companies which did not demonstrate any growth on a chosen multiple; growth above the 25% level; and growth above the 50% level. The results are illustrated in the figures provided in the following section.

4.4.3 Results and Analysis

Despite the preliminary nature of the research, some positive ESG-related implications could be discerned from the results of the analysis.

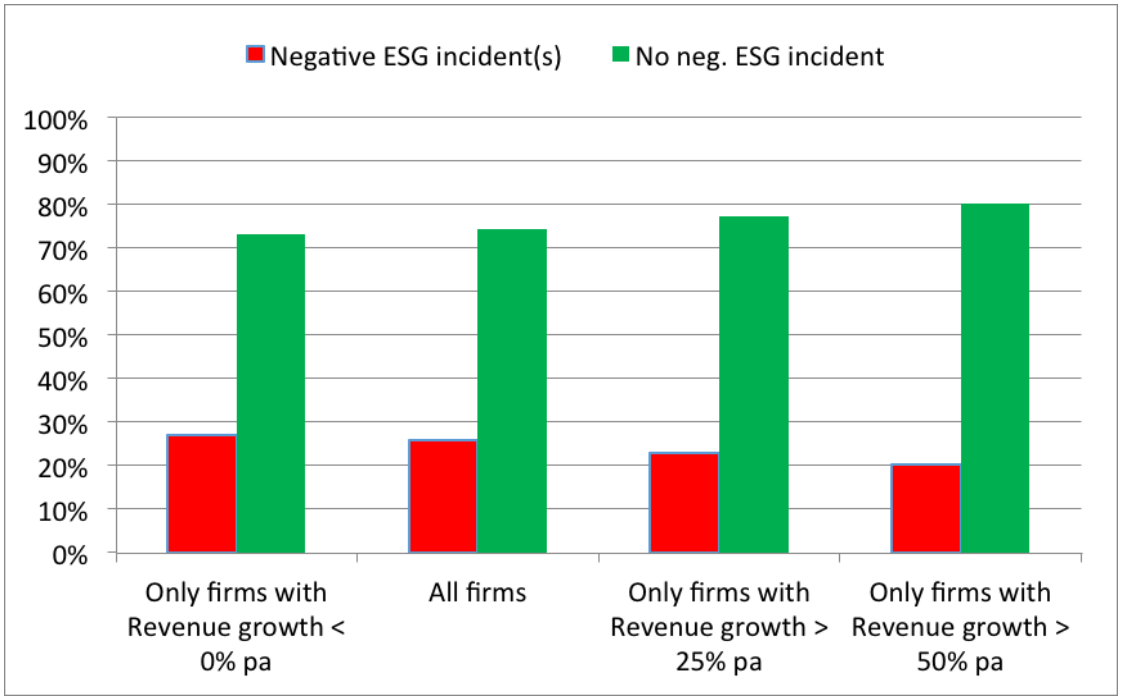
§Figure 4.2 represents the distribution of the multiple of invested capital. Data on invested capital was amongst the few fully available data points. The companies were categorized by size: less than 0%, 25–50%, 50% and more, and a portfolio of all firms. This division allows identifying the power of a relationship between company performance with and without negative events. The first specification of firms with no invested capital multiple increase graph has the lowest difference between companies with no negative ESG event and those which suffered negative ESG events. The difference grows in parallel with size specification. The final specification indicates the majority of companies, which demonstrated the strongest performance, to be those free from negative ESG events.

Figure 4.2 Distribution of Multiple of Invested Capital by ESG Incident(s) (%)



Description: This graph represents distribution of multiple of invested capital by ESG incidents. Axis X is the size in relation of multiple of invested capital indication in percentage equivalent. It has four specifications. The first one represents which did not demonstrate any growth of invested capital indicator. The second specification represents all companies from PE firm's list. The third specification reflects companies with invested capital multiple to grow between 25 % and 50% per year. The fourth specification represents companies, with annual growth of multiple of invested capital over 50%. Each specification reflects a group of companies, each group represents 100%. Further each specification indicates which percentage of total number of companies' fir into a category, were companies involved in negative ESG-related event, and which percent of these companies were not involved. The percentage is captured by axis Y.

Figure 4.3 Revenue Growth per Annum by ESG Incident(s) (%)

