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ESG Investments in Turbulent Waters: A Fund Flow Analysis During Market Distress

An empirical analysis of European sustainability-rated mutual funds before and after the outbreak of the COVID-19 pandemic & the Russia-Ukraine war

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We were drawn to the subject of sustainability from the beginning, motivated by its profound relevance in today's society. Given the remarkable growth of sustainable investments and their emergence as a significant component within financial markets, we ultimately decided to focus our thesis on sustainability in the mutual fund market. Additionally, we find it intriguing to link this topic to recent events that have disrupted financial markets.

Working on our master's thesis has been a rewarding and engaging journey. The knowledge that we have acquired in this field is something we will carry forward into our professional careers.

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Abstract

This thesis explores how investments focused on Environmental, Social, and Governance (ESG) criteria are affected by two distinct economic shocks: the COVID-19 pandemic and the Russia-Ukraine war. To examine the main objectives of the study, we analyze how net flows vary across mutual funds with different sustainability ratings during times of crisis, referring to funds with high sustainability ratings as ESG investments.

Our study reveals that the impact on ESG investments varies between the two shocks, challenging the established view of their steady resilience during periods of market distress. We find that ESG investments in general navigated through the pandemic with minimal disruption. However, these funds did not show higher resilience compared to other funds, pointing towards a widespread steadfastness in the market. The analysis of the war, on the other hand, presents a contrasting picture, where ESG investments displayed relatively lower resilience, while low sustainability-rated funds emerged as the most robust group.

The observed shift in investor sentiment away from ESG investments after the outbreak of the war points towards a crisis-driven reevaluation of these investments' appeal. The insight from our study raises questions related to the motivations behind ESG investing, previously attributed to ethical concerns, suggesting a more complex interplay of ethical and financial drivers. Our findings also reveal different investor responses when comparing retail and institutional investors. We observe that retail funds drive the findings of our overall fund analysis and appear to reflect the broader market sentiment more accurately.

In sum, our research adds depth to the understanding of how ESG investments are impacted when facing economic shocks, challenging the notion of ESG investments as safe havens during market distress.

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1. Introduction

In an era defined by global challenges, including the escalating threat of climate change, the transition towards a sustainable economy has become an important priority. In response, the financial sector has experienced a noticeable shift over the past decade, increasingly focusing on sustainable investing and incorporating Environmental, Social, and Governance (ESG) criteria within investment strategies. Projections indicate that assets under ESG investments are expected to surpass $53 trillion by 2025 (Bloomberg Intelligence, 2021). The fast growth in sustainable investing within asset management clearly signifies a shift in financial strategies to align with these global priorities.

However, the journey towards a sustainable economy is not undisturbed, nor is it sheltered from the shockwaves of global crises and economic shocks. In early 2020, the COVID-19 pandemic unexpectedly struck the world, sending tremors through global markets. Starting as a health crisis, the pandemic rapidly transformed into a worldwide social and economic emergency, causing instability and economic distress (Partington & Wearden, 2020). Not long after the pandemic emerged, geopolitical tensions intensified and reached a boiling point as Russia invaded Ukraine in early 2022, escalating an ongoing conflict. The impact of this war goes beyond human suffering, sending shockwaves through energy markets and international relations, and disturbing supply chains worldwide (European Council, 2023).

Socially Responsible Investing (SRI) and ESG investing are both investment strategies within the broader category of sustainable investing. Although SRI has been around for several decades, the introduction of ESG rating systems is a relatively new concept that has made sustainable investing more accessible for investors. In this context, ESG ratings offer a clear classification of funds based on their investment choices. The ratings play a vital role in advancing the practice of ESG investing by helping investors identify the most sustainable investment options – those with high ratings. Launched in 2016, the Morningstar Sustainability Rating (MSR) represents an important step in making ESG considerations for mutual funds more accessible to all investors.[1]

An experimental study conducted by Hartzmark & Sussman (2019) finds a dual motivation for ESG investing. On one hand, investors expect ESG investments to yield better performance

[1] The MSR classifies sustainability from 1 to 5 globes, where 5 globes represent the most sustainable category. See section 4.4.1 for further elaboration.

in terms of returns, implying a financial motive for ESG investing. On the other hand, their research also indicates evidence of motives beyond financial gain, resonating with concepts of altruism or the concept of a "warm glow" – a feeling of personal satisfaction from engaging in ethical or socially responsible activities. This suggests that the motivation behind ESG investing seems to be driven by a combination of financial and non-financial concerns.

Given the two underlying motivations for ESG investing, we find it interesting to investigate how economic shocks impact ESG investments. Several studies find that ESG investments demonstrate resilience during economic shocks, such as the COVID-19 pandemic, pointing to investors viewing sustainability as a necessity rather than a luxury. Research conducted by Pastor & Vorsatz (2020), Bialkowski & Starks (2016), and Gianfrate et al. (2021) collectively suggest that ESG investments not only experience higher net flows compared to traditional funds during times of crisis but also offer better returns, presenting these assets as "rainy-day assets". This trend is further attributed to investors' non-financial motives, particularly ethical considerations, which appear to motivate investors to prioritize sustainability even during market distress.

However, the evidence from previous studies regarding ESG investments' resilience during economic shocks is primarily drawn from health-, financial-, and environmental crises; the emergence of war in Europe presents a new test case. The Russia-Ukraine war presents distinct risks and challenges compared to a global health crisis, potentially challenging the resilience typically associated with ESG investments. This necessitates a reevaluation of whether the robustness observed in ESG investments persists consistently across various types of shocks, especially in the case of geopolitical conflicts not previously studied in this context. Furthermore, analyzing the European market is particularly interesting considering its dominant position in the ESG landscape, capturing 72,5% of the worldwide sustainable investment net flows in the first quarters of 2020 (Bioy, 2020). Previous research also focuses on the U.S. mutual fund market, leaving the European mutual fund market rather unexplored.

Our investigation seeks to fill this research gap by focusing on the European mutual fund market and the impact of two distinct shocks, the COVID-19 pandemic, and the Russia-Ukraine war, on ESG investments. More specifically, we analyze how fund flows, in relation to ESG ratings, withstand or vary in the aftermath of these two shocks, and whether these potential effects remain persistent across the shocks. Understanding the resilience of ESG investments during economic downturns and whether the impact varies between different

economic shocks emerges as an important subject and is thus established as the main objective of this thesis. With this in mind, our main research question is phrased as follows:

1) *Do economic shocks impact ESG investments, and is this impact consistent across various shocks?*

If ESG investments are primarily driven by non-financial motives and ethical concerns, as suggested by several researchers, we should expect the high-rated funds to be less affected by these shocks than their lower-rated peers, even though the shocks potentially represent risks not beneficial for ESG investments. However, we take a somewhat critical stance on this viewpoint, hypothesizing a more intricate approach to ESG investments' response to economic shock.

More specifically, we assume that investors incorporate both financial and non-financial concerns into their investment decisions, with ethical concerns not necessarily being the primary force. This view implies that the impact of shocks on ESG investments will depend on the characteristics of the specific shock. Hence, our hypothesis presents a more nuanced view than formerly suggested. Should this be the case, then the resilience of ESG investments observed during past shocks could reflect more than ethical concerns, and the perception of sustainability as a necessity. The evidence showing that ESG investments also demonstrated higher returns during the crises may offer a compelling reason for investors' steadfastness and commitment to their investment strategy. Building on previous research, our hypothesis seeks to nuance this initial view of resilience among ESG investments during turbulent times. Hence, we open the door for variable shock responses depending on the nature of the crisis and the shock-specific risks at hand.

The COVID-19 pandemic was a global health crisis with a widespread impact across all industries and regions, which was followed by a swift recovery in financial markets (Su et al., 2022). We perceive the pandemic as representing a global shock, affecting markets worldwide relatively uniformly. Therefore, when previous studies identify certain effects of this shock on ESG investments for the U.S. market, it seems reasonable to expect similar outcomes in Europe. The Russia-Ukraine conflict, on the other hand, represents a geopolitical disturbance with more specific economic consequences, primarily impacting the European market more significantly. Further, the war had more targeted effects on specific sectors, such as energy markets and supply chains, potentially leading investors to change their view on ESG investments (European Council, 2023). Hence, the more interesting part is to test whether the

previously observed resilience for ESG investments also applies during the war. In summary, we hypothesize that the effects are not consistent across the pandemic and the Russia-Ukraine war, due to their diverse characteristics and risks at hand, potentially leading to different investor responses.

Furthermore, our sample data distinguishes between funds that are available to retail investors or exclusively for institutional investors. There are fundamental differences between institutional investors and retail investors, such as source of capital, investment horizon, risk tolerance, access to information, expertise, and investment decision process (Palmer, 2023). Furthermore, institutional investors typically have more complex and strategic approaches to investing and are found to be less prone to redirect their flows away from ESG investments in response to market signals (Cao et al., 2021). Due to these factors, we expect that institutional investors are less likely to shift their investment strategies and preferences during economic shocks when compared to retail investors. Hence, we explore this aspect in a secondary research question, which is:

2) *Does the impact of economic shocks on ESG investments differ between institutional and retail investors?*

Our study examines fund flows before and during the pandemic and the Russia-Ukraine war, by executing a regression model based on the difference-in-differences method, incorporating fixed effects. This approach enables us to compare the net flows for funds with high- and low sustainability ratings to those of average ratings, before and after the two shocks. In our analysis, we use the MSR to categorize the funds into different sustainability categories, where ESG investments refer to high-rated funds. Furthermore, this allows for an understanding of how these specific events impact ESG investments compared to lower-rated assets. Based on this, we aim to contribute to the field of understanding the resilience of ESG investments during economic shocks, and the consistency of this across shocks.

Our findings suggest that the two shocks impact ESG investments differently. We observe that ESG investments, in general, were largely unaffected by the pandemic. However, our analysis suggests that the resilience of ESG investments corresponds with a wider market trend, not solely inherent to ESG investments. Conversely, when analyzing the Russia-Ukraine war, we find ESG investments to generally demonstrate relatively less resilience. Their low-rated counterparts, on the other hand, are found to showcase relative robustness during the war,

indicating a shift in investor sentiment away from ESG investments. These findings present a more complex and nuanced picture of ESG investments' responses to economic shocks.

Furthermore, we find that the two shocks impact retail- and institutional funds differently. Our findings suggest that low-rated retail funds recover relatively weaker during the pandemic. However, this observation does not extend to low-rated institutional funds or the comprehensive fund analysis. In our analysis of the war, we find the impact on retail funds to be consistent with the collective fund analysis, indicating that retail investors reflect the broader market sentiment more accurately. Institutional funds, on the other hand, were found to have a consistent response across all funds, indicating more stability in investment strategies among institutional investors during market distress.

In summary, we find that the shocks' impact on ESG investments is not uniform. Our findings challenge the established view of ESG investments' resilience when faced with economic shocks, suggesting a more complex picture, where the impact on ESG investments varies depending on the nature of the shock at hand. Moreover, our study nuances the findings of previous research regarding investors viewing sustainability as a necessity, primarily attributed to ethical concerns. More specifically, our results suggest a more complex interplay of financial and non-financial motives for ESG investing. However, further research is necessary to determine why investors seem to reevaluate ESG investments' attractiveness in the aftermath of the war, but not during the pandemic, and why these different shocks lead to different investor responses.

The thesis is structured as follows. Section 2 covers existing literature regarding mutual fund flows, ESG investing, and economic shocks. This is followed by the background section which sets the theoretical and historical stage for the research. Our data set, variables, and summary statistics are presented in Section 4. The methodology section then describes the model design and the analysis techniques employed. Section 6 presents the results, including both graphical and empirical findings. These results are then further examined in the discussion part presented in Section 7. Finally, the thesis ends with the conclusion presented in Section 8, followed by the references, and the accompanying Appendix section.

2. Literature Review

In this chapter, we will shed light on some of the previously published studies on fund flow dynamics, ESG investments, and the impact of economic shocks on ESG investments from which we have been inspired.

2.1 Fund Flow Analysis

There has been a lot of research on the topic of fund flow dynamics. Research done by Sirri & Tufano (1998) finds that investors, in general, are more likely to invest in funds with particularly good past returns. The research also suggests that funds with easily accessible fund information, reasonable fees, and robust marketing efforts tend to attract greater fund flows compared to funds that lack these characteristics. These findings provide valuable insight regarding different fund flow dynamics; insight that possibly could be transferred to the impact on ESG investments.

2.1.1 ESG Ratings and Fund Flows

Shifting the focus towards ESG criteria and the Morningstar Sustainability Rating (MSR), Ammann et al. (2017) analyse how the introduction of MSR affected fund flows. Their research finds a significant shift in investor sentiment following the launch in March 2016, suggesting a trend where specifically retail investors increasingly transferred their money from lower- to higher sustainability-rated funds. Their research indicates that retail investors value the MSR, in contrast to institutional investors who most likely already had incorporated ESG considerations into their investment strategies, resulting in a weaker response to the publishing of the rating.

The significant positive influence of a high MSR on fund flows is further underpinned by a study conducted by Hartzmark & Sussman (2019). However, they did not find that high sustainability-rated funds yielded higher returns when comparing financial returns with lower-rated funds. The researchers suggested that investors prefer funds with high sustainability ratings because they make them feel good and match their personal values or desire to support societal benefits. Nonetheless, the researchers also found experimental evidence supporting that investors expect high-rated funds to perform better in terms of financial returns, pointing toward investors having financial motives for ESG investing. In summary, their research

presents a nuanced view, balancing financial and non-financial concerns, where investors seemingly are attracted to ESG investments but driven more by the ethical principles these funds represent.

