In labels we trust? The influence of sustainability labels in mutual fund flows

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Abstract

The European sustainability mutual fund market is characterized by the co-existence of several labels and certifications designed to assist investors in making informed investment decisions. This study investigates the impact of sustainability labels sponsored by government and non-profit organizations (GNPOs) on fund flows in a setting where a multiplicity of labels coexist. Our results support investors' preferences for sustainability labels, with GNPO labels standing out as salient signals. After being awarded a GNPO label, mutual funds attract additional flows compared to otherwise comparable funds. Furthermore, this impact is more pronounced for funds conveying another sustainability signal, such as Morningstar top globes, the LCD, or an ESG name, irrespective of whether they hold low or high sustainability priors. Our results thus suggest a complementary effect of GNPO and other sustainability labels. We also investigate the effect of funds being classified as Article 8 and 9 of the Sustainable Finance Disclosure Regulation (SFDR) classification after March 2021; the results highlight the influence of this classification in investors' mutual fund decision-making, although the observed effect diminishes in several robustness tests. Notably, we document a clientele effect, as the abnormal flows post GNPO and Article 8/9 labeling are more pronounced for funds targeting institutional investors. Our paper provides useful insights into the effectiveness of different labels by suggesting that GNPO and SFDR labels convey informative and trustful signals for investors.

Keywords: Flows, Mutual funds, SFDR, Signaling, Sustainability labels, Sustainable finance, Third-party certifications.

"Within the ESG industry you have a never-ending development of new signals"

Bob Mann, chief operating officer of Sustainalytics, Financial Times,

1. Introduction

Currently, there is a great variety of labeling schemes aimed at guiding and promoting sustainable investments. Certifying the sustainable features of investment funds has gained popularity as sustainable investing moves into the mainstream, with investors facing an increasing offer of seemingly comparable sustainable options in financial markets. By the end of 2022, the number of sustainable funds worldwide reached 7,012, reflecting a tenfold surge in funds and a threefold increase in terms of assets under management since 2012 (UNCTAD, 2023). Europe is, by far, the largest sustainability fund market, holding a share of 83% of global sustainable funds' assets under management (Zeb & Morningstar, 2022). The European market is also at the forefront of regulatory efforts to drive capital toward sustainable projects, as established by the European Union (EU) Sustainable Finance Action Plan. In this context, sustainable labels serve as a crucial mechanism for directing flows to sustainable investments. Drawing on signaling theory (Spence, 1973), labels play an important role in mitigating information asymmetries,[1] particularly in credence good markets, where the qualities of the product are difficult to verify and thus buyers are at disadvantage relative to sellers (Atkinson & Rosenthal, 2014).

Labels can come in the form of a certification awarded by a third-party or they can be self-declared (Dekhili & Achabou, 2014). One category of third-party labels are those sponsored by governmental bodies or non-profit organizations (GNPOs, hereafter). In Europe, there are currently several well-known GNPO labels for funds at the country or regional level, such as the Ecolabel in Austria (*Österreichisches Umweltzeichen*), Towards Sustainability in Belgium, *Investissement Socialment Responsible (ISR)*, and Greenfin in France, as well as *Forum Nachhaltige Geldanlagen* (FNG) in Germany, Austria, Liechtenstein, and Switzerland, LuxFLAG ESG/ Climate Finance/ Environment in Luxembourg, and Nordic Swan in Nordic countries. Besides third-party labels endorsed by GNPOs, private financial data intermediaries have entered the business of sustainability ratings by providing third-party assessment of companies' and/or mutual funds' Environment, Social and Governance (ESG) performance or risks. Typically, these rating agencies evaluate companies on these

[1] In markets with imperfect and asymmetric information, companies often use signals to communicate product information (Mishra et al., 1998; Spence, 1974). Signaling theory implies that signals such as labels serve as cues of the quality of unobservable product attributes, thereby improving the functioning of markets (Erdem & Swait, 1998).

three dimensions, which are then combined to provide an aggregate ESG score. One prominent player in this business is Morningstar, whose sustainability ratings (the globes) are widely used by investors. Morningstar also identifies funds that declare sustainable attributes, and flags funds that perform well on the carbon dimension with an eco-label - the 'Low Carbon Designation' (LCD).[1] Unlike ESG ratings, computed by commercial data providers without any cost to the fund, GNPO labels are costly, as they are granted following an application process that entails costs (fee and disclosure costs) for mutual funds (Brito-Ramos et al., 2023).

In addition to third-party certifications, funds can make their sustainability profile salient through self-declared signals by adopting an ESG-related name or classifying themselves under article 8 or 9 of the EU Sustainable Finance Disclosure Regulation (SFDR). Holding an ESG designation in the name is a simple, costless, and effective way of signaling an ESG strategy (Anderson & Robinson, 2022, Gounopoulos et al., 2023). As to the SFDR, in force since March 2021, it mandates asset managers to disclose information regarding the integration of sustainability risks (Regulation EU 2019/2088). Accordingly, asset managers have the option to classify funds into article 8 (pertaining to funds that promote environmental and social characteristics but without prioritizing them as the overarching objective) or article 9 (pertaining to funds with sustainable goals as their primary objective), with all other funds falling under article 6. Although the regulation was conceived as a disclosure-based framework, SFDR's categories for financial products now embody a common language for sustainability in the investment industry (Eurosif, 2022) and, in practice, have come into usage as an unofficial labeling for sustainability (EFAMA, 2021).[2]

Although the informational role and trust attribute of labels are well acknowledged, the profusion of sustainability labels might undermine the idea of a clear-cut quality signal, potentially leading to increased investor confusion (Brécard, 2014). As a consequence, investors may find themselves incurring higher search costs as they strive to differentiate between the numerous labels available. Thus, the profusion of labels may compromise their effectiveness and have the adverse effect of decreasing the likelihood of investors purchasing sustainable funds. In light of these concerns, the aim of this research is to investigate how investors respond to the multitude of sustainability labels in investment decision-making, using a dataset of equity funds sold in the EU countries. The existence of multiple sustainability labels in Europe represents an ideal setting to investigate investors' response to different types of labels. Do investors react differently to third-party labels (sponsored by GNPOs or ESG ratings from commercial data vendors) and self-declared labels (the SFDR classification and holding an ESG-related name)? Considering recent evidence that GNPO-sponsored labels and private

[2] Eurosif (2022) notes the distinct logics underlying a disclosure-based framework and labels in the strict sense. A disclosure-based regulation aims to foster transparency and, as such, is designed to be as broad as possible in scope whereas a label is a seal of approval awarded to products that comply with ambitious standards. Nevertheless, even though it was not the regulators' objective that the SFDR provisions were treated as labels (EFAMA, 2021), the SFDR acts as a financial product classification system. Furthermore, SFDR is not purely disclosure-based since, for instance, it sets several requirements for financial products to qualify as article 9 (Eurosif, 2022).

sector ones are not fully aligned (Brito-Ramos et al., 2023), the issue of whether investors perceive certain labels as more trustworthy than others becomes even more relevant. While previous studies have shown that private sector labels like Morningstar globes or the LCD have impacted investors' decisions (e.g., Ammann et al., 2019; Hartzmark & Sussman, 2019, Ceccarelli et al., 2023a), how GNPO labels compete with those of the private sector for investor's attention and how this translates into investment decisions has not yet been explored. In this context, our research investigates the salience of different sustainability signals on mutual fund investments. Furthermore, we examine whether investors react to the awarding of GNPO labels**.** Building on the literature of signalling theory (Spence, 1973), we expect that, in line with Brito-Ramos et al. (2023), investors view third-party and costly signals such as GNPO-endorsed labels as more trustworthy than those awarded by financial intermediaries and self-declared labels. Moreover, considering that the introduction of the SFDR classification in 2021 brought another layer of signals to consider, we further explore how investors respond to the classification of funds into article 8 or 9 of the regulation.

The paper gives contribution to several strands of the literature. First, it contributes to the body of literature on how demand for sustainable investments is affected by financial versus non-financial motives**.** In particular, recent research documents the role of sustainable preferences in socially responsible investing (e.g., Rossi et al., 2019; Anderson & Robinson, 2022; Riedl & Smeets, 2017; Gutsche & Ziegler, 2019; Bauer et al., 2021; Giglio et al., 2023). Our results are consistent with these studies by documenting European investors' preferences for investments with sustainability signals.

Second, this paper relates to a growing literature that report the salience of sustainability cues in driving investors decisions. For instance, Hartzmark and Sussman (2019) and Ammann et al. (2019) document that the introduction of Morningstar's sustainability globe ratings triggered investor flows into top-rated funds. Likewise, Ceccarelli et al. (2023a) observe the preference for funds awarded with Morningstar's climate performance tag - the LCD. Becker et al. (2022) and Ferriani (2023) explores the effect of the disclosure of fund classification into articles 8 and 9 on mutual fund flows. The former finds that the disclosure led to increased flows into article 8 and article 9 funds, while the latter finds that investors rely more on the Morningstar globes than regulation-based labels. We contribute to this line of work by investigating how fund flows react to different types of sustainability labels, namely those provided by third parties (GNPO *vs* private sector ones) and self-declared labels (an ESG name and the SFDR classification). While private sector sustainability certifications and ratings are prevalent in the US, Europe has experienced the emergence of sustainability labels sponsored by GNPOs (Crifo et al., 2020). To the best of our knowledge, there are no studies investigating how investors react to GNPO sustainability labels, especially in the presence of alternative labeling schemes for mutual funds. This paper fills this gap. The results highlight that flows are responsive to funds holding GNPO labels. This effect is more pronounced for funds targeting institutional investors. Moreover, regarding how investors' decisions are affected by the multiplicity of sustainable labels in the mutual fund landscape,

our evidence suggests that investors seem to respond positively to the awarding of a GNPO label even when funds already display other sustainability labels, suggesting labels to be informative and complementary. Our results are robust when we use another set of recently launched labels: article 8 and 9 of the SFDR.