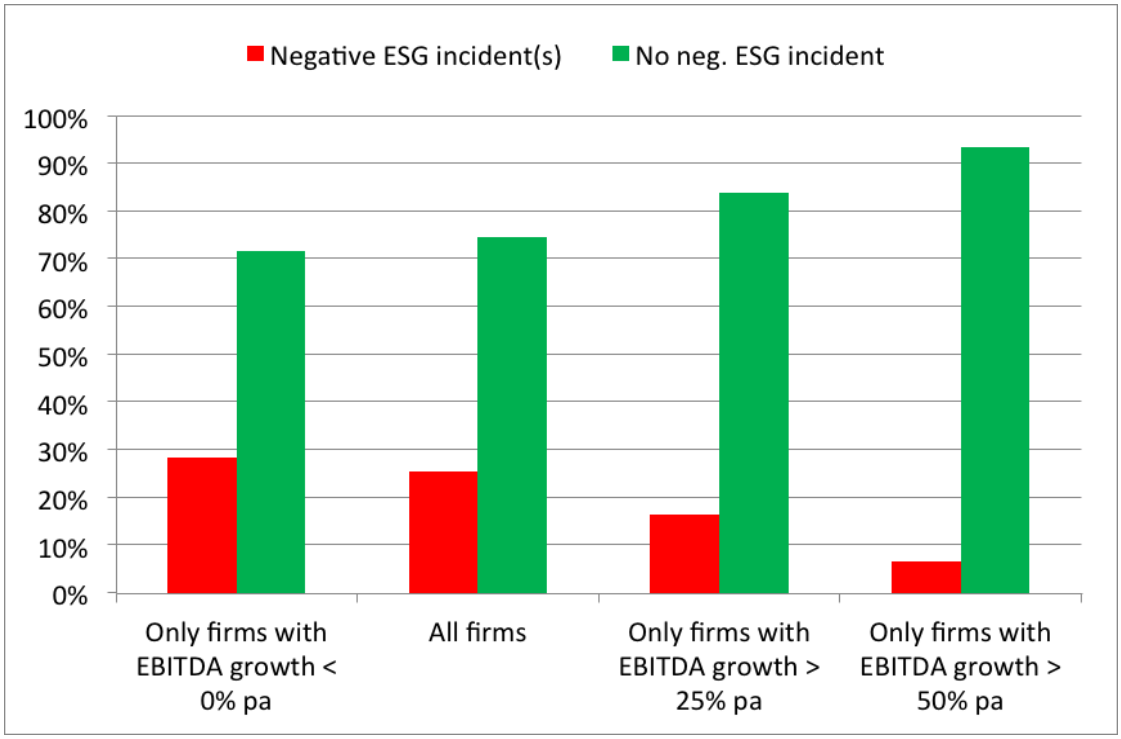


Description: This graph represents distribution of revenue growth per year by ESG incidents. Axis X is the size of revenue growth expressed in percentage equivalent. It has four specifications. The first one represents group pf companies, which did not demonstrate any revenue growth. The second specification represents all companies from PE firm's list. The third specification reflects companies with revenue growth indicator between 25 % and 50% per year. The fourth specification represents companies, with annual growth over 50%. Each specification reflects a group of companies. Each group represents 100%. Further each specification indicates which percentage of total number of companies' fit into a category, were companies involved in negative ESG-related event, and which percept of these companies were not involved. The percentage is captured by axis Y.

In Figure 4.3, the portfolios were analysed on the basis of revenue growth. This metric was chosen due to its popularity among private equity investors, as it provides estimates of business expansion and growth improvement. An indicator was also available from the dataset representing the full portfolio companies' coverage. A similar methodology was applied. On the basis of the revenue growth indicator, companies demonstrated a similar pattern, however, with less steep differences. In the specification of companies which did not demonstrate any revenue growth, up to 70% had no involvement with ESG negative events. Similar results characterized all companies, on the basis of specification. The discrepancy between the top performing companies on the basis of the revenue growth indicator was 60%.

This result, similarly to Figure 4.2, indicated a connection between negative ESG events and company performance, based on the growing discrepancies between the two categories.

Figure 4.4 EBITDA Growth per Annum by ESG Incident (%)



Description: This graph represents distribution of EBITDA growth per year by ESG incidents. Axis X is the size of EBITDA growth expressed in percentage equivalent. It has four specifications. The first one represents group pf companies, which did not demonstrate any EBITDA growth. The second specification represents all companies from PE firm's list. The third specification reflects companies with EBITDA growth indicator between 25 % and 50% per year. The fourth specification represents companies, with annual growth over 50%. Each specification reflects a group of companies. Each group represents 100%. Further each specification indicates which percentage of total number of companies fit into a category, were companies involved in negative ESG-related event, and which percept of these companies were not involved. The percentage is captured by axis Y.

The relationship between private equity multiple and negative ESG events becomes more clear, as the companies with an EBITDA indicator growth above 50% are barely represented by any companies affected by negative ESG events (less than 10% of the whole portfolio), as presented in Figure 4.4. This multiple was chosen as a widespread measure of

profitability that is widely applied in the private equity and financial sector. In addition, the dataset used for the analysis provided all the required elements. The figure in a way mimics the trends demonstrated in Figure 4.3; however, the results are more drastic.. The specification that included companies that did not demonstrate strong EBITDA data had a 43.32% difference between those, which were and were not affected by negative ESG events. The all-firm specification demonstrated a 49.02% difference. The companies that demonstrated EBITDA growth at 25% and more annually performed 67.44% better, in the case of the companies with a negative ESG-related track record during the investment period. The portfolio that was built on the basis of top-performing companies, and included companies with a record of negative ESG-related events demonstrated the most significant drop in performance. Those companies generated low performance indicators in comparison to the overall portfolio with negative events; the performance dropped by 18.82%, which also a significant indicator in comparison with the similar results is shown in Figure 4.3. Moreover, the difference in the performance of the portfolio that included companies that were involved in negative ESG incidents was 86.65% worse in comparison to the portfolio of top-performing companies, where companies with negative events were excluded.

Despite the explorative characteristics of the analysis, the clear trend across the three multiples reveals a clear relationship with ESG indicators, presented in the form of negative ESG events. This provides a strong foundation for further empirical evaluation, and one which requires more detailed examination of the influence that the ESG factor has on portfolio performance, which would be possible with a more extensive dataset.

4.5 Concluding Remarks

The rapid development of an ESG framework across financial markets exposed a reluctance of private equity to follow the growing trend. The industry remains amongst the slowest to adopt new standards. This trend is accompanied with a significant lack of deep studies, as the private equity market has been largely disregarded by academics. This gap becomes especially visible in comparison to the equity market, which has attracted significant attention and empirical examination of various aspects of ESG-related subjects from both academics and practitioners.

This study has presented a prominent overview of the progress of ESG integration in

the private equity context with the main aim to define the obstacles present in the industry. In addition, market participants provided the investment data, which was adopted in the explorative study, tailored to establish the relationship of private equity multiples and ESG incidents, as the second part of this essay. This study has provided a strong basis for more prominent empirical research, which requires in-depth data availability.

A few dominating trends were detected to define ESG framework development within the private equity industry. Firstly, the main impulses for ESG implementation are based on the growing evidence of value creation and portfolio risk minimization opportunities (Cronelli et al., 2015), and stimulated by institutional investors and LPs. Additionally, the changing environment of the financial markets creates a positive environment for framework development (Malk, 2014; PWC, 2015).

Further, as demonstrated in numerous industry reports, the integration process has occurred unevenly, with a major shift toward ESG implementation at the due diligence and investment decision stages (PRI, 2014).

