Has the Covid-19 crisis changed the way investors look at ESG criteria in their investment strategy?

Auteur : Hardy, Céleste
Promoteur(s) : Lambert, Marie
Faculté : HEC-Ecole de gestion de l'Université de Liège
Diplôme : Master en sciences de gestion, à finalité spécialisée en Banking and Asset Management
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HAS THE COVID-19 CRISIS CHANGED THE WAY INVESTORS LOOK AT ESG CRITERIA IN THEIR INVESTMENT STRATEGY?

Jury:
Promoter:
Marie LAMBERT
Readers:
Cédric GILLAIN
Jérôme RUTH

Dissertation by
Céleste HARDY
For a Master's Degree in Management
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and Asset Management
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1. <u>INTRODUCTION</u>

In a world facing growing challenges from climate change and resource depletion to social inequality, urgent actions are needed to move towards a more sustainable economy. To this end, two major international agreements have been adopted in 2015: the 2030 Agenda and Sustainable Development Goals (SDG) introduced by the United Nations and the Paris Agreement signed at the COP21 (21st Conference of the Parties).

To achieve this transition to a low carbon and more viable economy, finance has a key role to play in the re-allocation of capital towards more sustainable activities. Over the last decade, the world has shown a growing interest in sustainable finance, intensifying the integration of non-financial criteria related to environmental, social and governance (ESG) factors that investors consider in their investment allocation decisions. While the origin of the acronym ESG dates back to 2005, it is only in recent years that investors have started embracing sustainability in their investment strategies. Indeed, the consideration of extra-financial factors in the investment decision experienced a slow start due to the potential conflict of interest with return maximisation perceived by investors and asset managers.

Although sustainable funds still currently account for a small portion of global assets under management held by investment funds, this share is growing steadily over the years which pushes ESG investing strategy from niche to mainstream one. The increasing appetite for ESG criteria is well reflected by the all-time high assets under management in sustainable funds that hit as of the end of the first quarter 2021. According to Morningstar Manager Research (2021), global sustainable mutual funds total nearly $2 trillion of which 81 percent are managed in Europe.

The demand for socially responsible (SR) funds is driven by the demand of a diverse pool of investors. While value-driven investors, which are predominantly represented by a new generation of investors referred as to the millennials, seek to integrate their personal values into their investment decisions, others, referred to as profit-seeking investors, make use of sustainable investments to manage their risks or achieve better performance even if the findings of numerous academic literatures regarding this question are still highly controversial (Derwall, Koedijk, and Ter Horst, 2011). This demand is also spurred by the regulatory and legislative momentum behind ESG and most importantly the shifts that the modern society is undergoing

through a heightened awareness of the risks associated with ESG factors (PwC, 2020). This is no surprise as the 16th edition of the global risk report issued by the World Economic Forum (2021) stated that risks linked to climate change as well as the exacerbation of social disparities caused by the coronavirus crisis constitute major threats that the modern world will have to deal with in coming years. As a response to this growing demand, the global mutual fund industry continuously expands its offering by launching new sustainable funds or repurposing existing ones (Morningstar, 2020).

Given the growing importance of ESG criteria when making investment decision, investors need accurate ways to measure sustainable performances and evaluate ESG risks. Although a number of ESG-related information is publicly available, investors are not always in a position to aggregate and to analyse this large body of data. For this reason, most investors rely considerably on ratings, rankings or indices provided by private rating agencies. Just as credit rating do for the financial performance, the ESG rating provides an easy way for investors to assess the quality of an investment vehicle in terms of environmental, social and governance criteria and thus increases comparability between several companies or investment funds on the basis of sustainable performance.

As ESG scores have gained in prominence, the validity of these ratings has been widely questioned. Indeed, sustainability ratings may vary considerably from one rating agency to another (Berg et al., 2019). These discrepancies can be partly explained by the existence of a wide range of models and measurement as well as by the lack of consistency in the data used to construct the ratings. The weak convergence in sustainability ratings has raised questions among investors as to whether reliance on these ratings may have misled some of their investment decisions. Additionally, the lack of transparency shown by some ESG-rating providers makes it even more difficult for investors to determine whether the investment they have undertaken really matches their personal criteria. Improving the consistency and quality of ESG information constitute one of the major challenges facing by responsible investment to gain investors' confidence and to pursue further expansion.

Although literature has evidenced that funds exhibiting high ESG profile attract more flows in bull markets (Ammann et al., 2018), little is known about investors' behaviour towards sustainable funds in times of recession. The sudden and unexpected degradation of the economy and its markets caused by the Covid-19 crisis at the beginning of the year 2020 will help to fill

this gap by assessing the impact of the market distress on the growing ESG preference of investors. At first glance, investors have continued to value sustainable finance as Morningstar reports that sustainable funds recorded global inflows of $45.6 billion in the first quarter of 2020. The crisis would have reinforced, or at least sustained, the consideration of ESG criteria as total assets under management in sustainable funds keep growing exponentially.

This thesis aims at analysing the potential change in investors' behaviour towards sustainable investment funds in the wake of the Covid-19 crisis. Meanwhile, the purpose is to investigate whether investors continue to value sustainable finance in market downturns or whether the trend towards the consideration of ESG risks in investment decisions, that is prevalent in bull markets, is set aside when the economy is struggling which would point out a source of fragility in these ESG investments.

The rest of the thesis is organized as follows. Section 2 will cover the literature review on sustainable investment. This section aims to shed light on investors' motivations for this investment philosophy from its genesis to the current challenges it is facing for further expansion. Section 3 will briefly review the choice of the database as well as the sample composition. Subsequently, Section 4 will describe the methodology used to perform this study as well as the motivation to include different control parameters in the model to ensure that the observed phenomena are attributed to the sustainability of the fund. Section 5 will present and discuss the results obtained through the panel analysis. Finally, Section 6 will conclude this thesis.

2. LITERATURE REVIEW

2.1. Socially Responsible Investment (SRI) definition

As the awareness of sustainability and ESG issues has surged, so has the volume of terms and nomenclature applied. This plethora of definitions and methodologies has resulted in a lack of harmonization among asset owners, asset managers and academics. Indeed, there is a wide spectrum of terminology to refer to sustainable investing. Socially responsible investing, impact investing, green investing and ESG investing are terms that are often used interchangeably by academics and investors to pertain to this umbrella term (Schueth, 2003).

In the literature, Schueth (2003) defines SRI as "the process of integrating personal values and societal concerns into investment decision-making". At the supranational level, the Global Sustainable Investment Alliance (GSIA), which gathers the seven largest organisations promoting sustainable investments in the world[1], defines sustainable investment as "an investment approach that considers environmental, social and governance factors (ESG) in portfolio selection and management". BlackRock, the world's largest asset manager, introduces an additional dimension to the concept by defining sustainable investing as "combining traditional investing with sustainability-related insights in an effort to reduce risk and enhance long-term returns". One of the most widely accepted definitions is given by the United Nations Principles for Responsible Investment in 2005: "Responsible investment is an approach to investing that aims to incorporate ESG factors into investment decisions, to better manage risk and generate sustainable, long-term returns."

Although these definitions differ from one to another, there remains a common denominator: the combination of traditional investment approaches with ESG-related insights. This concept is gaining a lot of momentum in recent years but the consideration of ESG issues in asset allocation decisions is not a new phenomenon.

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[1] Eurosif, Japan Sustainable Investment Forum (JSIF), Responsible Investment Association Australasia (RIAA), UK SIF, Dutch Association of Investors for Sustainable Development (VBDO), RIA Canada and US SIF.

2.2. From SRI to ESG

Over the last decade, investors have shown a growing interest in non-financial criteria to support their investment decision-making. What originally consisted of the exclusion of "sin" stocks in the name of religious beliefs has migrated to a modern landscape challenged by environmental, social, and governance concerns.

What is currently known as sustainable investing was first religiously motivated. SRI found its origins in the 18th century when religious groups such as Muslims, Methodists or Quakers laid out ethical parameters on their investment portfolios. In order to make investments that comply with Islamic law, Muslims adopted a method that excluded prohibited activities such as weapons. This method, which will later be referred to as negative screening, was also implemented by the Methodists and Quakers to create investment vehicles that rule out the alcohol, tobacco, and gambling activity sectors (Richardson, 2008).

Over the years, this movement based on religious principles grew in prominence and progressively turned into a political contestation (Revelli, 2013). SRI gained increasing attention between the 1970s and 90s, as being regarded as a leverage for societal causes and environmental concerns such as ending the war in Vietnam, fighting the South African apartheid regime, and tackling climate change (Renneboog et al., 2008b; Townsend, 2020).

Sustainable investing continued to flourish throughout the 21st century thanks to the support of international organizations. In early 2004, the concept was further popularized by the former United Nations Secretary General, Kofi Annan, who called on the world-leading financial institutions to integrate environmental, social and corporate governance into the global investment industry (Morningstar, 2021). This initiative was followed by the issuance of two landmark reports, namely the Freshfield Report and "Who Cares Wins". The former was produced by the UNEP FI[2] and concluded that considering ESG factors into investment analysis is consistent with fiduciary duty as they can have material impact on the financial performance of potential investments (UNEP FI, 2005). The latter resulted from the UN Global Compact and highlighted that ESG factors have financial relevance. The acceptance of those findings has

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[2] United Nations Environnent Program Finance Initiative

removed a major hurdle for ESG to move from niche and become mainstream. Together, these two reports constitute the roots of the UN Principles for Responsible Investment (UN PRI) which encouraged the incorporation of ESG into financial practice. By 2020, the PRI encompasses more than 3,000 signatories representing over \$103 trillion worldwide (UNPRI, 2020).

As the fund management industry expanded, new socially responsible investing practices have emerged to achieve both financial and non-financial results. Although negative screening constitutes the cornerstone of traditional socially responsible investment, modern SRI investing encompasses a variety of strategies. The CFA Institute (2015) classifies the various sustainable investment approaches in six strategies: (i) Exclusionary screening which consists of in the exclusion of certain companies, industries or countries from the investment universe on the basis of specific ESG criteria; (ii) Best-in-Class refers to the selection of companies outperforming peers sector in ESG measures; (iii) Active ownership also known as engagement and voting, refers to the exertion of shareholder power to influence corporate behaviour; (iv) Thematic investing which involves investment in themes or assets specifically related to sustainability; (v) Impact investing is an investment strategy which purpose is to generate positive social and environmental impacts while delivering financial return; (vi) ESG integration consists in the explicit inclusion of ESG factors alongside traditional financial factors into the evaluation of an investment. While these strategies follow those developed by Eurosif, the European organisation identifies an additional strategy by considering the norms-based screening approach as the 7th responsible investing strategy (Eurosif, 2018).

In response to the ever-growing investor appetite, the finance industry continues to diversify its array of investment solutions under the sustainable banner. The oldest and most basic SRI investment product consists of corporate shares, but it is spreading to many other asset classes, including corporate and government bonds, mutual funds, banking account, real estate, and private equity.

2.3. SRI current landscape

Sustainable investments are continuing to climb globally with asset under management reaching \$35.3 trillion at the beginning of 2020, a growth of 15 percent in the last two years (GSIA, 2020). With this expansion, sustainable investment now accounts for 35.9 percent of

total professionally managed assets under management. The global sustainable market is dominated by Europe, the United States and Japan. As of 2018, Europe was the main player of SRI market with $14.1 trillion total assets under management, which represented nearly half of global responsible investing assets. However, this global repartition has experienced significant change in year 2020. Most of this change results from the transition undergone by the European regulatory framework which has impacted the way sustainable investment is defined (EU Taxonomy). Using this new and stricter definition, Europe reported total sustainable investment assets of $12 trillion, a decline of 13% compared to 2018. This denotes a huge decline in the global repartition, as Europe now accounts for 34%. In 2020, sustainable investing expands considerably in the United States with a growth of 42%, bringing the proportion of professionally managed assets under sustainable investing strategies in the US to 48%. Other regions have demonstrated exponential growth, with regions such as Japan, and Canada experiencing an increase of 34%, and 48% respectively over the past two years (GSIA, 2020).

Another substantial change relates to the sustainable investment strategies implemented. Among the previously mentioned strategies, ESG integration is the major sustainable investment strategy with $25.2 trillion assets under management. The most popular sustainable investment strategy, exclusionary screening, now ranks second with $15 trillion (GSIA, 2020).

The asset classes available for sustainable finance have diversified over the years. In 2018, most sustainable assets were allocated to the public equity and fixed income asset classes amounting to 51% and 36% of the total sustainable assets, respectively. The mix of asset classes is diversifying over time with, for example, sustainable investments in real estate accounting for 3% in 2018 (GSIA, 2018). Furthermore, mutual funds are a commonly used investment vehicle in sustainable finance as it enables to implement diverse sustainable investment strategies. A significant part of these investments is done through investment funds. As of September 2020, the launch of new funds and repurposing of others brought the total number of sustainable funds globally to 3,774. In the first quarter of 2021, the global sustainable universe attracted an all-time record level of net inflows of $185.3 billion and nearly reached the threshold of $2 trillion assets. Asset managers have responded to this continued interest in sustainable finance by growing their sustainable fund offerings by launching new products or by repurposing conventional products into sustainable funds. In the last quarter of 2020, 215 funds with sustainability mandates were launched globally (Morningstar Manager Research, 2021).

When looking at the division of the market between institutional and retail investors, it is evident that institutional investors dominate the market. However, retail investors have been showing growing interest in sustainable investing, representing one quarter of total sustainable investing assets over the last two years compared to 20% in 2016. The growing appetite for sustainable investments is primarily driven by a new generation of investors referred to as millennials who are known for allocating their capital in alignment with their personal values (CNBC, 2021).

2.4. The drivers of ESG preferences

As sustainable finance hits mainstream, questions arise regarding investors' preferences and the drivers of these non-financial preferences. This surge is in part motivated by heightened ethical concerns, but also by the presumed financial gain associated with green investments. In the literature, Hartzmark and Sussman (2019) identified two main motives for sustainable investors: the non-pecuniary motive and the conviction that sustainability ensures better risk-adjusted returns. Consistent with this statement, Derwall et al., (2011) identified two categories of socially responsible investors. On one hand the value-driven investors, predominantly represented by a new generation of investors referred as to the millennials, who seek to integrate their personal values into their investment decisions and on the other hand profit-seeking investors who make use of sustainable investments to achieve better performance. According to Schueth (2003), what motivates SRI investors is not only to invest in accordance with their values but also to have a positive impact on the environmental and social situation.

However, the investment decision is in reality often driven by a combination of both sets of these factors. As sustainable investing is not only values-driven, but also profit-driven (Ballestero et al., 2012), it is difficult to assign investors to a single category since only a minority of socially responsible investors is exclusively guided by values. Based on the importance they attribute to financial return and social responsibility associated with the investment, Nilsson (2009) categorized SRI investors into three subgroups: investors who primarily care about financial return, those whose main motive is social responsibility, and those who value both return and social responsibility in the decision to invest responsibly.

In a 2007 cross-country study, Williams found that SRI is largely driven by non-monetary incomes rather than financial returns. Similarly, Bauer and Smeets (2015) investigated why

individuals hold SRI equity funds. They found that the major driver of SRI is investors' social preferences and to a lesser extent, the return expectations as most socially responsible investors expect SRI funds to underperform conventional funds. In line with this finding, Riedl and Smeets (2017) attributed the willingness of investors to hold SRI funds to their social preferences rather than financial motives. However, these results must be balanced as financial considerations remain a fundamental factor of investment choices.

- Profit-driven investors - Performance

According to a study conducted by Amel-Zadeh and Serafeim (2017), the primary motive for investors to consider ESG data in their investment strategy resides in its relevance to financial performance. Although the sustainability-performance relationship has been the focus of numerous academic researches over the last decades, the findings on the financial effects of ESG criteria showed mixed evidence. While some studies report that certain SRI criteria can lead to a superior performance (Derwall et al, 2005; Statman & Glushkov, 2009; Ashwin Kumar et al. 2016; Badia et al., 2020), other studies provide evidence that incorporating ESG factors into investment decisions lead to financial underperformance (Brammer et al, 2006; Hong & Kacperczyk, 2009). Although no consensus has yet been reached, a considerable number of studies conclude that the financial performance of SRI is indistinguishable from that of conventional investments (Hamilton et al, 1993; Statman, 2000; Bello, 2005; Bauer et al., 2005; Kreander et al., 2005; Benson et al., 2006; Renneboog et al., 2008a; Utz & Wimmer, 2015).

In line with the underperformance argument, a bulk of literature has pointed out that investors incur a diversification loss for investing in SRI funds. Adler and Kritzman (2008) argue that SRI funds pay a cost for excluding some attractive firms from their portfolios. By studying the performance of "sin" portfolios, Fabozzi et al. (2008) and Hong et al. (2009) contend that exclusion strategies may result in poor performance. SRI opponents view the application of sustainable criteria to investment portfolios as an affront to the diversification principle introduced in the Modern Portfolio Theory (Markowitz, 1952). SRI strategies constraint portfolio optimization as it restricts the investment universe which may limit the diversification possibilities and therefore shift the mean-variance frontier towards less favourable risk–return trade-offs than those of conventional funds (Geczy et al., 2005).

However, when Bello (2005) investigate the extent to which the ethical and moral screening affects the level of diversification, he points out that the degree of portfolio diversification of SRI funds does not significantly differ from conventional funds. Alternatively, Renneboog et al. (2011) considered ESG screens as a "stock picking" strategy through which firms with characteristics that are believed to achieve superior performance are selected. For their part, Pederson et al. (2020) stressed that positive ESG factors could be a predictor of futures returns as they contain relevant information about firm fundamentals.

Consistent with this finding, Barnett and Salomon (2006) studied the risk-adjusted performance of SRI funds and found that intensive screening increases the financial benefits. Fulton, Kahn and Sharples (2012) extend the analysis one step further by disaggregating the ESG score into the three core pillars and found that the factor which contribute the most to performance when screening for ESG lies in the Governance pilar. However, these results are contradictory to those of Lee et al. (2010) who studied whether the number of social screens affect returns. They concluded that screening intensity and systematic risk are negatively correlated, but that highly screened funds do suffer on a risk-adjusted performance basis. In a more recent study, Chatterjee (2018) examined the effects of Morningstar ESG score on US mutual funds' performance. He found that risk-adjusted returns of both lower and medium ESG rated funds are generally higher than those of high rated funds.

Alongside the difficulty of defining exactly what constitutes a sustainable investment, the choice of ESG measures used to perform the analysis and the potential divergence among these metrics (see section 2.6.) can explain part of this lack of consensus regarding the performance of ESG focused portfolios (Berg et al., 2019).