Third, we provide insights on the investment decisions of institutional investors. Institutional investors are the primary owners of corporations worldwide (Dyck et al., 2019), thereby potentially playing an important role in the allocation of capital resources to sustainable activities. A growing body of research provides evidence that professional asset managers are increasingly integrating ESG considerations in their investment decisions (Krueger et al., 2020; Ceccarelli et al., 2023b) and that institutional ownership is linked to higher levels of corporate social and environmental performance (Dyck, et al., 2019; Kim et al., 2019). Our evidence highlights a differentiated response of institutional investors to the awarding of GNPO labels and the article 8/9 classification, as there is a more pronounced flow effect in the case of funds targeting institutional investors.

The remainder of this paper is organized as follows. Section 2 presents an overview of the sustainable labelling landscape in Europe and discusses the relevant literature. Section 3 describes the data. Sections 4 to 6 analyze and discuss the empirical results. Finally, Section 7 concludes.

2. Institutional background and literature review

2.1. Overview of labeling schemes in Europe

GNPO labels have become popular instruments for certifying and promoting sustainable investments (Crifo et al., 2020). These labels can be sponsored by entities such as non-profit associations (e.g., professional responsible investment associations), and governments as part of their public policy goals for promoting sustainable investments, as in the case of France, Austria, and the Nordic countries. Labels can be segmented by whether they have a broad ESG scope (ESG labels) or if they specifically target environmental issues (Green labels). Most ESG labels require a certain level of ESG or other sustainability screening criteria, expressed as a percentage of the portfolio that must be subject to ESG analysis or as compulsory screening of a certain percentage of the direct holdings or items in the portfolio. Green labels focus more on the environmental dimension of ESG; as such, they have stringent criteria for activities that could harm the environment in addition to social and governance criteria. They usually demand a minimum proportion of 'green' activities in the portfolio, strict exclusion of fossil fuels, and a definition of what constitutes a 'green' asset (Megaeva et al., 2021).

Private financial data providers have become important actors in the ESG rating industry. In August 2016, Morningstar introduced its sustainability ratings, which use a five-globe system to communicate the ESG level of funds based on companies' ESG performance. At the end of 2019, this

rating scheme evolved to measure company-level ESG material risks, aiming to assess how well companies manage the material ESG issues they face within their own industry and across industries. The methodology was further updated in late 2021 to also incorporate country-level ESG risk ratings. A fund with high ESG risks relative to its Morningstar global category will receive one globe, meaning that it is exposed to significant ESG risks, while a fund facing negligible financial risks in terms of ESG issues will receive a five-globe rating. In addition to its generic sustainability ratings, Morningstar introduced its LCD eco-label in 2018, which signals funds that have low overall carbon risk and lower-than-average exposure to companies with fossil-fuel involvement. This label is represented by a green leaf icon, an eye-catching signal that investors can associate with low-carbon investments aligned with the transition to a low carbon economy. Besides awarding the globes and the LCD, Morningstar also signals funds with an ESG profile by flagging them as having a sustainable investment attribute.

Labels sponsored by GNPOs and those provided by private financial data companies differ in several aspects besides the private nature of the sponsor. On the one hand, GNPO labels are binary assessments, as they are attributed if funds meet minimum required standards, whereas labels sponsored by the private sector can be binary (e.g., in the case of the LCD) or a numerical or categorical scale, like a rating (e.g., Morningstar globes, which can range from one to five globes according to whether funds bear high or low ESG risks, or the underlying fund's sustainability scores). On the other hand, the former are voluntary and require that funds submit themselves for certification, whereas the latter are attributed by the rating agencies regardless the fund has taken any action to be assessed in terms of sustainability performance. Furthermore, an important distinction lies in the costs borne by funds. GNPO labels involve additional costs, including the payment of fees to the labeling agency and disclosure costs. In contrast, labels from ESG rating agencies are assigned to funds without request and at no additional cost[3].

In addition to third-party labels, funds can also signal their sustainability through voluntary information provided by themselves. This includes the SFDR classification and the inclusion of ESG-related terms in their names. In practice, the classification of funds under articles 8 or 9 of the SFDR has been understood by the market as a sustainable labeling scheme (EFAMA, 2021). As to the name, incorporating an ESG-related expression is among the foremost and self-evident means to communicate a sustainability strategy to investors[4].

Table 1 provides an overview of the main types of sustainability labels available for mutual funds in the EU. Panel A lists the nine major GNPO sponsored labels (Novethic, 2022). Six of these labels are categorized as ESG, and three have a specific green focus. The six ESG labels are Ecolabel

[3] Unlike credit rating services, ESG ratings are not paid for by the companies or funds being rated; instead, the cost of ESG ratings is supported by their clients, which are mainly institutional investors and asset managers.

[4] Several papers (e.g., Capotă et al., 2022; Dikoli et al., 2022) classify funds as ESG based solely on the inclusion of specific terms such as 'ESG', 'climate', environment', 'green', etc., in their names.

(Austria), Towards Sustainability (Belgium), ISR (France), FNG (Germany, Austria, Liechtenstein, and Switzerland), LuxFLAG ESG (Luxembourg), and Nordic Swan (Nordic countries). LuxFLAG Climate Finance (Luxembourg), LuxFLAG Environment (Luxembourg), and Greenfin (France) are green-specific labels. Panel B displays the labels provided by Morningstar, namely the well-known globes and the LCD,[5] while Panel C addresses fund classification under articles 8 or 9 of SFDR.

[Table 1 around here]

Figure 1 shows the evolution of labeled equity funds from January 2019 to December 2021. We observe that there is a clear increase in the percentage of funds classified as Sustainable by Morningstar[6] and those holding the LCD. After the introduction of the SFDR, there is also a notable increase in funds classifying themselves as article 8. There are less funds holding GNPO labels, and classified as article 9, but these also show a slightly increasing trend. The percentage of funds that receive 5 globes tends to be stable as it is capped to a percentage of the total number of funds in the category as defined by Morningstar methodology.

[Figure 1 around here]

2.2. Demand for sustainable and green investments

The growth of socially responsible investment has led to a significant body of research investigating investors' social preferences. A set of studies have highlighted the role of social preferences in influencing investors' decisions (e.g., Riedl & Smeets, 2017). Specifically, survey-based (e.g., Gutsche & Ziegler, 2019; Rossi et al., 2019; Bauer et al., 2021; Giglio et al., 2023) and experiment-based studies (e.g., Apostolakis et al., 2016; Heeb et al., 2023) provide evidence of investors' willingness-to-pay for such investments, consistent with investors deriving utility from positive social and environmental externalities. This evidence extends to the mutual fund landscape, with investors showing a strong motivation to invest in funds with sustainability attributes compared to their conventional peers (Baker et al., 2022). A growing body of literature also provides insights on social and environmental preferences of institutional investors, showing that professional money managers are increasingly concerned with managing ESG risks, particularly climate risks (Krueger et al., 2020; Stroebel & Wurgler 2021; Ceccarelli et al., 2023b) and engaging with companies to improve their ESG performance (Dimson et al., 2015; Kim et al., 2019; Krueger et al., 2020; Flammer et al., 2021).

[5] Other private providers of mutual funds ESG data include MSCI and Refinitiv. However, this study specifically focuses on Morningstar, as it was the pioneer in developing ESG scores at the fund level, in addition to offering significant labels of fund-level ESG performance and risks.

[6] The Sustainable Attributes framework was adopted by Morningstar in 2020, having replaced the prior data points 'Socially Responsible Fund/Socially Conscious'. We consider Sustainable funds as those that during the period under analysis were classified as 'Socially Responsible Fund/Socially Conscious' or as having Sustainable Intentions.

Another stream of the literature has explored sustainability preferences by investigating the flow-performance relationship of socially responsible versus non-socially responsible funds. The underlying argument is that if non-pecuniary motives drive investors' choices, then sustainability-related funds should attract higher flows compared to their conventional peers, regardless of performance. Prior studies on this matter provide evidence of socially responsible investors being less responsive to past performance than conventional investors at least to what poor performance is concerned (Bollen, 2007; Benson & Humphrey, 2008; Renneboog et al., 2011; Capotă et al., 2022), consistent with investors deriving utility from non-financial attributes However, institutional investors appear to be more demanding, as there is evidence that they penalize flows of sustainable funds that exhibit poor past performance (Klinkowska & Zhao, 2023). While these studies are typically based on a dichotomous categorization of funds with explicit socially responsible mandates versus all other funds, subsequent studies explore the reaction of investors to sustainability signals regardless funds are classified as socially responsible or not. For instance, El Ghoul and Karoui (2017) analyze investors' reaction to sustainability characteristics of actively managed funds based on ESG ratings of the underlying holdings, and show that the flow-performance relationship weakens as the funds' level of corporate social responsibility increases, confirming prior evidence that non-pecuniary preferences are less responsive to past performance.