In summary, both studies have examined how the launch of a relatively new and more accessible ESG-rating system affected investor sentiment within the U.S. mutual fund market. Findings from these studies show a positive relationship between higher ratings and increased net flows, suggesting that the launch of the Morningstar Sustainability Rating played an important role in directing investment capital flows into ESG investments.

2.2 ESG Investments and Economic Shocks

Several studies suggest that ESG investments demonstrate resilience during economic shocks, in terms of relatively higher net flows and financial returns. Pastor & Vorsatz (2020) suggest investors view sustainability as an essential need rather than a luxury good, further underpinned by research conducted by Fang & Parida (2022). Both studies argue how ESG investments showed resilience during the COVID-19 pandemic, highlighting how sustainability was prioritized by investors, reflected by net flows into these funds. The suggested robustness of ESG investments is further underpinned by other studies, like Bialkowski & Starks (2016), finding SRI funds to attract more fund flows in general, as well as during several financial and environmental crises, indicating that SRI funds demonstrated relatively more resilience than traditional funds. Moreover, they suggest that these attributes are mostly driven by investors' non-financial motives, primarily ethical concerns.

The existing literature studying the relationship between ESG investments and performance in terms of financial returns presents a mixed image. A study conducted by Bansal et al. (2022) finds that stocks with high SRI ratings underperform those with lower ratings in terms of return during turbulent times. Furthermore, Pastor et al. (2020) argue that green assets generally are priced higher, and therefore should underperform, on average, in the future. Furthermore, the researchers suggest that ESG investors willingly accept lower returns, attributed to non-financial concerns. On the other hand, a study conducted by Pastor & Vorsatz (2020), focusing on fund performance and fund flows, shows that ESG investments yielded relatively higher returns during the pandemic. This aligns with the research conducted by Varma & Nofsinger (2012), finding SRI funds to generally yield higher returns in economic downturns while underperforming in stable conditions. This is further underpinned by a study conducted by

Gianfrate et al. (2021), finding ESG investments to perform relatively better during times of crisis, presenting these assets as “rainy-day-assets”.

A study conducted by Ferriani & Natoli (2021) also provides valuable insight. They studied the effect of ESG risk on fund flows during the COVID-19 pandemic, finding a flight-to-safety effect towards high sustainability-rated funds. Their research highlighted a marked preference for funds with low ESG risk during the pandemic, with a notable weight on environmental factors. Furthermore, Boungou & Yatie (2022) studied how the Ukraine-Russia war impacted global stock market returns in general, finding a significant negative effect on global stock markets. This effect was particularly strong in neighbouring countries and those advocating for conflict resolution. Their findings highlight the typically immediate market reactions to negative economic shocks.

This chapter has synthesized key insights from studies on economic shocks, fund flow dynamics, and ESG ratings. The research suggests that investors value the MSR and that high-rated funds in general attract relatively more net flows than lower-rated funds. Furthermore, previous research also finds that ESG investments, in general, have shown to be resilient in the past decades, as well as during times of crisis. This was also found to be true during the pandemic, where ESG investments yielded higher returns and net flows. Furthermore, researchers attribute these findings to be driven primarily by non-financial concerns. However, some researchers also highlight financial motives for ESG investing, balancing this with ethical concerns. These findings may collectively offer a deeper understanding of how economic shocks impact market dynamics, and more specifically ESG investments.

3. Background

In this chapter, we establish the context for the forthcoming analysis and discussion. More specifically, we present a selection of relevant theories and contextual information that shapes the landscape of our research. This will further contribute to a more detailed examination of our research questions.

3.1 Understanding Economic Shocks

An economic shock refers to unexpected and unpredictable events that have substantial effects on the economy, usually due to exogenous factors not explained by a standard economic model. Shocks could arise in both the demand and the supply side of an economy, and the effect on the economy can be either negative or positive. Moreover, the shocks can occur for several reasons, such as technological disruptions, monetary or fiscal policy changes, as well as natural disasters. Additionally, shocks can differ in terms of their nature, severity, and duration; while some only trigger short-term disruptions in the economy, others might lead to more severe consequences such as an economic recession. (Investopedia, 2023). The financial crisis in 2008 is an example of an economic shock that had severe consequences, which developed into a long-lasting economic recession globally, especially affecting North America and Europe (Wikipedia, 2023). In contrast to the financial crisis, which originated from within the financial sector, we have more recently seen how global economic shocks can be caused by factors outside the economic sphere, for example, the shock caused by COVID-19.

The impact of economic shocks on fund flow dynamics could potentially depend on various factors, such as the shock-specific risks, fund characteristics, the severity of the shock, and policy responses. The shocks analysed in this thesis, the COVID-19 pandemic, and the Russia-Ukraine war, are fundamentally different, possibly impacting ESG investments differently.

3.2 Covid-19 Pandemic

The COVID-19 pandemic was a global health crisis caused by an outbreak of the coronavirus. On January 30th, 2020, the World Health Organization (WHO) declared the outbreak as a public health emergency of international concern. Later on, WHO declared Europe as the epicenter of the pandemic on March 11th. (WHO, 2023). The extensive crisis required the

implementation of intrusive restrictions in many countries, resulting in national lockdowns, closed borders, mandates for isolation and quarantine, along with work- and travel-related restrictions. As April 2020 began, more than fifty percent of the global population was affected by restrictions caused by the pandemic (Sandford, 2020).

The pandemic and all the accompanying restrictions had significant impacts on global economic and financial activities. Uncertainty in the market increased rapidly, and it eventually led to a collapse in major global stock markets, typically referred to as the 2020 Market Crash (Su et al., 2022). The steady growth in the financial markets since the 2009 financial crisis rapidly transitioned into a bear market. For instance, the main UK index, FTSE dropped more than 10% on its worst day since 1987 (BBC News, 2020). However, despite the drastic fall in the financial markets due to the shock, the recovery was quicker than initially expected. The COVID-19 pandemic was in general characterized by extraordinary governmental and monetary support worldwide, aiming to limit the economic and human impact of the disease (IMF, 2021). Research conducted by Su et al. (2022) finds that the European stock market, in general, experienced a rapid and unprecedented recovery, resulting in notable higher returns following the COVID-19 shock, compared to before the pandemic. The years 2020 and 2021 proved to be relatively good worldwide in terms of financial returns, despite the 2020 Market Crash, with the MSCI World Index recording annual returns of 6.11% and 31.98%, respectively (MSCI, 2023b). Comparable numbers for Europe are represented by the MSCI Europe Index, recording annual returns of -2.82% and 25.85% (MSCI, 2023a).

3.3 The Russia-Ukraine War

On the 24th of February 2022, a significant turning point occurred in the Russian-Ukrainian conflict – a conflict that had been going on for nearly a decade. In the years leading up to the Russian annexation of Crimea in 2014, the ties between the European Union and Ukraine grew stronger. In late 2021, the tension intensified as discussions regarding a potential NATO membership for Ukraine took place and Russian forces were deployed near the border to Ukraine. Shortly thereafter, Russia invaded Ukraine on February 24th, 2022, violating the United Nations charter. The global response was immediate, with widespread condemnation, heavy sanctions against Russia, and military aid for Ukraine. (FN-sambandet, 2023). The conflict marked a historic turning point for European security, casting the political situation into its deepest instability since World War II (Gronholt-pedersen & Adomaitis, 2022).

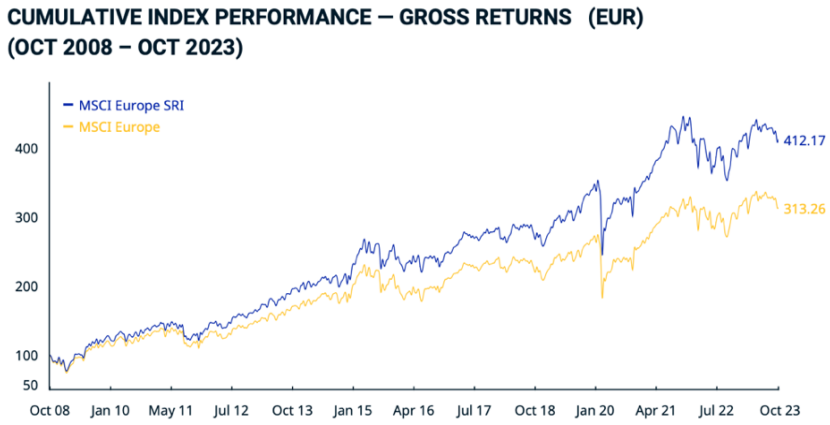
The ongoing war between Russia and Ukraine has significantly impacted the global economy, illustrating the disruptive effects of geopolitical conflicts. Commodity markets were especially disturbed by the conflict, with the energy sector experiencing the most profound impact, as Europe faced a cut in natural gas exports from Russia (European Council, 2023). Exploring how this war impacted various sustainability-rated funds can offer valuable insight into the broader understanding of how times of uncertainty affect ESG investing.

3.4 Overview of ESG Investing

ESG investing has gained significant momentum in recent years. According to Morningstar, there we only 60 SRI funds available to investors in 2006, while the number of European sustainable funds reached 3196 in 2020 (Liu, 2021). But since then, topics such as climate change and human rights, as well as other environmental-, social- and governance-related issues, have contributed to raising awareness around the importance of ESG considerations and stressed the need to incorporate these in investments (Kuhnast & Vallabh, 2021).

According to the Global Sustainable Investment Alliance, all ESG investments accounted for more than a third of the money managed globally in 2021, a figure that shows us which significant position ESG considerations have in the market (ETF Trends, 2021). In the rise of ESG investing, European ESG investments attract significantly higher net flows compared to other regions. In 2020, the flow into ESG investments added up to 233 billion according to Morningstar. (Liu, 2021). As of 2022, the European market accounted for 82% of the worldwide ESG assets under management, which was roughly $2,276 billion, making Europe the leading region of ESG investing (Jacobsen, 2022).

Furthermore, ESG investments have been shown to yield great returns during the last decade. Figure 3.1 illustrates the cumulative and annual performance of the MSCI Europe SRI Index compared to the MSCI Europe Index from October 2008 to October 2023, in terms of financial returns (MSCI, 2023a). It is evident from the graph that the MSCI Europe SRI Index, which focuses on companies with outstanding ESG ratings, generally outperformed the broader MSCI Europe Index in terms of financial returns during the period.



ANNUAL PERFORMANCE (%)

Year	MSCI Europe SRI	MSCI Europe
2022	-13.42	-8.92
2021	28.20	25.85
2020	2.09	-2.82
2019	30.75	26.88
2018	-6.58	-10.00
2017	11.73	10.88
2016	0.70	3.22
2015	15.35	8.78
2014	6.54	7.40
2013	25.02	20.51
2012	19.45	18.09
2011	-4.48	-7.51
2010	12.20	11.75
2009	36.76	32.55

Figure 3.1: *Cumulative and Annual Index Performance (2009-2022). (MSCI, 2023a).*

In recent years, the SRI Index has shown a slight outperformance in the years prior and during the pandemic, when compared to the broader market, as illustrated in Figure 3.1. However, in 2022, when the war emerged, it is evident that the SRI Index underperformed the benchmark.

3.5 Institutional and Retail Investors

In this study, we examine the differences between two investor types: institutional and retail investors. Institutional investors are typically professional investors who manage investments on behalf of others, including organizations and companies. Retail investors, on the other hand, are non-professionals who manage their own assets. (Marcus by Goldman Sachs, 2021). We have gathered data from Morningstar Direct, where it is specified whether funds are available to retail investors or solely for institutional investors. Henceforth in this study, we will refer to these funds as "institutional funds" and the others as "retail funds", indicative of the different investors' responses to the shocks.

The key differences between these two investor types are the scale of investment, accessibility to investments, knowledge, time horizon, and risk tolerance. Since institutional investors are trading on behalf of others, they typically have to follow policies and might face strict regulations when it comes to investment strategies. Institutional investors normally trade at a larger scale than most retail investors. In summary, institutional investors are generally characterized by having more complex investment strategies with longer investment horizons, larger scales of investments, and more conservative risk profiles, compared to retail investors.

4. Data and Sample Overview

4.1 Data Overview

In our thesis, we have retrieved all our data from the Morningstar Direct Desktop, which is an investment analysis system where we have access to an extensive database with the necessary data on mutual funds, and other essential variables for our analysis.

We collected raw data on all European Open-End Mutual funds at both share class- and fund levels. When data points only were available at the share class level, we systematically aggregated them to the fund level to ensure uniformity. Our dataset covers a period from January 2019 to March 2023, enabling a comparative analysis of investment trends before and after the outbreak of the COVID-19 pandemic and the Russia-Ukraine war.

After consolidating the data at the fund level and omitting funds with missing values, our final sample consists of 4,407 funds. This includes 887 institutional funds and 3,520 retail funds. Additionally, to mitigate the influence of outliers in our analysis, following the approach of Hartzmark & Sussman (2019), we have excluded the extreme top 1% of net flow data. The final dataset is structured in a long format, optimizing the data for our in-depth analysis using R-studio. The next section will detail our data collection process and the thorough data preparation steps taken to prepare the dataset for our analysis.