- **Profit-driven investors - Risk**

While some studies report that the reduction of diversification potential implied by SRI strategies increases the risk, others argue that ESG investments act as a protection against downside risk (Godfrey et al., 2009). By investing in firms that exhibit environmental, social, and governance responsibility, SRI portfolios are less likely to experience large negative outcomes that arise during corporate social crises or environmental disasters. In other words, ESG attributes mitigate the downside risk. In line with this conjecture, Hoepner et al. (2018) found that the involvement in ESG issue can prove to be beneficial for shareholders as it lowers

firms' exposure to downside risks. They argued that this dampening effect is particularly relevant when addressing risks attributed to 'E' or environmental issues. In accordance with previous literature, Chatterjee (2018) analyses mutual funds' performance over a period from 2005 to 2016 and finds that funds with higher ESG profiles exhibit better risk-adjusted returns in periods of market downturn. However, this dampening effect comes at the cost of underperforming during bull market periods (Nofsinger & Varma, 2014).

The popularity of mutual funds that focus on ESG criteria could be explained by this downside protection. Indeed, these funds benefit from an asymmetric return pattern which prove to be highly valuable for investors seeking resilience against downside risk during poor economic times (Albuquerque et al., 2020). This is evidenced by Kahneman and Tversky's (1979) Prospect Theory which demonstrates that investors are loss averse. As the slope of the utility function in the loss area is sharper than in the gain area, investors do not assess gains and losses of similar magnitude equally. As a result, they are more likely to invest in the skewed portfolio rather than in the efficient portfolio as defined by Markowitz because the gain in utility for overperforming in bear markets is larger than the loss in utility for underperforming in bull markets.

- Value-driven investors

For many investors, SRI is not only a way to achieve risk and yield optimization but represents a way to get non-financial benefits. In contradiction with the traditional financial theories, an extensive body of evidence reveals that investors do integrate non-financial preferences when it comes to make their investment decision (Bauer & Smeets, 2015; Delsen & Lehr, 2019). In an experimental study analysing investor behaviour towards socially responsible mutual funds, Barreda-Tarrazona et al. (2011) found that investors are willing to set aside part of the financial performance to respect their values. The extent to which investors are willing to sacrifice financial returns is depending on their moral preferences (Bauer & Smeets, 2015). In the same way, Riedl and Smeets (2017) show that despite the underperformance expectation compared to their conventional peers, many investors remain loyal to socially responsible mutual funds. These findings suggest that investors are willing to pay a premium to invest in accordance with their beliefs.

In contrast to the foundations of the modern portfolio theory (MPT), several papers point out that investors do not just focus on returns and risk of their investments. Under MPT, investors' utility is expressed as a function of solely 2 variables: risk and return. Rational investors should thus restrict their attention to utilitarian benefits (i.e., low risk and high expected return) by selecting efficient portfolios depending on their level of risk aversion (Markowitz, 1952). However, the following decades have been filled with studies attempting to challenge this theory by developing new models that incorporate additional variables. Whereas the conclusions regarding SRI financial performance are still controversial, the increasing popularity of sustainable investments might be explained by the non-financial utility investors derive from investing in a manner consistent with a set of personal and social values (Bollen, 2007). In this context, Beal et al. (2005) and Bollen (2007) suggested that investors have a multi-attribute utility function corresponding to the classical mean-variance model to which the portfolio's degree of sustainability is added. Hence, under the condition that their financial conditions are met and depending on their attitude towards sustainability, investors will obtain extra-financial utility by investing in SRI. As a result, Renneboog et al. (2008b) contend that the inclusion of sustainability dimension in the utility function reduces the value that SRI investors place on financial characteristics. However, Dorfleitner et al. (2016) documented that unlike absolute financial returns, which scale naturally with the amount of capital invested, most investors experience a saturation effect for non-financial utility.

Although many studies have highlighted the desire of investors to integrate social values into their investment decisions, the hypothetical nature of majority of these surveys can lead to results that reflect investors' motivations rather than their actual behaviour. In fact, respondents tend to report hypothetical and socially desirable investment decisions instead of actual ones (Vyvyan et al., 2007).

To address this issue, a set of studies have been conducted by focusing on actual holdings and investors' investment decisions. One way to understand investors' actual behaviour is to analyse flows going in and out of investment funds. Indeed, if SRI investors value non-financial information in making their investment choices, then higher profile SRI funds would be expected to receive higher inflows as compared to conventional funds.

2.5. SRI funds flows

Bollen (2007) and Benson and Humphrey (2008) were among the first to study investor behaviour by analysing the dynamics of fund flows towards a sample of socially equity mutual funds. The former provides evidence that SRI funds exhibit significantly lower volatility in flows whereas the latter suggest that sustainable investors are less sensitive to negative returns than conventional funds. This result supports the idea that investors derive additional value from sustainable investments. The findings of Bialkowski and Starks (2016) are consistent with that of previous research. After studying funds' flows over a 12-year period (i.e., from 1999 to 2011), they found that SRI funds have experienced consistently positive flows and that these flows show greater persistence than those of conventional funds.

More recently, Amman et al. (2018) investigate the effect of the introduction of Morningstar sustainability rating on mutual funds flows. They found strong evidence that the availability of sustainability information has prompted investors to shift money away from funds with low sustainable profile into highly rated funds. After conducting a flows analysis on the US mutual funds market to investigate whether investor value sustainability, Hartzmark and Sussman (2019) came to the same conclusion. They observed that after the rating publication, mutual funds that exhibit high ESG profile experience sizable inflows. This demonstrates investors' willingness to reallocate their money from funds with low portfolio sustainability ratings to those with high ratings. By finding no evidence that high sustainability funds outperform low sustainability funds, they confirmed the relevance of a multi-attribute utility function as investors attach a non-monetary value to socially responsible investing.

In summary, literature point out that not all SRI investors are alike. The sustainable market is composed of a heterogeneous group of investors who differ in the pecuniary and non-pecuniary benefits that they expect to derive from their investment. The merging of these different investor profiles into a single definition seems to create methodological difficulties in scholars' efforts to assess the performance of SRI.

2.6. ESG ratings

As more and more investors want to integrate their social convictions in investment decision-making process, the number of ESG rating providers is on the rise as well. Indeed, investors

make use of ESG information through third-party ESG ratings to achieve their investment objectives. Just like the diversity in labelling to refer to SRI, the ESG rating market is widely diversified with more than 600 'products' from over 150 organizations providing ESG data (Hawley, 2017). Despite the large number of ESG rating providers, the industry is rapidly consolidating, with a few leading players among which some renowned data providers including Bloomberg, Morningstar, MSCI or Refinitiv Thomson Reuters.

Not all rating systems are the equivalent. Some rating agencies based their methodology on ESG performance whereas others based it on ESG risk. Given that there is no regulation on how to report and assess this non-financial information, ESG rating agencies benefit from significant wiggle room in the development of their own metrics and measurement techniques (Chatterji et al., 2015). This leads to substantial divergences between ESG ratings from different providers (Berg et al., 2019) which might get investors confused.

This lack of convergence in ESG measurements has raised questions on the validity of rating as sustainable indicators and has therefore been the focus of several studies in recent years. Semenova et al. (2014) compared the environmental ratings of three providers and argued that even though the ratings have common dimensions, they do not converge. Chatterji et al (2015) highlighted the heterogeneity between ESG agencies which stems from a lack of theorization (i.e., ESG definition) and commensurability (i.e., measurement, indicators composition and weight). In a similar vein, Dorfleitner et al (2015) found an evident lack of consensus between three important sustainability rating providers, while corroborating the above-mentioned underlying reasons. Hawley (2017) confirmed the reasons for this lack of consensus between the main rating agencies while adding two additional reasons: data gathering methods and transparency. He argued that part of the heterogeneity across agencies results from a lack of transparency in raters' methodology which result from their willingness to protect their intellectual property and data sources. In a recent study, Berg et al. (2019) found an average correlation of 0.54 between different ESG ratings, which supports that the information provided by ESG rating agencies is relatively noisy. By studying the data of six renowned rating agencies[3], he found that the major drivers of divergence lie in the difference in scope (i.e., the

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[3] KLD (MSCI Stats), Sustainalytics, Vigeo Eiris (Moody's), RobecoSAM (S&P Global), Asset4 (Refinitiv), and MSCI

set of attributes considered) and in measurement (i.e., the indicators used to assess each attribute). As significant as it may be, the difference in weights (i.e., relative importance) raters assign to each category impacts the rating differential to a much lesser extent.

Besides the differences in ratings among providers, it is important to highlight that sustainability ratings witness geographical and size biases. According to Steen (2019), the distribution of ESG rating is subject to a geographical bias. When comparing the ESG scores of peer companies from the two largest ESG continents (Europe and North America), Doyle (2018) observed that companies from the European continent had an average score of 66, while their US peers would receive a score of 50. The underlying reason for this geographical bias seems to be the stricter level of disclosure requirements in Europe (Doyle, 2018). Consistent with this conjecture, Dyck et al. (2019) found that institutional investors that are domiciled in countries exhibiting high social norms put pressure on corporations to adopt better ESG practices.

As reported by Doyle (2018), the ESG rating industry also exhibits a large-cap bias. Like the geographic bias, this size bias finds part of its explanation in the different level of sustainable disclosure. Because they have greater resources to devote to full transparency, larger companies score higher (Drempetic et al., 2019). Hahn et al. (2013) pointed out that due to wider visibility as well as the greater stakeholder scrutiny and pressure, the corporate size and the degree of sustainable reporting are positively correlated. Their financial power and thus additional investments devoting to the improvement of their ESG profile may be an additional explanation of this bias. In addition, Doyle (2018) observed that, as long as they demonstrate robust disclosure practice, companies with weak ESG practices can still achieve a high ESG score and even outscore a peer with stronger ESG practices but weaker disclosure practice.

Doyle (2018) concluded that the comprehensive disclosure practice plays an essential role in the achievement of high ESG ratings. By having the tendency to reward companies with greater disclosure, the rating system create a situation where the focus is on disclosure, rather than on the underlying risks disclosed. This rating discrepancies and the potential biases associated with them raise questions on the ability of ratings to reveal the real sustainability performance of firms which represents a major barrier to further boost the ESG adoption and the achievement of a sustainable economy. As rating disagreements threaten to dampen confidence in ESG ratings and misled investors' decisions, it is of great importance for rating agencies to provide more transparency on their methodology.

2.7. <u>Regulatory framework</u>

Despite its rapid growth, ESG investing still faces obstacles to continue its emergence. As green investments become mainstream, it is reaching a tipping point: the exploding interest in sustainable investments has pushed managers to continuously expands their offering by launching new products. Nevertheless, without some way to control how the concept is used, SRI runs the risk of being reduced to a marketing tool. This constitutes an important challenge for sustainable finance development as greenwashing is regarded as the biggest hurdle for SRI strategies (Eurosif, 2018).

The European Union has taken the lead to overcome the challenge faced by sustainable finance through the development of a series of reforms and new regulations to prevent greenwashing and enhance comparability. An ambitious package of measures has been adopted in response to the European Green Deal (2019) which aim is to be the first carbon neutral continent by 2050 and thus reach its international environmental commitments. Although there is still a lot of work to be done, the EU regulatory landscape for sustainable finance has undergone considerable changes in the past years. These progresses include the Sustainable Finance Action Plan and its set of subsequent regulations which purpose is to promote sustainable investment across the European continent. The frontrunner of this Action Plan consists in the so-called EU taxonomy, which entered into force in July 2020 and attempts to create a harmonized understanding of which economic activities can be considered as "environmentally sustainable". Another key component of the Action Plan is the Sustainable Finance Disclosure Regulation (SFDR, Regulation (EU) 2019/2088) which objective is to enhance the transparency on the degree of sustainability both at the entity, and product level. This new regulation set out requirements for institutional investors, asset managers and advisers to report the integration of sustainability risks and adverse impacts in their investments. Sustainability reporting is also moving forwards with the proposal of the Corporate Sustainable Reporting Directive that would amend the Non-Financial Reporting Directive (Directive 2014/95/EU) in place since 2018. This new directive is expected to come into force in 2024 and will require all large and listed companies in the EU to follow detailed sustainability reporting standards.

In the United States, the regulatory framework regarding sustainable finance is also about to undergo considerable improvements as climate change and other ESG matters are central focus of the Biden administration (Biden, 2021). The Securities and Exchange Commission (SEC)

announced that they are undertaking steps toward a broader regulatory policy environment for sustainable investing. In a request for information issued in March 2021, the SEC' leaders indicated that they would work toward a climate risks and ESG-related information disclosure regulation (GSIA, 2020).

The EU is rightly recognised as a green policy pioneer, but this new regulatory framework could impact the green finance to a much global extend. Since lot of U.S. investment firms offer funds over the European continent, they would have to comply with the coming regulation by demonstrating that they are serious about sustainability. Moreover, this will lead to increasing pressure on listed companies as they will face a dilemma: enhance the focus on ESG issues or risk losing investor capital. Given its extensive ramifications over financial actors, the new European rules could thus have far-reaching consequences around the world and become the first step towards "a global regulation".

The development of such a regulatory framework comes at a crucial time because of the uncertainty that the coronavirus pandemic has engendered.

2.8. Market distress - COVID-19 crisis

In early 2020, the coronavirus pandemic, or COVID-19, generated a major shock to the global economy. This outbreak has reminded how interconnected the modern world has become. Within a few months, the viral outbreak spread from a regional health crisis in Wuhan (China) to a global crisis. Although the COVID-19 crisis originated outside the financial industry, the impact on the real economy was immediate. The quarantines and lockdowns measures taken by governments directly affected consumption and thus business revenues. The virus' spread generated a major turmoil in financial markets: the stock market plummeted while market volatility skyrocketed all around the world. Financial markets started to tumble on 20th February 2020, when the World Health Organization (WHO) declared COVID-19 as a global health emergency before reclassifying it as pandemic on 11th March (Ramelli and Wagner, 2020). In a single-month period, the major stock markets have witnessed a double-digit decline with the S&P 500 recorded an all-time high of 3,386 points on February 19, 2020, before plunging to 2,237 points on 23rd March 2020 (Albulescu, 2020). As the "fear gauge" VIX reached its historical peak, the volatility of all financial markets grew from an average of 0.0071 in February to 0.0196 in March (Zhang et al., 2020). The great uncertainty surrounding the

pandemic and the economic losses it would engender has caused markets to become unpredictable (Altig, 2020).

Despite its brief duration, the National Bureau of Economic Research (NBER) which defines recession as "the period between a peak of economic activity and its subsequent trough", identified the year 2020 as a recession period. The pandemic thus brought an end to a record-long expansion period that began after the trough in 2009. After massive interventions from governments and central banks around the world, volatility diminished, and stock markets started to recover. The global stock market re-entered a bull market on March 23rd when the US government announced its stimulus package. Unlike previous recessions, the time it takes for the financial market to return to its previous peak level was not so long. The market took less than 5 months to fully recover and was back to its precrash level by August.

2.9. Investors' behaviour in market distress

When looking at investor behaviour in tight economic times, it is important to be aware that institutional and retail investors behave differently. Institutional investors are less likely to show a large shift in investment allocation since they have specific investment mandates as opposed to retail investors who invest according to pro-social preferences (Riedl et al., 2017). Regarding sustainable finance, most of institutional have strong ESG mandates (e.g., PRI signatories) and perform active ownership strategy. Investors' clients and beneficiaries' preferences as well as regulatory requirements put pressure on institutional investors to integrate ESG issues into their decision-making (Cao et al., 2020).

Retail investors are more affected by market distress. While institutional investors have deep pockets and therefore few financial constraints, retail investors tend to focus on liquidity and are therefore more likely to change their portfolio composition by shifting from risky to safer assets. Indeed, individual investors behaviour towards risk changes in period of market crisis (Hoffmann et al., 2013). While their perceptions of risk increase during hard times, investors' return expectations as well as risk tolerance decrease. These changes in perceptions impact trading and risk-taking behaviour. An example comes from the fear and uncertainty caused by the terrorist attacks. These events have led to an increase in risk aversion which was translated in the fund industry by a reduction in investment in equity funds and an increase of inflows into government bond funds (Wang et al., 2020). A recent study of Himanshu et al. (2021)

confirmed these statements. The extreme uncertainty caused by the COVID-19 pandemic has conducted individual investors to reallocate their portfolio by moving towards conservative assets. This change in allocation stems from the fact that investors build their future portfolios based on the returns of previous allocations and that returns on risky assets have not met expectations.

However, all investors do not behave alike when dealing with uncertainty. Whereas some investors become more risk averse, others see the plummeting stock prices as an opportunity to invest in risky assets for better future gains (Himanshu et al., 2021). This strategy, also known as "buying the dip", consists in investing in assets that sharply depreciate in anticipation of higher expected return in the future.

While sustainable finance is becoming mainstream, knowledge about the actual value that investors assign to it is still limited. The market distress caused by the Covid-19 pandemic is thus an interesting landscape to shed light on the actual motivations for investing in sustainable funds. Studying investor behaviour through the crisis will enable to test whether investors value sustainability in time of bear markets or whether ESG investing is a luxury only available in bull markets period.

3. <u>DATA</u>

To perform this analysis, data on mutual funds were retrieved from the Morningstar Direct database. This database is one of the most complete sources at the mutual fund level and has been used in an extensive body of studies over the past decades (from Chevalier and Ellison in 1999, to Ammann et al. in 2018). Furthermore, Morningstar, in collaboration with Sustainalytics, was one of the first databases to provide monthly sustainability rating for funds. For this reason, this database has been preferred to others such as Refinitiv Thomson Reuters. The methodology used by Morningstar to achieve their final ESG score is described hereafter.

3.1. <u>Morningstar & Sustainability rating</u>

The sustainability rating provided by Morningstar is used for the purpose of this analysis as it is an easy way for investors to assess the sustainability of their investments and has been shown to attract fund flows (Hartzmark & Sussman, 2019). Since 2016, Morningstar has provided investors with a fund-level ESG rating that enables the latter to assess the risk-level of their portfolio by considering ESG criteria. This rating, also known as the Morningstar's globes rating, is based on Sustainalytics' ratings which evaluate companies' material ESG risk.

A three-step process is used to achieve the final fund' sustainability rating (Morningstar Research, 2019):

1. First, the Morningstar Portfolio Sustainability Score is computed as an asset-weighted average of ESG risk rating[4] of each individual company that composes the portfolio. For the sake of relevancy, a fund is required to have at least 67% of its assets under management covered by company ESG score to obtain a Portfolio Sustainability Score.

2. The second step consists in the calculation of the Morningstar Historical Portfolio Sustainability Score. Morningstar computed this historical sustainability score as a weighted average of the past 12 months' portfolio sustainability score. To add

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[4] ESG risk rating measures the degree to which unmanaged ESG risk could put a company's economic value at risk. The lower the score, the better.

consistency in the rating while reflecting the current decisions of the portfolio managers, the average grants more weight to the most recent portfolios.

$$Historical\ Portfolio\ Sustainability\ Score = \frac{\sum_{i=0}^{11}(12-i) \times Portfolio\ Sustainability_i}{\sum_{i=0}^{11}i+1}$$

Where i is the number of months from present.

3. Finally, funds are assigned a sustainability rating ranging from 1 up to 5 globes according to the percentile ranks within their Morningstar global categories. A fund with significant ESG risk relative to its peer group would receive 1 globe, whereas a fund with negligible ESG risk would be awarded 5 globes.