Thirdly, measurement techniques were reviewed. This appeared to be the most problematic area, as suggested by reports (Doughty Hanson & Co. and WWF, 2012; Crifo and Forget, 2013). This outcome was linked to low information availability. The majority of private equity firms rely on developing methodology in-house, which makes information not compatible across the industry. In comparison to the equity market, the quantification process was visibly slow, similarly complicated by information availability constraints. Another factor that makes the measuring approach hard to define is the thin line between financial and intangible benefits, which are related to the implications of ESG (RobecoSAM, 2012; Commonfund Institute, 2013). It has been established that the majority of existing approaches are based on the development of a metric system and the application of econometric analysis tailored to detect added value in the portfolio.

Finally, significant barriers were identified. In addition to the complications with metric development, due to the investment horizon, which was significantly longer in comparison to the equity market, it is hard to demonstrate ESG-related benefits in a short period of time. This creates significant investor scepticism (Commonfund Institute, 2013; PWC, 2014). An additional big issue is the lack of reporting standards and information availability, which negatively impact on development in industry transparency (PRI 2013; 2015).

The literature overview has revealed transparency, reporting practices and, as a result,

investor scepticism to be strong obstacles across the industry and to delay ESG framework development in the context of private equity.

The exploratory study of the industry player revealed valuable insight. Due to significant limitations in data availability it was not possible to perform an in-depth analysis; however the results demonstrated an overall trend of companies with strong multiples to be classified as those without negative ESG implication prior or during the investment period. These results provide evidence of a relationship between the ESG negative factor and portfolio companies' performance.

It is important to obtain more detailed data to evaluate the nature of this influence, for it would allow us to understand the influence ESG factors have on portfolio performance. More detailed datasets are also required to examine the opportunities to mitigate ESG-related risk, as well as to create added value. As this study has demonstrated, the increase in information sharing and the assistance of a private equity firm with a coherent standardized approach to measurement techniques can contribute to a more in-depth analysis which, in return, will not only attract academics but encourage investors to implement ESG on a deeper level and develop more sophisticated approaches.

Appendix 3 Literature Table

Company/ name	Research	Year	Description
BSR	Reporting for Environmental, Social and Governance Considerations in the Private Equity Sector. Report for General Partners.	August, 2012	Provide short overview on current stage of reporting practices for private equity funds, Stakeholder expectations and drivers for introducing ESG factors into investment strategy.
The British Private Equity and Venture Capital Association (BVCA) and PWC	Guide to Responsible Investment.	2012	Growing acknowledgement of the financial proprietaries of ESG framework and growing investors' interest towards the framework stands behind reports' motivation. BVCA provided in-depth PE industry overview and grasps how the interest towards ESG framework unfolds, switching from simple attempt to boost company's image to understanding the hidden financial potential. Further, the report investigates key drivers for GPs to incorporate PE. Risk management is the top priority, followed by LPs demand; opportunities for cost savings and regulations pressure. The report also considers potential for ESG framework implementation on pre-investment, hold and exit period, with case studies for each step.
The British Private Equity and Venture Capital Association (BVCA), PWC and Waterman	Responsible Investment. A Guide for Private Equity and Venture Capital Firms.	2014	Report on development of ESG-dimension in investment strategies of PE firms. Provides detailed guidance for implementing ESG factors into investment stage on pre-investment, investment and exit stages. Study also suggests potential option for reporting standardizations.
The British Private Equity and Venture Capital Association (BVCA), PWC	Guide to Responsible Investment. Putting Principles to Practice.	2015	Series of reports continues, with new thoroughly explored case studies of ESG implementation on each stage of investment cycle. The style of analyses remains unchanged, and several case studies were transferred from previous report (3i, Terrafirma PE). Comparing to the first report, issued in 2012, these reports are mostly focused on case studies, rather than following trends in the industry.
Commonfund Institute	From SRI to ESG: The Changing World of Responsible	September, 2013	Brief overview of existent responsible investing practices including SRI funds, impact investment and ESG factor implementation. Overview on rise of ESG, with showcase of practical implementation of ESG into investment process.

	Investing.		
Cornelli, F., Ioannou, I. and Zhang, T.	ADVEQ Applied Research Series. ESG Moving Out of the Compliance Room and into the Heart of the Investment Process.	February, 2015 London Business School, Coller Institute of Private Equity	In-depth study on the rise of implementing ESG factors into PE investment strategies, supported by the interviews with LPs and GPs. The study overviewed the roots of pressure on ESG integration, existent barriers on strategy adaptations and explored existent policies and strategies in ESG integration.
Crifo, P and Forget, V. D.	Think Global, Invest Responsibly. Why the Private Equity Goes Green.	2013. Journal of Business Ethics, Vol. 116, No. 21, pp. 21–48.	This paper focuses on French private equity industry, analysing the implementation of ESG factors in the strategy, which is commonly characterized as an "engagement" type. The data gathered from UN PRI, French PE firms and survey data directed to PE firms. Main finding supports the suggestion that managing ESG factors could facilitate value creation.
DB Climate Change Advisors, Deutsche Bank Group	Sustainable Investing. Establishing Long-Term Value and Performance. Climate Change Investors Research.	2012	This report does not provide an overview on private equity firms' activities; however it represents a big picture of studies dedicated to the entire spectrum of responsible investment, focusing on evolution of sustainability literature, sustainability and corporate costs, sustainability and corporate financial performance, and sustainability and fund performance. It compares studies dedicated to CSR and ESG separately, and includes analyses of practices of SRY funds.
Doughty Hanson and Co together with WWF	Private Equity and Responsible Investment: An Opportunity for Value Creation.	2012	One of the broadest reports on the integration of ESG practices by private equity funds. The report covers the rise of ESG issues and the growing link between PE and ESG. It covers the possibilities for PE to implement ESG factors at the pre-investment stage and provides an overview on the growth of active ownership trends. Another big part of the report is dedicated to the major trends in ESG, including valuation issues, understanding the link between sustainability and value creation, identification of key factors which impact on value creation, as well as the hurdles created by reporting policies. The report provides some statistical data.