2.2 Response to salient information on sustainability and environmental features

An established literature investigates factors that are salient to investors when making mutual fund investment decisions. For instance, there is evidence that investors respond to information on advertising (Sirri & Tufano, 1998), fees (Barber et al., 2005), performance rankings (Kaniel & Parham, 2017), and fund category (Fang et al., 2021). Considering the complexity of the mutual fund investment decision resulting from the existence of a large number of funds and the difficulties individual investors face in processing sophisticated information, such as assessing sustainable features (Ammann et al., 2019), the literature concurs that retail investors pay attention to prominent, accessible and easy to understand signals. In particular, it has been shown that investors resort to simple and well-known performance indicators provided by third parties, such as Morningstar star ratings (Del Guercio & Tkac, 2008; Evans & Sun, 2021; Ben-David et al., 2019), to guide their investment decisions.

For investors who look for sustainable investments, the task of identifying funds that satisfy their needs is even more burdensome due to the additional search costs involved in this process (Anderson & Robinson, 2022; Gutsche & Zwergel, 2020). Commercial data vendors have responded to these needs by extending performance indicators to the sustainability arena and introducing intuitive and simple signals designed to ease investors' assessment of mutual funds' sustainability profiles. The salience of this information is confirmed by several studies. For instance, Hartzmark and Sussman

(2019) and Ammann et al. (2019) find that following the introduction of Morningstar's sustainability globe ratings in 2016, US investors redirected their savings from low-rated funds to high-rated ones, consistent with investors favoring sustainability attributes. Empirical evidence further highlights this trend during times of economic and social stress, such as during the Covid-19 pandemic, with investors still favoring five-globe funds during this period (Pástor & Vorsatz, 2020; Ferriani & Natoli, 2021).

In addition to salient measures of general sustainability, there is also evidence of a link between salient carbon-related information and fund flows, reflecting investors' increasing sensitivity to green investments. Ceccarelli et al. (2023a) investigate investors' capital allocation to funds in the aftermath of the introduction, in 2018, of Morningstar's LCD eco-label and find that funds awarded with this label experience higher flows compared to other funds. Likewise, Reboredo and Otero (2021) document that investors allocate more flows to funds with lower carbon risk scores, as disclosed by Morningstar.[7]

Besides sustainability signals provided by third-parties, there are also salient self-declared signals that funds can resort to with the aim of attracting additional flows. Previous evidence outside the sustainability arena shows evidence that investors are sensitive to changes in fund names to reflect trending styles (Cooper et al., 2005; Arbaa & Varon, 2019). Therefore, adopting sustainability jargon in fund names can be a simple strategy to cater to socially and green conscious investors. For instance, Anderson and Robinson (2022) find that environmentally engaged investors with low levels of literacy are more likely to allocate their portfolios toward funds with ESG-appealing names, consistent with the belief that the name is a salient signal of sustainability. In turn, El Ghoul and Karoui (2021), Cochart et al. (2022) and Gibbon et al. (2023) investigate the impact of fund name changes that are undertaken to reflect ESG-related expressions and find that greening fund names increases fund flows, consistent with fund names playing an influential role in the investor's decision-making process. Furthermore, Gounopoulos et al. (2023), claim that having an ESG name is a more impactful signal in attracting fund flows compared to third-party sustainability ratings like Morningstar. Besides an ESG-related name, the ESG information funds provide in their prospectus also seems to be perceived positively by investors, as documented by Kaustia and Yu (2021). Becoming a signatory of the United Nations Principles for Responsible Investing (PRI) is another way for mutual funds to publicly express their commitment to sustainability. Launched in 2006, this initiative calls for asset managers to incorporate ESG factors in investment decision making.[8] Several studies document that PRI affiliation represents a salient signal to investors, as asset management companies that become signatory of the PRI have seen their funds enjoy increased flows after signing them (Humphrey & Li, 2021; Gibson Brandon et al., 2022; Kim & Yoon, 2023).

[7] The carbon risk score of a fund is one of the indicators used by Morningstar to award the LCD label. Indeed, this label is attributed to funds depending on whether the carbon risk score is below 10 and the fossil fuel involvement is less than 7% of the (weighted) assets in the fund portfolio.
[8] https://www.unpri.org/signatories/signatory-resources/become-a-signatory

Funds can also self-signal their sustainability profile by classifying themselves into one of the categories of the SFDR. Indeed, this regulation requires that funds self-classify themselves as article 8 (so-called 'light green') or 9 (so-called 'dark green') funds according to whether they promote environmental or social characteristics (Article 8) or have a sustainable investment as its objective (Article 9). In practice, the classification of funds under articles 8 or 9 of the Regulation acts as an unofficial sustainability labeling scheme (EFAMA, 2021), with funds bearing these classifications benefiting from increased visibility, which could potentially play a role in investors' mutual fund choice. Several recent studies investigate how investors respond to funds being classified under the SFDR, documenting a higher flows to funds that are labeled as Article 8 or 9 funds (Emiris et al., 2023), or primarily Article 8 (Becker et al., 2022) or Article 9 (Ferriani, 2023) funds.

While extant studies investigating investors' reaction to sustainability labels typically focus on one or two labels in isolation, this paper performs a comprehensive analysis of the salience of sustainability signals considering both labels provided by third parties (GNPO vs private sector ones) and self-declared labels (an ESG name and the SFDR classification). Further, our analysis is the first to consider the impact of GNPO labels, widely popular in Europe, on investors' decision-making.

3. Data

3.1. Dataset

Our unique dataset combines information obtained from several data sources. We select all equity funds that were available for sale in EU countries in the period 2019-2021. We collected data on GNPO-labeled funds from the lists of funds available on the websites of the labeling agencies and from Novethic for French funds. From Morningstar, we collect all other information regarding fund features. Although mutual funds often issue several share classes to cater different groups of investors, the underlying portfolio is the same across share classes. This means that the ESG label applies to all share classes, regardless of the fee structure or other features. For this reason, our analyses are conducted at the fund level. In aggregating data from the share-class to the fund level, we compute funds' returns as value-weighted average values across different share classes. Fund assets (in US dollars) is the sum of the assets under management (AUM) of its different share classes. Fund age is based on the oldest share class. Other fund-level information is retrieved from the primary share class of the funds or in its absence the oldest share class. Funds with total net assets (TNA) lower than 1 million US dollars were excluded. In addition, we required funds to have at least 12 monthly return and TNA observations and also to have Morningstar sustainability ratings.

Table 2 shows the number of funds sold in the EU by domicile after the filtering process. The final dataset is composed of 7,208 equity funds, the majority of which are domiciled in Luxembourg, Ireland and also France. The table further presents the distribution of funds according to sustainability

signals, including the number of funds that possess an ESG-related expression in their names[9]. We observe that 2,429 funds are classified as Sustainable funds according to Morningstar, while 653 funds hold GNPO labels. A considerable number of funds exhibit Morningstar's LCD, as well as the article 8 classification. GNPO-labeled funds are domiciled mainly in Luxembourg and France.

[Table 2 around here]

3.2. Variables and summary statistics

Fund flows are computed as the net change in fund assets beyond asset appreciation. As in Sirri and Tufano (1998), we compute percent flows of fund *i* during month *t* as:

$$Flows_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1}(1+r_{i,t})}{TNA_{i,t-1}} \quad (1)$$

where $TNA_{i,t}$ and $TNA_{i,t-1}$ are the total net assets of all outstanding shares (in the local currency) for fund *i* at the end of months *t* and *t*-1; $r_{i,t}$ is the raw return for fund *i* during month *t*, which we define as the discrete returns based on the net asset values of fund *i* at the end of months *t* and *t*-1. The returns are net of operating expenses, inclusive of any distributions, and denoted in local currency This measure of fund flows assumes that all flows occur at the end of the month. To reduce the effect of outliers, we remove the observations of fund flows beyond the 99.5th percentile or below the 0.5th percentile.[10]

Following Hartzmark and Sussman (2019) and Ceccarelli et al. (2023a,b), we also compute normalized flows, corresponding to percentiles of the net flows' rankings within fund size deciles. First, each month funds are allocated to deciles based on fund size and then we rank funds based on their net flows and compute percentiles of the rankings. As argued by Ceccarelli et al. (2023b), normalized flows mitigate the potential influence of fund size and outliers in the computation of monthly flows, particularly when there is substantial fund size heterogeneity, thereby using this specification of flows to check the soundness of results. Normalized flows offer an additional advantage in that they convey the competitive effect of the variable under investigation, by ranking the flows. This feature is particularly relevant given the highly competitive nature of the industry (Leippold & Rueegg, 2020).