3.2. Sample Selection

For the purpose of selecting the funds that constitute the main sample, several screens were applied to the dataset. The sample focus on equity open-ended mutual funds. The choice to focus on equity mutual funds stems from the greater accessibility of sustainability data. Given the purpose of this analysis, an additional filter was applied so that the funds which do not provide a sustainability rating were excluded from the sample. As the analysis is performed on monthly flows, funds that do not report on a monthly frequency were dropped. The data set retrieved spans an 18-month period, beginning in September 2019 and ending in February 2021. The choice to perform this analysis on monthly basis allows a view of investor behaviour prior to the Covid-19 crash which between February and March 2020 as well as the evolution during the recovery, and the post-crisis period.

Morningstar provides data at the share class level, but the analysis was conducted at the fund level. For funds that have multiple share classes, data from the different share classes were thus aggregated to the fund level. As this thesis aims at analysing the way investors value sustainability rating when investing, the aggregation is no problem. Indeed, the share classes differ in the fee structure, but the sustainability rating remains identical as the underlying pool of assets is the same across all share classes. Moreover, this method has been commonly used in previous research such as Hartzmark and Sussman (2019). The FundID provided by Morningstar has been used as the main basis to perform this aggregation as all the share classes of the same fund have the same FundID.

Fund total net assets (TNA) is calculated as the sum of the TNA across fund's share classes, while returns are computed as the weighted average. The fund age is calculated from the inception date of the oldest share class. Other fund-level information (such as expense ratio, alpha, and Morningstar star rating) is the one of the largest share class.

The final dataset consists of 4,726 equity mutual funds covering an 18-month period from September 2019 to end February 2021.

3.3. Summary Statistics

Appendix 2 shows the Morningstar sustainability rating distribution of the sample over the period studied. As of September 2019, the share of funds that received 5-globe rating accounts for 11% of the global sample with 79% of them domiciled in Europe. 382 funds received a 1-globe rating which represents 8% of the total sample. The sample distribution fits rather well with a normal distribution which reflects a well-balanced sample as it is consistent with the rating attribution of Morningstar. However, it is a bit skewed to the left reflecting a higher number of high and above average rated funds compared to low and below average rated funds, respectively (Appendix 3).

Sustainability Rating	N	Sample repartition (%)
High	531	11.33%
Above Average	1099	23.25%
Average	1716	36.31%
Below Average	998	21.12%
Low	382	8.08%
Total	4726	100%

Figure 1 – Sample sustainability repartition as of September 2019

As shown in the summary statistics reported in appendix 4, funds experience on average monthly inflows over the reporting period. It should be noted that the flow distribution of the overall sample is skewed to the right as the mean is well above the median. By grouping funds on the basis of their sustainability category as of September 2019, some divergence in fund-specific characteristics can be highlighted (Figure 2). Consistent with the findings of Hartzmark and Sussmann (2019) which studied the relationship between sustainability rating and flows, funds with high ESG score tend to attract larger monthly flows compared to low ESG funds.

Over the 18-month period studied, the sample experienced average inflows of 0.5% per month, but the 5-globe funds recorded monthly inflows of 1.51% while average monthly flows for 1-globe funds are nearly null.

Regarding the other variables, funds in the highest ESG category have superior past performance, based on both prior month's returns and Morningstar star ratings. Compared to funds with low sustainability rating, funds obtaining the highest sustainability rating tend to be larger in size and have lower expense ratio. The difference in age between the two extreme rating categories is of less than one year which means that they are on average of the same age. A rather surprising observation concerns the scores of the ESG breakdown pillars[5]. Although the environmental pillar is fully consistent with the globe ratings as measures of portfolio sustainability, the same conclusion cannot be drawn for the social and governance aspects even if the difference is lower. An explanation would be that the divergence on the environmental pillar drives a significant part of the overall score.

Sustainability Rating	High	Above Average	Average	Below Average	Low	High-Low
Net Flows ($ million)	3.510	2.089	0.820	-0.092	-0.296	3.8063***
Net Flows (%)	1.50800	0.72710	0.47320	0.14340	-0.01126	1.5193***
Total Net Assets ($ million)	422.00	421.30	461.60	285.90	316.60	105.4***
Monthly Return (%)	1.4150	1.2530	1.1700	1.0840	0.9738	0.4412*
Alpha (%)	-3.9424	-5.9178	-8.1257	-10.061	-11.826	7.8836***
Star Rating	3.604	3.410	3.128	3.000	2.801	0.803***
LTM Risk	6.479	6.410	6.423	6.442	6.311	0.168
Age (months)	156	169	158	152	146	10.8***
Expense Ratio (%)	1.238	1.330	1.371	1.449	1.446	-0.20846
ESG Env. Pillar	3.873	4.026	4.626	4.848	5.210	-1.337***
ESG Soc. Pillar	8.060	8.254	8.454	8.073	7.662	0.398***
ESG Gov. Pillar	6.875	6.898	6.993	6.635	6.305	0.570***
N	531	1099	1716	998	382	-
%	11.24%	23.25%	36.31%	21.12%	8.08%	-

Figure 2 – Summary statistics by sustainability categories from September 2019 through February 2021

[5] The scores generally rank from 0 to 20, where the lower score denote the lower risk.

4. METHODOLOGY

To investigate whether investors consider non-financial information and more especially sustainability rating in their investment decision, a flow analysis is performed. If investors value non-financial information in their choice of funds, then funds exhibiting a high ESG profile are expected to receive higher flows. To answer this question, a panel regression is performed as it allows to assess the effects of several explanatory variables on a dependant variable over time. In this analysis, the dependant variable is the funds flows whereas the main explanatory variable of interest is the sustainability rating. To determine which panel regression model is appropriate to use, several tests were performed on the sample. First, the Breusch-Pagan test is performed to test the hypothesis of homoscedasticity of the error term. The result obtained is available in the Appendix 5. Since the p-value of the test is less than 1%, this means that the null hypothesis should be rejected, i.e. that the variance of the error term is not constant. As heteroskedasticity is present in the regression model, the pooled OLS regression is not an appropriate model because although the estimator remains unbiased, it is no longer of minimum variance (Hill et al., 2018). In others words the individual differences of the cross-sectional units might lead to different coefficients.

Given this consideration, the fixed-effect regression or the random-effect regression become relevant for the purpose of the analysis. On one hand, the fixed-effect model accounts for this heterogeneity by assuming that each individual has a unique intercept, while on the other hand the random-effect model assumes that individuals have a common intercept that corresponds to the population average (Hill et al., 2018). A Hausman test statistic can be carried out to distinguish the two models and determine which is more adequate. The result of the Hausman test is provided in the appendices (Appendix 6). The outcome of this test is a very large value with a p-value below the 1% threshold, which means that the random-effect regression model is not consistent and that it is therefore preferable to use the fixed-effect model.

Since the objective of this research is to compare the impact of the pandemic on investment flows into ESG and other funds, the analysis is done on a balanced sample. The analysis focuses on the evolution of flows for all funds that received a sustainability rating at the beginning of August 2019. Further analyses will be performed on restricted samples to provide some nuances in the discussion.

4.1. Flows Analysis

The main variable of interest of this analysis is net flow experienced by a sample of equity mutual funds. Two measures of flows have been calculated. First, percentage flows are computed following Sirri and Tufano (1998).

$$Flow_{i,t} = \frac{TNA_{i,t}}{TNA_{i,t-1}} - (1 + R_{i,t}),$$

where Flow$_{i,t}$ indicates the percentage of change in Total Net Assets (TNA) in the fund i between time t and time t-1 minus appreciation. R$_{i,t}$ is the net return of fund i at time t.

Secondly, absolute flows or dollar flows are measured as the monthly change in total net assets net of reinvested returns (Barber, Huang, and Odean, 2016).

$$Flow_{i,t} = TNA_{i,t} - TNA_{i,t-1} (1 + R_{i,t}),$$

where Flow$_{i,t}$ denotes the dollars flow of fund i, TNA$_{i,t}$ is the Total Net Assets in fund i on date t and R$_{i,t}$ is the net return of fund i on date t.

Analysing both these measures is interesting as the percentage flows enable to account for the growth rate of total assets under management, whereas the dollar flows enable to study more precisely the determinants of investors' investments (Del Guercio & Tkac, 2002). Although both types of flows are computed, a major part of the research is based on dollar flows since the main purposes of this thesis is to understand investors preference regarding sustainability.

Following Ammann et al. (2018), the flows have been winsorized at the 1st and 99th percentiles to ensure the robustness of the findings. That is to say that the bottom extreme values have been replaced by the value of the 1st percentile and the top extreme values have been replaced by the value of the 99th percentile. The winsorization thus mitigate the impact of extreme outliers on the results.

4.2. Panel Regression Model

The first step consists in the estimation of the Covid-19 crisis's impact on investment flows to mutual funds. It will be performed using the following regression model on the whole sample:

$$Flow_{i,t} = \beta_1 Crisis_t + \beta_2 PostCrisis_t + \beta_3 Control_{i,t} + \varepsilon_{i,t}$$

Where *Crisis* is a dummy variable equal to 1 for the month of February, March and April 2020, and 0 otherwise. A quantitative evaluation including regression analysis on computed funds flows will then be performed to determine if a quantifiable relationship exists between funds flows and ESG ratings. Fund flows will be used to measure the investors' demand for mutual funds and test the hypothesis that mutual funds with high ESG score experience larger net flows than mutual funds with low ESG score.

To investigate potential effects of bear market on investment preferences, a difference-in-difference analysis will be performed in order to compare flows towards mutual funds with a difference in ESG score during and after market distress. In other words, the purpose of this test is to see whether the market crash caused by the Covid-19 significantly changed the way capital is allocated towards funds with high ESG score in comparison to those that have low ESG score.

The second step is to show the evolution of investment flows towards funds with different levels of sustainability. To this end, the regression model is adjusted as follows:

$$Flow_{i,t} = \alpha_i + \beta_1 High_{i,t} + \beta_2 Low_{i,t} + \beta_3 Crisis_t + \beta_4 PostCrisis_t + \beta_5 (High_{i,t} \times Crisis_t) + \beta_6 (Low_{i,t} \times Crisis_t) + \beta_7 (High_{i,t} \times PostCrisis_t) + \beta_8 (Low_{i,t} \times PostCrisis_t) + \beta_9 Control_{i,t} + \varepsilon_{i,t}$$

Where, $Flow_{i,t}$ is the dependent variable and represents the net cash flow of fund i in month t, $High_i$ is a dummy variable equals to 1 if the fund i scores 5 globes and equals 0 otherwise, Low_i is a dummy variable equals to 1 if the fund i scores 1 globes and equals 0 otherwise, $Crisis_t$ is a dummy variable whose value is 1 if t ∈ [02/2020 - 04/2020] and 0 otherwise and $PostCrisis_t$ is a dummy variable whose value is 1 if t ∈ [05/2020 - 02/2021] and 0 otherwise. $High_i \times Crisis_t$ and $Low_i \times Crisis_t$ capture the interaction effects between the ESG rating, and the Covid-19 shock while $High_i \times PostCrisis_t$ and $Low_i \times PostCrisis_t$ capture the effects of the ESG rating after the Covid-19 shock. $\beta_5, \beta_6, \beta_7$ and β_8 are thus the main coefficients of interest for this study.

As previously stated in the summary statistics of the sample, fund-specific characteristics can vary widely between funds of different sustainability categories. To ensure that the evolution of the flows are explained by the significance of ESG variables and are not distorted by the difference in usual flow drivers, a control variable ($Control_{i,t}$) has been introduced into the regression model. This variable includes the natural logarithm of the total value of Assets Under Management in the fund i in month t-1, the fund's age (i.e., months since inception date) in the month t-1, the fund's return standard deviation over the last twelve months, the flow of fund i in month t-1 and the past performance of fund i in month t-1 which are measured as the lagged raw return, last twelve months returns and Morningstar Stars rating. Fixed effects variables are introduced in the model to consider the fund's investment strategy. The relevance of all these controls will be explained in more details in the following section.

Given that the analysis is carried out over a restricted period of time and that dummy variables are included in the regression model to account for the potential evolution of flow determinants according to the state of the market, it was decided not to include additional dummy variable to consider time fixed effect in the control variable.

As prior research points out that investors value mostly extreme outcomes (Hartzmark & Sussman, 2019), the first part of the analysis focuses on 1- and 5-globe rating funds. Thus, funds with five globes are categorized as *High* whereas funds with 1 globe are identified as *Low*. It should be noted that once a fund has been awarded a sustainability rating, the observations with continuing missing score are considered as no change. This approach seems consistent for analysing investor behaviour towards sustainable funds given that the Morningstar website publishes the latest available rating.

4.3. Flow Drivers

Flows into investment funds have been the subject of a number of studies. Literature has shown that these flows are influenced by several characteristics of the fund (Sirri & Tutano, 1998 and Spiegel & Zhang, 2013). Although many fund-specific variables affect their flows, the past performance, the size as well as the past flows are recognized to be the explanatory variables with the strongest predictive power for investment to mutual funds.

When taking a closer look at mutual fund flows, literature agrees that fund past performance positively impacts flows. Measuring the fund's performance using Jensen's alpha and raw

returns, Sirri and Tufano (1998) pointed out that mutual fund investors' chase performance as the level of new money is disproportionately higher for funds exhibiting very good performance over the prior period. Ivkovic and Weisbenner (2009) came to the same conclusion by pointing out that individual investors tend to retain their investment in mutual fund that have appreciated in value and are willing to sell poor performing ones. Adding the star rating to the control variable not only controls for the above-mentioned flow-performance relationship, but also captures the influence that this score has on investors' investment decisions as reported by Del Guercio and Tkac (2008) and Ben-David et al. (2019). To account for this performance-flow relationship, the monthly raw returns, Jensen's alpha as well as the Morningstar star rating[6] are added to the model. However, it is to be noted that the relationship between flows and returns differ for SRI funds compared to conventional funds (Bollen, 2007).

A third influential variable is the size of the fund measured as its total assets under management. When flows are computed in percentage, an equal dollar flow will result in a larger percentage impact for smaller funds (Sirri & Tufano, 1998). To account for the impact that size has on fund flows, a variable reflecting the logarithm of the total net assets in the previous period has been included to the regression model.

Further, Chevalier and Ellison (1997) find that the funds' age and flows' level are negatively correlated. Funds' age computed as the months since inception date is thus added in the control variable. Among others, Del Guercio & Tkac (2002) reported that mutual fund flows are highly autocorrelated which means that past fund flows have strong predictive power of current fund flows. To capture the impact that past flows have on current fund flows, the control variable includes a lagged flow measure.

As many investors pay attention to the risk of their portfolios, the level of risk measured as the volatility of returns over the past twelve months is a relevant control variable. Indeed, Sirri and Tufano (1998) found that funds with high return volatility receive fewer inflows than those with low performance volatility.

Finally, another variable known to influence fund flows is the expense ratio. According to the literature, there is a statistically significant negative relation between total expenses and fund

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[6] The Morningstar star rating is a measure of a fund's past performance relative to similar funds.

flows, but the economic significance is limited[7] (Sirri and Tufano, 1998). Considering this negative relation, it is not surprising to observe the same relation between funds' expense ratio and size. Barber et al. (2005) reported that funds with low expense ratios represents a significant portion of the assets in the mutual funds industry compared to those with high expense ratio.

By examining the components of the expenses in more detail, Barber et al. (2005) found that the front-end load fees drive the negative fee-flow relationship, whereas any relation has been identified between operating expenses and flows. Since annual reporting of the expense ratio is only mandatory in the United States, the data is missing for many funds in the sample. Following Ceccarelli et al. (2021), it has been decided not to include this variable in the regression model in order to keep a sufficiently large and balanced sample between Europe and the US. Moreover, as the expense ratio available on Morningstar is time invariant, its influence on investment flows will be captured by the fixed effect introduced in the regression.

As mentioned in the literature review, the sustainability rating exhibit several biases that are important to take into account when investigating investor behaviour. Without this consideration, inappropriate inferences could be drawn reflecting the bias and not the actual investors' behaviour. To account for the large-cap bias, a set of variables including style fixed effects are introduced in the model. The fund' investment style is derived from the 3-by-3 equity style box. Regarding the geographical bias faced by the company rating, it is important to note that Morningstar addresses part of this bias when awarding the sustainability rating at the fund level. Since the score assigned depends on the percentile rank within a Morningstar global category, a first control is made on the funds' investment area. In other words, funds investing in European companies are rated relative to other funds focusing on the same region, while funds investing in US companies are evaluated against other funds that have the same geographic focus. It is thus not necessary to insert country dummies in the model.

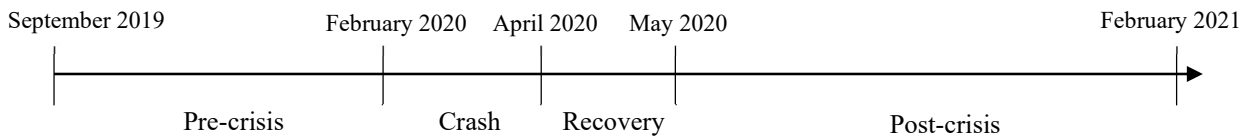All explanatory variables are lagged by one period since investors base their investment choice on reported information which may no longer reflect the current degree of sustainability of the fund as well as other factors known to determine flows such as the performance.

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[7] Barber et al. (2005) reported that a 1 percent decrease in total expenses is associated with 0.39% growth in inflows.

4.4. Further Analysis

- ▪ Crisis Sub-periods

The crisis period has been divided into two sub-periods to analyse the behaviour of investors according to the state of the markets and the actions taken. The different periods are structured as follows:

September 2019   February 2020   April 2020   May 2020   February 2021

|—————————————|————|————|———————————————→|

Pre-crisis   Crash   Recovery   Post-crisis

The following regression model is used to perform this analysis:

$$Flow_{i,t} = \alpha_i + \beta_1 High_{i,t} + \beta_2 Low_{i,t} + \beta_3 Crash_t + \beta_4 Recovery_t + \beta_5 PostCrisis_t +$$
$$\beta_6(High_{i,t} \times Crash_t) + \beta_7(High_{i,t} \times Recovery_t) + \beta_8(High_{i,t} \times PostCrisis_t) +$$
$$\beta_9(Low_{i,t} \times Crash_t) + \beta_{10}(Low_{i,t} \times Recovery_t) + \beta_{11}(Low_{i,t} \times PostCrisis_t) +$$
$$\beta_{12}Control_{i,t} + \varepsilon_{i,t}$$

- ▪ 5 Sustainability Categories

Although previous literature has shown that investors mainly value extreme sustainability categories, the fixed-effects regressions have been executed a second time by increasing the granularity of the ESG categories to obtain a more accurate insight. The following econometric model has been applied on each of the five Morningstar sustainable categories:

$$Flow_{i,t} = \beta_1 Crash_t + \beta_2 Recovery_t + \beta_3 PostCrisis_t + \beta_4 Control_{i,t} + \varepsilon_{i,t}$$

- ▪ Funds' Name Analysis

In recent years, a burgeoning literature has highlighted the fact that investors are sensitive to the names of mutual funds when making investment decision. Cooper et al. (2005) and Espenlaub et al. (2017) found evidence that funds which change their name to reflect current "hot style" experienced relatively larger inflows in the year after the name change. In a similar way, Green and Jame (2013) pointed out that the name fluency of a fund affects investor decision-making process. Jacobs and Hillert (2016) and Doellman et al. (2019) also illustrated the importance of the fund's name in triggering capital flows by investigating the "alphabetic bias" in financial markets. They found that funds positioned in the beginning of an alphabetical

listing attract relatively larger inflows. In a research on hedge funds, Joenväärä & Ioan Tiu (2017) showed that investors' attention is attracted by hedge fund name containing gravitas i.e., a combination of words associated with "weight, influence, authority, seriousness and good judgement" (Joenväärä & Ioan Tiu, 2017).