4.2 Data Collection Process

4.2.1 Collection and Cleaning Process

We collected daily data at the fund level on fund size and net flows in euros, as well as weekly data at the share class level on returns, sustainability ratings, and total net assets (TNA).[2] This allowed for calculating weighted average fund-level returns, utilizing the share-level TNA and total fund size per week. We also gathered static variables like Morningstar's overall rating, alpha, inception date (fund age), equity asset allocation, and investor type – all at the share

[2] Fund size is equal to a fund's total net assets (TNA), meaning the total assets net of fees and expenses across all share classes in a mutual fund (Morningstar, 2023).

class level. Furthermore, we collected the equity Russia variable explicitly for the war analysis, capturing the net share of each fund's equity placed in Russia.

After retrieving the necessary data from Morningstar Direct, we processed it to form our final dataset. Firstly, we converted the daily fund-level data to weekly data, by using the last daily data per week for fund size and summing the daily net flows per week. Furthermore, we consolidated data from multiple share classes to fund-level data. We calculated the fund age variable by using the inception date at the share class level and obtained the age of the oldest share class when aggregating to the fund level. For variables such as past yearly returns, equity Russia, Morningstar's Overall Rating, asset allocation (%), and institutional indicators, we kept the values from the largest share class per fund. To determine the largest share class, we utilized the TNA as of February 2022 on the share class level. The methodology of aggregating the data from the share class level to the fund level has been widely employed in prior research, for instance, utilized by Hartzmark & Sussman (2019). Additionally, funds with less than 80% equity investment or with a fund size below a threshold of 500,000 EUR were excluded.

Furthermore, we computed a weighted average for the weekly returns and alphas across share classes, to aggregate the data to the fund level. To calculate the weighted average, we first created weights for each week by dividing the total net assets at the share class level (monthly) by the total fund size (weekly).

Before importing our dataset into R-studio, we converted it into a long format, suitable for time-series and panel data analysis. In our case, each row denotes an individual observation of a specific fund for a given week, with multiple rows per fund. The dataset includes dynamic data like weekly return, net flow, and fund size, and static variables that do not change over time such as fund age and the Morningstar Overall Rating. Adopting the long format offers several advantages. This format facilitates comparison between different periods and observational units, making it an ideal choice for our analysis.

4.3 Sample Period

Our study uses weekly mutual fund data spanning from January 2019 to March 2023. This four-year timeframe provides us with valuable insights into investment trends both before and after the outbreak of the COVID-19 pandemic and the Russia-Ukraine war. To analyze the impact of these shocks on ESG investments, we segmented both economic shocks into three

phases, illustrated in Figure 4.1: pre-shock, shock, and post-shock. In the sections below, we will briefly explain in more detail how we have divided them, and our rationale for selecting the specific periods for the different phases characterizing our study.

In our analysis, we chose a one-year duration for both pre-shock and post-shock recovery periods, balanced with shorter shock durations for the immediate shock periods. The duration of the selected pre- and post-periods is generally longer than those of previous studies. However, this approach allows for a detailed examination of the trends before and after the shocks, ensuring clear baseline and recovery patterns. Longer pre- and post-shock periods help identify delayed impacts and control for seasonal variations, enriching our understanding of the more persistent impacts of the two shocks. Conversely, shorter shock periods facilitate a focused analysis of the immediate effects. Including the weeks leading up to the outbreak of the shocks in the shock period, particularly when there is significant media focus, allows for understanding how the situation evolved and gradually approached the shock point. However, it is important to acknowledge that using longer pre- and post-periods can present challenges, like the impact outside of external factors not related to the shocks, which could potentially skew the results. The goal is to make sure that our study's conclusions reflect the impact of the shocks, without being overshadowed by unrelated external factors. Thus, a careful interpretation is key to preserving the analysis's accuracy and reliability.

The COVID-19 pandemic began affecting Europe significantly around late February to early March 2020, and WHO declared Europe as the epicenter of the pandemic on March 13th. Hence, we have identified the shock caused by COVID-19 as the period from 23.02.2020 to 29.03.2020, hereby referred to as the covid shock. The Russia-Ukraine war, on the other hand, officially began with the invasion of Ukraine on February 24th, and we define the war shock period from 31.01.2022 to 20.03.2022. This period includes the market tension leading up to the invasion, as well as the following weeks. This methodology ensures a comprehensive and nuanced understanding of both the short-term and extended impacts of the shocks. The defined periods related to the two shocks are illustrated in Figure 4.1 below.

The Covid periods

Pre-Shock	Shock	Post-Shock
17.02.2019 - 16.02.2020	17.02.2020 - 29.03.2020	30.03.2020 - 04.04.2021

The War periods

Pre-Shock	Shock	Post-Shock
21.02.2021 - 30.01.2022	31.01.2022 - 20.03.2022	21.03.2020 - 26.03.2023

Figure 4.1*: Definition of sample periods*

Further in our thesis, we will refer to the defined shock-period caused by the pandemic as the covid shock, and the defined shock-period prompted by Russia's invasion of Ukraine as the war shock. Similarly, the defined post-periods will be referred to as the following recovery periods for the pandemic and the war.

4.4 Main Variable Definitions

4.4.1 Morningstar's Sustainability Rating

Crucial to our analysis is the assessment of how investors perceive and evaluate the sustainability of funds, and to do this, we rely on a rating provided and calculated by Morningstar Inc. The Morningstar Sustainability Rating (MSR) was first introduced in 2016 aiming to help investors assess how funds address environmental, social, and governance issues, primarily grounded on the ESG risk ratings of the companies within their portfolios (Morningstar Research, 2021). When computing the rating, Morningstar uses Sustainalytics' ESG Risk Ratings for corporate issuers and Sustainalytics' Country Risk Ratings for sovereign issuers - based on historical holdings. A fund is eligible to obtain a sustainability score if minimum 67% of its assets possesses a company ESG risk rating. Furthermore, the rating is based on a scale ranging from 1 (lowest) to 5 (highest). The MSR is updated once a month, based on the latest portfolio for each fund. The fund's portfolio first receives a score, and a rating is then assigned to the fund based on its position relative to its peers within the same Morningstar Global Category. (Morningstar Research, 2021). This suggests that a higher MSR represents lower ESG risk relative to a fund's peer group.

In our analysis, we classify the funds into three distinct sustainability categories using the MSR: the high-rated funds also referred to as ESG investments, correspond to an MSR of 5.

The average-rated funds fall within the 2 to 4 range, while low-rated funds have an MSR of 1. It should be noted that the MSR is a dynamic variable, and consequently, a fund can be in one sustainability category in one month, and another category the next, if the MSR changes.[3]

4.4.2 Net Flow Percentage

Our main variable of interest is net flow (%). This variable builds on the net flow (EUR) variable collected from Morningstar Direct, which refers to the total amount of money being moved in or out of a fund for a given period. Furthermore, the net flow (EUR) variable represents the change in a fund's TNA that cannot be explained by the monthly total return and is corrected for reinvestments and distributions (Morningstar Research, 2018).

More specifically, our dependent variable net flow (%) is calculated at the fund level, as the proportion of the current week's net flows in euros, relative to the previous week's fund size. See Equation 1 for the calculation of our dependent variable net flow (%), based on Morningstar's calculation of funds weekly net cash flows in EUR (Morningstar Research, 2018).

$$(1)\ Net\ Flow\ (\%) = \frac{Net\ Flow\ (EUR)_t}{Fund\ Size_{t-1}}$$

$$= \frac{TNA_t - TNA_{t-1} - 1 * (1 + r) + \left(\left(\frac{TNA_{t-1}}{p_{t-1}}\right) * \sum_{i=1}^{t} d_i\right) * (1 - b)}{TNA_{t-1}}$$

Equation 1: *Our dependent variable Net Flow (%)*

$Net\ Flow\ (EUR)_t = net\ cash\ flows\ in\ a\ mutual\ fund\ in\ EUR\ for\ week\ t$

$TNA_{t-1} = total\ net\ assets\ in\ a\ mutual\ fund\ at\ the\ end\ of\ week\ t - 1$

$TNA_t = total\ net\ assets\ in\ a\ mutual\ fund\ at\ the\ end\ of\ week\ t$

$r_t = monthly\ return\ for\ week\ t$

$d_i = distribution\ (capital\ gain\ or\ dividend)\ during\ week\ t$

$p_{t-1} = net\ asset\ value\ in\ the\ beginning\ of\ week\ t$

$b = reinvestment\ rate$

[3] We have conducted a similar analysis using the static MSR instead of the dynamic MSR rating, which did not result in any noteworthy differences. For the COVID-19 analysis, the rating from February 2020 was used, while the rating for January 2022 was used in the analysis of the Russia-Ukraine war.

This method is frequently used in previous studies that examine fund flows. In our opinion, the net flow (%) variable gives a relative understanding of the size of capital flows in relation to the size of the funds. We argue that the calculation is a good indicator of fund flow. This method is useful when comparing net flows across funds of different sizes because it normalizes the fund flows. More specifically, it makes it possible to see which type of fund is experiencing a relatively larger movement in capital flows relative to their size.

4.5 Sample Overview

Summary Table

Summary Statistics for the Dataset

Variables	Observations	Mean	St. Dev	Minimum	Maximum
Fund Size	821,691	466.0	1,141.2	0.6	34,404.0
Net flow	821,691	0.0006	0.3694	−1.1369	1.1521
Return	821,691	0.20	2.59	−35.28	25.56
Fund Age	821,691	15.1	10.3	0.0	82.3
Equity Russia	821,691	0.22	1.35	−9.27	57.94
Sustainability Rating	821,691	3.22	1.11	1.00	5.00
Overall Rating	821,691	3.17	0.93	1.00	5.00
Alpha	821,691	−1.90	5.20	−31.18	36.80

Table 4.1: *Summary statistics of key variables over the sample period*
This table presents the number of observations, mean, standard deviation, minimum value, and maximum value of each variable. Sustainability Rating and Overall Rating is denoted through a stochastic whole-number scale from 1 (lowest rating) to 5 (highest rating). The other variables are expressed as numerical values. Fund Size is in million Euros, net flow, return, and alpha is in percent, determined weekly. Fund age is in years, and Equity Russia is determined as a fraction of the fund's equity placed in Russia, determined monthly. All variables are continuous, except overall rating and alpha, which are static variables throughout the estimation period.

Table 4.1 presents summary statistics for the entire estimation period to provide a brief overview of the data. The dataset contains 821,691 observations for each variable presented, ranging from the first week of January 2019 to the final week of March 2023. Our main variable of interest, net flow (%) exhibits an average value of positive 0.0006%, with a standard deviation of approx. 0.37%. The range in net flow spans from a notable outflow of -1,137% to a prominent inflow of 1,152%, indicating fluctuations in investor sentiment or deliberate financial maneuvers throughout our dataset.

Another notable variable is the MSR, which has an average of 3.22. Similarly, the Morningstar Overall Rating averages at 3.17. Both ratings suggest that the majority of funds fall within the medium to high range on their respective scales. Further, the average weekly return is 0.20%, with a notable standard deviation of 2.59%. The returns have fluctuated significantly, as evidenced by the minimum return of -35.28% and the maximum of 25.56%.

The fund sizes vary greatly, with an average of €466 million while peaking at €34,404 million, showing the potential for a wide range of fund scales in the dataset. The average fund age is 15.1 years, suggesting a mix of both older and newer funds.

The variable Equity Russia includes data spanning from the first week in the pre-war period and throughout the post-war period. Within this timeframe, funds, on average, allocate 0.22% of their equity holdings to Russia. The dataset reveals a maximal allocation to Russian equities at 57.94%. Conversely, the minimal allocation registers at -9.27%, implying some funds might be shorting Russian equities. The average alpha for the funds during the sample period stands at -1.90%, also showing large variations across funds.

Summary Table

Descriptiv Statistics for each Sustainability Category

Sustainability Category	Observations	Funds	Age	Fund Size	Net Flow	Return	Equity Russia
High	174,466	919	15.3	518.13	0.03	0.20	0.10
Average	562,405	2,967	15.3	464.73	−0.01	0.20	0.24
Low	84,820	449	14.2	367.30	−0.02	0.21	0.29

Table 4.2: *Summary statistics for each sustainability category*

When examining an overview of the different sustainability categories, presented in Table 4.2, we find that the high sustainability category stands out in terms of their financial clout. With an average fund size of €518 million, they markedly surpass the low-rated funds, which average at €367 million. Notably, while average-rated funds dominate in quantity, they exhibit a marginal negative net flow on average, along with low-rated funds. Conversely, high-rated funds have, on average, exhibited a positive net flow during the sample period. Another notable observation is the increasing equity investments in Russia as we move from the high towards the low sustainability category.

Summary Table

Descriptiv Statistics for Institutional and Retail Funds

Fund Category	Observations	Funds	Age	Fund Size	Net Flow	Return	Equity Russia
Institutional	160,225	876	12.9	574.93	0.0049	0.21	0.29
Retail	661,466	3,459	15.7	439.62	−0.0004	0.20	0.20

Table 4.3: *Summary statistics for each fund category*

Table 4.3 examines summary statistics for the different fund categories: institutional funds and retail funds. Although smaller in number, institutional funds have a considerably larger average fund size of €574,9 million, compared to an average of €439,6 million for retail funds. This is further corroborated by Figure A.1 in the Appendix, which illustrates the development of average fund size for the two fund categories throughout the sample period. Another finding is that, on average, institutional funds experience a positive net flow, while retail funds exhibit a slightly negative net flow.