Investors can resort to different labels to identify and select funds with sustainability features. To analyze the effect of sustainability signals on fund flows, we created several dummy variables corresponding to different sustainability labels available to investors. *GNPO Label* identifies funds with a GNPO label, Morningstar ESG ratings (*Globes*) and *LCD* refers to funds holding the Morningstar

[9] Following previous studies (e.g., Nofsinger & Varma, 2014, 2023), we searched for words (in English and in local language) that suggest a sustainable oriented fund, such as ESG, Green, Climate, Sustainable, Socially responsible, Impact, Social, Environment, and SDG. The data on funds' names refers to December 2021.
[10] Such criteria are also often applied in other studies on fund flows (Barber et al., 2005; Bollen, 2007).

globes and the LCD label, respectively. We further consider *ESG Name* to identify funds containing ESG-related words in their name. Finally, we also add two dummy variables to capture funds' SFDR classification: *Article 8* and *Article 9*. Considering that Morningstar assigns a flag to funds with sustainable features, we also include a dummy *Sustainable* to identify these funds. It is important to note, however, that this flag is not treated as a label in the context of this research.

Information on the dates when GNPO labels were awarded is not available for all funds. Out of the labeling schemes, we were only able to collect historical data on the dates of GNPO label attribution for five of the labeling schemes mentioned above: Toward Sustainability, ISR, FNG, LuxFLAG ESG and Nordic Swan. Thus, from the above dataset we remove funds with labels sponsored by other entities (Ecolabel, Greenfin, LuxFLAG Climate Finance and LuxFLAG Environment).

To explore whether the flows response to the awarding of a GNPO label is different for funds targeting more to institutional investors, we also create a dummy variable (Institutional) identifying institutional funds, which we define as those with more than 50% of assets stemming from institutional share classes, as in Ceccarelli et al. (2023b).

Our analysis controls for a set of variables that previous studies (Ammann et al., 2019; Hartzmark & Sussman, 2019; Ceccarelli et al., 2023a) have shown to be drivers of fund flows, namely fund past performance and risk, and some fund characteristics. We use funds' returns over the prior 12 months (*12-month returns*), and the Morningstar star rating (*Stars*) in the prior month to control for past performance, and the standard deviation of returns over the past 12 months (*12-month volatility*) to control for risk. Additionally, we control for the log of size in the prior month, the log of fund age, and fund fees.

Panel A of Table 3 reports the summary statistics of the variables for the overall dataset covering the period January 2019 to December 2021. Panel B reports the statistics of the funds awarded with GNPO labels from January 2019 to March 2021, which represent the treated sample and the period of our main analysis. This subsample is used to study the effect of the awarding of GNPO labels on fund flows. Looking at the overall dataset (Panel A), we observe that around 36% of funds are flagged as Sustainable, 54% hold Morningstar's LCD and 35% are self-classified as article 8. Further, only a small percentage of funds hold a GNPO label or has an ESG-related name (around 10%), and very few (just 4%) are self-classified as article 9 funds. As to the treated sample (Panel B), most of the funds that were awarded a GNPO label are also classified by Morningstar as Sustainable funds (around 92%), and the proportion of funds having the LCD or an ESG-related name is also higher (66% and 23%, respectively) compared to the overall dataset.

[Table 3 around here]

Table 4 reports the frequencies of GNPO-labeled funds holding other sustainability signals. As can be observed, a large proportion of funds awarded a GNPO label (45%) classify themselves as article 9 funds. Around one fifth are flagged as Sustainable by Morningstar and have an ESG name. Only a small percentage of GNPO-labeled funds hold 1 or 2 globes. We also analyze the Pearson pairwise correlations between the sustainability labels. As shown in Table 5, the correlations are positive and statistically significant, in particular between the GNPO, ESG name, and Article 9 labels. Furthermore, as expected, the Sustainable flag variable exhibits a significant correlation with sustainability labels.[11]

[Table 4 around here]

[Table 5 around here]

4. Investors' sensitivity to multiple sustainability labels

Sustainability labels such as Morningstar globes and the LCD have been shown in the literature to strongly influence investors' mutual fund choices, consistent with preferences for salient sustainability signals (e.g., Hartzmark & Sussman, 2019; Ammann et al., 2019; Ceccarelli et al., 2023a). However, within the European market, several additional sustainability labels convey such features to investors. Hence, our analysis starts assessing the importance of a multitude of sustainability labels in shaping mutual fund investors' decision-making. Following evidence on sustainable preferences, we posit that funds holding sustainability labels such as GNPO labels, top ESG ratings from commercial data vendors (e.g., Morningstar globes and the LCD), as well as those with an ESG-related name, and classified as articles 8 or 9 of the SFDR will benefit in terms of increased inflows.

For this purpose, we run a pooled regression of monthly fund flows or normalized flows ($Flows_{i,t}$), as follows:

$$Flows_{i,t} = \propto_{\mathbf{0}} + \beta sust\_signals_i + \theta X_{i,t-1} + FE + \in_{i,t} \qquad (2)$$

Where $sust\_signals_i = \{GNPO\ Label_i, Globes_{i,t-1,}, LCD_i, ESG\ Name_i, Article\ 8_i, Article\ 9_i\ \}$ are a set of dummy variables that provide a signal for investors on sustainability features of the fund, $GNPO\ Label_i$ is a dummy variable identifying funds that have been awarded a GNPO label, $Globes_{i,t-1}$ refer to dummy variables for Morningstar globes (1 to 5 globes, with 3 being considered the reference rating), LCD_i is a dummy variable for funds awarded the LCD tag by Morningstar, and $ESG\ Name_i$ is a dummy variable identifying funds with an ESG-related name. For the period April

[11] Given that the sustainability labels are binary variables, we also considered Tetrachoric correlations, a special type of correlation used for binary variables, which confirms a high correlation between the different variables (see Table A1 in Supplementary Appendix).

2021 to December 2021, we add two dummies to identify funds with articles 8 ($Article\ 8_i$) or 9 ($Article\ 9_i$) classification.

The regression includes a set of control variables ($X_{i,t-1}$) that are measured at the end of the previous month to control for reverse causality. As mentioned in the previous section, these variables include the log of aggregated size of the fund, the log of age, fees, star ratings, past returns and volatility of past returns. Similar to the globes, the star ratings are represented by dummy variables (1 to 5 stars, with 3 stars being considered the reference rating). The regression also controls for category, family and time fixed-effects, to assure that the result is not driven by a particular style category, the brand of a certain family or time trends.

The period of analysis is from January 2019 to December 2021, with the exception of the regression including SFDR classifications, in which we consider the period April 2021 to December 2021, as the SFDR was introduced in March 2021. Table 6 reports the regression results. Column (1) presents the estimates considering the set of variables identified in the flow-performance literature as determinants of fund flows and Morningstar globes. The results show that funds with 5 globes (top ESG-rated funds) attract higher flows, in line with Hartzmark and Sussman (2019). Consistent with previous findings, past returns are also an important driver of flows, as shown by the significance of the past 12-month returns. Moreover, past risk-adjusted performance, as measured by Morningstar star ratings, is also statistically significant: funds with 4 and 5 stars have inflows, whereas funds with 1 and 2 stars have outflows relative to the baseline case of 3 stars. The results in Column (4), which report the regression estimates based on the same explanatory variables but using normalized flows as the dependent variable, are overall similar, but further highlight investors' preferences for funds with 4 globes along with their reluctance to invest in funds with 1 globe.

Column (2) shows the estimates including other sustainability signals besides Morningstar globes (equation 2). Funds holding a GNPO label or having an ESG name experience 0.721% and 0.834% higher flows per month, respectively. These results indicate that when we consider other sustainability signals, some of them appear to be more associated with fund flows than Morningstar globes, as the coefficient of the variable 5 globes is no longer statistically significant. Column (5) shows the estimates using normalized flows as the dependent variable. The results show that funds with GNPO labels, funds with ESG-related names, and funds awarded with 5 globes are the ones that attract higher flows. In particular, funds with a GNPO label have 3 percentiles higher flows, and those with an ESG name move up around 4 percentiles in flows.

Columns (3) and (6) present estimates of the coefficients for the shorter period April 2021 to December 2021, incorporating the variables that identify articles 8 and 9 of SFDR and using flows and normalized flows, respectively. The results of column (3) show that holding a GNPO label and an ESG-related name continues to impact flows and, additionally, that article 8 funds attract higher fund flows.

Nevertheless, the magnitude of the effect of GNPO labels on fund flows is smaller in the period April-December 2021 compared to the longer period. Using normalized flows (column 6), there is no statistically significant effect of the GNPO label on flows. The only sustainability signals that are statistically significant are the ESG Name and the article 8 classification. In this setting, the coefficient of the LCD label even turns negative, which might indicate some competitive effects of labels. Regarding the effect of the ESG name, it translates into 4 percentile higher flows, reinforcing the effect of names on decision-making.

The results confirm investors' sustainable investment preferences, with GNPO labels and ESG names being the sustainability signals attracting higher fund flows. Moreover, we observe that after the launch of the SFDR, some sustainability signals seem to lose influence in driving investors' decisions, whereas funds classified under article 8 or with an ESG-related name are significantly associated with higher fund flows. For robustness purposes, we provide in Tables A2 and A3 of the Supplementary Appendix other specifications, including the lag of flows to control for the autocorrelation of fund flows, as well as different fixed-effects controls. The main conclusions are unchanged.

[Table 6 around here]

5. Does the awarding of a GNPO label impact fund flows? A Diff-in-Diff approach

5.1. Baseline analysis

Regarding the effectiveness of labeling, previous work documented that the introduction of salient signals of sustainability, such as the Morningstar globes or the LCD, represents a shock that impacts fund flows (e.g., Hartzmark & Sussman, 2019; Ammann et al., 2019; Ceccarelli et al. 2023a). Therefore, we posit that the awarding of a GNPO label sends a signal that affects investment decisions, resulting in increased flows.