For this reason, fund's name is often used by asset managers to reflect their sustainable mandate or to attract investors attention. Considering these behavioural biases, it is interesting to examine whether funds with a sustainability-related name capture more flows than others in the wake of the crisis. A common way to conduct such analysis consists in the introduction of a dummy variable. The funds with sustainability-related name are attribute a value of 1, and the rest take the value of 0. Funds with names that include the following strings are considered as sustainable-related: "Sust", "Durable", "Green", "ESG", "Ethic", "Responsib", "Impact", "Climate", "Environment", "SRI" and "SDG". Out of the 4,726 funds composing the main sample, 403 funds meet the required criteria.

$$Flow_{i,t} = \alpha_i + \beta_1 Crisis_t + \beta_2 PostCrisis_t + \beta_3 Name_i + \beta_4 (Crisis_t \times Name_i)$$
$$+ \beta_5 (PostCrisis_t \times Name_i) + \beta_6 Control_{i,t} + \varepsilon_{i,t}$$

- ▪ Other Rating Providers

Given that there is a wide range of ratings available to investors, it is worth analysing whether the conclusions remain relevant when using other ESG score. This part of the analysis consists of graphical evidence to better visualise the discrepancies in conclusions that may result depending on the provider chosen.

Two other well-known ESG scores at the fund level are for example those of MSCI (the acronym for Morgan Stanley Capital International) and Thomson Reuters Refinitiv. As the Thomson Reuters API does not yet allow for the extraction of ESG ratings of funds and MSCI provides its ratings by ISIN search on its website, the ratings have been retrieved manually for each fund. Not all funds in the main sample are rated by both providers. For this reason, the analysis has been performed on a reduced sample of 3,198 mutual funds. The reason for this different coverage can partly be explained by the divergence in rating methodology. For example, MSCI requires that 65% of the holdings of the fund to be rated to provide a sustainability score at the fund level, whereas Morningstar and Refinitiv require at least 67% and 70%, respectively.

These 2 providers rely on the rating they grant at the company level to determine the score at the fund level. Thomson Reuters and MSCI sustainability rating cover more than 330,000 and 53,000 funds, respectively. Each provider has its own rating scale with its particularities. As previously explained in the data section, Morningstar uses a scale of 1 to 5 globes where the highest score is 5. Thomson Reuters assigns a score between 0 and 100; the higher the score, the more sustainable the fund is considered to be. Finally, MSCI designed its rating scale by dividing the funds into seven categories ranging from AAA for the best to CCC for the least performant on a sustainable basis. A brief explanation of the significance of each category for the various ESG rating providers is available in appendix 7.

The limited historical scores offered by both providers at the fund level constitutes a limit for this analysis. As MSCI does not provide historical ratings for investment funds, the score used to perform the analysis is the one available in June 2021. As for Refinitiv, they started publishing a fund rating known as the Lipper Fund ESG Score in July 2020 (Refinitiv, 2020). Being the oldest score available, it will be used in this analysis under the assumption that it is in line with other existing scores at the time of the crisis. Furthermore, it is quite reasonable to assume that the rating could be known by investors as Refinitiv has been providing fund's holdings and the ESG ratings for companies since 2002.

For the Morningstar rating, the score of July 2020 was chosen to be as comparable as possible with other ratings. This is not a major obstacle to the analysis as it focuses on the grouping of above-average categories (5- and 4-globe rating) compared to below-average categories (2- and 1-globe rating), which further limits likelihood of group change. Following Wimmer statements[8] (2013) and given the short period of analysis, the study therefore assumes that the sustainability score is unchanged. For the purpose of this graphical analysis, the funds were divided into 3 categories according to the following criteria:

	Morningstar	Thomson Reuters	MSCI
Sustainable	5 globes - 4 globes	>75	AAA - AA
Neutral	3 globes	[45;75]	A - BBB
Non-Sustainable	1 globe - 2 globes	<45	BB - B - CCC

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[8] Using Thomson Reuters ESG score, he found evidence that ESG-scores persist for approximately two years. He also pointed out that the lack of long-term persistence is mainly due to the rebalancing done by fund managers instead of a change in the ESG scores of the holdings. Finally, he identified signs of a certain momentum effect in the ESG rating, i.e. "winners stay winners" and "losers stay losers".

5. RESULTS AND DISCUSSION

5.1. Graphical evidence

First of all, it should be noted that the announcement of the pandemic caused panic in the financial markets. This panic resulted in massive capital withdrawals from equity mutual funds. Figure 3 illustrates the average monthly flows to the funds in the sample between September 2019 and February 2021. As previously stated in the literature review, the shock caused by the Covid-19 was brutal and severe, as was the recovery. Based on the sample under analysis, average monthly flows amounted to $2,129,347 in January 2020 before undergoing a first drop to $333,691 in the February which turned into average outflows of $2,400,948 during the month of March 2020. As the graph suggests, this massive withdrawal of capital was brief as flows quickly turned positive again. However, the situation remains uncertain, and investors are hesitant to invest which result in average monthly flows below pre-crisis level. A small drop in flows can also be observed in October 2020. This was in part explained by the announcement of a potential lockdown, which again caused growing uncertainty in the financial markets, even though the magnitude was much smaller.
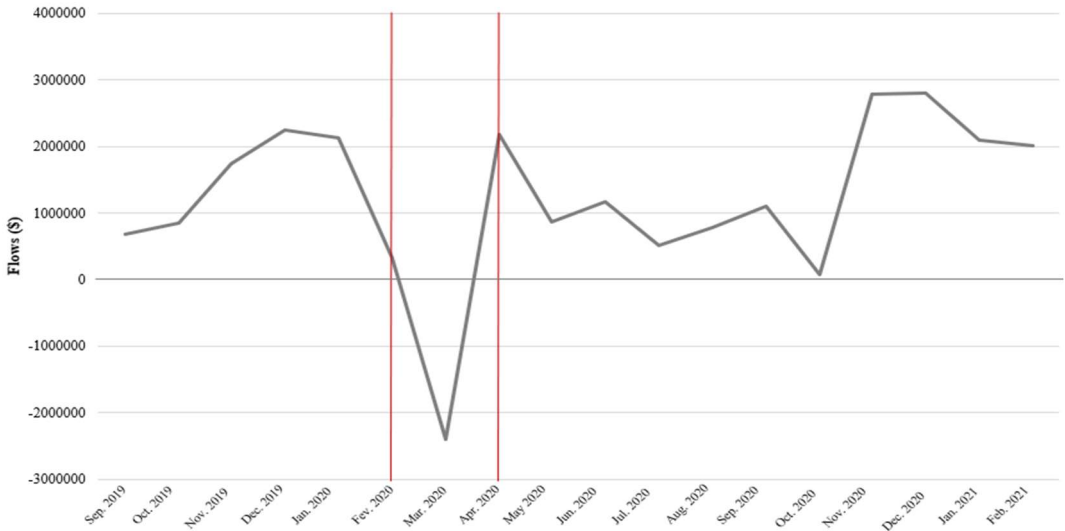
Figure 3 – Average flows ($) from September 2019 to February 2021

As the aim of this thesis is to explore the difference in flows depending on the degree of sustainability of the funds, a first insight can be drawn by looking at the average monthly flows per sustainability category (as of January 2020) over the period studied. Figure 4 illustrates the average monthly flows at the global level. Appendix 8 enables to transpose the analysis to European investors as it shows average monthly flows for funds sold in Europe.

Figure 4 – Average flows per sustainability category

When looking at the graph, a first observation is that the flows recorded in the two extreme sustainability categories follow quite similar fluctuations. Moreover, flows into funds that are considered as sustainable remain higher than those of other funds over the whole period under review. In line with the findings of Ammann et al. (2018), investors seem to consider the sustainability of their portfolio while making investment decision as funds with a high ESG score received more new money than those with a low ESG score during the pre-crisis period. This trend seems to persist during the market crash that occurred at the end of February 2020. Despite the sharp drop in flows into investment funds and the narrowing of the gap, the average flows recorded by high ESG funds remains larger than those of low ESG funds. In March 2020, funds rated 5 globes reported average net outflows of $799.556, while funds with a score of 1 globe experienced negative flows of $ -1,967,694. The graph also shows that the recovery was much quicker for the more sustainable funds as average monthly flows returned to positive after only one period, whereas it was not until November 2020 that the low rated funds experienced average monthly inflows.

Graph in appendix 8 highlights the difference in behaviour between global and European investors. An interesting difference is that funds sold over the European continent with a high ESG profile continued to record positive flows during the month of the collapse, which was not the case in the global analysis. Apart from this key distinction, the European trend is similar to the global one.

The panel regression will now be performed to see whether the previous findings remain consistent after controlling for other explanatory variables.

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5.2. Regression results

This section is devoted to the analysis of the results obtained from the various regressions described in the methodology section. It is worth noting that the results obtained may differ from the initial insights reached in the graphical analysis, as the regressions apply a series of controls to determine the actual impact of the sustainability score on investment flows.

- Covid impact

First of all, the primary regression allows to analyse the reaction of investors to the announcement of the Coronavirus pandemic. The relevant coefficient for the purpose of this assessment is the one of *Crisis*, a dummy variable equal to 1 for the month of February, March and April 2020, and 0 otherwise. The coefficient of the dummy variable determines whether the fund flows during the crisis period are significantly different from those prior and after the crisis. The results of this fixed effects panel regression can be observed in appendix 9. A first point to notice is that all regressors are statistically significant at the 1% level. Moreover, a joint hypothesis test reveals a F-statistic of 1040.37 which corresponding p-value is 0. This result thus allows to reject the null hypothesis which means that the set of dependant variables are jointly significant to explain the funds' flows.

Consistent with the literature, the fund' size and the level of risk influence negatively the fund flows whereas the past performance (return, alpha and star rating) and lagged fund flows exhibit a positive coefficient. The *Crisis* variable has a negative coefficient (-0.625) which is consistent with the impact previously observed in the graphical representation of investment flows. Unconditional of their ESG category, average monthly flows decreased by 0.625 percent point compared to average monthly flows in other periods. In dollar flows, this represents monthly outflows of $2.09 million on average. When subdividing the crisis into crash and recovery, the outcomes are even more striking. The crash that occurred at the end of February and persisted until the end of March 2020 resulted in an average monthly flow decrease of 1 percentage point (or -$3.6 million) compared to other months whereas the market rebound resulted in significantly higher flows ($2.2 million) in comparison to average monthly flows in non-crisis period. Finally, when compared to the pre-crisis period, funds experienced on average 1.1% lower monthly flows which correspond to a decrease of $1.4 million in the months following the crisis.

- <u>High and Low ESG funds</u>

The second regression determines the impact of the crisis on the *High* and *Low* sustainability categories of mutual funds in comparison to the middle categories (2-3-4 globes rating). The outcomes can be observed in appendix 10.

At first sight, the results are somewhat surprising. Indeed, after controlling for several flow drivers and the introduction of fixed effects, the figures indicate that, compared to the middle category, funds with the highest sustainability rating receive on average less flows per month. The *High* and *Low* dummies are statistically insignificant which means that the evolution of funds' assets under management is fairly similar to the one of average funds. This contradicts what is revealed by the summary statistics and the graphical evidence in previous sections. It would therefore indicate that investors' capital allocation is not directly influenced by the sustainability score of the fund itself but rather by other characteristics. Explanations of broken-down regressions are given hereafter in an attempt to understand this result.

To investigate the reasons of these results, the regression was broken down into several steps. First, a pooled OLS regression has been performed without any control. The results are in line with those found in the preceding sections, i.e. the higher the fund's ESG score, the more investment it receives (Appendix 11). To this point, nothing is surprising since, for example, fund performance and flows are positively correlated and, as illustrated in the summary statistics of the previous section, funds with a strong ESG profile perform significantly better than those in the low category.

However this finding is not indicative of the role of ESG rating in the way investors decide to allocate their capital. When controlling for the major flow determinants (size, past performance, past flows and age), the results remain in line with those previously stated (Appendix 11). The coefficient of *High* variable sank, whereas the one of *Low* increased. But the signs remain unchanged and statistically significant. This slight change in coefficient can for example be explained by the fact that a part of the original association was due to the high ESG profile performing, on average, better relative to other funds.

By including binary variables to account for the crisis and post-crisis effect in the econometric model, a non-significant drop in flows during the crisis period and significant new investments in the post-crisis period are observed. The insignificance of the crisis coefficient is explained

by the sharp drop in flows during the crash, which were quickly recovered to their pre-crisis level during the market rebound in the wake of the announcement of the US stimulus package. None of the interaction terms between the sustainability rating and the state of the market are significant, which suggests that the shock caused by the pandemic did not modify the behaviour of investors present before the crisis (Appendix 11).

However this analysis does not allow either to draw scientifically valid conclusions regarding investors' interest in ESG investments as other elements such as fund's strategy, reputation or advertising (Fang et al., 2014) are unobserved elements that can also significantly influence the evolution of investment flows in mutual funds. To take these elements into account, the fixed effect regression has then been performed in several steps (Appendix 12). Similarly to the pooled OLS regression, the model including sustainability scores as well as main control variables reveals that investment vehicles with a high (low) ESG profile have on average higher (lower) inflows than funds in the middle class but that the difference is not significant. The variables capturing the effect of the crisis and post-crisis on flows are both significantly negative. This means that average monthly flows have dropped significantly in the aftermath of the pandemic regardless of the sustainability category. This seems to be in accordance with the graphical results. However, the inclusion of interaction terms that capture the effect of evolution of the market condition and the sustainability category caused an inversion of the signs of these two variables. The coefficient of the *High* variable becomes negative while that of the *Low* variable becomes positive. This rather surprising change in sign would suggests that, all other things being equal, the high ESG funds receive on average lower flows than the medium category.

This change in results therefore indicates that the positive relationship between flows and sustainability score is due to other intrinsic characteristics of the funds rather than the ESG rating itself. However this situation seems to have changed following the pandemic. When looking at the variables of interest in this analysis, i.e. the interaction terms between the ESG rating and the sub-periods, the results are interesting. While no interaction terms with the *Low* variable have a statistically significant coefficient, both coefficients of the *High x Crisis* and *High x Post-crisis* interaction terms are positive and respectively significant at the 10% and 1% level. This means that funds with a 5-globe score receive significant larger inflows during the crisis ($1.33 million) and post-crisis period ($1.46 million) relative to funds with average ratings, compared to before the crisis. This would suggest that the coronavirus pandemic has

triggered a change in investor behaviour and their appetite for sustainable investments as investors seem to be placing more attention the degree of sustainability of their investment in the wake of the crisis.

A potential obstacle of the fixed-effects regression comes from the fact that the model is qualified as dynamic as it includes in its control variables a lagged variable of the dependent variable (i.e., lagged flows) and is performed under a short analysis window. This may induce a bias in the estimation known as Nickell bias (Nickell, 1981). However, it does not appear that the analysis suffers from this bias as the results remain roughly unchanged when the regression is completed by omitting this lagged explanatory variable (Appendix 13).

Another limitation of the fixed-effects analysis is that this approach does not take into account variables that are time-invariant. Since each coefficient is computed based on the difference from the mean value of the variable, coefficient of time-invariant dummies would be equal to 0. Although the ESG score is time-dependent in this analysis, it remains relatively stable for a large proportion of the sample. Part of the effect of the sustainability score could then be included in this fixed effect variable. To overcome part of this issue and to better understand the results, the regression has been rerun individually for each sustainability category. The results can be observed in table 5.

The outcomes are consistent with the graphical evidence obtained in the previous section. The crash that occurred between February 2020 and March 2020 significantly affected the capital allocation of investors. Compared to the pre-crisis period, funds with low sustainability score were the less impacted (-$2.35), whereas the magnitude of the shock to funds with high and average score is almost the same (-$3.78 and -$3.70, respectively). Independently of the sustainability category, the *Recovery* variable showed insignificant coefficients. This suggests that, despite the sharp reduction in flows incurred by the crash, all categories recover around their pre-crisis level during the market rebound. Finally, while the average monthly flows of high ESG funds after the Covid-19 crisis return to a level unchanged from the pre-crisis period, those of medium and low funds fall significantly. For the medium category, flows are $3.17 million lower than before the crisis. Funds with a low ESG rating recorded a decrease in monthly flows of $3.83 million compared to the pre-crisis level. These individual regressions therefore lead to slightly different conclusions than the "aggregate" regression, but the same trend can be observed. The crisis caused by the Coronavirus pandemic has affected the way

investors look at ESG criteria in their investment decision-making process. One explanation for this increase in interest may be that the pandemic has heightened investors' concerns about environmental and social risks. In the face of these growing threats, investors are eager to hedge their investment, which they believe can be achieved through ESG investment strategies.

To examine whether the behaviour of European investors diverges from the global trend, the analysis has been carried out on a sample of funds with a sales area located on the European continent[9] (Appendix 14). The same conclusion can be drawn as in the previous section. The European trend seems to be in line with the global trend with one exception. This exception is that the coefficient of the *Crisis x High* interaction term is significantly positive at the 10% level. This means that, compared to the average fund, funds with an ESG score of 5 globes received significantly more flows ($1.5 million) during the crisis period relative to the pre-crisis period. As in the global analysis, funds with a strong ESG profile receive significantly more new capital after the crisis than before the crisis, compared to funds in the medium category. However, this difference is more pronounced for European investors ($2.2 million) than in the global investor analysis ($1.7 million).