5. Methodology

The methodology used in our analysis will be outlined in the sections below, detailing how we implement different estimation techniques to a linear regression model when addressing our research questions. The method used in our analysis is based on a linear regression model, more specifically a two-way fixed effects model using a differences-in-differences approach. This approach ensures a robust and comprehensive analysis.

5.1 Linear Regression Model

Our analysis employs a model based on linear regression theory, using ordinary least squares. Linear regression is a statistical method used to examine the relationship between a dependent variable and one or more independent variables by fitting a linear equation to the observed data. It is a fundamental tool in data analysis, providing insights to how different variables are correlated and the strength of these relationships.

We have addressed a few critical assumptions in our linear regression model to ensure reliability. Firstly, we conducted a Wooldridge test, confirming the presence of autocorrelation in the residuals, a common issue in panel data. Additionally, the Breusch-Pagan test revealed heteroskedasticity in our dataset. To counter these violations of independence and homoskedasticity assumptions, we cluster our standard errors, effectively adjusting for heteroskedasticity and autocorrelation within clusters, as suggested by (Cameron & Miller, 2015). This approach helps avoid underestimating the standard errors and overestimating statistical significance. Furthermore, a Variance Inflation Factor analysis indicated that multicollinearity is not a concern in our model.[4]

In the following sections, we will briefly describe the statistical methods and techniques we have used before we explain our specific regression model in detail.

[4] A VIF analysis is to detect any multicollinearity among our independent variables, reducing the risk of potential bias in our coefficient estimates (Investopedia, 2023).

5.1.1 Fixed Effects

Our panel data comprises weekly data from over 4,000 unique funds over several years. This structure makes fixed effect models well suited, according to Baltagi (2005), as they control for each fund's time-invariant characteristics, thereby highlighting the influence of time-varying factors such as ESG ratings and economic shocks. A fixed effects model is preferable when evaluating the effects of dynamic variables within our funds, which is crucial for our focus on the impact of various shocks on ESG investments. Furthermore, when comparing pre-shock, shock, and post-shock periods, a fixed effect model can effectively handle such time-specific effects. (Baltagi, 2005).

In our case, it is reasonable to believe that unobserved individual characteristics exist and correlate with our dependent variable, for example, management style or risk profile. These are variables we do not control for in our model due to a lack of available data amongst our funds. However, by assuming that the unobserved characteristics are constant across time but vary across funds, we can control for these unobserved characteristics by using fixed effects in our model, making this model preferable. We conducted a Hausman test to determine the suitability of fixed effects models over random effects for our specific regression model. The test yielded a significantly low p-value (<2.2e-16), indicating that fixed effects models are more appropriate for our data analysis than random effects models. Next, we'll elaborate on how fixed effects models operate.

Fixed effects are formulated as follows in a general model, where one typically distinguishes between time-fixed effects and individual-specific effects:

$$Y_{i,t} = \mu_i + \eta_t + \beta X_{i,t} + \varepsilon_i$$

Equation 2: *General fixed effects model*

Equation 2 specifies that the outcome variable $Y_{i,t}$ for fund *i* at time *t* is a function of individual-specific effects μ_i and time-fixed effects η_t, as well as observed variables $X_{i,t}$ with β representing the coefficients of those variables and ε_i representing the error term. The individual-specific effects μ_i capture all unobserved characteristics of each fund that do not change over time. The time-fixed effects η_t, on the other hand, capture both observed and unobserved factors that change over time but are constant across funds. The fixed effect model treats each fund's average effect as a constant, helping to control for differences between funds

that could affect the coefficients, whether these factors are observed or unobserved. The model focuses on the changes within each individual fund over time and removes the influence of differences between the funds. By doing so, the model reduces the risk of biased estimators due to omitted variable bias, making our analysis of the panel data more reliable.

5.1.2 Differences-in-Differences Regression

The differences-in-differences (DiD) regression is a method in statistics used to examine the causal impact of a treatment, in our case the impact of economic shocks, on different groups. The method helps in controlling for unobserved, time-invariant factors that could affect the outcome, thus offering a more precise estimate of the causal effect. However, this method does not control for the time-varying factors that could have different effects on the outcomes for each group. The method compares the evolution of a specific outcome, in this case, net flows, across groups that are differently affected by the shocks. (Abadie, 2005). Our DiD-regression uses average-rated funds as the baseline control group, comparing these funds with high- and low-rated funds, to assess the varying effects of shocks based on sustainability ratings. We hypothesize that although all funds are exposed to the shocks, the extent of the impact is linked to the fund's sustainability rating.

The accuracy of DiD estimates relies on the parallel trend assumption, and if this assumption is violated, it could lead to biased estimates. The assumption suggests that, in the absence of the shocks, all groups would have followed parallel trends over time. (Abadie, 2005). If this assumption holds, it suggests that any observed divergence in trends post-shock can be attributed to the influence of the economic shock differentiated by the sustainability ratings. To assess this assumption, we conducted a visual analysis by plotting the development of our dependent variable, net flow (%), during the pre-covid and pre-war periods, for each sustainability category.

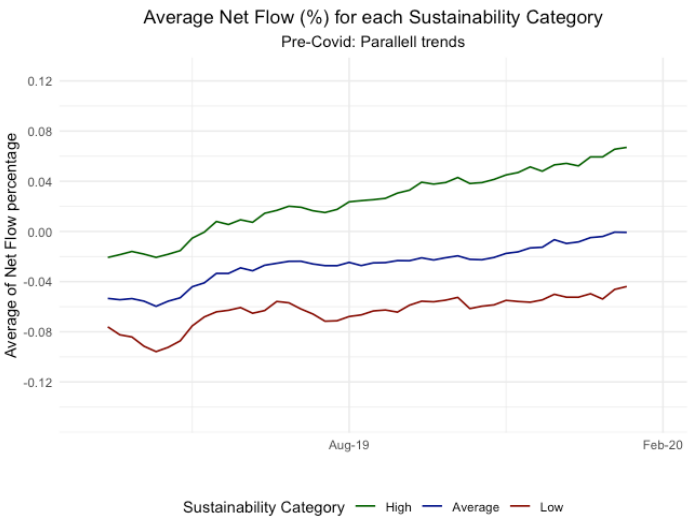


Figure 5.1: *Parallel trends pre-covid*

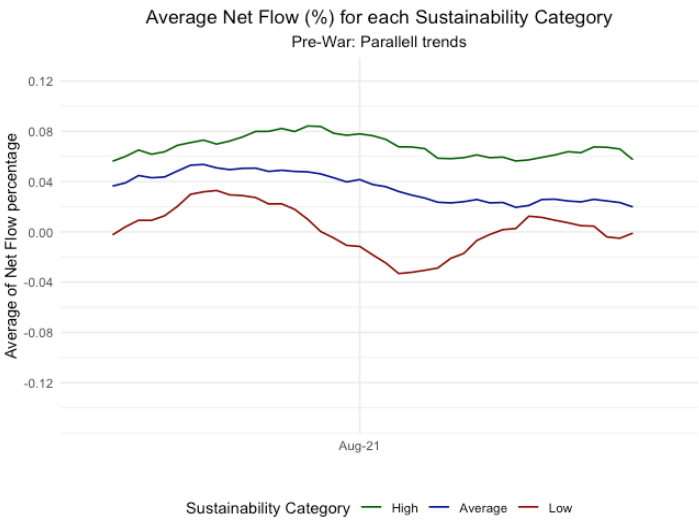


Figure 5.2: *Parallel trends pre-war*

The trends for the groups before the covid shock are illustrated in Figure 5.1, while the trendlines before the war shock are illustrated in Figure 5.2. We have adjusted for seasonality and applied a 10-week rolling moving average, to help smooth out short-term fluctuations and reveal the underlying trends more clearly. By visually inspecting the provided graphs, we attempt to assess whether the assumption seems to hold. From Figure 5.1, it appears that the three lines for the different sustainability categories are relatively parallel to each other before the pandemic. The lines seem to move in a consistent pattern with each other, without any noteworthy converging trends, supporting the parallel trend assumptions. Regarding the pre-war period, Figure 5.2 illustrates that the three lines appear to move in a generally parallel pattern throughout the period. While the lines are not perfectly parallel, they do not exhibit strong diverging or converging trends, which is promising for the assumption. Based on this visual inspection, we assume that the parallel trend assumption holds.

We will in the following section explain the specific model used in our analysis, which combines the difference-in-difference approach with a fixed effects model.

5.2 Our Regression Model

Our primary objective is to explore whether economic shocks, specifically the COVID-19 pandemic and the Russia-Ukraine war, impact ESG investments and to assess if the impact is consistent across both shocks. To do so, we employ separate regression models for each shock and the corresponding recovery period, comparing the impact on high- and low-rated funds against average-rated funds.

5.2.1 Main Regression Model

$$Net\ Flow_{i,t} = \beta_1 * High\ ESG_i \times Shock\ Period_t + \beta_2 * Low\ ESG_i \times \text{Shock Period}_t + \beta_3 * High\ ESG_i \times Post\ Period_t + \beta_4 * Low\ ESG_i \times \text{Post Period}_t + \beta_5 * High\ ESG_i + \beta_6 * Low\ ESG_i + \beta_7 * \text{Shock Period}_t + \beta_8 * Post\ Period_t + \mu_i + \eta_t + \gamma * X_{i,t} + \varepsilon_i$$

Equation 3: *Main regression model*

Our main regression model is presented in Equation 3 and will be elaborated on in the following section. The variables $High\ ESG_i$ and $Low\ ESG_i$ indicate whether fund *i* has a high (5) or low (1) MSR. Average-rated funds are the omitted sustainability category in our model.[5] $Shock\ Period_t$ and $Post\ Period_t$ are dummy variables indicating the periods during the two different shocks and recovery periods. The pre-period is the omitted period in both of our models, serving as the reference group. The key parameters of interest are $\beta_1, \beta_2, \beta_3$ & β_4 which capture the interaction effects of the sustainability ratings with the shock- and post-shock dummies. More specifically, these coefficients estimate the difference in net flows for high- and low-rated funds in the shock- and post-period compared to average-rated funds, relative to the pre-period. Furthermore, β_5 & β_6 captures the difference in average net flow for high- and low-rated funds compared to average-rated funds in the pre-periods. β_7 & β_8 measures the relative difference in net flows for average-rated funds during the shock periods and post-shock periods, respectively, relative to the pre-shock period. These coefficients are important to understand the general effect of the shocks and post-shock periods on the net flows for funds with an average sustainability rating. The coefficients of the interaction terms then adjust these baseline effects for funds with high- and low ratings.

Furthermore, the model controls for unobserved time-invariant fund-specific effects μ_i, including all unobserved characteristics of each fund that do not change over time. The model also controls for time-fixed effects η_t, including both observed and unobserved factors that change over time but are constant across funds. Lastly, $X_{i,t}$ is a vector including fund-level controls, such as our dynamic variables *Lagged Weekly Return*, *Fund Age,* and, specifically for our war model, *Equity Russia,* while ε_i captures the error term.

[5] To provide further insight, we also conduct a similar analysis comparing ESG investments directly to low-rated funds. See Chapter 6 and the accompanying appendix section for these results.

5.2.2 Regression Model for Different Investor Types

In our study, we employ our regression model on different sub-samples, separating institutional and retail funds. Our objective is to investigate whether the two shocks impacted ESG investments differently for the two fund types. By conducting separate analyses for institutional and retail funds, we aim to uncover nuanced insights into how different investor types respond to global crises in the context of sustainability. This will give us deeper insight into understanding the dynamics at play in the fund flow market during times of uncertainty and market distress.

6. Results

6.1 Graphical Evidence

In the following sections, we present graphical evidence supporting our analysis. Using charts and graphs, we will illustrate key trends and patterns observed in our data, providing a visual representation of our findings. This visual approach makes it easier to interpret the complex data set and expands our overall understanding of the findings in our study.

6.1.1 All European Mutual Funds

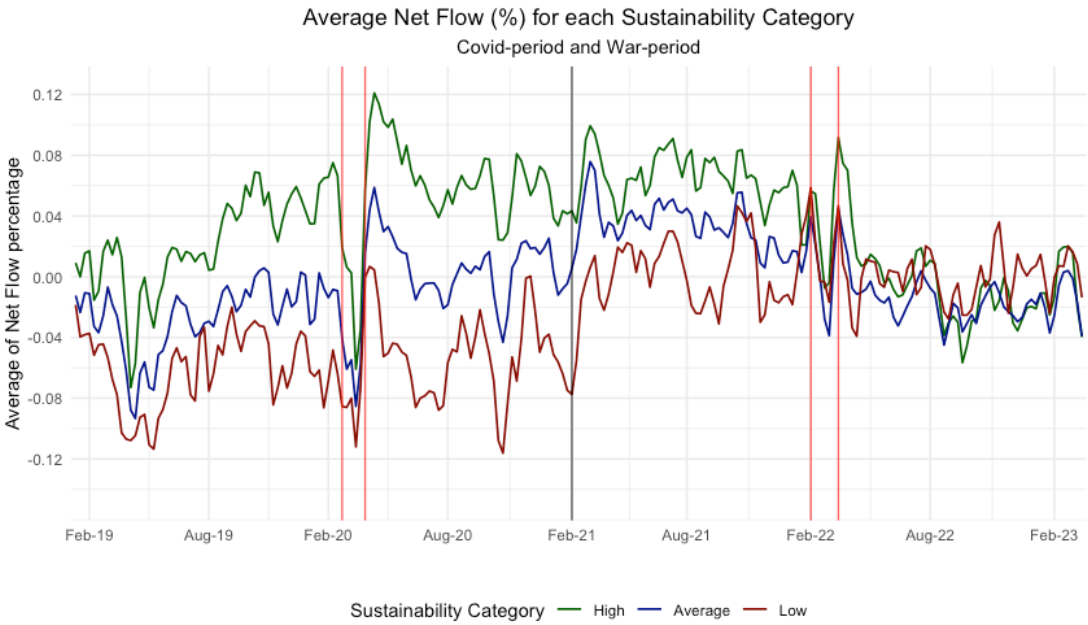


Figure 6.1: *Average net flows for all funds for each sustainability category*
Adjusted for yearly seasonality and using 2 weeks moving rolling average to provide a clearer visualization of the prevailing trends. This also applies to Figure 6.3 and Figure 6.4. The shocks of interest are denoted by red vertical lines; the first two lines correspond to covid shock, while the last two lines correspond to the war shock. The black vertical line denotes the start of the pre-war period. This applies to all figures in chapter 6.