The results of section 4 show that investors have preferences for funds awarded with GNPO labels, highlighting a selection effect. To further explore investors' response to the signal conveyed by the awarding of a GNPO label, we make use of the dates of the awarding of the GNPO label and we employ a difference-in-difference (DiD) regression approach, to help us disentangle whether there is a treatment effect. In other words, we investigate if funds awarded a GNPO label receive higher flows compared to funds that never received GNPO labels.

$$Flows_{i,t} = \propto_0 + \beta_1 GNPO\ Label_i + \beta_2 Post_{i,t} + \beta_3 GNPO\ Label_i \times Post_{i,t} + \theta X_{i,t-1} + FE + \in_{i,t} \quad (3)$$

The specification relies on two dummy variables: one that identifies funds that received a GNPO label during the period January 2019 to March 2021 (*GNPO Label*), and another that assumes the value of 1 for observations after the fund are awarded the label (*Post*). The coefficient of the variable of interest is the interaction term $GNPO\ Label_i \times Post_{i,t}$ (β_3). A positive and statistically significant coefficient indicates that the fund has more flows after receiving the GNPO label. We control for the variables included in the previous specification (Table 6) and also for one of the main sustainability labels - the Morningstar globes. The regressions also control for different fixed effects. Specifically, we control for fund style category, fund family and time fixed-effects, fund and time fixed-effects, and fund family and category by time fixed-effects that allow to control for time trends that might affect some categories.

To isolate the effect of awarding a GNPO label, we impose additional filters in the treated sample. We remove funds with multiple GNPO labels (i.e., repeated treatment over time) and funds that were awarded a label before 2019. We also remove funds that were labeled, decertified, and again re-labeled. After this filtering, we have 6,344 equity funds, 191 that were awarded with a GNPO label during the period January 2019 to March 2021 (that we denominate as treated sample, see Panel B of Table 3), and 6,153 that never received any GNPO label. The ending period of March 2021 is intended to avoid overlapping with the introduction of the SFDR.

Results on the estimation of equation (3) are presented in Panel A of Table 7, where the columns show the coefficients of interest considering both flows and normalized flows and controlling for the different fixed-effects. The results show that the interaction coefficient is positive and statistically significant for all the specifications of the model, indicating that after being awarded a GNPO label, funds attract more flows. The coefficient of 1.24 in column (1) means that average monthly flows increase 1.24 percentage points following the label attribution. Subsequent columns incorporate category by time effects and fund fixed effects. The estimation with fund fixed effects controls for time invariant confounding factors, resulting in a smaller yet still statistically significant coefficient. This helps to tackle the problem of omitted fund variables. Columns (4) to (6) used normalized flows as dependent variable. The coefficient in column (4) indicates that funds experienced an upward movement of 4.998 percentiles in flows after receiving a label. This value diminishes as category-by-time fixed effects and fund fixed effects are introduced, although it remains statistically significant. Overall, the estimates show that average monthly fund flows increase by 0.733 to 1.240 percentage or move up 3.995 to 4.908 percentiles depending on the different fixed-effect controls. These estimates are comparable to the effect of LCD as reported in Cecarreli et al. (2023) who find an average increase of around 0.36% for relative flows and 2.76 for normalized flows. Moreover, our results align with those of Hartzmark and Sussman (2019), who observe an increase of 0.33 percentage points in flows and an upward movement of 3.25 for normalized flows when funds are awarded 5 globes. We note that these studies use US funds for their empirical analysis, typically featuring larger fund size and resulting in lower relative values of flows. Additionally, EU investors exhibit stronger sustainable preferences (Gibson Brandon et al. 2022), which might also account for the higher coefficient observed in our analysis. Finally, our results may simply reflect the strong signaling impact of GNPO labels as costly and governmental sponsored labels.

To control for potential confounding effects from other fund characteristics that might amplify or reduce the effect of the awarding of a GNPO label, we employ two matching methods. First, we apply propensity score matching, as in Ammann et al. (2019), El Ghoul and Karoui (2021), and Mugerman et al. (2022), using fund features like size and star ratings. Secondly, we also control for confounding effects coming from peer labels schemes by matching funds on the sustainable investment attribute and, additionally, size and fees.[12] We match each treated fund (awarded with a GNPO label) to three control funds (without GNPO label) based on the closest estimated propensity scores. Panels B and C of Table 7 present the results considering these two matched control samples.

[12] To select the most relevant matching variables, we ran a logit model with the GNPO label as the dependent variable and the fund characteristics as explanatory variables. These results on the propensity to be treated are available on Table A4 of the Supplementary Appendix. Based on this analysis, fund size and star ratings appear as those exhibiting strong explanatory power when we consider only the main fund characteristics, while fund size, fees and the Sustainable Investment attribute are the ones that appear as more important when we also add fund sustainability features.

[Table 7 around here]

The results show that our previous findings still hold with matched control samples. The awarding of a GNPO label has a positive and statistically significant impact on fund flows, regardless of the method used for computing flows and the fixed effects controls. In Panel B of table 7, we can see that the coefficients of the interaction variable are even higher for the matched control sample, meaning that the effect of awarding a GNPO label is stronger when we matched the treated funds with non-treated funds that are similar in terms of size and past performance. In addition, the effect of GNPO labels is also observed when we match funds for the sustainable investment attribute, size and fees, as shown in Panel C.

5.2. Heterogeneity across funds

5.2.1. Do GNPO labels cater to diverse clientele?

Mutual funds typically offer different share classes to cater to diverse segments of the market, particularly retail and institutional investors. Having documented that investors shift their money to funds that have received a GNPO label, we now question whether this response varies across different these two types of investors. The costly nature of GNPO labels, coupled with their endorsement by independent third parties, contributes to their perception of high-quality signals, catering to the growing demand among institutional investors for sustainability-driven portfolios. Moreover, institutional investors, characterized by their higher sophistication and lower search costs (Del Guercio & Tkac, 2002; James & Karceski, 2006), are better able to closely monitor fund managers (Gibson Brandon et al., 2022). Consequently, it is reasonable to expect that institutional investors are better suited to perceive the nuances of different labeling schemes, thus being less prone to manipulation through greenwashing, in line with Dumitrescu et al. (2022). In this section, we investigate whether the flows response to the awarding of a GNPO label is different for funds targeting more institutional investors. For this purpose, we add to equation 3 a triple interaction term between the *Post* variable, the *GNPO Label* variable, and a variable identifying funds targeting institutional investors. The control variables are the same as in the previous analysis.

Table 8 presents the results. The coefficients of the triple interaction variable are positive and statistically significant, being robust to different fixed-effect controls. Funds awarded with a GNPO label that target institutional investors receive more than 1.3% flows, highlighting a distinct behavior between the institutional and retail segments in response to the awarding of a GNPO label. Institutional investors exhibit a more pronounced reaction to these labels compared to retail investors, consistent

with the argument that institutional investors place more value in the sustainability information associated with GNPO labels, perceiving them as more credible. These findings are robust to using normalized flows, an alternative definition of funds targeting institutional investors[13], and matched control samples, as shown in table A5 of the Supplementary Appendix. Our results differ from Hartzmark and Sussman (2019), who do not find a differential response of institutional and retail investors when funds receive the Morningstar globes. Notably, Ceccarelli et al. (2023a) find that retail investors only reacted to funds receiving the LCD label, while institutional investors also reacted to funds' carbon risk scores, consistent with institutional investors being more sophisticated market players and thus being able to react to finer layers of sustainability information.

[Table 8 around here]

5.2.2. Funds holding other sustainability signals

Another question raised by the multiplicity of signals is the additive value GNPO labels bring given the multiplicity of labels. In the complex landscape of labels, the influence of labels from GNPOs might differ according to whether funds hold other signals of sustainability. For funds that have previously not signalled any commitment to sustainability, the award of a GNPO label could serve as a potent initial endorsement, given the perceived credibility and rigorous standards associated with such institutions. Moreover, it can differentiate funds in an increasingly crowded marketplace. For a fund that already holds multiple sustainability signals, the effects of awarding a GNPO label might not be significant. Therefore, the juxtaposition with other labels could either magnify their importance, if they are deemed superior, or dilute it, if they are seen as redundant or less rigorous.

In this section, we explore the marginal impact of an additional sustainability label given the proliferation of labels. To tackle this question, we anchor in the literature that highlights certain sustainability signals, such as the Morningstar Globes (Hartzmark & Sussman, 2019; Ammann et al. (2019), the LCD (Ceccarelli et al., 2023a), and fund names (El Ghoul & Karoui (2021; Cochart et al., 2022) as salient signals for investors. Yet, the impact of GNPO labels on mutual fund decisions remains unexplored. Based on signaling theory, their costly nature suggests that they serve as indicators of high-quality products, shaping investors' perception of GNPO-labeled funds as having high sustainable standards (Brito-Ramos et al., 2023). We thus anticipate that if the signal conveyed by the GNPO label is salient and offers additional information, investors will revise their prior assessment on the fund's sustainability attributes. We thus analyze the flow impact that the awarding of a GNPO label has on funds that already hold other sustainability signals.

[13] The alternative definition of funds targeting institutional investors consider those with more than 75% of assets stemming from institutional share classes.