ESG Analytics	ESG Reporting in Private Equity.	June, 2014	Brief on reporting requirements for IPO and increased regulations for ESG reporting.
Global Sustainable Investment Alliance (GSIA)	Global Sustainable Investment Review.	2014	Overview on the rise of global sustainable investment 2011–2014. Growth of SRI funds, SRI strategies and market characteristics, overview on investors' position and asset allocation approach. Statistics on investment growth by region introduced by investment size, growth and development of practices. Brief mention of ESG and statistics on overall investors' engagement and trends in investment.
INSEAD and Global Private Equity Initiative	ESG in Private Equity: A Fast-Evolving Standard.	May, 2014	After introducing the emerging role of the ESG factor in PE investment strategy, provides brief reflection on position of GPs on each of ESG aspects, as well as mentioning the Total Impact Measurement model and KPI approach, without analysis, followed by representative cases of ESG engagement by PE funds.
Ioannou, I. and Serafeim, G.	The Impact of Corporate Social Responsibility on Investment Recommendations.	Harvard Business School, Working Paper, February, 2015	Rather than focusing on ESG concept, this extensive study focuses on CSR, its development and recent shift in the perception of the framework. It helps to understand changing in reporting practices and the occurrence of a general positive shift toward RI appreciation.
Malk Sustainability Partner together with EDF Environmental Defense Fund	ESG in Private Equity. Perspective and Best Practices for Managing Environmental, Social and Governance Issues.	2012, 2013	Provides annual reports on the development of ESG approaches within PE sector. The results are based on the interview of GPs and LPs, which are geographically allocated between North America and European regions. The report sheds light on motivation, stages in which ESG factors are integrated in the investment process, and analyses LPs position on the matter in more detail. Another substantial part of the reports focuses on the most successful practices funds implement to manage ESG-related risks and opportunities, divided into several categories: leadership, people, diligence, operations, metrics and communication.
Malk Sustainability Partner	ESG in Private Equity. Issue Focus: Large Enterprise Customer Sustainability Requirements Emerge as	2014	Specialized report on how the views of the media, consumers and NGOs affect companies, and subsequently private equity funds and their position on ESG-related issues and strategies. The survey supports the idea of increased enquiries from customers regarding sustainability directed to companies. Some companies have their own approach to working with customers' enquiries. However, as suggested in the report, it could be

	Drivers of ESG Management.		more beneficial for GPs to develop their own evaluation technique in order to navigate potential risks related to portfolio companies and their customer relations. So far GPs have not demonstrated a standardized approach to meet the enquiries.
Malk Sustainability Partner	ESG in Private Equity. ESG Becoming Core to Investment Process.	2015	One of the latest reports on ESG trends. The report is based on the interviews of GPs and LPs. Statistics represent growing role of ESG in the investment strategy. Majority of LPs especially in Europe consider ESG as one of the most significant factors during the manager's selection process. The key results of the survey indicated that NGO and media power in affecting company's image has risen, therefore managing ESG effectively is important. A significant shift in perception of ESG has occurred as GPs see it as a crucial risk management technique, rather than adopting ESG due to LPs' demand.
Mercer	Shedding Light on Responsible Investments: Approaches, Returns and Impacts.	November, 2009	A literature review rather than a report on existent studies, mainly focuses on increased acceptance of environmental, social and governance factors affecting financial performance, as well as overviewing the negative screening approach. However, no link or mention of the private equity sector is made.
Mercer and LGT Capital Partners	Global Insight on the ESG in Alternative Investing.	March, 2015	One of the very few detailed reports based on the results deducted from the survey of pension funds, asset management firms, endowments/foundations, insurance companies, banks, sovereign wealth funds and family offices on a global perspective. The report comprises insight into the volume of ESG criteria integration into investment process, motivation and expectation linked to it, as well as studying existent issues and firstly tries to preview future opportunities for the sector. The results suggest that the practice is growing; three-quarters of respondents implement ESG criteria, which demonstrates supportive evidence of growing interest in ESG from the private equity sector.
MSCI	Optimizing Environmental, Social, and Governance Factors in Portfolio Construction.	February, 2013	Guidance to implement ESG factors in the portfolio to measure risk and performance for institutional investors. Showcases the process on the bases of three strategies: "ESG worst in class exclusion", "simple ESG tilt" and "ESG momentum". The results were limited given the short time frame; however the third strategy demonstrated positive risk-adjusted performance, whereas other results were slightly negative or did not show any improvements.
Novethic	Where Does Private Equity Business	July 2009, Worki	One of the earlier works on studying the implementation of ESG factors within private equity investment universe. Working paper did

	Stand on the Integration of ESG Issues?	ng Paper	not demonstrate high integration of any statistics, limiting the overview by covering global trend of years 2008 and 2009. Further deepening into why private equity turned to adopt ESG screening after the recession. Also the switching to an overview of existing practices and strategies, hurdles (such as business diversity, lack of structure and reporting standards) and poor availability of financial research. The final part focuses on drivers for ESG-related strategies and provides some recommendations.
PGGM	PGGM Responsible Investing in Private Equity.	August, 2014	Provides guidance and expresses expectation from the position of LPs to GPs.
PRI	Responsible Investment in Private Equity.	June, 2011	Another complete guide for GPs with detailed introduction of possibilities for creating ESG-based portfolios.
PRI	Integrating ESG in Private Equity. A Guide for General Partners.	2014	One of the most complete guides for detailed direction of possibilities for ESG implementation into every stage of investment. Supported by examples.
PRI	Report on Progress	2015	Summarizes the programme of the sustainable investment industry over the past year. Provides representative statistical data of positive moves and growing share of PRI portfolios. Reported growing interest from asset owners; however there is a lack of deep integration into strategic decisions. The report suggests asset owners to be the key driver for ESG implementation and better transparency from investment managers.
PWC	Do Investors Care about Sustainability? Seven Trends Provide Clues.	March, 2012	The report provides an overview of investors' changing attitudes towards sustainability and the ESG grid. It is based on seven key trends, which prove expectations to be positive: (1) ESG concept gains popularity with shareholders; (2) unwavering sustainable investment growth; (3) positive interdependence between ESG factors and financial performance; (4) foundation of related initiatives and ESG data providers; (5) involvement of data providers' sector leaders, such as MSCI; (6) growing demand from institutional investors.
PWC	Responsible Investment: Creating Value from Environmental, Social and	May, 2012	PWC presents its view and provides some recommendations for such factors as drivers and procedures, and analyses possibilities and issues in measuring value created through ESG-integration practices. Also points out that extracting value created through ESG is hard to