Figure 6.1 illustrates the average net flow for each sustainability group throughout our sample period. The first notable observation is that all fund categories in general seem to exhibit similar fluctuations throughout the entire sample period. Further, it is evident from the graphical representation that both shock periods are characterized by a sharp decline in net flow across all sustainability categories. Additionally, the plot illustrates that the low-rated funds exhibited, on average, a negative net flow throughout all COVID-19-related periods. Average-rated funds experienced negative net flows, on average, prior to the pandemic, but

seem to have experienced a relative increase in average net flow after the outbreak of the pandemic. High-rated funds, on the other hand, experienced a positive and relatively higher average net flow both prior to the pandemic, as well as during the post-covid period. These observations are further emphasized by the bar plot illustrated in Figure A.2, presented in the Appendix. The figures underpin that the increase in net flow seems to be present for high- and average-rated funds during the post-covid period, relative to pre-covid. The gap between the categories' net flows remains throughout the covid-related periods.

When analyzing the Russia-Ukraine war, on the other hand, we observe a different pattern. Low-rated funds seem to exhibit a relative increase in net flows in the pre-war period, compared to the previous periods. Furthermore, we can observe a relative decrease in net flows for average and high-rated funds in the post-war period, compared to the pre-war period. These observed patterns are also underpinned by the bar plot illustrated in Figure A.3, presented in the Appendix. The gap between the categories' net flows was still present during the pre-war period, but the differences decreased significantly after the war shock. The net flows for low-rated funds seem to surpass those of the high- and average-rated funds after the war shock - a phenomenon not observed at any other point in our sample period.

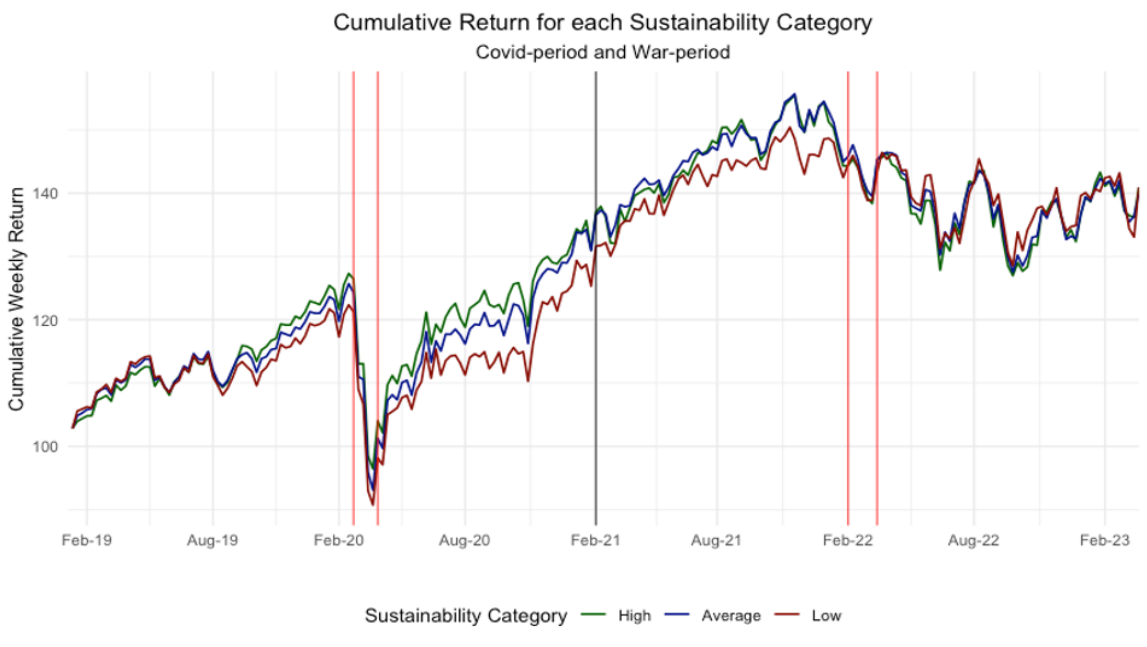


Figure 6.2: *Average cumulative return for each sustainability category*

Furthermore, Figure 6.2 illustrates the cumulative returns for each sustainability category throughout the sample period. Firstly, we see that during the latter half of the pre-covid period and the whole post-covid period, the cumulative returns for high-rated funds generally rank higher in value compared to the other groups. Low-rated funds, on the other hand, seem to

perform relatively worse compared to average-rated funds during the same timeframe. The difference between the groups' cumulative return decreases in the pre-war period compared to post-covid. Furthermore, we can observe a slight outperformance for low-rated funds, compared to the other categories, during the post-war period. Moreover, both shock periods are characterized by a sharp decline across all funds. Lastly, we can observe an upward-sloping trend for all categories prior to the pandemic, as well as after the covid-shock and throughout the pre-war period. The post-war period, on the other hand, is characterized by a more stable or slightly decreasing trend for all funds.

6.1.2 Retail and Institutional Funds

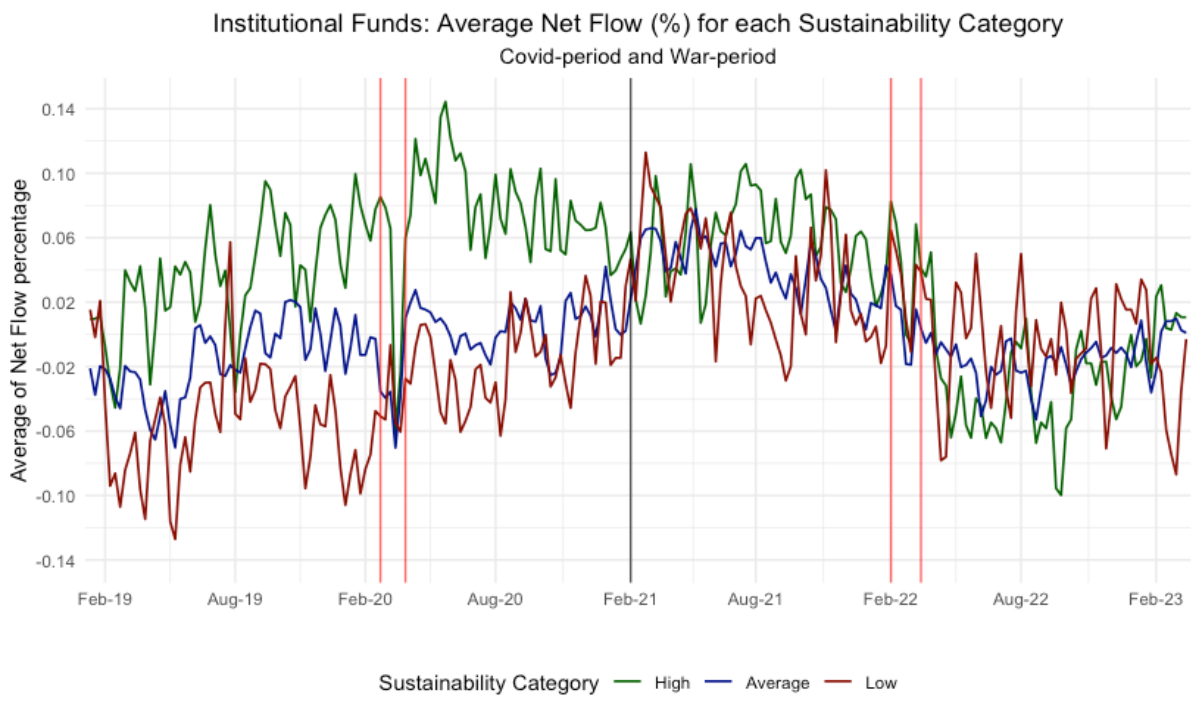


***Figure 6.3**: Average net flows for institutional funds for each sustainability category*

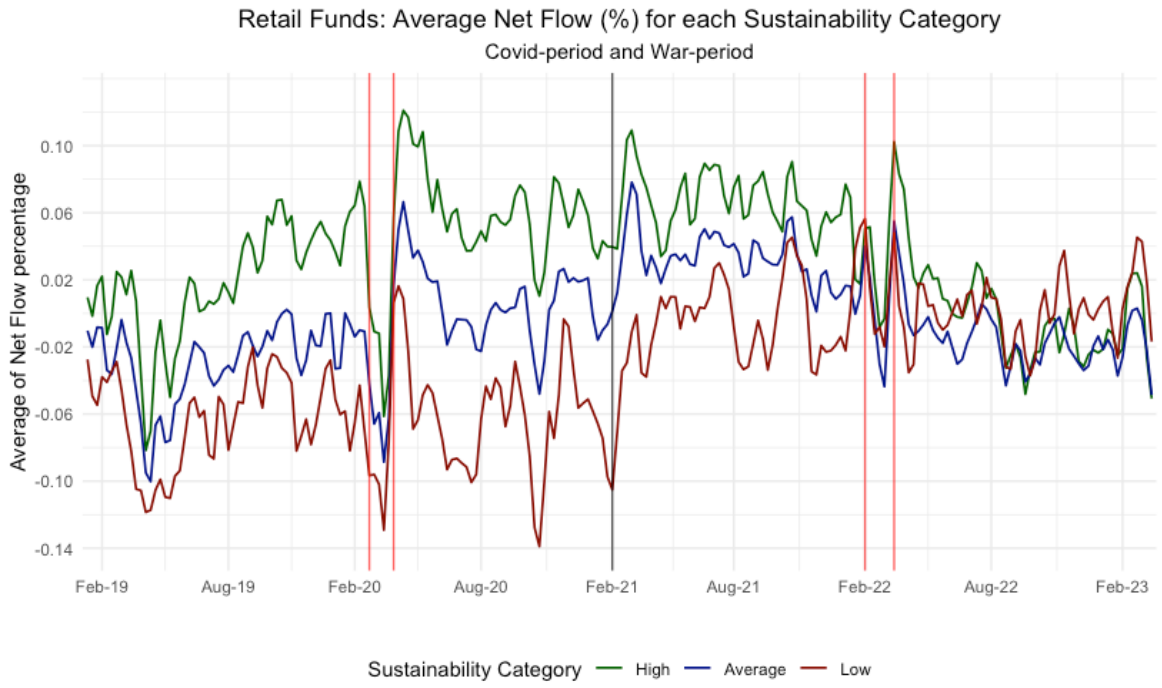


Figure 6.4: *Average net flows for retail funds for each sustainability category*

Analyzing the net flow trends across sustainability categories for both institutional funds and retail funds, illustrated in Figure 6.3 and Figure 6.4, reveals some differences between the two fund types. Firstly, we observe that the magnitude of the net flow variations, in general, seem to be more pronounced for retail funds in comparison to their institutional counterparts. This is especially present during the post-covid and pre-war periods. This is further underpinned by the bar plots illustrated in Figure A.4 and Figure A.5, presented in the Appendix. Furthermore, the bar plots do not distinguish between the sustainability categories, and hence reveal some differences between the fund types in general. More specifically, in the pre-covid period, institutional funds generally experienced higher net flows than retail funds, while the opposite is observed in the post-covid period. After the war shock, on the other hand, institutional funds mainly exhibited negative net flows on average, while retail funds mostly exhibited positive average net flows.

The results from our regression model will be executed in the following. Moreover, the analysis will determine the significance of the findings discussed above, and if the observed findings remain after controlling for other explanatory variables and fixed effects.

6.2 Regression Results

The tables below present regression results from our regression model, detailed in section 5.2. The primary coefficients of interest are the interaction terms, which capture the interaction effects of the sustainability ratings and indicators for the shock and post-periods. Essentially, these coefficients quantify the additional change in net flows to high and low-rated funds compared to average-rated funds during the shock and post-shock period, relative to the pre-shock period. All interpretations below assume that the other variables in the model are held constant. Furthermore, the interpretation of the variables retains consistent applicability across all regression output tables, substituting the term "period" after post-, pre-, and -shock with either "war" or "covid" where contextually appropriate. Only coefficients significant at the 5% level or lower are considered statistically significant.

6.2.1 All European Mutual Funds

Table 6.1 presents the regression results from our regression model during the COVID-19- and war-related periods. The findings from the regression analysis will be interpreted in the following section.