We start by performing a DiD regression analysis considering a triple interaction between the Label and Post-label variables and each of the other labels. The results, presented in Table 9, show that awarding a GNPO label has a positive impact on fund flows, as shown by the positive and statistically significant coefficient of the double interaction variable. Furthermore, the coefficients of the triple interaction are also positive and statistically significant, indicating that the flow effect is stronger for funds holding top globes (4 or 5), holding the LCD, or holding an ESG name. Funds displaying top globes and the LCD experience an increase of flows of around 0.9 percent. Notably, the effect is stronger for funds with an ESG-related name, who benefit from an increase of around 3 percentage points in flows with the awarding of a GNPO label. In table A6 of the Supplementary Appendix, we present robustness results considering normalized flows and matched control samples. Overall, the results are robust to these specifications.

[Table 9 around here]

We next explore whether the impact of GNPO label is different depending the multitude of sustainability signals that funds already possess. We might expect a stronger impact of GNPO labels on funds with "low priors" of sustainability signals, i.e., funds that are not framed has having sustainable features. In this case, it is likely that the awarding of the label will lead investors to update their assessment of funds' sustainability attributes. Moreover, if investors already possess information that characterizes funds as sustainable, yet they not perceive them salient and trustful, investors' assessment will be also updated. In this context, we assess whether the impact of awarding a GNPO label differs across funds with different sustainability priors. We categorize funds into three levels based on their sustainability credentials: funds with low priors are characterized by a relatively limited emphasis on sustainability and, accordingly, we assume that these funds hold three or fewer Morningstar globes, lack the LCD, and do not incorporate an ESG name. Funds with high priors are defined as funds that epitomize strong sustainability signals. They are distinguished by exhibiting two out of three of the following labels: four or five Morningstar globes, the LCD designation and an ESG name. Funds with medium priors are funds that do not fit into the aforementioned categories and fall into this intermediate classification. We then run a DiD regression that considers triple interactions for the three levels of prior sustainability signals. The results, reported in Table 10, show that the awarding of a GNPO label has a positive effect in fund flows, with the effect being stronger whatever the strength of prior sustainability signals funds hold. These findings are robust to using normalized flows and matched control samples, as presented in table A7 of the Supplementary Appendix

[Table 10 around here]

6 The SFDR effect on fund flows

6.1. The impact of being classified as Article 8 and 9

In this section, we investigate investors' response to the introduction of the SFDR regulation, particularly with respect to the salience of the sustainability signals conveyed through the SFDR classification of funds as article 8 or 9. Although Becker et al. (2022), Ferriani (2023) and Emiris et al. (2023) address the impact of the regulation on fund flows, our research design differs from theirs by making use of the different dates that funds announced themselves as article 8 and 9, as disclosed by Morningstar, as well as different control samples and matching methods.

To analyze the 'post-effect' of article 8 and 9 labeling, we employ the following DiD regression:

$$Flows_{i,t} = \propto_0 + \beta_1 Article\_x_i + \beta_2 Post\ Article\_x_{i,t} + \beta_3 Article\_x_i \times Post\ Article\_x_{i,t} + \theta X_{i,t-1} + FE + \in_{i,t} \quad (4)$$

$Article\_x_i$ identifies if the fund was labeled as article 8 or 9, and $Post\ Article\_x_{i,t}$ assumes the value of 1 for observations after the fund upgraded to those labels. The coefficient of the variable of interest is the interaction term $Article\_x_i \times Post\ Article\_x_{i,t}$ (β_3). A positive and statistically significant coefficient indicates that signalling the funds with one of the articles has a positive impact on fund flows. Controls and the fixed effects are similar to previous specifications and the analysis is conducted in the period July 2020 to December 2021. To isolate the effect of the SFDR label, we impose additional filters on the sample. For analysing the effect of article 8, we exclude all funds with article 9 from the counterfactual, and vice-versa.

The results of estimating equation (4) are presented in Table 11 with columns showing the coefficients of interest for both flows and normalized flows, while controlling for different fixed-effects. Panel A reports the results for article 8 and Panel B those for article 9. This analysis focuses on the results of the full sample.[14] The results show that the classification of funds into articles 8 and 9 has a positive and statistically significant impact on flows. Specifically, when funds are classified into Article 8(9), they receive more 0.7 (1) percentage flows, respectively, compared to funds that are not classified as such. Our results are comparable to those of Emiris et al. (2023), who find that funds classified as Article 8 and 9 experience increased flows of 1.2 percent after the SFDR came into force. Becker et al. (2022) and Ferriani (2023) also observe higher flows post regulation, although the former claim this effect is mainly driven by Article 8 funds, while the latter finds higher evidence of increased flows only for Article 9 funds.

[14] The results considering control matched samples are reported in the Supplementary Appendix. The matching procedure follows the same steps as in section 5.1., i.e., by forming two matched samples based on the same fund features, where the second matched sample considers if the fund is considered sustainable. We note that control samples differ for article 8 and 9, as all funds that are classified as article 9 are removed from the control sample of article 8, and vice versa.

[Table 11 around here]

The effect associated with article 9 is statistically insignificant for relative flows, although it is still statistically significant for normalized flows. We note that the specification with fund fixed effects results in lower coefficients.

In the supplementary appendix (Table A8) we provide additional robustness tests with matched control samples for article 8 and 9 funds. These tests reveal that the effect on relative flows tends to lose statistical significance when we use fund fixed effects and control matched samples, particularly when matching with funds that already are tagged as sustainable.

6.2. Articles 8 and 9 and investor clientele

The results of Section 5.2.1 suggest that institutional investors follow GNPO labels, consistent with these labels conveying strong sustainability signals. In this section, we revisit the preferences of institutional investors for article 8 and 9 labeling to assess whether there is a clientele effect in the SFDR classification. For this purpose, we use the same specification of the previous section, but we add a triple interaction variable in the equation, between the Post variable, the SFDR article, and a variable identifying those funds targeting to institutional investors. The control variables are the same as in the previous analyses. The results, presented in Table 12, show statistically significant coefficients of the interaction term, suggesting a stronger flow effect to funds targeting institutional investors when they are classified as article 8 or article 9 funds. In table A9 of the Supplementary Appendix we present additional specifications for robustness analysis (using the alternative definition of funds targeting institutional investors, normalized flows and matched samples).

[Table 12 around here]

6.3 Effect of priors of sustainability

In this section, we expand the analysis by addressing the impact of the SFDR classification in a setting where other labeling schemes by third-party certifiers already compete for investors' attention, an issue that has not been explored yet. We run a DiD regression analysis considering a triple interaction between the Article 8/9 and Post-Article 8/9 variables and each of the other labels. The results, presented in Table 13, show that funds holding another label experience a stronger increase in flows after being classified as Article 8 and 9 of the SFDR compared to funds that do not exhibit this classification. In Table A10 of the Supplementary Appendix we present additional specifications for robustness analysis. The results are robust to using normalized flows. When using matched control samples, the triple interaction coefficients with the LCD and the top globes lose significance. Notably, the results indicate

that whatever scenario is considered, funds holding GNPO labels and the ESG name experience increased flows when funds are signalled with a regulation-based label.

[Table 13 around here]

Similarly to the previous analysis in section 5.2.2., we further explore whether the impact of funds being classified as Article 8 and 9 is different depending on the prior level of sustainability signals that funds already hold. We thus run a DiD regression that considers triple interactions for the three levels of prior sustainability signals. Table 14 presents the results. As we can observe, funds that are classified as Article 8 or 9 experience higher flows regardless the prior sustainability signals they hold. These findings are robust to using normalized flows. However, the results do not always hold when using matched control samples: In the case of Article 8, the flow benefits are only observed when funds hold high sustainability priors, while in the case of Article 9, these benefits mostly disappear. These results are presented in table A11 of the Supplementary Appendix.

[Table 14 around here]

7. Conclusions

Sustainability labels and certification of financial products aim to mitigate informational asymmetries, increase transparency, and facilitate investors' decision-making process when it comes to selecting sustainable funds. In Europe, investors can resort to different types of sustainable labels such as GNPO-sponsored labels and ESG ratings from commercial data vendors that assess funds' sustainability risks. In addition, funds can communicate their sustainability features by including ESG-related designations in the name or self-classifying themselves as article 8 or 9 of the SFDR. Although some of these signals such as the Morningstar globes (Hartzmark & Sussman, 2019; Ammann et al., 2019), the Morningstar LCD (Ceccarelli et al., 2023a), and the SFDR (Becker et al., 2022; Ferriani, 2022), have been recognized as relevant for attracting fund flows, the literature has not yet analysed the relevance of GNPO labels, and how do GNPO labels compete with other types of sustainability signals in the European landscape. This paper fills this gap. As far as we are aware of, our research is the first to perform a comprehensive investigation of investors' response to GNPO labels.

Drawing on a dataset of equity funds sold in Europe, our findings confirm European investors' preferences for sustainable investments, as mutual funds holding sustainability labels benefit from higher flows over the period January 2019 to December 2021. Our initial results document investors' preferences for sustainability labels, with GNPO labels standing out as salient signals. Next, using a difference-in-difference approach and matching fund features, we find that GNPO labels have an effect

on fund flows, as the awarding of a GNPO label attracts additional flows. Furthermore, this impact is stronger for funds holding other sustainability signals, such as Morningstar top globes, the LCD and an ESG name, suggesting a complementary effect of labels. Moreover, the flow effect of awarding a sustainability label is observed when funds are grouped into different levels of prior sustainability signals.