	Dependent Variable Net Flows (%)				Dependent Variable Net Flows ($ million)		
	High	Average	Low		High	Average	Low
Lagged Return (%)	0.058	0.078	0.054	Lagged Return (%)	0.194	0.122	0.107
p-value	0	0	0	*p-value*	0	0	0.003
Lagged Alpha (%)	0.085	0.088	0.041	Lagged Alpha (%)	0.190	0.144	0.108
p-value	0	0	0	*p-value*	0	0	0
Lagged Flows (%)	0.146	0.136	0.094	Lagged Flows (%)	0.299	0.315	0.274
p-value	0	0	0	*p-value*	0	0	0
Lagged Log(TNA) ($)	-5.401	-5.949	-2.848	Lagged Log(TNA) ($)	-5.631	-8.260	-4.305
p-value	0	0	0	*p-value*	0	0	0
Lagged Age (months)	0.211	0.157	0.129	Lagged Age (months)	0.383	0.327	0.464
p-value	0	0	0	*p-value*	0.002	0	0
Lagged Stars	0.452	0.332	0.524	Lagged Stars	0.238	0.784	1.394
p-value	0.005	0	0.001	*p-value*	0.695	0.017	0.007
Crash	-1.015	-1.293	-0.687	Crash	-3.784	-3.730	-2.353
p-value	0.005	0	0.0484	*p-value*	0.005	0	0.033
Recovery	-0.792	-0.211	0.016	Recovery	2.106	0.827	-0.654
p-value	0.061	0.313	0.969	*p-value*	0.186	0.321	0.614
Post-Crisis	-1.235	-1.651	-1.159	Post-Crisis	-2.265	-3.173	-3.833
p-value	0.001	0	0.001	*p-value*	0.102	0	0
N	6715	23407	4897	N	6715	23408	4897
LSDV R2	0.244185	0.241715	0.244745	LSDV R2	0.304852	0.292553	0.322676

Table 5 – Individual regressions for High, Average and Low categories

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[9] The sample includes funds with the following area for sales: Austria, Belgium, Denmark, European Cross-Border, Finland, France, Germany, Greece, Italy, Malta, Netherlands, Nordic Cross-Border, Norway, Portugal, Spain, Slovenia, Sweden, Switzerland.

- <u>5 Sustainability Categories</u>

Some studies have shown that investors are more interested in the extreme categories than in the mid-range (Hartzmark & Sussman, 2019). However, it is also of interest to see how the flows to these other categories have behaved. When looking at the graph in the appendices (Appendix 15), a first observation is that the high and above-average categories record flows that follow a similar trend. The flows experienced by funds with a below-average rating are closer to those of the average category.

The terms of interest in these fixed-effects regressions are the coefficients of the variables Crash, Recovery and Post-Crisis. In line with the graph, the regression outcomes (Appendix 16) indicate that the sustainability class which was most affected by the crash was the above-average funds. These funds flows are down by $5 million from their pre-crisis level. In contrast, funds in the below average category are least impacted, with a decrease of $1.8 million compared to average monthly flows prior to the pandemic announcement. These results confirm what has previously been suggested in the literature, i.e. that sustainable investors are more loyal than others.

Despite this sudden shock in February and March 2020, the flows of all categories recovered to their pre-crisis level during the market rebound. This is supported by the fact that the *Recovery* coefficient is never significantly different from 0 as p-values ranging from 0.186 to 0.614. One exception to this is the hardest hit category (i.e., above average) which shows a positive and statistically significant coefficient at the 1% level. This means that the average flows recorded in the month following the announcement of the stimulus package in the US are higher ($3.4 million) than the average monthly flows recorded before the crisis began.

Looking now at the evolution of flows after the crisis, two elements can be highlighted. Firstly, flows into mutual funds with a higher ESG profile are returning to an average monthly level that is identical to those recorded before the crisis. The second result that can be extracted from these figures is that funds with an average or lower sustainability rating have significantly lower flows than before the crisis. Funds in the low category, which were used to report flows close to zero in the pre-crisis period, are thus experiencing investment withdrawals throughout almost the entire the post-crisis period under analysis.

- Fund name

The results show that, after controlling for the effects of the explanatory variables, there is a strong positive relation between mutual fund flows and sustainability-related names (Figure 5). In other words, funds whose title include ESG-related terms attract a significant larger amount of money compared other funds. Over the full period analysed, funds with a sustainability designation in their name gained 1.12% more investment than other funds. In terms of dollar flows, this means that, on average, funds with a sustainable-related name attract $3.6 million more a month compared to the rest of the funds.

To observe the evolution of this behaviour throughout the period studied, binary variables indicating the different sub-periods are introduced into the model. The variables of interest are now the interaction terms *Name x Crisis* and *Name x Post-Crisis*. As the coefficient of the *Name x Crisis* variable is not significant, this means that flows across the two fund categories behaved in a similar way during the crisis. However, the significantly positive coefficient of the second interaction terms indicates that investors are even more sensitive to the name of the fund when they want to invest in green investments during post-crisis months. After the crisis, funds exhibiting sustainable-related name attract significantly more new investments, about $3 million a month, compared to the rest of the funds.

This interesting finding raises serious questions on sustainable investment and the concern about greenwashing. As more and more investors have started to eye on green vehicles while allocating their capital, many funds have been created or renamed to reflect a so-called sustainable investment strategy. However, without any regulation, sustainable-related terms can be used as a pure marketing tool to capture the expanding demand. Some fund titles clearly indicate sustainability terminology, regardless of the actual degree of sustainability of their holdings. There is therefore an urgent need to restrict the use of potentially misleading name. One solution would be to extend the SEC's "Names rule" to the field of sustainable finance. This rule requires that at least 80% of the mutual funds' holdings be invested in accordance with the investment type, industry and geographic location their names suggest (SEC, 2020).

	Dependent Variables	
	Net Flows ($ million)	Net Flows ($ million)
Lagged Return (%)	0.085	0.033
p-value	0	0.017
Lagged Alpha (%)	0.125	0.135
p-value	0	0
Lagged Flows (%)	0.588	0.586
p-value	0	0
Lagged Log(TNA) ($)	0.253	0.246
p-value	0	0
Lagged Stars	1.047	1.032
p-value	0	0
Lagged Age (months)	-0.007	-0.007
p-value	0	0
Name	3.604	1.870
p-value	0	0.006
Crisis		-0.583
p-value		0.065
Post-Crisis		1.12
p-value		0
Name x Crisis		-0.318
p-value		0.773
Name x Post-Crisis		3.065
p-value		0
N	63793	63793
R2	0.0987	0.0988

Figure 5 – Fund name regression

▪ Other providers

This part of the study provides a graphical representation of the evolution of flows according to three different ESG score (Figure 6). The graphical findings are somewhat striking. Depending on the provider used, the conclusions are indeed very different. While the results previously obtained using the Morningstar globes rating remain valid for this restricted sample, the conclusions with the two other providers are completely contradictory.

Referring to the rating provided by Thomson Reuters, the flows of the three categories follow a symmetrical pattern. However, the results are completely opposite to those observed with the Morningstar ESG score. It is the funds in the non-sustainable category that show positive flows and consistently higher than the other two categories regardless of the state of the financial markets. Moreover, this trend becomes even more pronounced in the post-crisis period, with new investments soaring and widening the gap further.

Looking now at the graph made with MSCI scores, the difference in flows between the three categories is much less apparent. Regardless of the category in which the fund features, the average monthly flows recorded remain positive throughout the entire period analysed except during the crash months. There is a slight trend, however, with neutral funds attracting the

largest new investments. While funds in the sustainable category were on average receiving fewer flows before the crisis, this trend was reversed in the first six months after the crisis. Thereafter, the two categories recorded almost identical flows.

Although the evolution of flows is completely different from one supplier to another, some common patterns can nevertheless be observed. Regardless of the ESG score provider, funds in the non-sustainable category suffered the least from the crash at the end of February 2020, whereas the neutral funds experienced the largest outflows on average. A second observation is that the trends present before the crisis seem to persist to a certain extent in the post-crisis period. Flows for each of the categories return approximately to their pre-crisis level by April.

These huge differences in findings are somewhat surprising but not unexpected. An important challenge for ESG rating is the divergence of scores that different providers assigned to the same investment vehicle. As mentioned earlier in the literature review, each provider employs its own methodology to determine the degree of sustainability it awards to the company and investment portfolio which leads to a lack of convergence between agencies. This glaring finding once again highlights the importance of transparency in the methodologies that raters use to assign their scores. It also emphasises the importance for sustainable investors to undertake their own due diligence. Despite the simplicity and ease of use of these ratings, investors need to understand the underlying rating methodology to ensure that investments labelled as sustainable by one provider actually corresponds to the values they seek to convey.
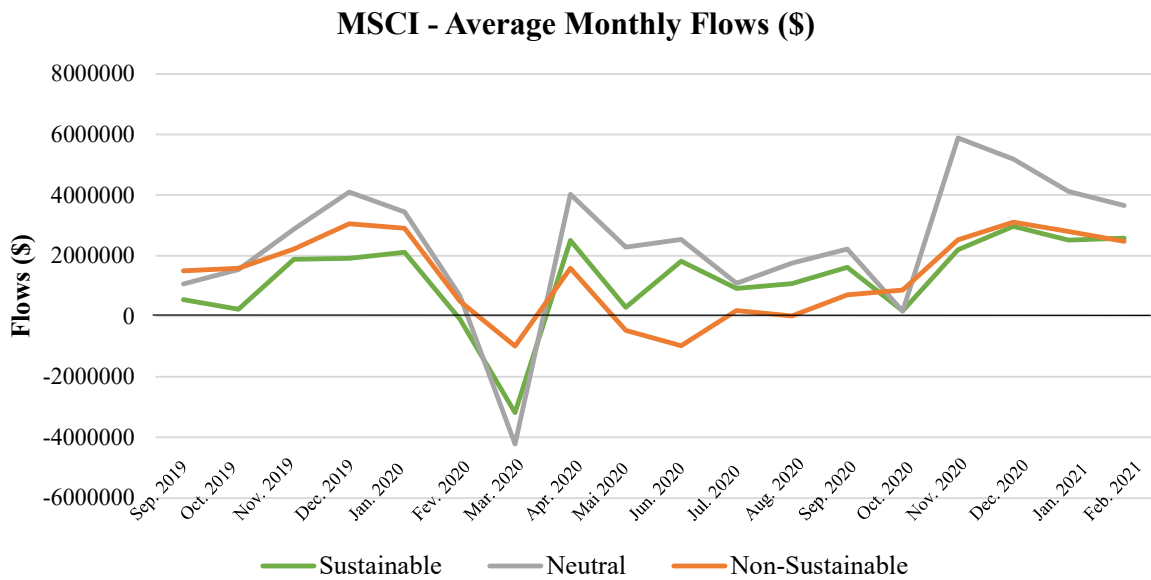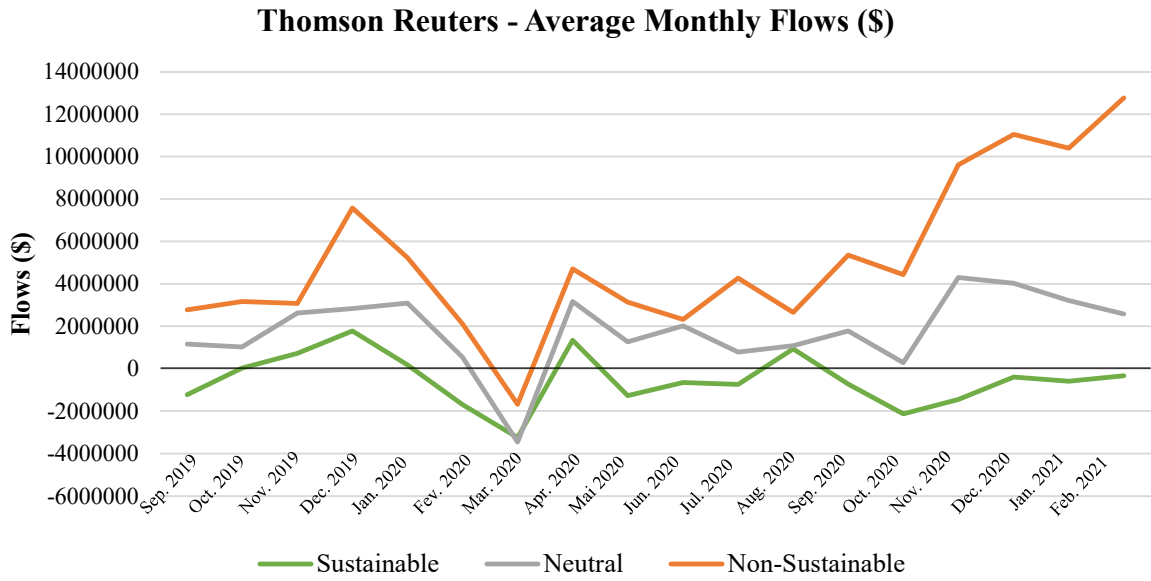

Morningstar - Average Monthly Flows ($)

Thomson Reuters - Average Monthly Flows ($)

MSCI - Average Monthly Flows ($)
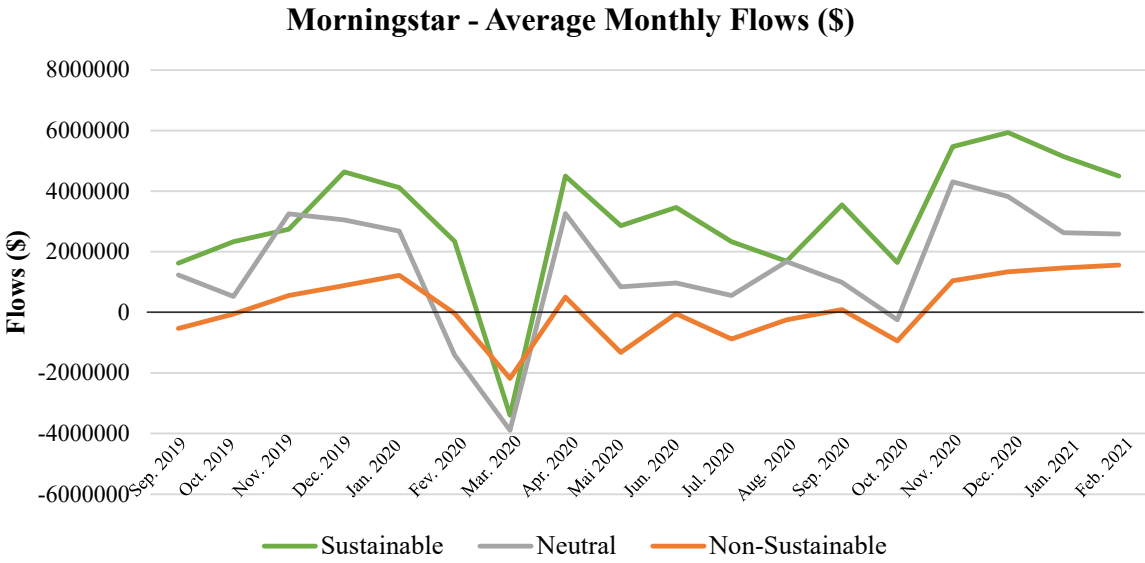
Figure 6 – Average monthly flows evolution ($) based on diverse rating providers

6. CONCLUSION

Alongside the growing concerns about climate change over the past decade, sustainable finance has been gaining in popularity. The growing interest in bringing together financial return and positive impact on society has contributed to the spread of this investment practice. ESG investment strategies are recording exponential growth in new money as the range of ESG vehicles is expanding by the launch of new funds and the repurposing of others.

The announcement of the Covid-19 pandemic prompted one of the most severe market crashes in recent years and was the first market downturn since the spread of sustainable finance. The uncertainty surrounding this unprecedented event has caused panic in financial markets which results in significant capital outflows from the mutual fund industry. ESG investments have not been immune. The impacts of this unforeseen event on the real economy and the financial system have increased awareness on environmental and social risks as well as related issues such as climate change (J.P. Morgan, 2020). This thesis aims at better understanding whether the coronavirus outbreak has affected the way investors viewed sustainable finance during the market distress and the subsequent months.

To perform this research, the sample of equity mutual funds with a sustainability score as of September 2019 was extracted from the Morningstar database. The ESG score delivered by the same provider was used to classify the funds according to their sustainability degree and allow the investigation of the flow-sustainability relationship around the Covid-19 crisis. A summary statistic of the main parameters was computed and reveals important differentials in characteristics according to the degree of sustainability. Given these significant discrepancies between the funds, the study is carried out using a panel regression that controls for the impact of the various parameters known to influence the flows as well as the inclusion of fixed effects to capture the impact of time-invariant characteristics such as the fund's strategy. In order to study the evolution of the sustainability-flow relationship in the aftermath of the pandemic, the analytical time frame has been segmented into three main sub-periods. The pre-crisis period covers the period from September 2019 to January 2020, the crisis period includes the months of February, March and April and finally the post-crisis period goes from May 2020 to February 2021.

A first observation is made from graphical evidence of average monthly dollar flows. The announcement of the pandemic caused massive outflows, but investors quickly regained confidence in the market. Based on the sustainability categories provided by Morningstar, there is a positive relationship between the degree of sustainability and investment flows. Funds in the highest category have more flows than other categories, while funds in the lowest category receive the least flows. However, this analysis does not allow valid conclusions to be drawn regarding investors' interest in ESG investments. Given the significant divergence in the properties of the various categories, it is important to account for factors that are known to influence the level of investment towards mutual funds, such as total assets under management, past performance, and previously recorded flows. The fixed effects panel regression analysis shows that, although sustainable investments were not favoured prior to the covid-19 outbreak, the crisis has resulted in an increase in flows towards the highest sustainability category funds. The global impact of this crisis has acted as a wake-up call for a change in the financial system and has intensified investors' attention to the degree of sustainability of their investments. The analysis at the European level reports that Europe-based investors are driving this trend as the effect is even more pronounced for funds that are marketed on the old continent.

A further study reports that investors allocate their capital to investments that they regard as sustainable by looking at the fund's title. Funds whose name mentions sustainability-related terms attract substantially more new capital than others. The Covid-19 crisis has reinforced this trend. This finding shows that some investors choose the strategy to which they allocate their money by relying solely on the name of the fund, and therefore run the risk of investing in funds that claim to be sustainable when their holdings do not match up at all. Knowing that investors attach a lot of importance to the name of the fund, sustainable finance can be subject of greenwashing. This result highlights the relevance of the regulations being enforced. Without any regulatory framework, the use of ESG investment terms could become a pure marketing tool to attract more money.

Nevertheless, the previous conclusions should be taken with caution as the rating of a same fund can vary a lot depending on the granting rating agency. A graphical overview shows the divergence in average monthly flows by sustainability category with respect to three distinct ESG score providers. When analysing the trend in investment flows of the given sample in the

context of the crisis that occurred at the end of February 2020, the conclusions that emerge differ completely depending on the score used. This raises concerns about the lack of consistency in ESG ratings, the reliance in the eyes of investors and the effect this can have on investment allocation. Beyond the final rating, it is therefore important that the investors fully understand the underlying criteria used by providers to assign their score. The level of transparency that providers demonstrate regarding the methodology used is therefore crucial for sustainable investors to ascertain that their money is being allocated to investments that match the values they intend to convey.