The COVID-19 Pandemic

The *Covid Shock* coefficient reflects the estimated impact of the covid shock on the net flows of funds with average ratings, controlling for other factors in the model. The *Covid Shock* coefficient equals -0.044 and is statistically significant at the 1% level. This suggests that there was a 0.044 percentage point decrease, on average, in net flows for average-rated funds in the covid shock period, compared to the pre-covid period. The coefficients for the interaction terms then adjust this baseline effects for funds with high- and low ratings. However, the shock-related interaction terms lack statistical significance. Hence, we cannot conclusively differentiate the impacts of the different sustainability categories from each other during the COVID-19 shock period, based on our data.

Did-analysis: the pandemic and the Russia-Ukraine war

	Dependent variable: Net Flow (%)	
	Covid	War
High ESG	0.045***	0.028***
	(0.007)	(0.008)
Low ESG	-0.048***	-0.031***
	(0.008)	(0.010)
Shock Period	-0.044***	-0.050***
	(0.004)	(0.004)
Post Period	0.038***	-0.049***
	(0.003)	(0.003)
High ESG x Shock Period	-0.015	-0.006
	(0.012)	(0.010)
Low ESG x Shock Period	0.022	0.069***
	(0.016)	(0.016)
High ESG x Post Period	0.004	-0.022***
	(0.008)	(0.008)
Low ESG x Post period	-0.016	0.046***
	(0.010)	(0.011)
Equity Russia		-0.003***
		(0.001)
Lagged Weekly Return	0.002***	0.005***
	(0.0003)	(0.0005)
Fund Age	-0.001**	-0.001**
	(0.001)	(0.0005)

Month	-0.001***	-0.002***
	(0.0002)	(0.0002)
Observations	390,067	380,868
R^2	0.007	0.007
Adjusted R^2	0.001	0.001
F statistic	254.381***	224.654***
	(df = 11; 387658)	(df = 12; 378416)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 6.1: *Regression output – Main analysis of all funds*

The *Post Covid* coefficient reflects the estimated impact of the post-shock recovery period on the net flows of average-rated funds, controlling for other factors in the model. The coefficient equals 0.038 and is statistically significant at the 1% level, indicating that there was an average 0.038 percentage point increase in net flows for average-rated funds during the recovery period, compared to the pre-covid period. The interaction terms *High ESG x Post Covid* and *Low ESG x Post Covid* also lack statistical significance. This indicates that the effect of the recovery period on net flows for high- and low-rated funds cannot be differentiated from that of average-rated funds when analyzing all funds collectively.

Our regression output shows that the *High ESG* coefficient is statistically significant at the 1% level and equals 0.045. This suggests that, during the pre-covid period, high-rated funds experienced net flows that were 0.045 percentage points higher, on average, than funds with an average rating. Conversely, the *Low ESG* coefficient is statistically significant and equals -0.048. This indicates that during the pre-covid period, low-rated funds exhibited net flows that were 0.048 percentage points lower, on average, than funds with average ratings. Furthermore, the *Lagged Weekly Return* variable is statistically significant and implies that for every 1% increase in the previous week's return, there is, on average, an increase of 0.002 percentage points in the current week's net flows. Moreover, the *Fund Age* coefficient of -0.001, significant at the 5% level, indicates that an additional year in a fund's age is associated with a 0.001 percentage point decrease in net flows.

The Russia-Ukraine War

The *War Shock* coefficient equals -0.050 and is statistically significant at the 1% level. The coefficient indicates a significant decrease in net flows for average-rated funds during the war shock period, compared to pre-shock levels. Furthermore, the interaction term *High ESG x War Shock* lacks statistical significance. Without a significant interaction term, we cannot conclusively differentiate the experience of high-rated funds from that of average-rated funds during the war shock period. The *Low ESG x War Shock* coefficient of 0.069, on the other hand, is significant at the 1% level. This suggests that in the war shock period, low-rated funds experienced a relatively smaller decrease in average net flows of 0.069 percentage points, compared to average-rated funds, relative to pre-war levels. Hence, low-rated ESG funds either experienced a smaller decrease or possibly an increase in net flows compared to average-rated funds, when considering the war shock period.

In the post-war period, the *Post War* coefficient of -0.049, which is statistically significant at the 1% level, indicates an average decrease in net flows of 0.049 percentage points for average-rated funds, relative to the pre-war period. Furthermore, the significant *High ESG x Post War* coefficient is negative and equals -0.022. This suggests that high-rated funds, on average, experienced an additional decrease in net flows by 0.022 percentage points, compared to average-rated funds in the war-recovery period, relative to pre-war levels. Conversely, the significant *Low ESG x Post War* coefficient is positive and equals 0.046. This further suggests that low-rated funds experienced a relative increase in net flows by 0.046 percentage points during the post-war period compared to average-rated funds, relative to the pre-war period. These significant interaction terms, with opposite signs, suggest a divergence in the recovery experience of high- and low-rated funds relative to their average counterparts, after the war shock.

The other variables in the regression model also give valuable insight. The *High ESG* coefficient of 0.028, significant at the 1% level, suggests that high-rated funds, on average, have net flows that are 0.028 percentage points higher than those of average ratings, during the pre-war period. Conversely, the *Low ESG* coefficient, also significant at the 1% level, indicates that low-rated funds, on average, have net flows that are 0.031 percentage points lower than those of average-rated funds, during the pre-war period.

Additionally, the negative and significant *Equity Russia* coefficient, equaling -0.003, suggests that for every 1% increase of a fund's equity that is placed in Russia, there is an average

decrease in net flows by 0.003 percentage points across all funds. This highlights the negative impact of Russian equity exposure on fund flows. Moreover, the *Fund Age* coefficient of -0.001, significant at the 5% level, indicates that an additional year in a fund's age is associated with a 0.001 percentage point decrease in net flows. Lastly, the statistically significant *Lagged Weekly Return* coefficient of 0.005 suggests that a 1% increase in the previous week's return corresponds with an expected increase in average net flows by 0.005 percentage points. This highlights a positive relationship between short-term past performance and net flows.

Furthermore, Table A.2 in the Appendix gives further insight, providing the results of our regression model where low-rated funds serve as the omitted reference group. We see that the previously insignificant *High ESG x War Shock* coefficient now is negative and equals -0.076, significant at the 1% level. This indicates that during the war shock period, high-rated funds experienced an additional decrease in average net flows of 0.076 percentage points, compared to low-rated funds, relative to pre-war levels. *High ESG x Post War* is also negative and equals -0.067, significant at the 1% level. This coefficient further implies that high-rated funds, on average, experienced an additional decrease in net flows by 0.067 percentage points during the recovery period compared to low-rated funds, relative to the pre-war period. Moreover, *Average ESG x War Shock* and *Average ESG x Post War* are also negative and significant at the 1% level, and equal to -0.069 and -0.046 respectively, with similar interpretations as those for high-rated funds above.

Conducting a similar analysis of the COVID-19 pandemic, with low-rated funds as the baseline category, did not yield any noteworthy differences from the results from our main regression model, and hence is not commented any further.

6.2.2 Retail and Institutional Funds

We now report the regression results from the analysis detailed in section 5.2, separating retail funds and institutional funds into separate sub-samples. The primary emphasis of this analysis lies in discerning the disparities between the two fund categories and comparing these findings to the collective fund analysis. The regression results from analyzing both the pandemic and the Russia-Ukraine war are presented in Table 6.2, and will be detailed in the following section.

Did-analysis: the pandemic and the Russia-Ukraine war - Institutional and Retail Funds

	Dependent variable: Net Flow (%)			
	Covid		War	
	Institutional	Retail	Institutional	Retail
High ESG	0.043***	0.053***	0.034*	0.029***
	(0.014)	(0.008)	(0.019)	(0.009)
Low ESG	-0.042***	-0.036***	0.005	-0.040***
	(0.015)	(0.009)	(0.021)	(0.012)
Shock Period	-0.045***	-0.045***	-0.042***	-0.050***
	(0.010)	(0.005)	(0.009)	(0.005)
Post Period	0.027***	0.043***	-0.055***	-0.046***
	(0.007)	(0.004)	(0.007)	(0.004)
High ESG x Shock	0.025	-0.023*	0.012	-0.008
	(0.024)	(0.013)	(0.022)	(0.011)
Low ESG x Shock	0.042	0.016	0.054	0.069***
	(0.028)	(0.020)	(0.044)	(0.017)
High ESG x Post Shock	0.009	-0.008	-0.025	-0.018**
	(0.017)	(0.009)	(0.017)	(0.009)
Low ESG x Post Shock	0.030	-0.030**	-0.006	0.058***
	(0.019)	(0.012)	(0.022)	(0.013)
Equity Russia			-0.002	-0.004***
			(0.001)	(0.001)
Lagged Weekly Return	0.0003	0.003***	0.001*	0.006***
	(0.001)	(0.0003)	(0.001)	(0.0004)

Fund Age	-0.0004	-0.001**	-0.004***	-0.001***
	(0.002)	(0.001)	(0.001)	(0.001)
Month	-0.0004	-0.001***	-0.002***	-0.001***
	(0.0004)	(0.0002)	(0.0005)	(0.0002)
Observations	75,950	314,117	74,757	306,111
R^2	0.004	0.008	0.008	0.007
Adjusted R^2	-0.005	0.002	-0.001	0.001
F statistic	28.340***	227.139***	47.892***	186.515***
	(df = 11; 75282)	(df = 11; 312144)	(df = 12; 74083)	(df = 12; 304101)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 6.2: *Regression results – institutional and retail funds*

The COVID-19 Pandemic

The *Low ESG x Post Covid* interaction term is negative and significant for retail funds, but not significant for institutional funds. This suggests a stronger reduction in net flows for low-rated retail funds during the post-covid period, compared to average-rated funds, relative to pre-covid levels. However, we cannot conclusively differentiate the recovery experience for low-rated institutional funds from that of average-rated institutional funds. Moreover, comparing the other variables might present valuable insight. The *High ESG*, *Low ESG, Covid Shock* and *Post Covid* coefficients are all statistically significant with the same signs, and hence consistent with the combined fund analysis. Moreover, net flows for institutional funds do not seem to be significantly influenced by lagged weekly return, fund age, or month during these periods, in contrast to retail funds with significant coefficients for these variables.

The Russia-Ukraine War

In general, institutional funds lack statistical significance for the interaction terms. This is, however, not the case for retail funds. However, this is not the case for retail funds. These findings are in line with the collective fund analysis, suggesting that the observed patterns in the combined funds' analysis are primarily driven by retail investors. Furthermore, the signs of the *High ESG x War Shock* coefficients differ between the fund categories, but neither is significant.

Moreover, the *High ESG* coefficient is positive and significant for both fund categories, in line with the combined fund analysis. Conversely, only retail funds have a negative and statistically significant *Low ESG* coefficient, in line with the overall analysis. Furthermore, the negative impact of Equity Russia on net flows is only significant for retail funds. This indicates that retail funds are more sensitive to Russian equity exposure than institutional funds. The net flows in retail funds are also more influenced by past returns, as indicated by a positive and significant coefficient for Lagged Weekly Return for retail funds, compared to the insignificant coefficient for institutional funds. However, institutional funds have a relatively larger negative coefficient for *Fund Age*, compared to the retail funds. This suggests that the age of a fund has a relatively stronger negative influence on net flows among institutional investors, during this war-related period. These findings suggest different patterns and sensitivities to certain factors between institutional and retail funds.

7. Discussion

7.1 Discussion of Empirical Results

We will in the following sections first discuss our findings related to the impact of the COVID-19 pandemic before we delve into the contrasting impact of the Russia-Ukraine war on ESG investments. Thereafter, a discussion of the potential underlying factors will be presented.

7.1.1 The COVID-19 Pandemic

As indicated by previous research, there is a clear preference towards ESG investments prior to the pandemic, in normal, preemptions-shock, times.[6] Low-rated funds, on the other hand, appear to be the least attractive category, as reflected by their net flow levels before the pandemic. These findings are expected, and align with the research done by Ammann et al. (2017), finding a shift in investor sentiment from lower-rated funds towards high-rated funds following the launch of the MSR in 2016.

Regarding research question (1), we find ESG investments in general to be rather unaffected by the pandemic. When analyzing the immediate impact of the pandemic, we find a remarkable drop in net flows and returns to be a general phenomenon for funds during the shock period. This is supported by research done by Su et al. (2022), finding that the European stock markets reacted rapidly and negatively to the outbreak of the pandemic. However, despite an overall marked decline in net flows, all funds, in general, quickly bounced back in the recovery period, showing net flow levels that exceeded those recorded before the pandemic. These findings suggest that ESG investments demonstrated resilience during this crisis, in line with our initial hypothesis and the findings of Pastor & Vorsatz (2020).

However, our findings present a more nuanced view than the findings of Pastor & Vorsatz (2020). More specifically, our findings indicate that ESG investments' resilience aligns with a broader market trend, rather than attributing specific to ESG investments. Furthermore, the widespread market resilience observed in our study aligns with research conducted by Su et al. (2022). The researchers found a rapid and extraordinary recovery across nearly all European stock markets during the pandemic, resulting in substantially higher returns in the

[6] ESG investments are referring to the funds in the high-rated sustainability category, as defined in section 4.4.1.

recovery period. This indicates that the market robustness observed in the collective funds' analysis derives more from the unique characteristics of the crisis, rather than the ESG principles that the funds adhere to.