We further investigate the effect of funds being classified as Article 8 and 9 of the Sustainable Finance Disclosure Regulation (SFDR) classification, with the results highlighting the influence of this classification in investors' mutual fund decision making. We also observe a clientele effect. By distinguishing funds that cater to retail to institutional investors, our results show that the effect of funds being awarded a GNPO label and being classified as Article 8/9 is stronger for the institutional segment.

The findings show that GNPO labels and SFDR classification are influential for investors' decisions. The fact that the awarding of label impact flows either when funds have top Morningstar globes or the LCD or an ESG name, as well as when funds have low sustainability priors or high sustainability priors is indicative of GNPO and SFDR labels being informative and trustful for investors.

Our results have important implications for policy regulation, as labels are an important element of the ambitious plan of the EU in driving capital flows to finance the green transition and reach the net zero objective by 2050. To fight greenwashing, more governments are planning to launch labels for certifying sustainable funds. For instance, the Financial Conduct Authority in the UK is developing and plans to implement its own labels, building on existing work by other international industry and official sector initiatives. Our findings are informative for shaping policy proposals to be issued for consultation in the near future.

This research has important implications for the development of sustainable investment markets. Considering investors' increasing preferences for sustainable financial products and the proliferation of sustainable labels and certifications, assessing investors' reaction to different labeling schemes is critical for financial advisers and fund managers concerned on how trustworthy investors perceive labels sponsored by different types of entities. Likewise, this research is relevant to policymakers and regulators (e.g., EU policymakers developing an eco-label for mutual funds), as labels represent an important instrument for increasing transparency and enhancing the allocation of capital resources to investments that support the transition to a greener and sustainable economy, in line with the goals of the Paris Agreement.

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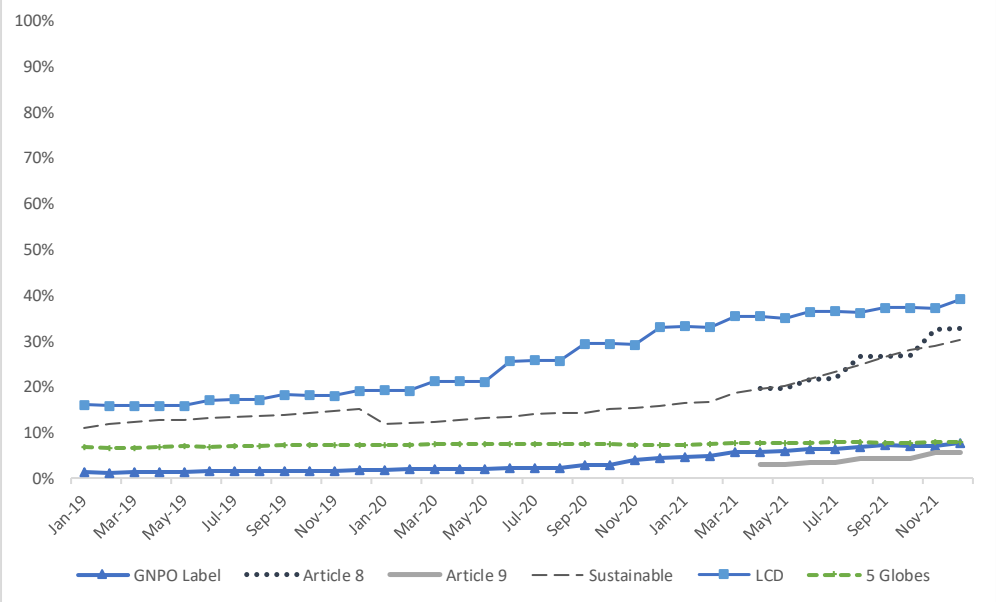
Figures and Tables

Figure 1: Percentage of funds with sustainable labels from all equity funds sold in Europe



This figure reports the percentage of equity funds holding sustainability labels over the period January 2019 to December 2021 considering the entire dataset of equity funds that are registered for sale in EU countries. GNPO Label refers to funds holding a label sponsored by a government or non-private organization. LCD identifies funds holding the Morningstar Low Carbon Designation, and 5 Globes refers to funds awarded with the top Morningstar sustainability rating (5 globes). Article 8 and 9 identify funds that after March 2021 used the SFDR to disclose their level of sustainability. Sustainable corresponds to funds classified as having Sustainable intentions or as Socially Responsible Fund/Socially Conscious fund by Morningstar.

Table 1: Labeling schemes for investment funds in the European Union

	Labels	Introduction date	Sponsor
Panel A - GNPO labels			
ESG	French ISR	January 2016	Ministry of Economic and Finance (French Government)
	Belgian Towards Sustainability	February 2019	Febelfin (the Belgian financial sector federation)
	FNG	2015	Forum Nachhaltige Geldanlagen (FNG), the German Forum for Responsible Investment
	Austrian Ecolabel	1990/2004 for financial products	Austrian Ministry for Sustainable Development and Tourism
	Luxflag ESG	May 2014	Luxembourg Labeling Agency (LuxFLAG)
	Nordic Swan	1989/ June 2017 for financial products	Nordic Council of Ministers
Green	French Greenfin	December 2015	Ministry of Transition Ecological and Solidarity (French Government)
	Luxflag Climate Finance	September 2016	Luxembourg Labeling Agency (LuxFLAG)
	Luxflag Environment	June 2011	Luxembourg Labeling Agency (LuxFLAG)
Panel B – Labels awarded by Morningstar			
	Morningstar Globes	March 2016	Morningstar
	Morningstar LCD	April 2018	Morningstar
Panel C – Self-assigned labels of sustainability			
	Article 8/Article 9	March 2021	Sustainable Financial Disclosure Regulation

This table presents the main sustainability labels of mutual funds in EU countries. The introduction date and the nature of the sponsor are also reported.

Table 2: Number of funds in the dataset by domicile

Domicile	Total		Identified as Sustainable by Morningstar	GNPO Label	LCD	ESG Name	5 Globes	Article 8	Article 9
	Freq.	Percent							
Austria	229	3.18	59	25	124	20	22	55	1
Belgium	149	2.07	45	24	56	20	22	49	8
Denmark	300	4.16	130	34	183	19	20	146	14
Estonia	6	0.08	0	0	1	0	2	0	0
Finland	209	2.90	101	8	102	12	28	81	5
France	917	12.72	423	205	493	61	138	293	58
Germany	359	4.98	86	22	197	32	38	72	3
Ireland	953	13.22	216	33	450	74	88	227	21
Italy	104	1.44	24	0	35	7	7	26	1
Luxembourg	2856	39.62	906	284	1445	272	233	935	144
Netherlands	136	1.89	82	2	63	40	18	61	26
Norway	54	0.75	24	0	29	1	5	32	2
Portugal	41	0.57	10	0	14	3	6	13	1
Slovenia	19	0.26	0	0	9	0	0	0	0
Spain	363	5.04	71	1	155	6	19	52	0
Sweden	317	4.40	223	13	218	6	46	253	20
Switzerland	16	0.22	4	0	9	2	1	4	0
United Kingdom	175	2.43	22	2	99	18	31	7	1
United States	5	0.07	3	0	3	0	1	0	0
Total	7208	100	2429	653	3685	593	725	2303	305

This table reports the number and percentage of equity funds in the final dataset by domicile. It also reports the number of funds holding a GNPO label, classified as Sustainable by Morningstar, holding the Morningstar LCD, with ESG related words in its name, with the top Morningstar sustainability rating (5 Globes), and classified as article 8 or article 9 of the SFDR. The number of funds with 5 Globes and with a ESG name refer to December 2021.

Table 3: Descriptive statistics

VARIABLES	Obs	Mean	Std. Dev.	Min	Max
Panel A - All sample Jan 2019-Dec2021					
Flows	199,346	-0.17	6.28	-22.17	41.58
Normalized Flows	199,346	49.96	28.91	0.00	100.00
Fund size (million US$)	199,336	617	7,918	1	1,919,000
Fund age (in years)	199,346	15.45	9.40	1.08	87.61
12-month returns (%)	199,346	12.30	19.50	-60.60	173.70
12-month volatility (%)	199,346	5.30	1.90	0.40	20.40
Stars	198,586	3.14	1.12	1.00	5.00
Fees (%)	199,346	1.40	0.62	0.05	4.19
Institutional	199,346	0.34	0.47	0.00	1.00
Sustainable	199,346	0.36	0.48	0.00	1.00
Globes	199,346	3.17	1.09	1.00	5.00
LCD	199,346	0.54	0.50	0.00	1.00
GNPO Label	199,346	0.10	0.30	0.00	1.00
ESG Name	199,346	0.08	0.27	0.00	1.00
Article 8	199,346	0.35	0.48	0.00	1.00
Article 9	199,346	0.04	0.20	0.00	1.00
Panel B - GNPO-labeled funds (Treated sample) Jan 2019-March 2021					
Flows	4,586	0.73	6.74	-22.17	41.58
Normalized Flows	4,586	54.82	28.70	0.00	100.00
Fund size (million US$)	4,586	613	2,161	1	123,700
Fund age (in years)	4,586	15.62	8.10	1.10	37.46
12-month returns (%)	4,586	5.70	13.10	-34.60	83.20
12-month volatility (%)	4,586	5.40	1.80	1.10	14.30
Stars	4,578	3.33	1.08	1.00	5.00
Fees (%)	4,586	1.38	0.53	0.12	3.95
Institutional	4,586	0.34	0.47	0.00	1.00
Sustainable	4,586	0.92	0.27	0.00	1.00
Globes	4,586	3.58	1.08	1.00	5.00
LCD	4,586	0.66	0.47	0.00	1.00
GNPO Label	4,586	1.00	0.00	1.00	1.00
ESG Name	4,586	0.23	0.42	0.00	1.00