	Governance Issues.		deduct and is not necessarily viewed as financial.
PWC	Putting the Price into Value.	2013	The report addresses the issue of communicating the value created through ESG-related practices. The report focuses on GPs' perspective and is based on the survey of 108 PE houses from 13 countries. With a short statistically supported review of GPs' position towards ESG, the report focuses on the necessity of creating standardized value assessment practices.
PWC	Bridging the Gap: Aligning the Responsible Investment Interests of Limited Partners and General Partners.	2015	One of the newest researches, targeting the lack of dialogue between LPs and GPs on the PRI matter. The report is based on a sample of 60 LPs in 14 countries, which collectively allocate around $500 billion to private equity fund managers. Majority of LPs believe in future growth of ESG and consider it as one of the key factors for investment decisions. As well as risk management, corporate values and reputation management were named as top three motivating factors for ESG consideration. Growing number of LPs considers quantitative gains from ESG. However, this study supports evidence of hesitance among investors regarding the possibility of creating tangible value.
RobecoSAM Sustainability Investing	Responsible Investing in Private Equity. ESG Engagement Report.	2013	An investment company with global presence, which focuses on responsible investing, provides annual report on the results of its engagement with PE funds. The company was one of the pioneers, which established its own PE Fund programme in 2006. Every year the company provides ESG assessment of the program, which currently includes seven programs. It is based on the KPI evaluation approach, handled through a survey of 66 fund managers. This is an investors' report, crafted to reflect fund activities to LPs. This study represents an example of reporting practices. The report highlights overall ESG performance of the PE funds on a yearly basis, assessing ESG policy, strategy and environmental, social and governance performance, on the basis of scores attributed by the respondents. Another key aspect of the report investigates the influence of fund size, fund vintage year, investment region, PE segment and how UN PRI subscription affects ESG performance.
RobecoSAM Sustainability Investing	Responsible Investing in Private Equity. ESG Engagement Report.	2014	This report continues the RobecoSAM ESG series. It represents the analysis of a "company's engagement with private equity funds on ESG integration" (RobecoSAM 2014, p. 4). An example of a report to investors, based on the ESG assessment of seven programmes through a survey of 79 fund managers.

Teti, I., Dell'Acqua and Zocchi	UN PRI and Private Equity Returns. Empirical Evidence from US Market. *Investment Management and Financial Innovations*, Vol. 9, Iss. 3	2012	The paper examines if the loyalty to PRI principles adds economic value for PE funds in the USA. The dataset is analysed in the article using multivariate regressions on the funds; returns, using UN PRI compliance variable as an explanatory one. The outcomes demonstrate positive economic contribution from UN PRI compliance.
US SIF Foundation	The Impact of Sustainable and Responsible Investment.	September, 2013	A report taken from the sustainable perspective. It encloses positive influence created through implementation of responsible investment, such as growing options for investors, benefits of active ownership and engagement, contributions to communities and individuals, and changes in public policies and standards for organizations.

Notes: This table represents summary of studies and industry reports dedicated to the topics of ESG and Private equity

Conclusion

C.1 Summary

Responsible investment is an ever growing topic in the academic field as well as in the financial sector. Interest to this subject remains high from both communities. Nevertheless, as sustainable approach in business and investment is characterised by steady growth, it unravels more and more unanswered questions, which creates an exciting research opportunity. This thesis represents a kaleidoscopically arranged set of essays, which not only evolve around ESG implementation issues within setting of various financial market participants, but makes a step further to embed a subject which is closely linked to sustainability – reputation management. Different from the first glance, academic literature reveals both subjects to be centric for the CSR area. As it was indicated in numerous studies, firms, which tackle sustainability approach to business highly prioritise reputation (Sarbutts, 2003; Adams, 2008, Robinson et al, 2011). Therefore, the closer look was taken on firm's reputation management interest, and reputations power over time. It set a challenging task to disclose a theme of reputation management, as it is a key contributing factor to the subject of ESG.

This thesis unravels with the essay dedicated to reputation management. Academic studies indicated, that addressing sustainability gives a strong positive boost to company's reputation. It is common to find literature, which addresses sustainable business approach and reputation management in one dimension, and advocates CSR to be a strong reputation management tool (Robinson et al, 2011). However, academic discussion over if reputation management works remains on-going. This essay addresses this question, and explores the power of reputation management remains strong over time. Understanding the power of reputation management over time is an important factor for company's strategic development.

For analysis the essay investigates *Fortune*'s "America's Most Admired Companies" rating. If company expresses interest in reputation management and willing to improve it, it could be reflected in its ranking. Therefore this essay addressed the company performance as measured by reputation scores over a time period from 1985 to 2010. Reputation ranking is a popular method of reputation measurement. Fortune's ranking is a widely accepted by

academics and practitioners. It has existed over three decades, and encompasses a broad range of industries, which makes as well-fitted sample for the analysis.

The study included two empirical strategies dedicated to assess firm's concerns over reputation management and assess reputation power over time: first the ordinary least square model was applied. The results indicated suggested firms' concern over reputation management be related to its performance in the ranking. Reputation appeared to remain powerful over the period of four year. In the second empirical strategy the data was addressed as unbalance panel. Applied model accounted for firms' fixed effects. Under this empirical approach it appeared, that reputation power reduces down to two years.