Analyzing institutional and retail funds separately provides further insight, revealing that the low-rated retail funds experienced a relatively weaker recovery. This indicates that retail investors seem to shy away from low-rated funds more after the outbreak of the pandemic. This could potentially be due to the nature of the shock and its associated risks, which we further elaborate on in section 7.1.4. Moreover, this is not evident for low-rated institutional funds, nor is it observed when studying all funds collectively. These findings align with our initial hypothesis regarding institutional investors demonstrating more steadiness in their investment strategies during market distress.

7.1.2 The Russia-Ukraine War

The Russia-Ukraine war presents a contrasting picture to the pandemic, regarding the impact on ESG investments. During the defined war-shock period, ESG investments are found to demonstrate less resilience compared to low-rated funds, evidenced by a relatively larger drop in net flows. Finding low-rated funds to show relative robustness during this shock is surprising and challenges the view of ESG investments as a safe haven during market distress, as suggested by Gianfrate et al. (2021). Moreover, this observed resilience applies exclusively to low-rated retail funds and is not evident when analyzing their low-rated institutional counterparts.

The war appears to have a relatively greater impact on ESG investments in general, evidenced by a more substantial decline in net flows during the recovery period. This resulted in net flow levels lower than those recorded prior to the war, in contrast to the observed patterns during the pandemic. In addition, we observe that low-rated funds surpassed ESG investments in terms of net flows, quite opposite to observed patterns prior to the war. In relation to research question (1), these findings clearly demonstrate that these two shocks have distinct effects on ESG investments. In the following recovery period, ESG investments are found to show relatively low resilience, while low-rated funds appear to be the most robust group, with their fund flows weathering the storm with little disruption. These findings point towards a shift in investor sentiment away from ESG investments in the aftermath of the war shock.

Furthermore, we observe that all institutional funds, despite different ratings, were uniformly impacted by the two shocks. This suggests that retail funds are the primary driving force of our collective findings and that these funds reflect the broader market sentiment more accurately. Since we do not observe a shift away from ESG investments for institutional funds, this further indicates that these funds are less responsive to changing their investment strategies and preferences during market distress, compared to retail funds, as we initially anticipated. These findings highlight distinct responses to shocks between the two investor types, addressing research question (2).

7.1.3 Potential Underlying Factors

Firstly, the established understanding from previous studies suggesting that ESG investments demonstrate resilience during crises is called into question. Our findings indicate that the presumed link between ESG ratings and the ability to withstand crises might not hold in all types of crises.

The different nature of the shocks – a global health crisis versus a geopolitical conflict – represent unique sets of risks and challenges, each carrying its own implications and impacts. The swift recovery observed in financial markets during the pandemic, both in terms of returns and net flows, might stem from the rapid and strong regulatory actions taken globally aiming to stabilize markets (IMF, 2021). This further implies that the overall trend of market robustness might not be attributed to ESG principles, but rather a general market response to the significant governmental and monetary support worldwide. Moreover, this points towards a more complex interpretation than the findings of Pastor & Vorsatz, (2020) attributing ESG investments' resilience during the pandemic to investors viewing sustainability as a necessity.

The Russia-Ukraine war, on the other side, is characterized by having a more local impact on Europe, impacting specific nations and sectors to a greater extent (European Council, 2023). The war introduced challenges such as energy instability, economic sanctions, and supply chain disruptions. During the war, investors were exposed to shock-specific risks that differed from those prominent during the pandemic. This could lead investors to reassess the risk profiles of their investments, potentially explaining the observed shift away from ESG investments. It is important to note that we lack conclusive explanations for why investors seem to shy away from ESG investment during this shock; further research is needed to investigate this. However, our analysis strongly indicates that investors seem to view ESG

investments as less favorable when entering the war, and low-rated funds as relatively more attractive, compared to during the pandemic. These findings challenge the persistence of ESG investments' robustness, as suggested by Pastor & Vorsatz (2020) and Bialkowski & Starks (2016), making our findings more nuanced.

The observed shift away from ESG investments brings us to our second point, which indicates that the motivations behind ESG investing are perhaps more complex than previously established. Several studies highlight how ESG investing is driven by non-financial motives (Bialkowski & Starks, 2016). If investors viewed sustainability as a necessity, we should expect ESG investments to show resilience and consistently attract more net flows. However, ESG investments demonstrating relatively less resilience indicate otherwise. In the context of war, investors might rather prioritize financial stability and risk management, pointing to a strategic aspect in ESG investment choices that goes beyond ethical considerations. This aligns with our findings, which indicate that seeking financial stability might play a larger role in ESG investing than suggested by previous research.

A positive relationship between financial return and net flow is largely evident for all funds. Both prior to and during the pandemic, ESG investments were found to yield higher returns compared to lower-rated funds. In addition, the low-rated funds showed relatively poor performance compared to average-rated funds. This could partially explain why investors seem to prefer ESG investments before and during the pandemic, while at the same time viewing their low-rated counterparts as least attractive. Our regression results also reveal a positive relationship between past short-term performance and net flows, regardless of the sustainability rating, supported by Sirri & Tufano (1998). This suggests that investors are responsive to fund performance, potentially using both long-term and short-term returns when making investment decisions. These findings support our hypothesis that ESG investing is also driven by financial incentives. Furthermore, this response to previous performance is most prominent for retail funds, strengthening our notion that retail investors are more responsive to market signals.

Research finds that green assets outperform, in terms of return, when shocks positively impact ESG factors, increasing investor preference towards green assets (Pastor et al., 2020). This may parallel the circumstances of the pandemic and is supported by previous studies finding a flight-to-safety effect towards ESG investments, highlighting a preference for funds with low ESG risk during the pandemic (Ferriani & Natoli, 2021). Even though we do not find ESG

investments to demonstrate relatively higher resilience, these funds recover fast and attract relatively higher net flows throughout the pandemic. This might indicate that the pandemic posed risks that retail investors viewed as more favorable for ESG investments compared to low-rated funds, potentially explaining why low-rated retail funds recovered relatively weaker.

The positive relationship between fund flows and returns is further reinforced by the war. A shift in financial returns seems to occur, where ESG investments underperformed their peers in 2022 (MSCI, 2023a). This is also evident in our data, where the low-rated funds appear to navigate the war crisis with minimal disruption, and perhaps even outperformed the returns of ESG-investments in the recovery period. Lower returns for ESG investments could contribute to the explanation of why these funds also demonstrate relatively lower resilience in terms of net flow during the war.

Finally, the observed shift in net flow patterns might indicate a wider reevaluation of what is considered an attractive investment during various types of shocks. Finding ESG investments to showcase relatively lower resilience during the war could imply a reassessment of these funds' attractiveness and the 'ethical premium' associated with them. This is further underpinned by a relative underperformance in returns for these funds during the same period. The characteristics of the war are different from those of the pandemic, and the shock itself might have acted as a catalyst for a broader reevaluation of ESG assets. These observed patterns could potentially represent a "normalization" that Pastor et al. (2020) predicted would happen in the future, indicating a cooling-off effect from the initial trend toward ESG investments. Pastor et al. (2020) argued that green assets in general are priced higher, and therefore eventually should underperform, in terms of return. However, we cannot draw any conclusions related to why these dynamics have evolved by solely analyzing our data, but our data do point towards ESG investment being viewed as relatively less attractive during the war, compared to during the pandemic.

In summary, our findings suggest the need for a more nuanced approach to understanding how ESG investments are affected by economic shocks. Our findings indicate that ESG investors balance ethical and financial motives, and whether ESG investments demonstrate relative resilience seems to be affected by the nature of the crisis at hand. This challenges the previously assumed view of ESG investments as resilient during turbulent times, attributed to investors' ethical considerations. However, our findings alone are not sufficient to

conclusively explain the observed shift away from ESG investments after the war shock – this should be further examined in future research.

7.2 Limitations and Future Research

7.2.1 Limitations

It is important to acknowledge the uncertainties and limitations related to our analysis, and as we will discuss in more detail in the section below, there are a few areas for potential improvement. However, we want to highlight that there are also some practical constraints that prevent us from making these improvements. It is essential to be aware of the limitations in our study when interpreting our findings. Furthermore, this could also be relevant for future research within this field.

One important limitation that must be acknowledged is related to our reliance on one type of ESG rating system - specifically, the Morningstar Sustainability Rating. Berg et al. (2022) find that ESG ratings from different providers differ substantially, meaning that our results might be representative only when using the Morningstar Sustainability Rating. This limitation is particularly relevant when comparing our findings with other studies that may use different providers of ESG ratings.

Additionally, our classification of high-rated funds as ESG investments should be approached with caution. As mentioned in section 4.4.1, the rating employed in our analysis is a relative measure, assessing ESG risk in a portfolio compared to industry peers within the same Morningstar Global Category. Consequently, a fund might appear to have a better rating than another, not necessarily due to lower ESG risk in absolute terms, but because it is being compared to different peer groups with varying standards. In our analysis, we consider these ratings to be perceived as sustainability indicators by typical investors. In practice, this might not fully capture the nuances within the rating.

Furthermore, it is important to note that there are some considerations to be aware of associated with using net flow in percentage as our dependent variable. The calculation of our dependent variable, *net flow (%)*, is elaborated in section 4.4.2. This method can lead to varying percentage net flows for the same absolute inflow or outflow, depending on the evolution in the funds' size. Despite this, the relative net flow measure remains preferable for

our study, because it normalizes capital flows across funds of varying sizes and illustrates which type of funds experience a relatively larger movement in capital flow. Absolute net flows in euros are useful for understanding the scale of capital movement but lack the comparative context needed to assess shocks' proportionate impact on various funds.

Ultimately, while acknowledging the limitations of our approach we conclude that the benefits of using a relative measure outweigh the potential drawbacks.[7] It allows us to determine subtler shifts in investor sentiment, particularly in response to shocks, which is crucial for the objectives of this thesis. This approach also aligns with established research in the field, including studies like Sirri & Tufano (1998) and Hartzmark & Sussman (2019).

In conclusion, while our study provides valuable insights regarding the impact of economic shocks on ESG investments, these limitations underscore the need to contextualize our results related to the restrictions of data representation and the unique aspects of the rating system. Future research might benefit from a more detailed dataset, encompassing multiple rating systems, to broaden the scope and applicability of similar studies. The highlighted considerations are crucial for a comprehensive understanding of our findings.

7.2.2 Future Research

Our findings suggest that ESG investments do not consistently demonstrate resilience during economic shocks, which nuances the findings of previous research. However, future research should explore the mechanisms driving investors' motivation for ESG investing amidst various shocks. This should include studying how investors balance financial- and non-financial concerns related to ESG investing and how this relationship changes during various shocks, like the contrasting scenario of a war versus a global health crisis.

As previously acknowledged, there are uncertainties surrounding investors' interpretations of the Morningstar Sustainability rating. Throughout this paper, we have not explicitly defined sustainability, relying instead on Morningstar's labeling. For instance, some investors might view the rating as a measure of a fund's social responsibility, whereas others might link it more closely to environmental considerations. Understanding how investors perceive these sustainability ratings remains an interesting and open area for future research, particularly in

[7] We have conducted the same analysis using net flow EUR as the dependent variable, which resulted in no noteworthy differences. See table A.1.1 in Appendix.

exploring the nuances of investor perceptions and their decision-making processes influenced by these ratings.

8. Conclusion

In this thesis, we have explored how ESG investments are impacted by two very different economic shocks, the COVID-19 pandemic, and the Russia-Ukraine war, and whether the impact is constant across the shocks. By addressing our two research questions, our study adds a layer of complexity to the existing narrative of ESG investments' resilience during economic shocks.

Regarding our first research question, we find that the two shocks have distinct effects on ESG investments. When it comes to the pandemic, ESG investments are seemingly unaffected, given the quick recovery resulting in net flow levels exceeding those recorded before the pandemic. However, it appears that the rapid recovery is a general market trend, and does not apply exclusively to ESG investments, reflected by a consistent investor response across all funds. Furthermore, our findings suggest that ESG investments show relatively lower resilience during the war, pointing towards a shift in investor sentiment away from ESG considerations. Low-rated funds, on the other hand, are found to be the most robust group during the war, weathering the storm with little disruption. This contrasts the findings of previous studies and questions the assumed resilience of ESG investments during times of uncertainty (Pastor & Vorsatz, 2020). These distinctions in our results related to the pandemic and the war underscore that different types of economic shocks do not uniformly impact ESG investments.

Regarding research question (2), our study aimed to examine whether the impact of economic shocks on ESG investments differs between institutional and retail investors. Our findings reveal notable distinctions between these two investor types. Firstly, we find that low-rated retail funds recovered relatively weaker during the pandemic. Furthermore, the patterns observed for retail funds during the war mirror the outcomes observed for our collective fund analysis. This suggests that retail funds generally play a more substantial role in shaping the overall analysis. However, the scenario differs for institutional funds. When analysing these funds, we do not observe a shift away from ESG investments during the war, finding all funds to be uniformly impacted by the shocks. Overall, our findings indicate that institutional investors demonstrate more consistency in their investment strategies during market distress, in line with our initial hypothesis.