In conclusion, finance has a key role to play in the transition towards a more sustainable economy. This thesis sheds light on the fact that many investors are well aware of this, and that the Covid-19 outbreak has reinforced this awareness. However, as sustainable finance has only come to mainstream in recent years, several challenges remain to be addressed to ensure efficient allocation of capital. The attention that investors pay to the name of the investments as well as to the final ESG rating to support their investment choices raises concerns about potential misleading decisions. The nascent regulatory framework surrounding sustainable finance will be crucial to the future development of ESG investment and the alleviation of these concerns.

7. BIBLIOGRAPHY

Adler, T., & Kritzman, M. (2008). The cost of socially responsible investing. *The Journal of Portfolio Management*, 35(1), 52-56. https://doi.org/10.3905/JPM.2008.35.1.52

Albulescu C. 2020. Coronavirus and financial volatility: 40 days of fasting and fear. Retrieved on 15th June, 2021, from https://arxiv.org/ftp/arxiv/papers/2003/2003.04005.pdf

Albuquerque, R., Koskinen, Y., Yang, S., & Zhang, C. (2020). Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash. *The Review of Corporate Finance Studies*, 9(3), 593-621.

Altig, D., Baker, S., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., ... & Thwaites, G. (2020). Economic uncertainty before and during the COVID-19 pandemic. *Journal of Public Economics*, *191*, 104274.

Amel-Zadeh, A., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. *Financial Analysts Journal*, 74(3), 87- 103. https://doi.org/10.2469/faj.v74.n3.2

Ammann, M., Bauer, C., Fischer, S., & Müller, P. (2018). The impact of the Morningstar Sustainability Rating on mutual fund flows. *European Financial Management*, 25(3), 520–553. https://doi.org/10.1111/eufm.12181

Arjaliès, D. L. (2010). A social movement perspective on finance: How socially responsible investment mattered. *Journal of business ethics*, *92*(1), 57-78.

Ashwin Kumar, N. C., Smith, C., Badis, L., Wang, N., Ambrosy, P., & Tavares, R. (2016). ESG factors and risk-adjusted performance: a new quantitative model. *Journal of Sustainable Finance & Investment*, 6(4), 292-300. https://doi.org/10.1080/20430795.2016.1234909

Badía, G., Ferruz, L., & Cortez, M. C. (2020). The performance of social responsible investing from retail investors' perspective: international evidence. *International Journal of Finance and Economics*. https://doi.org/10.1002/ijfe.2109

Ballestero, E., Bravo, M., Pérez-Gladish, B., Arenas-Parra, M., & Plà-Santamaria, D. (2012). Socially Responsible Investment: A multicriteria approach to portfolio selection combining ethical and financial objectives. *European Journal of Operational Research*, *216*(2), 487–494. https://doi.org/10.1016/j.ejor.2011.07.011

Barber, B. M., Huang, X., & Odean, T. (2016). Which factors matter to investors? Evidence from mutual fund flows. *The Review of Financial Studies*, *29*(10), 2600-2642.

Barber, B. M., Odean, T., & Zheng, L. (2005). Out of sight, out of mind: The effects of expenses on mutual fund flows. *The Journal of Business*, *78*(6), 2095-2120. https://doi.org/10.1086/497042

Barnett, M. L., & Salomon, R. M. (2006). Beyond dichotomy: The curvilinear relationship between social responsibility and financial performance. *Strategic Management Journal*, 27(11), 1101–1122. https://doi.org/10.1002/smj.557

Barreda-Tarrazona, I., Matallín-Sáez, J. C., & Balaguer-Franch, M. R. (2011). Measuring investors' socially responsible preferences in mutual funds. *Journal of Business Ethics*, *103*(2), 305-330.

Bauer, R., Koedijk, K., & Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Banking and Finance,* 29, 1751– 1767. https://doi.org/10.1016/j.jbankfin.2004.06.035

Bauer, R., & Smeets, P. (2015). Social identification and investment decisions. *Journal of Economic Behavior & Organization*, *117*, 121-134. https://doi.org/10.1016/j.jebo.2015.06.006

Beal, D. J., Goyen, M., & Philips, P. (2005). Why do we invest ethically?. *The Journal of Investing*, *14*(3), 66-78.

Bello, Z. Y. (2005). Socially responsible investing and portfolio diversification. *The journal of Financial Research*, 28(1), 41-57. https://doi.org/10.1111/j.1475-6803.2005.00113.x

Ben-David, I., Li, J., Rossi, A., & Song, Y. (2019). What do mutual fund investors really care about?. *Fisher College of Business Working Paper*, (2019-03), 005.

Benson, K. L., Brailsford, T. J., & Humphrey, J. E. (2006). Do socially responsible fund managers really invest differently? Journal of Business Ethics, 65(4), 337–357. https://doi.org/10.1007/s10551-006-0003-8

Benson, K., & J. Humphrey. 2008. Socially responsible investment funds: Investor reaction to current and past returns. *Journal of Banking and Finance* 32:1850–59.

Berg, F., Kölbel, J. & Rigobon, R. (2019). Aggregate Confusion: The Divergence of ESG Ratings. MIT Sloan Research Paper No. 5822-19. Available at http://dx.doi.org/10.2139/ssrn.3438533

Bialkowski, J., & Starks, L. T. (2016). SRI funds: Investor demand, exogenous shocks and ESG profiles.

Biden, J. (2021). Executive Order on Climate-Related Financial Risk. *The White House.* Retrieved on 15th July 2021, from https://www.whitehouse.gov/briefing-room/presidential-actions/2021/05/20/executive-order-on-climate-related-financial-risk/

BlackRock. (2019). Sustainability: The future of investing. *Blackrock*. Retrieved on 20 July 2020 from https://www.blackrock.com/us/individual/literature/whitepaper/bii-sustainability-future-investing-jan-2019.pdf

Bollen, N. (2007). Mutual fund attributes and investor behavior. *Journal of Financial and Quantitative Analysis*, 42:3, 683–708. https://doi.org/10.1017/S0022109000004142

Brammer, S., Brooks, C., & Pavelin, S. (2006). Corporate social performance and stock returns: UK evidence from disaggregate measures. *Financial management*, 35(3), 97-116.

Cao, J., Titman, S., Zhan, X., & Zhang, W. (2020). ESG preference, institutional trading, and stock return patterns (No. w28156). *National Bureau of Economic Research*.

Ceccarelli, M., Ramelli, S., & Wagner, A. F. (2021). Low-carbon mutual funds. *Swiss Finance Institute Research Paper*, (19-13).

CFA. (2015). Environmental, social, and governance issues in investing. *CFA institute*. Retrieved on 10th August 2020 from https://www.cfainstitute.org/-/media/documents/article/position-paper/esg-issues-in-investing-a-guide-for-investment-professionals.ashx

Chatterji, A., & Levine, D. (2006). Breaking down the wall of codes: Evaluating non-financial performance measurement. *California Management Review*, 48(2), 29-51.

Chatterjee, S. (2018). Fund Characteristics and Performances of Socially Responsible Mutual Funds: Do ESG Ratings Play a Role? *Journal of Accounting and Finance*. Retrieved from https://arxiv.org/abs/1806.09906

Chevalier, J., Ellison, G., 1997. Risk taking by mutual funds as a response to incentives. *Journal of Political Economy* 105, 1167–1199.

CNBC. (2021). Millennials spurred growth in sustainable investing for years. Now, all generations are interested in ESG options. Retrieved on 25 June 2021 from https://www.cnbc.com/2021/05/21/millennials-spurred-growth-in-esg-investing-now-all-ages-are-on-board.html

Cooper, M.J., Gulen, H. and Rau, P.R. (2005). Changing names with style: Mutual fund name changes and their effects on fund flows. *The Journal of Finance*, 60(6), pp. 2825-2858.

Del Guercio, D., & Tkac, P. A. (2002). The determinants of the flow of funds of managed portfolios: Mutual funds vs. pension funds. *Journal of Financial and Quantitative Analysis*, *37*(4), 523-557. https://doi.org/10.2307/3595011

Delsen, L., & Lehr, A. (2019). Value matters or values matter? An analysis of heterogeneity in preferences for sustainable investments. *Journal of Sustainable Finance & Investment*, *9*(3), 240-261.

Derwall, J., Koedijk, K., & Ter Horst, J. (2011). A tale of values-driven and profit-seeking social investors. *Journal of Banking & Finance*, 35(8), 2137-2147.

Doellman, T., Itzkowitz, J., Itzkowitz, J. & Sardarli, S. (2019). Alphabeticity bias in 401 (k) investing. *The Financial Review*, 54(4), pp. 643-677.

Dorfleitner, G., & Nguyen, M. (2016). Which proportion of SR investments is enough? A survey-based approach. *Business Research*, *9*(1), 1-25.

Doyle, T. (2018). Ratings that Don't Rate – the Subjective World of ESG Ratings Agencies. *Technical report*, ACCF American Council for Capital Formation. Retrieved from https://bit.ly/2LBwvky

Drempetic, S., Klein, C., & Zwergel, B. (2019). The influence of firm size on the ESG score: Corporate sustainability ratings under review. *Journal of Business Ethics*, 1-28.

Dyck, A., Lins, K. V., Roth, L. & Wagner, H. F. (2019). Do institutional investors drive corporate social responsibility? International evidence, *Journal of Financial Economics* 131(3), 693–714.

Espenlaub, S., ul Haq, I. & Khurshed, A. (2017). It's all in the name: Mutual fund name changes after SEC Rule 35d-1. *Journal of Banking & Finance*, 84, pp. 123-134

EUROSIF. (2018). European SRI study 2018. Retrieved on 15 September 2020 from http://www.eurosif.org/wp-content/uploads/2018/11/European-SRI-2018-Study.pd

Fabozzi, F., Ma, K., & Oliphant, B. (2008). Sin stock returns. *Journal of Portfolio Management*, 35(1), 82–94. https://doi.org/10.3905/JPM.2008.35.1.82

Fang, L. H., Peress, J., & Zheng, L. (2014). Does media coverage of stocks affect mutual funds' trading and performance?. *The Review of Financial Studies*, *27*(12), 3441-3466.

Fulton, M., Kahn, B., & Sharples, C. (2012). Sustainable investing: Establishing long-term value and performance. *Available at SSRN 2222740*.

Geczy, C., Stambaugh, R. F., & Levin, D. (2005). Investing in socially responsible mutual funds.

Godfrey, P. C., Merrill, C. B., & Hansen, J. M. (2009). The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis. *Strategic management journal*, *30*(4), 425-445.

Green, T.C. and Jame, R. (2013). Company name fluency, investor recognition, and firm value. *Journal of Financial Economics,* 109(3), pp. 813-834.

GSIA Global Sustainable Investment Alliance. (2018). Global Sustainable Investment Review 2018. Retrieved on 25th September 2020 from http://www.gsi-alliance.org/wp-content/uploads/2019/03/GSIR_Review2018.3.28.pdf

GSIA Global Sustainable Investment Alliance. (2020). Global Sustainable Investment Review 2020. Retrieved on 19 July 2021 from http://www.gsi-alliance.org/wp-content/uploads/2021/07/GSIR-2020.pdf

Hahn, R., & Kühnen, M. (2013). Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding feld of research. Journal of Cleaner Production, 59, 5–21. https://doi.org/10.1016/j.jclepro.2013.07.005

Hamilton, S., Jo, H., & Statman, M. (1993). Doing well while doing good? The investment performance of socially responsible mutual funds. *Financial Analysts Journal*, 49(6), 62-66. https://doi.org/10.2469/faj.v49.n6.62

Hartzmark, S. M., & Sussman, A. B. (2019). Do investors value sustainability? A natural experiment examining ranking and fund flows. *The Journal of Finance*, 74(6), 2789-2837.

Hawley, J. (2017). ESG Ratings and Rankings. *TruValue Labs*. Retrieved from https://www.truvaluelabs.com/wp-content/uploads/2017/12/ESG-Ratings-and-Rankings-All-Over-the-Map.pdf.

Hill, R. C., Griffiths, W. E., & Lim, G. C. (2018). *Principles of econometrics* (5th edition). Wiley.

Himanshu, R., Mushir, N., & Suryavanshi, R. Impact of COVID-19 on portfolio allocation decisions of individual investors. *Journal of Public Affairs*.

Hoepner, A. G., Oikonomou, I., Sautner, Z., Starks, L. T., & Zhou, X. (2018). ESG shareholder engagement and downside risk.

Hoffmann, A. O., Post, T., & Pennings, J. M. (2013). Individual investor perceptions and behavior during the financial crisis. *Journal of Banking & Finance*, *37*(1), 60-74.

Hong, H., & Kacperczyk, M. (2009). The price of sin: The effects of social norms on markets. *Journal of Financial Economics*, *93*(1), 15–36. https://doi.org/10.1016/j.jfineco.2008.09.001

Ivković, Z., & Weisbenner, S. (2009). Individual investor mutual fund flows. *Journal of Financial Economics*, *92*(2), 223–237. https://doi.org/10.1016/j.jfineco.2008.05.003

Jacobs, H. & Hillert, A. (2016). Alphabetic bias, investor recognition, and trading behavior. *Review of Finance*, 20(2), pp. 693-723.

J.P. Morgan. (2020). Why COVID-19 Could Prove to Be a Major Turning Point for ESG Investing. J.P. Morgan Research. Retrieved on 10th August 2020, from https://www.jpmorgan.com/insights/research/covid-19-esg-investing

Joenväärä, J., & Tiu, C. I. (2018). Hedge fund flows and name gravitas. *Available at SSRN 2939028*.

Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, *47*(2), 263–291. https://doi.org/10.2307/1914185

Kreander, N., Gray, R. H., Power, D. M., & Sinclair, C. D. (2005). Evaluating the performance of ethical and non-ethical funds: a matched pair analysis. *Journal of Business Finance & Accounting*, *32*(7-8), 1465-1493.

Lee, D. D., Humphrey, J. E., Benson, K. L., & Ahn, J. Y. K. (2010). Socially responsible investment fund performance: the impact of screening intensity. *Accounting and Finance (Parkville)*, *50*(2), 351–370. https://doi.org/10.1111/j.1467-629X.2009.00336.x

Markowitz, H., (1952). Portfolio selection. *The Journal of Finance*, Vol. 7, No. 1., pp. 77-91. https://doi.org/102307/2975974

Morningstar. (2021). ESG investing comes of age. Retrieved on 29 May 2021 from https://www.morningstar.com/features/esg-investing-history

Morningstar Manager Research. (2021). Global Sustainable Fund Flows: Q1 2021 in Review. Morningstar. Retrieved on 2nd July 2021 from https://www.morningstar.com/lp/global-esg-flows.

Morningstar Manager Research. (2019). Morningstar Sustainability Rating: Methodology. Morningstar. Retrieved on 15th June 2021, from https://www.morningstar.com/content/dam/marketing/shared/research/methodology/7441 56_Morningstar_Sustainability_Rating_for_Funds_Methodology.pdf

NBER. (2021). Business Cycle Dating. National Bureau of Economic Research. Retrieved on July 12, 2021, from https://www.nber.org/research/business-cycle-dating

Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica: Journal of the econometric society*, 1417-1426.

Nilsson, J. (2009), "Segmenting Socially Responsible Mutual Fund Investors: The Influence of Financial Return and Social Responsibility", International Journal of Bank Marketing, vol. 27(1), pp. 5-31. https://doi.org/10.1108/02652320910928218

Nofsinger, J., & Varma, A. (2014). Socially responsible funds and market crises. *Journal of Banking & Finance*, *48*, 180–193. https://doi.org/10.1016/j.jbankfin.2013.12.016

Pedersen, L. H., Fitzgibbons, S., & Pomorski, L. (2020). Responsible investing: The ESG-efficient frontier. *Journal of Financial Economics*.

Ramelli, S., & Wagner, A. F. (2020). Feverish stock price reactions to COVID-19. *The Review of Corporate Finance Studies*, *9*(3), 622-655.

Refinitiv. (2020). Refinitiv debuts Fund ESG Scores to facilitate industry transition to sustainable investing. *Refinitiv.* Retrieved on 10th July 2021, from https://www.refinitiv.com/en/media-center/press-releases/2020/july/refinitiv-debuts-fund-esg-scores-to-facilitate-industry-transition-to-sustainable-investing

Renneboog, L., Ter Horst, J., & Zhang, C. (2008a). The price of ethics and stakeholder governance: The performance of socially responsible mutual funds. *Journal of Corporate Finance*, 14(3), 302–322. https://doi.org/10.1016/j.jcorpfin.2008.03.009

Renneboog, L., Ter Horst, J., & Zhang, C. (2008b). Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Banking and Finance*, 32(9), 1723–1742. https://doi.org/10.1016/j.jbankfin.2007.12.039

Renneboog, L., Ter Horst, J., & Zhang, C. (2011). Is ethical money financially smart? Nonfinancial attributes and money flows of socially responsible investment funds. *Journal of Financial Intermediation*, *20*(4), 562-588.

Revelli, C. (2013). L'investissement socialement responsable. *Revue française de gestion*, 236(7), 79–92. https://doi.org/10.3166/RFG.236.79-92

Richardson, B. (2008). Corporate Financiers and the SRI Movement. In Socially Responsible Investment Law: Regulating the Unseen Polluters. *Oxford University Press*. https://doi.org/10.1093/acprof:oso/9780195333459.003.0002

Riedl, A., & Smeets, P. (2017). Why Do Investors Hold Socially Responsible Mutual Funds? *The Journal of Finance (New York)*, *72*(6), 2505–2550. https://doi.org/10.1111/jofi.12547

Schueth, S. (2003). Socially Responsible Investing in the United States. *Journal of Business Ethics*, 43(3), 189–194. https://doi.org/10.1023/A:1022981828869

SEC Securities and Exchange Commission. (2020). Press release: SEC Requests Comment on Fund Names Rule; Seeks to Eliminate Misleading Fund Names. *U.S. Securities and Exchange Commission.* Retrieved on 1st August 2021, from https://www.sec.gov/news/press-release/2020-50

Semenova, N., & Hassel, L. G. (2014). On the validity of environmental performance metrics. *Journal of Business Ethics*, *132*(2), 249-258.

Sirri, E. R., & Tufano, P. (1998). Costly search and mutual fund flows. *The journal of finance*, *53*(5), 1589-1622. https://doi.org/10.1111/0022-1082.00066

Spiegel, M., & Zhang, H. (2013). Mutual fund risk and market share-adjusted fund flows. *Journal of Financial Economics*, *108*(2), 506–528. https://doi.org/10.1016/j.jfineco.2012.05.018

Statman, M. (2000). Socially Responsible Mutual Funds. *Financial Analysts Journal*, 56(3), 30–39. https://doi.org/10.2469/faj.v56.n3.2358

Statman, M., & Glushkov, D. (2009). The Wages of Social Responsibility. F*inancial Analysts Journal*, 65(4), 33–46. https://doi.org/10.2469/faj.v65.n4.5

Steen, M., Moussawi, J. T., & Gjolberg, O. (2020). Is there a relationship between Morningstar's ESG ratings and mutual fund performance? *Journal of Sustainable Finance & Investment*, 10(4), 349-370. https://doi.org/10.1080/20430795.2019.1700065

Townsend, B. (2020). From sri to esg: The origins of socially responsible and sustainable investing. *The Journal of Impact and ESG Investing*, *1*(1), 10-25.