This essay expanded a relatively narrow pool of studies, which overlook the timing aspect in the context of reputation (Shultz et al (2001); Roberts and Dowling (2002); Ang and Wight (2009)). Positive outcomes of the analysis indicate, that firm's concerns over reputation management pay off. The power reputation appears to have strength over two years, which bring valuable implication for strategy planning.

Further essays move to the sustainability topics. The second essay tackles the topics of fund survival. It adopted survival analysis, which evolved from medical literature, and previously had a major implication to study survival in the context of IPO, as demonstrated studies of Suret (2011), Espenlaub et al (2012) and Espenlaub et al (2016).

The *ex ante* basis approach was applied to the data analysis. The dataset was based on the previous study of Kreander et al. (2005). Authors matched pairs on the basis of age, size, origin and investment universe at the end and middle of the sample, which provided a cross-section which allowed to study the survival.

The survival rates among ethical funds appeared to be significantly stronger in comparison to non-ethical ones. Only 10 non-ethical funds out of the 30 examined by Kreander et al. (2005) survived after 2002, when the analysis terminated. In comparison, 18 ethical funds remained in operation, which suggests an advantage of the ethical funds over conventional funds in a long-term perspective. Survival analysis revealed SRI funds to demonstrated stronger survival capabilities, which were attributed to the ethical specification of the fund.

The evaluation of ethical and non-ethical portfolio performance did not indicate significant abnormal performance. Both ethical and conventional funds demonstrated positive risk mitigation ability.

The next essay challenges the subject of sell-side broker and ESG rating. This study combines two subjects that were previously poorly addressed in academic literature, due to the lack of interest from the sell-side brokers in the subject. However, as new regulations have been introduced - MiFID II, it is expected to significantly impact brokers operation model, to tighten competition, facilitates transparency, and change the fees structure. Therefore, as brokers seeking for opportunity to maintain competitiveness and find new opportunity to generate the value, ESG could open doors to previously unexplored territories.

The empirical chapter of the essay was based on the data, provided by sell-side broker. The company generated ESG recommendations, as an alternative to the services selection they offer. There is significant demand for ESG rankings and recommendations on the market (Fowler and Hope 2007; Richardson and Cragg, 2009; Chatterji et al., 2009), as well as no established regulations approach or standardized requirements for issuing ESG ranking. These factors create positive market opportunity for new entrants (Fowler and Hope 2007; Richardson and Cragg, 2009), and, as brokerage houses have extensive access to data and research capabilities, these factors provides them with strong prerequisites to implement ESG and develop ESG ranking in-house.

The analysis focused on the two portfolios generated on the basis of the rating provided by the sell-side broker. The portfolios included European and French stocks (due to the origin of the sell-side broker). Based on the data an ASSET4 ESG-rating based portfolio was introduced. In addition, the portfolio performance was compared to the performance of the alternative SRI-fund based portfolios from France an Europe origin.

The results appeared to be strongly significant. The ESG ranking based portfolios did demonstrated significant alpha coefficient, however the results were not consistent, and were theme-specific. Recommendation-based portfolios generated negative alpha similar to the alternative SRI fund-based portfolio. When implementing long-short strategy, Oddo recommendations – based portfolio indicated abnormal return generation opportunity. These results suggest, that portfolio generated on the basis of Oddo and Cie recommendations could have competitive potential amongst other alternatives within the ESG unoverse. Overall, it suggests that broker ESG recommendations could provide feasible informaiotn to the market

with high demand for the ESG data, yet it could be further improved to be able to generate abnormal returns.

The final essay explore yet another area participants, where ESG implementation process occurs at a slower paste. This study is an in-depth exploration of the growing stimulus that private equity industry firms now have to increase their level of ESG framework engagement; it also introduced first case study of the real world data. From industry reports it became evident that a lack of empirical results still creates a general level of scepticism among certain groups of investors. Poor reporting practices and lack of a standardized approach hamper further take up of the ESG concept. As reporting regulations are free for interpretation, the data issued by the industry participants have been characterized by a low compatibility level.

Despite the existing obstacles, practices of ESG implementation have become more common in the private equity sector. There are opportunities for ESG to evolve at every stage of the investment process, as the reports reveal. Screening and due diligence have been applied at the pre-investment stage, the evaluation of any ESG-related risks and opportunities during the study of the investment decision, and the negotiation of ESG-related topics at the stage of the investment agreement; the implementation of the ESG process at the ownership stage includes engagement, monitoring, and reporting activities; during exit a firm can re-evaluate and assess its ESG techniques, as well as assessing pricing during the final stage.

The study has also revealed that measurement techniques are a challenging question for companies due to intangible nature of the ESG framework, making it complicated to assess the framework's implementation contribution.

The data provided by an industry participant allowed us to create a unique dataset, which reflected the impact of ESG-related negative activities on the company, included in the portfolio of the industry players. The evaluation of the cross-section demonstrated the strong influence on portfolio performance caused by negative ESG-related events; an especially strong influence was perceived for large-cap companies.

Overall, this study has provided a first look at the relationship between ESG and the private equity industry, demonstrating the growing potential for the framework to develop. It also as presented the first elements of influence that ESG can have on portfolio performance.

C.2 Contributions

This first essay expands the literature dedicated to reputation management and the reputation persistence. It expands the pool of study, which focuses on Fortune's AMAC ranking, such as Fombrun and Shanley, (1990), Black et al. (2000), Shultz and Ervorder (1998), Argenti and Forman (2000;), Deephouse (2000), Fombrun and Rindova (2000). The pool of academic literature dedicated to reputation management is notably focus on the financial benefits related to reputation (Brown and Perry, 1994; Fryxell and Wang, 1994; Ali et al., 2015; Weng and Chen, 2017). This study expands the methodology to seek the signs if reputation management could bring positive outcome.