Our findings challenge the assumed motivations for ESG investing suggested by previous research. While ethical considerations have been presumed to be the primary driver, our findings suggest that financial motives, such as the pursuit of financial stability and returns, might play a more significant role than previously recognized. Our evidence points to a shift in investor sentiment away from ESG investments after the outbreak of the war when faced with new shock-specific risks. While our study cannot conclusively identify the driving forces, it does point towards investors reevaluating the attractiveness of ESG investments during times of crises, depending on the nature of the crisis at hand.

In conclusion, our findings advocate for a more nuanced understanding of how economic shocks influence ESG investments, underpinned by the contrasting response to the pandemic and the Russia-Ukraine war. A complexity that is further accentuated by the different reactions among institutional and retail investors. This study aims to contribute to the field of understanding ESG investments during market distress and emphasize the need for future research into the motivations behind ESG investing in such conditions.

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A. Appendix

A.1 Robustness Analysis

A.1.1 Net Flow (EUR) as Dependent Variable

Did-analysis: the pandemic and the Russia-Ukraine war

	Dependent variable: Net Flow (EUR)	
	Covid	War
High ESG	337,132,700***	376,242.700**
	(120,249.400)	(157,140.100)
Low ESG	-197,120,300**	-303,233.600*
	(86,098.810)	(162,612.000)
Shock Period	-216,400.800***	-479,850.600***
	(54,945.000)	(63,938.180)
Post-Period	276,648.000***	-356,249.100***
	(40,219.860)	(52,238.180)
High ESG x Shock Period	-263,415.100	-229,185.000
	(184,521.800)	(216,418.900)
Low ESG x Shock Period	42,733.250	608,374.900***
	(310,140.600)	(187,287.000)
High ESG x Post Period	9,952.514	-336,811.900**
	(114,106.000)	(136,278.300)
Low ESG x Post period	-155,825.600	499,347.600***
	(177,964.000)	(164,780.000)
Equity Russia		-9,451.632
		(10,448.140)

Lagged Weekly Return	13,791.240***	51,757.810***
	(2,895.864)	(5,227.194)
Fund Age	-12,850.430	2,192.509
	(11,584.020)	(11,503.060)
Month	-1,844.775	-6,961.871**
	(2,940.817)	(3,064.176)
Observations	390,067	380,868
R^2	0.002	0.003
Adjusted R^2	-0.004	-0.004
F statistic	86.416***	93.485***
	(df = 11; 387658)	(df = 12; 378461)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table A.1: *Regression output with Net flow EUR as dependent variable*

A.1.2 Low-rated Funds as the Baseline Category

Did-analysis: the pandemic and the Russia-Ukraine war		
	Dependent variable: Net Flow (%)	
	Covid	War
High ESG	0.093***	0.059**
	(0.011)	(0.013)
Average ESG	0.048***	0.031**
	(0.008)	(0.010)
Shock Period	-0.023	0.019
	(0.016)	(0.016)

Post-Period	0.022**	-0.003
	(0.010)	(0.011)
High ESG x Shock Period	-0.037*	-0.076***
	(0.019)	(0.018)
Average ESG x Shock Period	-0.022	-0.069***
	(0.016)	(0.016)
High ESG x Post Period	0.020*	-0.067***
	(0.012)	(0.013)
Average ESG x Post period	0.016	-0.046***
	(0.010)	(0.011)
Equity Russia		-0.003***
		(0.001)
Lagged Weekly Return	0.022***	0.005***
	(0.0003)	(0.0003)
Fund Age	-0.001**	-0.001**
	(0.001)	(0.0005)
Month	-0.001***	-0.002***
	(0.0002)	(0.0002)
Observations	390,067	380,868
R^2	0.007	0.007
Adjusted R^2	0.001	0.001
F statistic	254.381*** (df = 11; 387658)	224.654*** (df = 12; 378416)

Note:

Table A.2*: Regression output with low-rated funds as reference group*

A.2 Figures

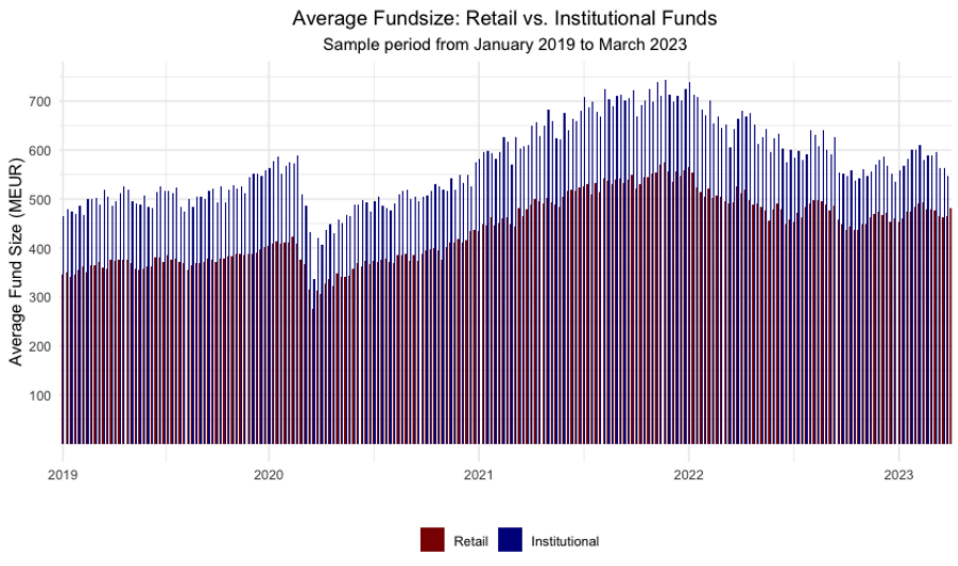

Figure A.1: *Development in Fund size (Institutional vs. Retail funds)*
Displays the average fund size for institutional and retail funds, throughout the entire sample period.

A.2.1 Bar Plots

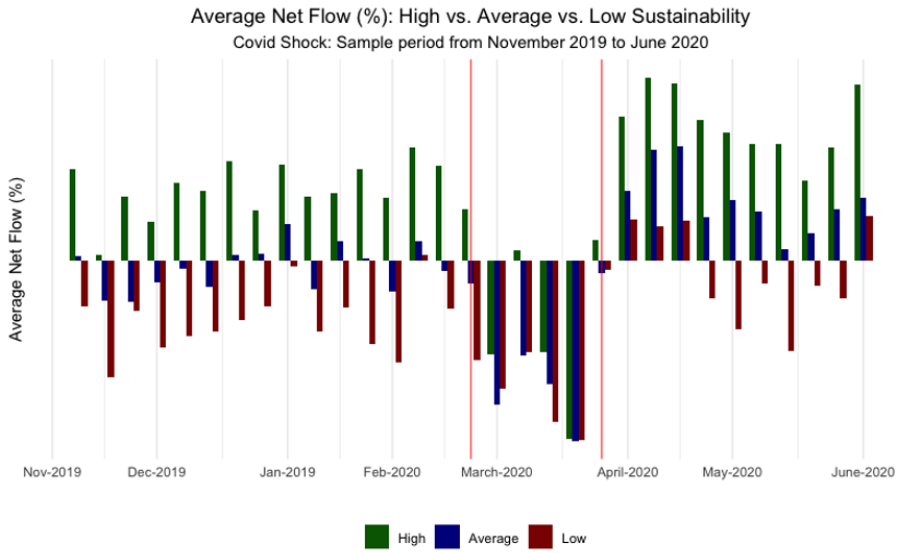

Figure A.2: *Average net flow per sustainability category (Covid-19)*
Displays a bar plot showing the average net flow for each sustainability-category before and after the covid shock.

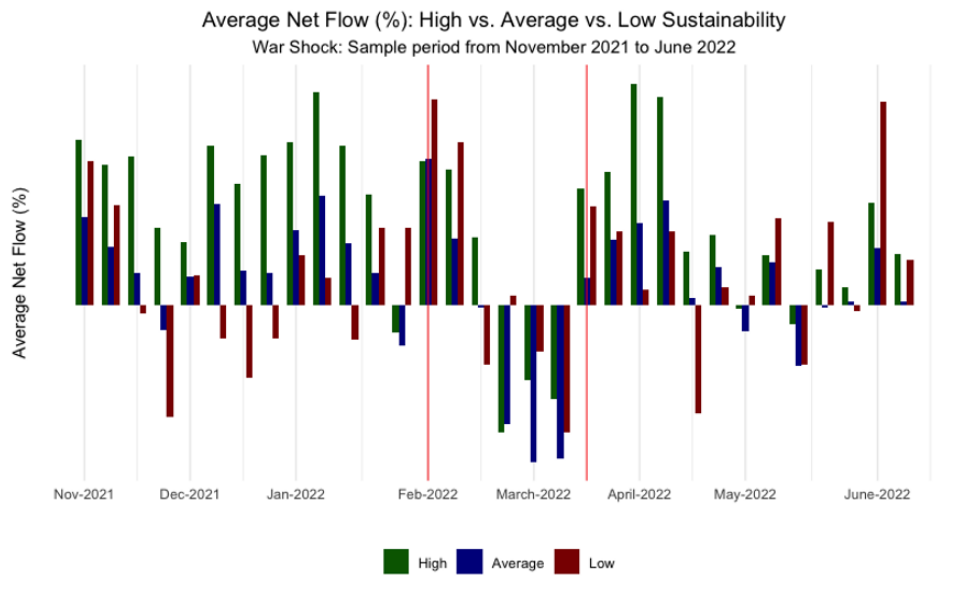

Figure A.3: *Average net flow per sustainability category (War)*
Displays a bar plot showing the average net flow for each sustainability-category before and after the war shock.

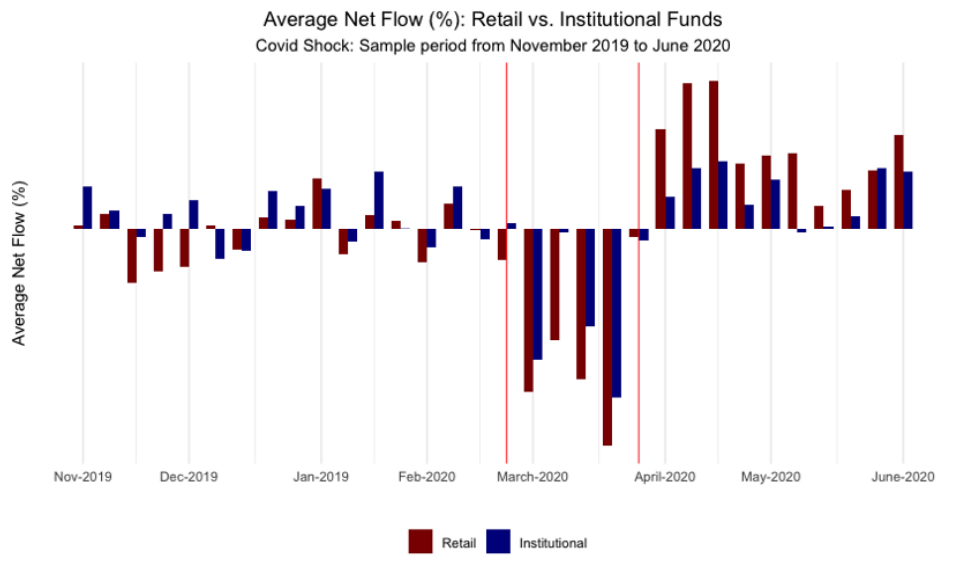

Figure A.4: *Average net flow for retail vs. institutional funds (Covid-19)*
Displays a bar plot showing the average net flow for institutional and retail funds before and after the covid shock.

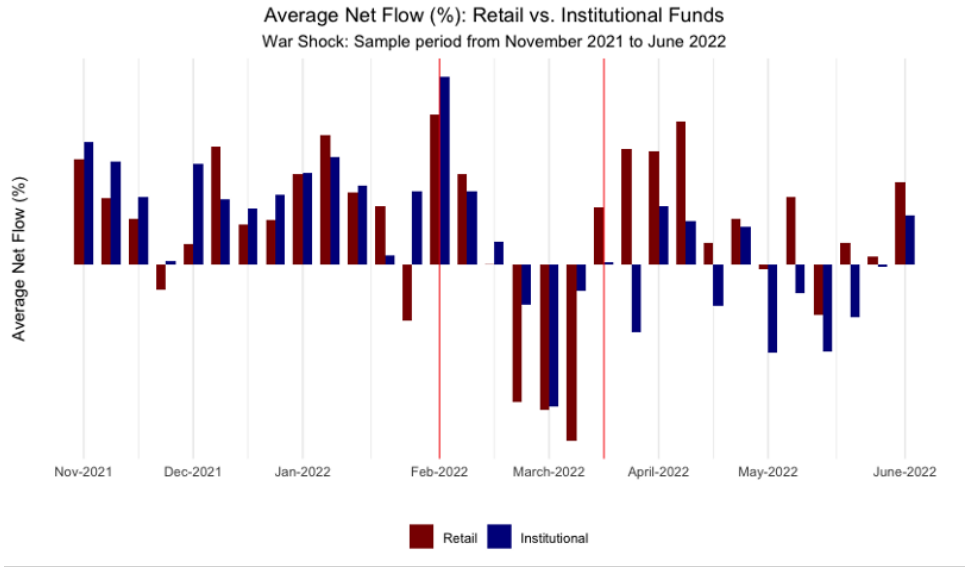

Figure A.5: *Average net flow for retail vs. institutional funds (War)*
Displays a bar plot showing the average net flow for institutional and retail funds before and after the war shock.