UN PRI. (2020). About the PRI. Retrieved on 20 June 2021 from https://www.unpri.org/pri/about-the-pri

UN PRI. (2020). What is responsible investment? Retrieved on 16 March 2021 from https://www.unpri.org/an-introduction-to-responsible-investment/what-is-responsible-investment/4780.article

UNEP FI. (2005). UNEP FI 2005 at a glance. Retrieved on March 2021 from https://www.unepfi.org/fileadmin/documents/2005_unepfi_ataglance_01.pdf

Utz, S., & Wimmer, M. (2014). Are they any good at all? A financial and ethical analysis of socially responsible mutual funds. *Journal of Asset Management*, *15*(1), 72-82.

Vyvyan, V., Ng, C., & Brimble, M. (2007). Socially responsible investing: The green attitudes and grey choices of Australian investors. *Corporate Governance: An International Review*, *15*(2), 370-381.

Wang, A. Y., & Young, M. (2020). Terrorist attacks and investor risk preference: Evidence from mutual fund flows. *Journal of Financial Economics*, *137*(2), 491-514.

Williams, G. (2007). Some Determinants of the Socially Responsible Investment Decision: A Cross-Country Study. *The Journal of Behavioral Finance*, *8*(1), 43–57. https://doi.org/10.1080/15427560709337016

Wimmer, M. (2013). ESG-persistence in socially responsible mutual funds. *J. Mgmt. & Sustainability*, *3*, 9.

Zhang, D., Hu, M., Ji, Q., 2020. Financial markets under the global pandemic of COVID-19. Finance Research Letters, 101528

8. APPENDICES

▪ **Appendix 1: Morningstar – U.S. Sustainable Funds Annual Flows and Assets**
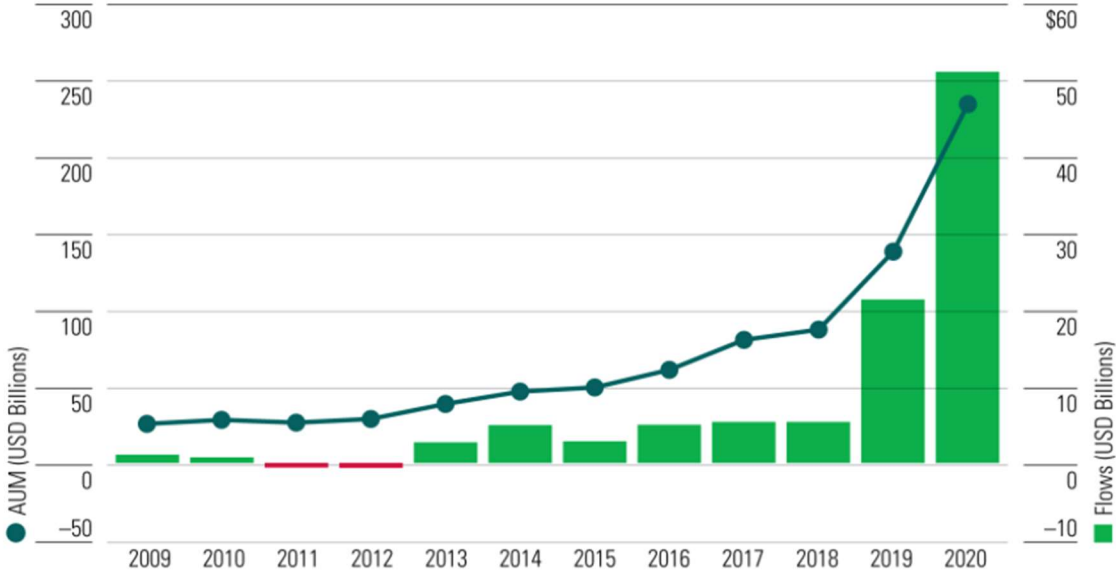
Source: Morningstar. (2021). A Broken Record: Flows for U.S. Sustainable Funds Again Reach New Heights.

▪ **Appendix 2: Morningstar sustainability rating distribution.**

	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Fev 2020	Mar 2020	Apr 2020	Mai 2020
Low	385	376	369	368	364	355	353	353	348
%	8.15%	7.96%	7.81%	7.79%	7.70%	7.51%	7.47%	7.47%	7.36%
Below Average	1001	982	971	958	968	975	968	964	958
%	21.18%	20.78%	20.55%	20.27%	20.48%	20.63%	20.48%	20.40%	20.27%
Average	1707	1726	1750	1761	1768	1767	1783	1769	1762
%	36.12%	36.52%	37.03%	37.26%	37.41%	37.39%	37.73%	37.43%	37.28%
Above Average	1102	1110	1103	1110	1096	1105	1112	1132	1156
%	23.32%	23.49%	23.34%	23.49%	23.19%	23.38%	23.53%	23.95%	24.46%
High	530	531	532	528	529	523	509	507	501
%	11.21%	11.24%	11.26%	11.17%	11.19%	11.07%	10.77%	10.73%	10.60%
Total (N)	4726	4726	4726	4726	4726	4726	4726	4726	4726

	Jun 2020	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021
Low	350	349	353	355	354	358	350	351	352
%	7.41%	7.38%	7.47%	7.51%	7.49%	7.58%	7.41%	7.43%	7.45%
Below Average	955	957	943	938	947	944	965	982	994
%	20.21%	20.25%	19.95%	19.85%	20.04%	19.97%	20.42%	20.78%	21.03%
Average	1769	1769	1761	1775	1763	1761	1740	1725	1724
%	37.43%	37.43%	37.26%	37.56%	37.30%	37.26%	36.82%	36.50%	36.48%
Above Average	1158	1165	1184	1177	1182	1186	1197	1209	1185
%	24.50%	24.65%	25.05%	24.90%	25.01%	25.10%	25.33%	25.58%	25.07%
High	493	485	484	480	479	476	473	458	470
%	10.43%	10.26%	10.24%	10.16%	10.14%	10.07%	10.01%	9.69%	9.94%
Total (N)	4726	4726	4726	4726	4726	4726	4726	4726	4726

- **Appendix 3: Sustainability Repartition - As of September 2019**
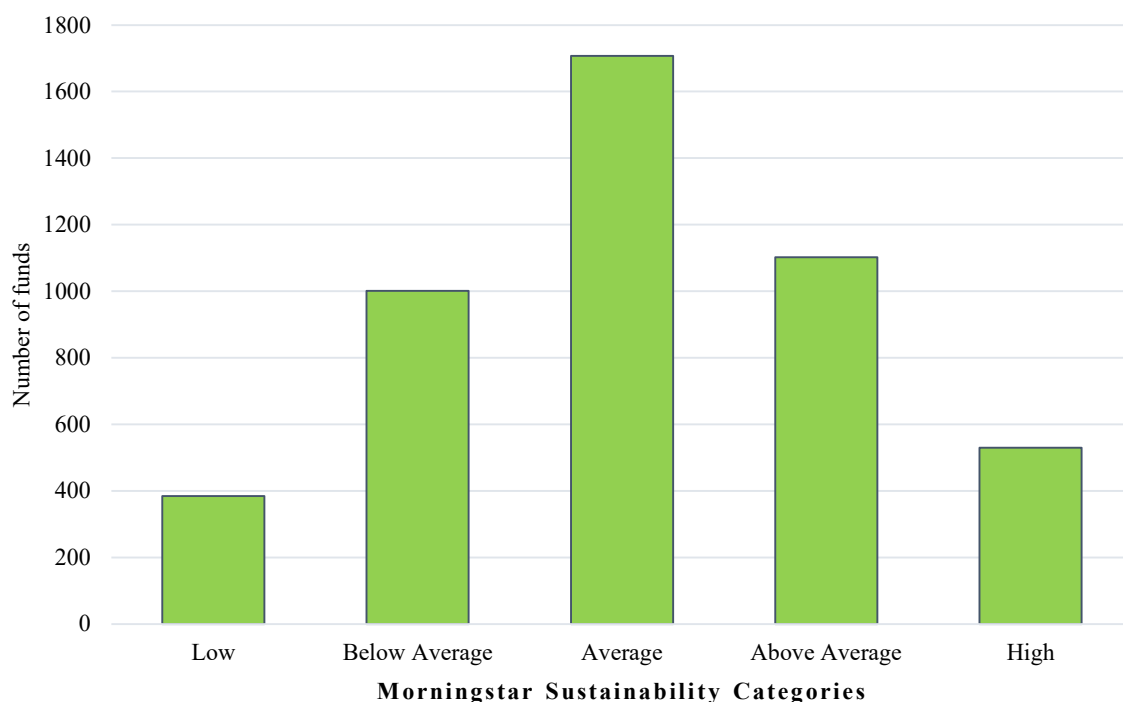
- **Appendix 4: Summary statistics of full sample**

Variables	N	Mean	Median	St. Dev.	Min	Max
Net Flows ($ million)	84897	1.1288	-0.0576	21.61	-147.60	154.90
Net Flows (%)	84897	0.5335	-0.143	6.917	-17.23	51.57
Total Net Assets ($ million)	84897	399.50	98.18	1107	0.00	31650
Monthly Return (%)	84897	1.184	2.026	7.978	-63.930	70.030
Alpha (%)	82383	-7.8289	-6.3747	15.54	-97.323	102.81
Star Rating	84897	3.191	3	1.078	1	5
LTM Risk	84897	6.421	6.387	2.724	0	232.5
Age (months)	84897	158.3	141	120	1	1452
Expense Ratio (%)	4033	1.366	1.15	0.8707	0.002	7.46
ESG Env. Pillar	4726	4.496	4.2	2.044	0	20.09
ESG Soc. Pillar	4726	8.22	8.63	2.011	0	15.28
ESG Gov. Pillar	4726	6.829	7.11	1.58	0	12.79

From September 2019 through February 2021

- **Appendix 5: Breusch-Pagan test**

```
Breusch-Pagan test -
  Null hypothesis: Variance of the unit-specific error = 0
  Asymptotic test statistic: Chi-square(1) = 1154.22
  with p-value = 5.43159e-253
```

- **Appendix 6: Hausman test**

```
Hausman test -
  Null hypothesis: GLS estimates are consistent
  Asymptotic test statistic: Chi-square(11) = 10923.8
  with p-value = 0
```

- **Appendix 7: ESG Rating Scales**
  - Morningstar Globes Rating

Distribution	Rating Icon
Best 10% (Lowest Risk)	🌐🌐🌐🌐🌐
Next 22.5%	🌐🌐🌐🌐○
Next 35%	🌐🌐🌐○○
Next 22.5%	🌐🌐○○○
Worst 10% (Highest Risk)	🌐○○○○
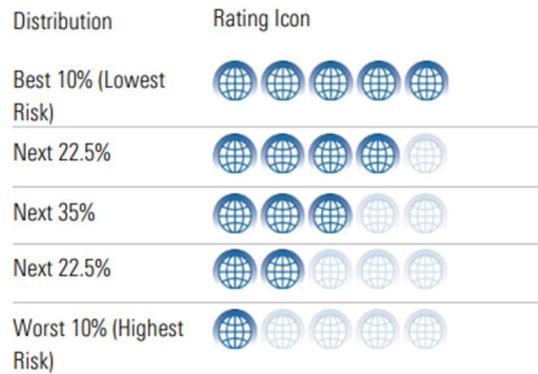
Source:

https://www.morningstar.com/content/dam/marketing/shared/research/methodology/744156_Morningstar_Sustainability_Rating_for_Funds_Methodology.pdf

- Thomson Reuters Scoring Scale

Source:

https://emea1.apps.cp.thomsonreuters.com/web/Apps/FundDetails/1.10.106/?s=LP684
80790&navigate=esgpage#/main

- MSCI Scoring Scale

Source:

https://www.msci.com/documents/1296102/15388113/MSCI+ESG+Fund+Ratings+Exec+Summary+Methodolo
gy.pdf

Appendix 8: Flows Evolution ($) in Europe
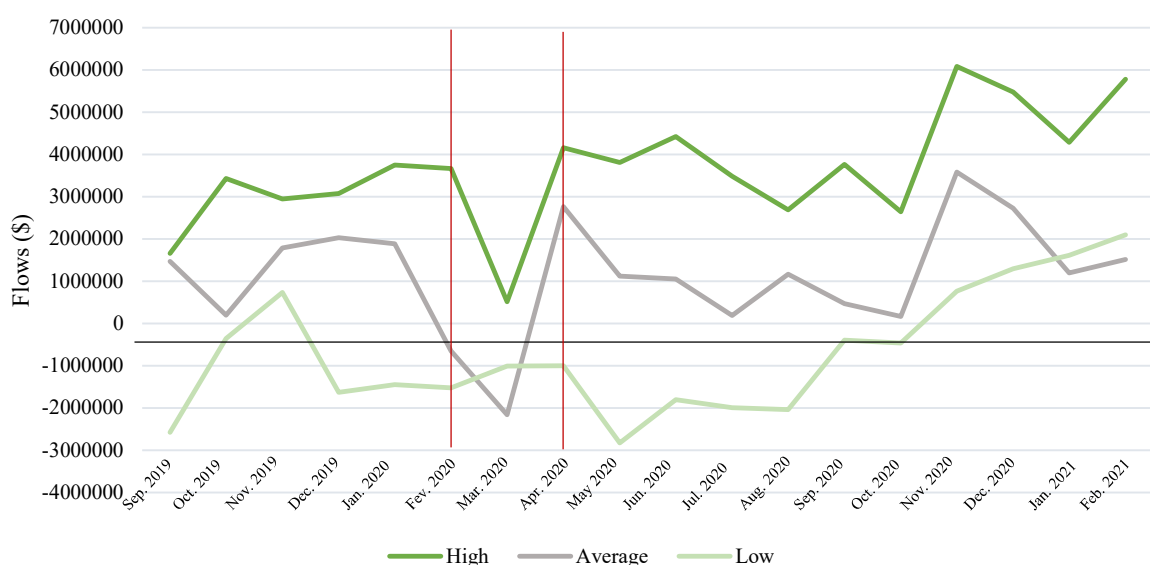
Appendix 9: Fixed effects panel regression results – Covid-impact and sub-periods

	Dependent Variables			
	Net Flows (%)		Net Flows ($ million)	
Lagged Return (%)	0.054	0.059	0.079	0.121
p-value	0	0	0	0
Lagged Alpha (%)	0.0741	0.074	0.146	0.143
p-value	0	0	0	0
Lagged Flows (%)	0.13	0.130	0.262	0.259
p-value	0	0	0	0
Lagged Log (TNA) ($)	-4.676	-4.594	-5.622	-4.953
p-value	0	0	0	0
Lagged Age (months)	0.135	0.124	0.3	0.240
p-value	0	0	0	0
Lagged Stars	0.374	0.364	1.038	0.946
p-value		0	0	0
Lagged Volatility	-0.062	-	0.195	-
p-value	0	-	0.002	-
Crisis	-0.625	-	-2.093	-
p-value	0	-	0.024	-
Crash	-	-1.005	-	-3.557
p-value	-	0	-	0
Recovery	-	-0.037	-	2.151
p-value	-	0.7719	-	0
Post-Crisis	-1.341	-1.134	-2.885	-1.404
p-value	0	0	0	0
N	63793	63793	63793	63793
LSDV R2	0.313004	0.312489	0.313004	0.312489

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- **Appendix 10: Fixed effects panel regression results – High vs. Low**

Fixed effects

	Dependent Variables	
	Net Flows (%)	Net Flows ($ million)
High ESG	-0.645	-0.068
p-value	0.002	0.925
Low ESG	-0.038	-0.909
p-value	0.875	0.295
Crisis x High	0.459	1.338
p-value	0.037	0.086
Crisis x Low	-0.067	0.213
p-value	0.793	0.814
Post-Crisis x High	0.918	1.457
p-value	0	0.018
Post-Crisis x Low	0.206	-0.180
p-value	0.305	0.801
Lagged Return (%)	0.054	0.074
p-value	0	0
Lagged Alpha (%)	0.070	0.140
p-value	0	0
Lagged Flows (%)	0.130	0.263
p-value	0	0
Lagged Log (TNA) ($)	-4.713	-5.761
p-value	0	0
Lagged Stars	0.372	1.039
p-value	0	0
Lagged Age (months)	0.138	0.331
p-value	0	0
Crisis	-0.680	-2.383
p-value	0	0
Post-Crisis	-1.454	-2.732
p-value	0	0
N	63793	82328
LSDV R_2	0.266673	0.266673

- **Appendix 11: Pooled OLS regression results – High vs. Low**

Pooled OLS

	Dependent Variables		
	Net Flows ($ million)		
	Without control	With control	With period dummies
High ESG	2.287	0.479	0.479
p-value	0	0.939	0.094
Low ESG	-1.569	-0.765	-0.737
p-value	0	0.020	0.025
Lagged Return (%)	-	0.085	0.032
p-value	-	0	0.022
Lagged Alpha (%)	-	0.125	0.137
p-value	-	0	0
Lagged Stars	-	1.042	1.026
p-value	-	0	0
Lagged Flows (%)	-	0.596	0.594
p-value	-	0	0
Lagged Log (TNA) ($)	-	0.277	0.273
p-value	-	0	0
Lagged Age (months)	-	-0.007	-0.007
p-value	-	0	0
Crisis	-	-	-0.606
p-value	-	-	0.05
Post-Crisis	-	-	1.343
p-value	-	-	0
N	84834	63793	63793
Strategy dummies	No	Yes	Yes
R_2	0.0230	0.0968	0.9700

Pooled OLS

	Dependent Variables	
	Net Flows (%)	Net Flows ($ million)
High ESG	0.510	0.771
p-value	0.000	0.085
Low ESG	-0.424	-1.140
p-value	0.006	0.285
Crisis x High	-0.325	0.263
p-value	0.134	0.717
Crisis x Low	0.007	0.759
p-value	0.978	0.373
Post-Crisis x High	0.072	0.767
p-value	0.660	0.163
Post-Crisis x Low	0.491	0.679
p-value	0.010	0.289
Lagged Return (%)	0.021	0.035
p-value	0	0.002
Lagged Alpha (%)	0.053	0.138
p-value	0	0
Lagged Flows (%)	0.293	0.556
p-value	0	0
Lagged Log (TNA) ($)	-0.188	0.734
p-value	0	0
Lagged Age (months)	-0.003	-0.010
p-value	0	0
Crisis	-0.057	-0.306
p-value	0.504	0.280
Post-Crisis	0.017	1.487
p-value	0.776	0
N	63793	63793
Strategy dummies	Yes	Yes
R_2	0.123249	0.123249