This essay further broadens the studies dedicated to the reputation endurance. Previous studies indicated the longevity of reputation based on the evidence from the Danish reputation ranking (Shultz et al, 2001). Another evidence of reputation longevity evolved from the studies, which prioritised finical performance, as the study of Roberts and Dowling (2009), which revealed firms persistent financial performance to be linked with strong positive reputation. Similarly, Ang and Wight (2009) supported indicated endurance in financial performance and longevity reputation effects. This study took the persistence as the prime focus, revealing the power of reputation to last over a prior of time.

The second essay provides two valuable contributions to the existing pool of research dedicated to SRI portfolio performance. The study addresses the survivorship bias, which was indicated in the studies of Bauer et al. (2005), Kempf and Osthoff (2008) and Renneboog et al. (2008). This study differentiates from previous studies, which mainly highlighted survival in descriptive statistics, and introduces a full-scale analysis. It explores the stronger financial characteristics of ethical fund survival, which was indicated, but not addressed in the research, through the implementation of survival analysis. This study provided evidence of stronger survival capabilities to be attribution of ethical specification.

It expands the boundaries of empirical implantation of survival analysis, as it was not applied to study SRI funds. The method is originated in the medical literature and was previously applied in assessment of survival in the area of IPO, as featured in the papers of Carpentier and Suret (2011), Espenlaub et al (2012) and Espenlaub et al (2016).

The results make important contribution for the literature, which focuses on the fee structure of asset management companies. Previously of Gil-Bazo et al. (2010) studied the dependence of the size from the fund to be defined as SRI or conventional. This study suggests, that SRI funds could improve the longevity of the fees, as SRI funds are characterised by the higher survival rates.

Brokers gave very little research coverage to the involvement into ESG topics. The third essay bridges the literature dedicated to the sell-side broker and ESG.

As this essay analyses the attempt to create an alternative service by a sell-side broker through development of an ESG ranking and recommendations, the practical and theoretical contributions come increasingly close. The study presented a detailed overview to identify the impact new regulation has on sell and buy-side brokers, as industry reports lack consistency (Bloomberg, 2017; KPMG, 2017). From a practical perspective, it overviews an example, which could be increasingly relevant for the companies, which are looking for the alternative value generation opportunities and consider entering the ESG space.

From the theoretical perspective, this essay adds diversity to the literature dedicated to the ESG and ESG ranking. In Chatterji and Levine (2006), Escrig-Olmedo et al. (2010), Delmas and Blass (2010) and Dorfleitner et al. (2015) the authors explore the development and application of various sustainability rankings. Escrig-Olmedo et al. (2010) highlighted the rising importance of sustainability rankings as an instrument to encourage investors to adopt sustainable investment approaches. Chatterji and Levine (2010) highlighted the diversity of ranking systems and the criteria applied, linking it to compatibility issues and investor confusion. Regardless, the rising trend for ESG implementation encourages investors to seek for a reliable ranking system. As sell-side brokers have compatible information resources, they could provide strongly competitive services in competition with similar products within ESG scope.

The forth essay develops a profound literature overview to explore the motivation and obstacles for ESG framework to penetrate private equity sector. It introduces complete an overview of existing reports, emphasizing the current stage of private equity industry' and general partners engagement with the ESG framework, focusing on its potential and benefits, examining the existing implementation techniques, and highlighting the existing issues. As works of Teti et al (2012) Cornelli et al (2015) attempted to investigate ESG implication for private equity sector, this study implement empirically-improved primary evidence of the

potential influence of ESG-related factors on portfolio performance, providing a significant stimulus for further analysis, moving the research further

C.3 Limitations

The scope of analysis presented in the four essays was subjected to a number of limitations. In the first essay, the analysis in the study is based on the data issued by the *Fortune*'s AMAC rating, the data provided by the rating defined the timeframe of the research. Data issued in the early years was not available for access, therefore the final timeline of the analysis is 1985–2010. In 2005 the rating was issued in a shorter version, so it was excluded from the analysed cross-section. Methodology, implemented in the stud, relayed on the data from ProQuest database to create variable, which represents firm's interest in reputation. The variable captured companies, which used Fortune's AMAC mention in the reports. The search for a specific wording combination created an addition limits to the search

Information availability similarly imposed limitations for the second essay. Cox (1974) Proportional Hazard model requires consistency of hazard rate over time. However it was not possible to gather information on the closing date on particular funds.

Analysis in the third study was conducted using the information provided by the industry player. It was a unique opportunity to examine a brokerage company, which diversify the product range in response to changing regulation field empowered by implementation of new MiFID II regulations. However it imposed certain constrains to the analysis. The broker provided information on the ranking and recommendations construction, however the scale was not provided, therefore the focus was made on recommendations and ASSET4 ranking was implemented to create an ESG ranking-based portfolio. As the ESG implementation practice was implemented within the company relatively early, the size of the available dataset is limited to the 2007–2016 timeframe. In addition, due to the European origin of the company and its geographical coverage, the analysis focuses on European and French markets only.

In addition, as market participants rarely reveal their methodology or make alternative ESG rankings publically available, the most efficient approach to compare the efficiency of a

product was to compare the performance to the SRI fund portfolios and the European-based benchmark portfolio. It was also discovered, that French financial market does not provide a home-based sustainable index.

The implementation of MiFID II was discussed in this study. However, as the Directive has not yet been implemented, the nature of the narrative carries a degree of uncertainty and the discussion is constrained by the available information, which could be subjected to potential change.

Data availability imposed even stronger limitations for the forth essay. Private equity is one of the most complex sectors to analyse due to data availability restrictions. This problem was widely discussed in the essay. The lack of regulations and standardized approaches to reporting affects the quality of the available data, which lacks both clarification and compatibility. In addition, private equity investors have not expressed a strong interest in the ESG framework, making the sector one of the slowest to adopt emerging practices. These factors have negatively impacted the dynamic of academic studies in the subject. Therefore no extensive empirical studies were dedicated to ESG within the private equity context, the analysis presented in the paper relied mainly on the publically available industry reports.