▪ **Appendix 12: Fixed effects panel regression results – High vs. Low**

Fixed effects

	Dependent Variables		
	Net Flows ($ million)		
	Without control	With control	With period dummies
High ESG	0.541	0.939	0.934
p-value	0.272	0.117	0.119
Low ESG	-0.861	-0.946	-0.964
p-value	0.138	0.198	0.190
Lagged Return (%)	-	0.926	0.074
p-value	-	0	0
Lagged Alpha (%)	-	0.149	0.140
p-value	-	0	0
Lagged Stars	-	0.947	1.047
p-value	-	0	0
Lagged Flows (%)	-	0.257	0.263
p-value	-	0	0
Lagged Log (TNA) ($)	-	-5.150	-5.695
p-value	-	0	0
Lagged Age (months)	-	0.149	0.328
p-value	-	0	0
Crisis	-	-	-2.214
p-value	-	-	0
Post-Crisis	-	-	-2.563
p-value	-	-	0
N	84834	63793	63793
LSDV R_2	0.2988	0.312244	0.312953

- **Appendix 13: Fixed effects panel regression results – With and without lagged flows**

	Dependent Variable	
	Net Flows ($ million)	
	With lagged flows	Without lagged flows
High	-0.068	0.028
p-value	0.925	0.970
Low	-0.909	-1.099
p-value	0.295	0.206
Crisis x High	1.338	1.268
p-value	0.086	0.105
Crisis x Low	0.213	0.255
p-value	0.814	0.778
Post-Crisis x High	1.457	1.299
p-value	0.018	0.035
Post-Crisis x Low	-0.180	0.123
p-value	0.801	0.863
Crisis	-2.383	-2.190
p-value	0	0
Post-Crisis	-2.732	-2.237
p-value	0	0
Lagged Return (%)	0.074	0.074
p-value	0	0
Lagged Alpha (%)	0.140	0.149
p-value	0	0
Lagged Flows (%)	0.263	-
p-value	0	-
Lagged Log (TNA) ($)	-5.761	-4.512
p-value	0	0
Lagged Age (months)	0.331	0.289
p-value	0	0
Lagged Stars	1.039	1.046
p-value	0	0
N	63793	63799
LSDV R_2	0.313026	0.309159

Appendix 14: Fixed effects panel regression results – High vs. Low in Europe

Fixed effects - Europe

	Dependent Variables	
	Net Flows (%)	Net Flows ($ million)
High ESG	-0.437	-1.248
p-value	0.076	0.107
Low ESG	0.180	-1.935
p-value	0.567	0.050
Crisis x High	-0.131	1.509
p-value	0.609	0.062
Crisis x Low	0.058	1.637
p-value	0.860	0.111
Post-Crisis x High	0.597	2.178
p-value	0.003	0.006
Post-Crisis x Low	0.090	0.956
p-value	0.724	0.302
Lagged Return (%)	0.054	0.059
p-value	0	0
Lagged Alpha (%)	0.092	0.204
p-value	0	0
Lagged Flows (%)	0.121	0.218
p-value	0	0
Lagged Log (TNA) ($)	-4.909	-4.721
p-value	0	0
Lagged Age (months)	0.154	0.278
p-value	0	0
Crisis	-0.878	-1.936
p-value	0	0
Post-Crisis	-1.599	-2.372
p-value	0	0
N	49876	49876
LSDV R_2	0.272302	0.292851

- **Appendix 15: Flows Evolution ($) of the 5 Sustainable Categories**

Flows Evolution ($) - Global
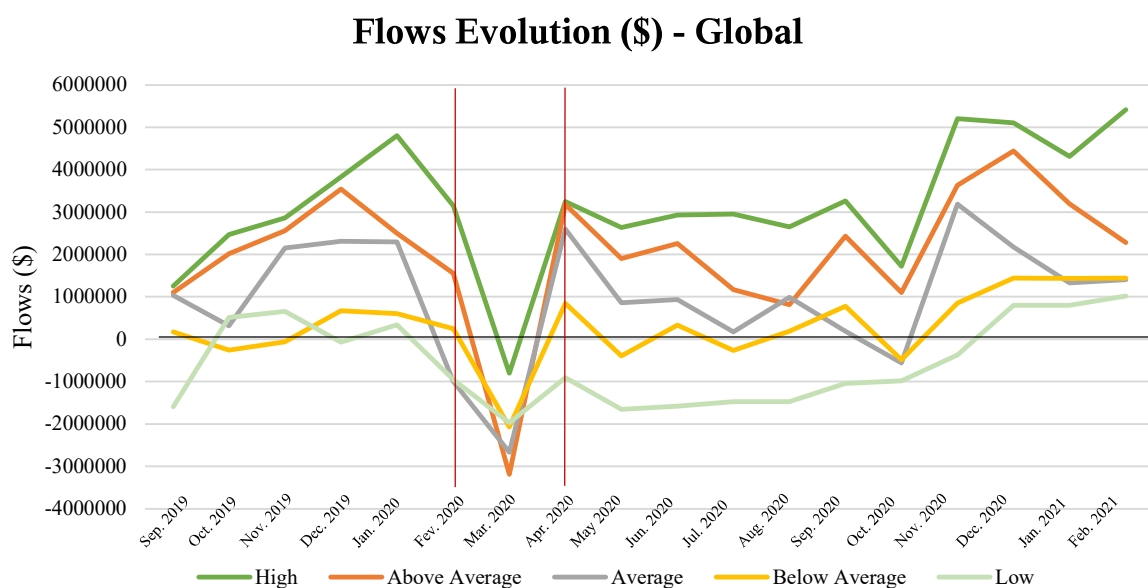
- **Appendix 16: Fixed effects panel regression results – 5 Sustainability Categories**

	Dependent Variable				
	Net Flows ($ million)				
	High	Above	Average	Below	Low
Lagged Return (%)	0.194	0.147	0.122	0.059	0.107
p-value	0.000	0	0	0.006	0.003
Lagged Alpha (%)	0.190	0.164	0.144	0.092	0.108
p-value	0	0	0	0	0
Lagged Flows (%)	0.300	0.211	0.315	0.203	0.274
p-value	0	0	0	0	0
Lagged Log (TNA) ($)	-5.631	-2.881	-8.260	-2.325	-4.305
p-value	0	0.002	0	0	0
Lagged Age (months)	0.383	0.172	0.327	0.198	0.464
p-value	0.002	0.010	0	0.0003	0
Lagged Stars	0.238	2.574	0.784	-0.058	1.394
p-value	0.695	0	0.017	0.845	0.007
Crash	-3.784	-5.093	-3.730	-1.817	-2.353
p-value	0.005	0	0	0.004	0.033
Recovery	2.106	3.498	0.827	0.828	-0.654
p-value	0.186	0.000	0.321	0.275	0.614
Post-Crisis	-2.265	-0.825	-3.173	-1.193	-3.833
p-value	0.102	0.296	0	0.065	0.001
N	6715	13563	23408	13906	4897
LSDV R_2	0.304852	0.313479	0.292553	0.321354	0.322676

▪ Appendix 17: Sample repartition with diverse ESG rating providers

MSCI	N
AAA	232
AA	989
A	1053
BBB	537
BB	340
B	47
CCC	0
Sustainable	1221
Neutral	1590
Non-sustainable	387
Total	3198

Thomson Reuters	N
90-100	0
80-89	74
70-79	793
60-69	1360
50-59	692
40-49	226
30-39	51
20-29	2
10-19	0
0-9	0
Sustainable	463
Neutral	2456
Non-sustainable	279
Total	3198

Morningstar	N
High	429
Above	778
Average	1186
Below	609
Low	196
Sustainable	1207
Neutral	1186
Non-sustainable	805
Total	3198

- **Appendix 18: Average monthly flows per sustainability group**

MSCI	Sep. 2019	Oct. 2019	Nov. 2019	Dec. 2019	Jan. 2020	Feb. 2020	Mar. 2020	Apr. 2020	May. 2020
Sustainable	551941	230559	1881621	1911023	2111813	-93295	-3182675	2506132	289156
Neutral	1066964	1545218	2867232	4097982	3441535	669966	-4215725	4027996	2282354
Non-Sustainable	1495077	1586883	2214690	3054951	2908527	489082	-983579	1581092	-470247

MSCI	Jun. 2020	Jul. 2020	Aug. 2020	Sep. 2020	Oct. 2020	Nov. 2020	Dec. 2020	Jan. 2021	Feb. 2021
Sustainable	1810903	918723	1071357	1616629	175468	2199797	2976731	2508397	2577566
Neutral	2531279	1083778	1756334	2211469	167804	5892550	5181028	4118740	3656654
Non-Sustainable	-970221	185408	7088	704842	863671	2527234	3114193	2796950	2473758

Reuters	Sep. 2019	Oct. 2019	Nov. 2019	Dec. 2019	Jan. 2020	Feb. 2020	Mar. 2020	Apr. 2020	May. 2020
Sustainable	-1233279	29498	726586	1782263	180129	-1692001	-3249592	1339956	-1280118
Neutral	1154786	1016768	2624708	2839867	3082197	538808	-3453606	3164651	1264562
Non-Sustainable	2767385	3164164	3067078	7576246	5235481	2111726	-1675056	4697594	3136557

Reuters	Jun. 2020	Jul. 2020	Aug. 2020	Sep. 2020	Oct. 2020	Nov. 2020	Dec. 2020	Jan. 2021	Feb. 2021
Sustainable	-655368	-746690	931770	-736827	-2136708	-1456100	-393007	-599585	-332563
Neutral	2014310	783845	1082281	1779949	278380	4297091	4024649	3212021	2580684
Non-Sustainable	2326876	4269708	2646110	5359071	4433389	9606755	11049404	10397000	12769908

Morningstar	Sep. 2019	Oct. 2019	Nov. 2019	Dec. 2019	Jan. 2020	Feb. 2020	Mar. 2020	Apr. 2020	May. 2020
Sustainable	1624933	2328168	2746223	4631445	4115078	2344981	-3390105	4493654	2857183
Neutral	1238391	524076	3247675	3050767	2681604	-1412581	-3891607	3263834	844194
Non-Sustainable	-528441	-55478	558444	888121	1224747	-30213	-2169679	509307	-1318840

Morningstar	Jun. 2020	Jul. 2020	Aug. 2020	Sep. 2020	Oct. 2020	Nov. 2020	Dec. 2020	Jan. 2021	Feb. 2021
Sustainable	3462529	2331049	1691537	3546246	1646209	5475419	5944268	5145676	4495678
Neutral	969226	560561	1673780	989828	-247511	4311944	3822903	2633047	2580822
Non-Sustainable	-44554	-879188	-247243	88608	-946714	1039712	1337471	1463670	1565029

MSCI - Average Monthly Flows ($)
95% Confidence Interval

Thomson Reuters - Average Monthly Flows ($)
95% Confidence Interval
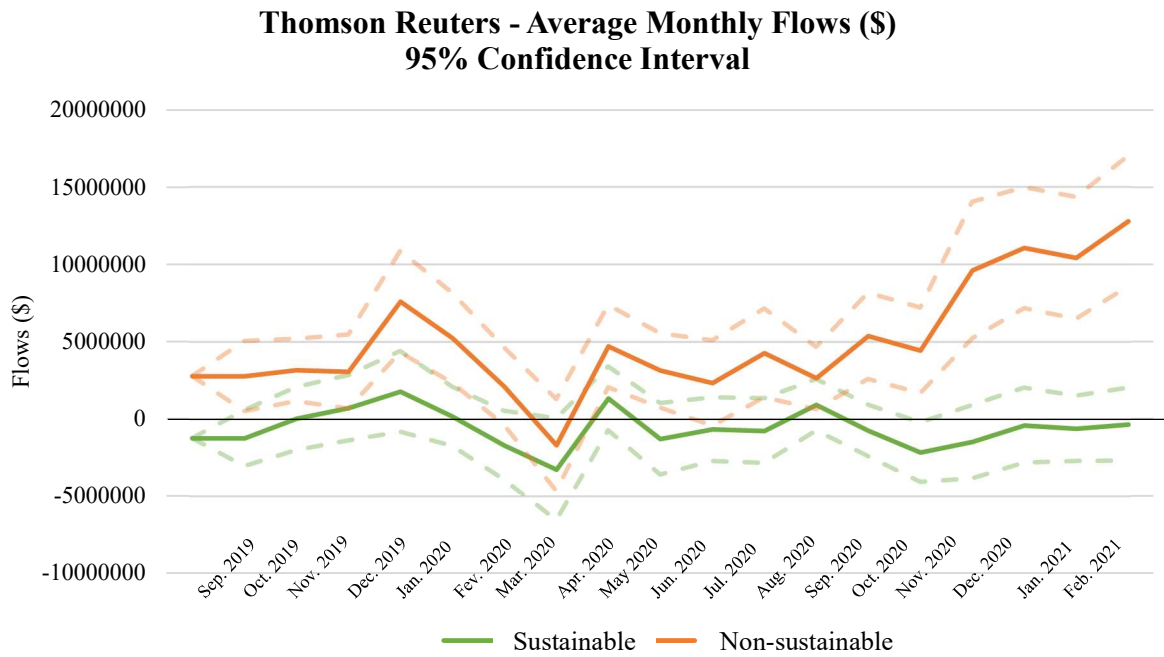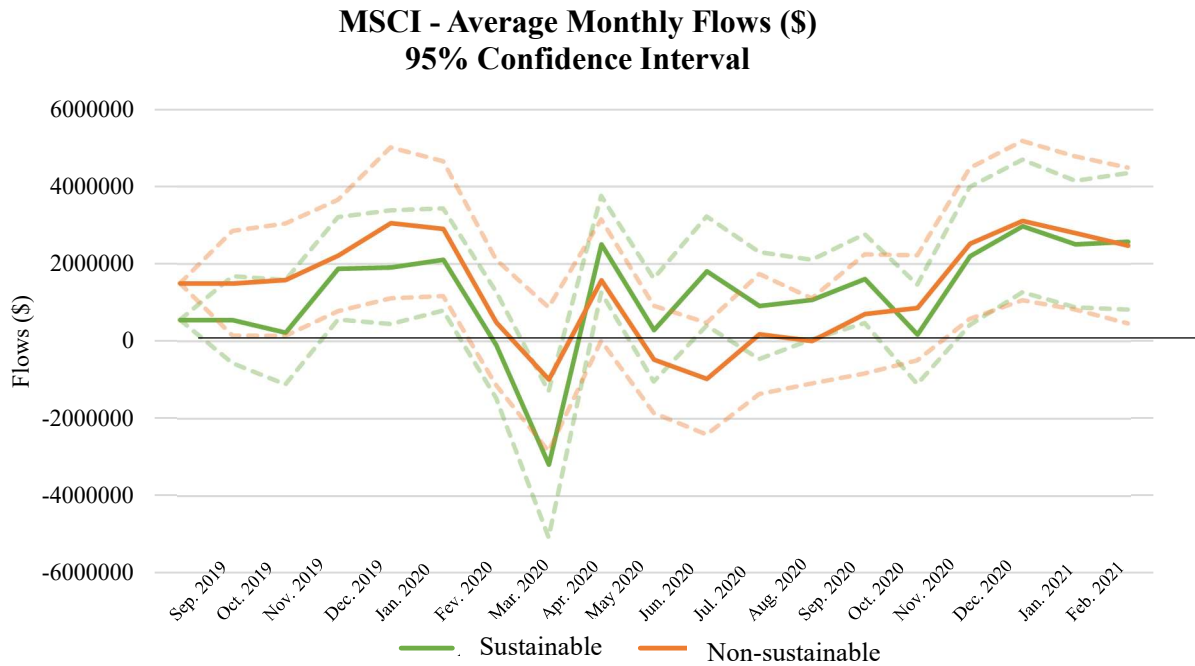
Morningstar - Average Monthly Flows ($)
95% Confidence Interval
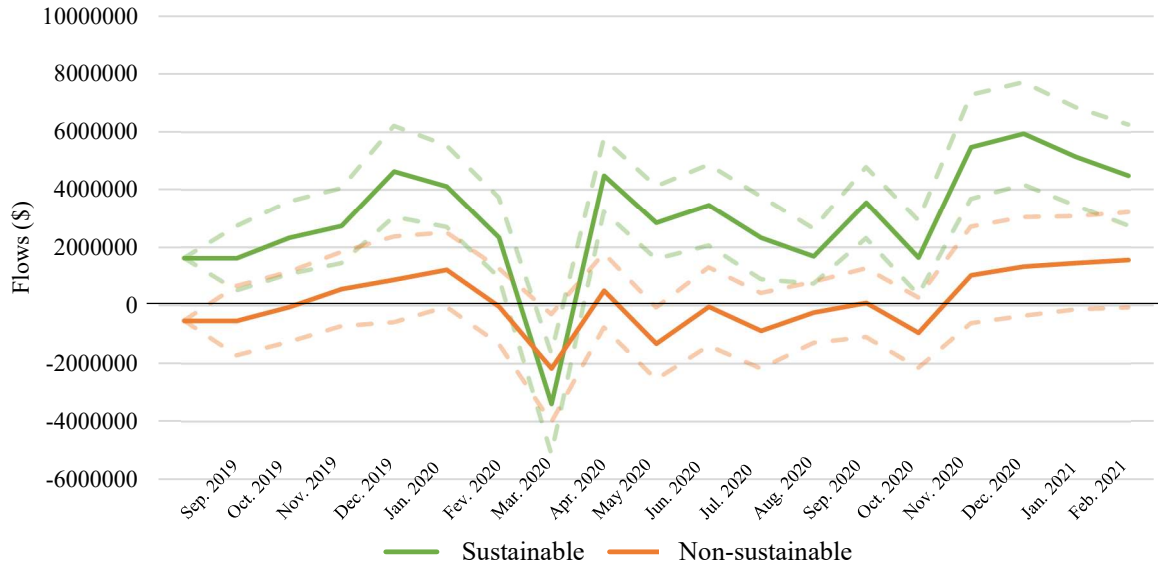
9. <u>EXECUTIVE SUMMARY</u>

In the face of 21st century challenges, sustainable finance has a key role to play. The trend is already well underway as more and more investors are revealing their appetite for this investment philosophy as evidenced by the exponential growth in the total amounts under management.

This thesis aims at testing whether the shock triggered by the Covid-19 pandemic has changed the way investors integrate ESG criteria when investing. The first part of this thesis shows that, regardless of its sustainability category, the drop in flows experienced by equity mutual funds was brutal, but the recovery was similarly rapid. The second examination looks at the movement of flows according to the fund' sustainability category and finds evidence that the coronavirus crisis has exacerbated the value that investors place on sustainable investing. When analysing the impact of the Morningstar rating on flows, funds that have been awarded a high score (5 globes) receive significantly more flows than other funds as a result of the crisis. In addition to the increased interest in ESG ratings, an analysis of the influence of fund names on capital allocation shows that funds whose names refer to sustainability or ESG investment received more flows than others and that this difference widened in the aftermath of the pandemic. Finally, it is shown that these conclusions must be interpreted with caution as they cannot be confirmed when the analysis is repeated using other ESG score providers.

These results therefore suggest that interest in sustainable finance was present before the crisis and remains present in the aftermath of the crisis. The findings also highlight the critical role of the coming regulation for companies, sustainable rating providers and asset managers in the further development of sustainable finance.