The exploratory presented in the paper was similarly impacted by data-related restrictions. The cross-section was constructed on the basis of the information provided by an industry participant. However the dataset provided was only partly complete, as some information was unavailable. Further information was not provided, which restricted opportunities for more in-depth analysis, and in addition the existing dataset covered only the period between 2007 and 2012.

C.4 Implications

The findings, demonstrated in four essays, brings positive implications for invstros, fund managers and other stakeholders. Finding in the first essay would find relevance amongst strategic management. Effective reputation management practices provide opportunities and a competitive advantage for a company, making it among the firm's top priorities. Detecting a link between reputation management and firm performance provides

encouraging evidence for companies, suggesting the positive results that could be fostered by reputation management.

The evidence of a long-term effect from reputation introduces a valuable insight that could impact reputation the management-related practices adopted by the company's managers. It also provides additional encouragement to increase investment in reputation, as the lasting effect from reputation could hinder any potential for lasting investment pay-offs.

Findings in the second essay bring a range of positive implications for asset managers. In order for Responsible investment practices to succeed among investors, it is important to provide strong positive evidence of a potential spectrum of possibilities that professionals could benefit from through the implementation of the ESG framework in the theory of investment strategy. This study demonstrated the long-term positive effect that SRI funds can benefit from, which could be a strong motivating factor for investors who seek long-term investment strategy and risk diversification opportunities.

The study of the sell-side broker bring a range of positive implications for the industry players. The implementation of the ESG framework could be characterized as uneven among market participants. Sell-side brokers demonstrated an incredibly low interest toward the matter. However, the changing context of financial markets regulations reinforces transparency and imposes complications that could lead both to an increase in competition and profit reduction. In these turbulent conditions, it is important for sell-side brokers to adjust at a faster pace and consider alternative routes in order for their business model to prosper. The ESG framework is a complex and flexible one that encompasses various possibilities that market players can tailor to their needs. Therefore, it could be suggested that some ESG-related techniques could supply brokers with new techniques and mechanisms that could help them function more efficiently under the new conditions.

Another important topic highlighted in this study is ESG rating practices. In order to succeed in an investment strategy that would fall into an ethical category, it is important to have an accurate valuation mechanism as well as an assessment system. These requirements cannot be meet without the application of a reliable ranking system by investors. Communications and transparency are the key factors to develop a successful methodology; it is therefore important for both academic and market participants to provide more standardized and transparent techniques, in order to improve the efficiency of an approach that could provide significant benefits for the ESG framework.

In the fourth essay, the lack of empirically supported evidence of potential benefits related to the ESG framework was cited by numerous reports as a significant obstacle to further expansion and development of techniques. This study not only identifies the potential benefits and techniques that have been overlooked by investors; it also demonstrates the first empirically supported evidence of the potential influence of ESG-related factors on a portfolio. These results could influence investors' attitudes towards the concept, and potentially encourage data-sharing practice as a further step to creating consistency in reporting practices.

C.5 Further Research

This thesis revealed a number of further research opportunities in the topics of reputation management and responsible investment. The first essay tested whether corporate reputation works, through examining if firm's interest in reputation impacts its performance as measured by AMAC ranking. The interest was translated into variable through the search of a specific wording in the ProQuest data availability. It is important to explore alternative stronger approach, which would provide robust data on company's interest in reputation and would signalise its inclination to manage it. It could be achieved through testing for diversified search phrases. Further methodology development would allow to test the longevity of reputation power under different settings. In addition, it could be interesting to adjust the model test the impact of variable which captures the sustainable business approach to potentially improve the longevity of reputation.

The second essay raised the question of fund survival capabilities. Number of studies tackled survivorship bias in the empirical research when evaluation performance of ethical and conventional funds (Gregory et al, 1997; Bauer et al. 2005; Gregory and Whittaker, 2007). As numerous studies raised attention over stronger survival capabilities (Gregory and Whittaker (2007) revealed 17.43% higher survival rate of SRI funds, Kempf and Osthoff (2008) reported even lower survival rates of conventional funds at 19% lower comparing to ethical funds), this study further tested the connection, revealing SRI specification to improve survival of the funds. As the analysis tested the European universe, it is interesting to see whether the same results hold for the funds in North American region. In addition. It is important to extend the challenge through defining a longer timeframe for the analysis. As

SRY specification appeared to be the strongest factor to define survival, age and size were amongst the other tested factors. It would be interesting to test implications through introduction of a larger variety of factors.

Academic research on the subject of ESG and brokerage is visibly frugal, as this market participants addressed the framework relatively recently. It could be suggested, that more brokers could address the framework in search for alternative ways to generate fees and improve it competitiveness under introduction of MiFID II. Therefore, it opens a vast opportunity for academic community to evaluate ESG-related opportunities, which could be adopted by brokerage firms.

This study focused on the case of industry player, which developed and ESG ranking and recommendations, and offered it amongst its product range. It would be interesting to draw a comparative analysis to further test the efficiency of the recommendations and test the ranking creation opportunity on a larger scale. The UK market could offer a particular interest; given France and UK remain the leaders in the sustainability sector. It is also important to apply various themes for portfolio generation in order to identify stronger opportunity to generate abnormal positive portfolio return. This could make the product competitive not only within ESG ecosystem, but also with mainstream investors.

In addition, an access to more in-depth methodologies of ESG ranking providers would provide an opportunity to take a closer look at the methodology of ranking development.

The forth essay reported limited investigation due to data availability, however, it established a fruitful ground for further research as it revealed the evidence of negative relationship between the ESG-related incidents and private equity multiples. It would be interesting to fully evaluate the impact ESG factors have on private equity portfolio performance. Currently academic research lack strong empirical studies on the subject. In-depth portfolio performance analysis would allow to search for evidence of positive ESG implications, which remain a subject of strong discussion.

Methodological outlook on the process of ESG implementation on various stages in requires further detailed investigation. It is important to understand at which stage implementation of ESG framework would bring most benefits.

Finally, the study revealed a strong need for empirical analysis to test the implication ESG brings for risk mitigation in the private equity settings.

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