This table reports descriptive statistics of fund characteristics. Panel A shows the characteristics for the all sample comprising equity funds available for sale in EU countries considering the period January 2019 to December 2021. Panel B present the characteristics for the treated sample composed of equity funds that were awarded a GNPO label during the period January 2019 to March 2021. All variables are computed at the fund level. Flows are computed as $(TNA_{i,t} - TNA_{i,t-1}(1 + r_{i,t}))/TNA_{i,t-1}$, Normalized Flows correspond to percentiles of the net flows' rankings within fund size deciles.). LCD, GNPO Label, ESG Name, Article 8 and Article 9 are dummies taking the value 1 if the fund was awarded the LCD, a GNPO label, its name contains ESG-related designations, is classified as SFDR article 8 or 9, respectively, and zero otherwise. Globes corresponds to Morningstar sustainability ratings (with a scale 1 to 5 globes). Sustainable is a dummy variable identifying funds flagged as Sustainable by Morningstar. Fund size refers to TNA in million USD and Fund age is in years. Fees are measured by Morningstar ongoing charge variable. Past returns is measured by previous 12-month returns and volatility by the standard deviation of returns in previous 12 months (12-month volatility. Stars refer to Morningstar performance ratings (with a scale 1 to 5 stars). Institutional is a dummy variable identifying institutional funds, which we define as those with more than 50% of assets stemming from institutional share classes.

Table 4: GNPO labels and other sustainability signals

GNPO	Sustainable	LCD	1 Globe	2 Globes	3 Globes	4 Globes	5 Globes	Article 8	Article 9	ESG Name
No	25,096	62,987	14,091	36,553	70,276	48,852	21,467	12,241	947	13,290
Yes	6,461	4,335	155	859	1,860	2,728	2,505	1,825	765	2,874
Total	31,557	67,322	14,246	37,412	72,136	51,580	23,972	14,066	1,712	16,164
%	20%	6%	1%	2%	3%	5%	10%	13%	45%	18%

This table reports the frequencies of GNPO-labeled funds across other sustainability signals considering the period January 2019 to December 2021.

Table 5: Pairwise Correlation between the sustainability labels

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) GNPO Label	1.000						
(2) LCD	0.052*	1.000					
(3) Sustainable	0.240*	0.133*	1.000				
(4) ESG Name	0.138*	0.069*	0.338*	1.000			
(5) Article 8	0.116*	0.124*	0.496*	0.156*	1.000		
(6) Article 9	0.173*	0.081*	0.222*	0.265*	-0.055*	1.000	
(7) Globes	0.078*	0.243*	0.176*	0.121*	0.139*	0.094*	1.000

This table reports Pearson pairwise correlations between the different variables measuring sustainability features considering the period January 2019 to December 2021.

Table 6: Fund flows and sustainability signals

VARIABLES	Flows			Normalized Flows		
	2019-2021	2019-2021	April-Dec 2021	2019-2021	2019-2021	April-Dec 2021
	(1)	(2)	(3)	(4)	(5)	(6)
GNPO Label		0.749***	0.382***		3.209***	1.506*
		(0.099)	(0.139)		(0.567)	(0.872)
LCD		0.038	-0.194**		0.129	-0.671
		(0.056)	(0.083)		(0.344)	(0.540)
ESG Name		0.849***	0.439***		4.183***	3.906***
		(0.110)	(0.147)		(0.604)	(0.900)
Article 8			0.337***			1.924***
			(0.075)			(0.561)
Article 9			0.307*			1.499
			(0.182)			(1.176)
1 Globe	0.023	0.054	0.233	-0.957*	-0.816	0.751
	(0.096)	(0.096)	(0.142)	(0.531)	(0.532)	(0.918)
2 Globes	0.031	0.049	-0.018	0.002	0.083	0.111
	(0.056)	(0.056)	(0.082)	(0.310)	(0.312)	(0.554)
4 Globes	0.076	-0.006	-0.020	0.968***	0.588**	0.648
	(0.049)	(0.048)	(0.078)	(0.276)	(0.274)	(0.497)
5 Globes	0.244***	0.056	-0.021	1.992***	1.128***	0.384
	(0.075)	(0.074)	(0.106)	(0.407)	(0.403)	(0.667)
12-month volatility	0.019	0.021	-0.031	-0.007	0.001	-0.560***
	(0.019)	(0.019)	(0.032)	(0.099)	(0.099)	(0.211)
12-month return	0.042***	0.042***	0.024***	0.239***	0.239***	0.162***
	(0.002)	(0.002)	(0.003)	(0.010)	(0.010)	(0.015)
Log size	0.078***	0.057***	-0.064***	-0.888***	-0.980***	-0.877***
	(0.019)	(0.019)	(0.023)	(0.097)	(0.097)	(0.151)
Log age	-0.438***	-0.403***	-0.326***	-3.244***	-3.078***	-3.771***
	(0.039)	(0.039)	(0.048)	(0.234)	(0.233)	(0.344)
Fees	-0.067	-0.066	0.033	-2.384***	-2.369***	-2.486***
	(0.045)	(0.044)	(0.056)	(0.285)	(0.285)	(0.459)
1 Star	-0.573***	-0.561***	-0.605***	-4.712***	-4.662***	-4.270***
	(0.079)	(0.079)	(0.116)	(0.445)	(0.445)	(0.760)
2 Stars	-0.329***	-0.329***	-0.495***	-2.847***	-2.853***	-3.512***
	(0.047)	(0.047)	(0.074)	(0.262)	(0.262)	(0.465)
4 Stars	0.389***	0.361***	0.306***	2.698***	2.567***	2.380***
	(0.046)	(0.046)	(0.074)	(0.251)	(0.250)	(0.457)
5 Stars	1.397***	1.335***	1.001***	8.421***	8.140***	6.820***
	(0.073)	(0.072)	(0.101)	(0.380)	(0.377)	(0.644)
Constant	-1.290***	-1.106***	1.065**	74.051***	74.818***	74.842***
	(0.388)	(0.388)	(0.493)	(1.954)	(1.956)	(3.086)
Observations	198,388	198,388	50,550	198,388	198,388	50,542
R-squared	0.065	0.067	0.038	0.104	0.107	0.125
Category & Family & Time FE	YES	YES	YES	YES	YES	YES

This table reports the results from pooled regressions of monthly fund flows on sustainability signals and lagged fund characteristics (Equation 2). Flows are computed as $(TNA_{i,t} - TNA_{i,t-1}(1 + r_{i,t}))/TNA_{i,t-1}$, Normalized Flows correspond to percentiles of the net flows' rankings within fund size deciles. GNPO Label, LCD, ESG Name, Article 8 and Article 9 are dummies taking the value 1 if the fund was awarded a GNPO label, the LCD, the fund name contains ESG-related designations, is classified as SFDR article 8 or 9, respectively, and zero otherwise. Globes corresponds to Morningstar sustainability ratings (with a scale of 1 to 5 globes). Dummy variables are considered for 4 of the ratings, with 3 as the reference rating. Past returns is measured by previous 12-month returns and volatility is measured by the standard deviation of returns in the previous 12 months (12-month volatility). Stars refer to Morningstar performance ratings (with a scale of 1 to 5 stars). As with Globes, 4 dummy variables are included, with 3 as the reference rating. Size is measured as the logarithm of TNA in USD and age as the logarithm of fund age. Fees are measured by Morningstar ongoing charge variable. Robust standard errors in parentheses clustered at fund level. ***, **, and * denote statistically significance at the 1%, 5% and 10% level, respectively.

Table 7: The effect of the awarding GNPO labels on fund flows

VARIABLES	Flows			Normalized Flows		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A - Treated and control sample						
GNPO Label x Post	1.240***	1.148***	0.733*	4.908***	4.623***	3.995***
	(0.319)	(0.314)	(0.384)	(1.422)	(1.420)	(1.454)
Observations	138,048	137,867	137,981	138,048	137,867	137,981
R-squared	0.072	0.117	0.149	0.114	0.158	0.233
Controls	YES	YES	YES	YES	YES	YES
Category & Family & Time FE	YES			YES		
Family & Category * Time FE		YES			YES	
Fund & Time FE			YES			YES
Panel B - Treated and matched control sample based on fund size and star ratings						
GNPO Label x Post	1.899***	1.787***	0.957**	7.329***	6.337***	4.339***
Observations	15,894	15,200	15,894	15,894	15,200	15,894
R-squared	0.103	0.198	0.143	0.179	0.275	0.244
Controls	YES	YES	YES	YES	YES	YES
Category & Family & Time FE	YES			YES		
Family & Category * Time FE		YES			YES	
Fund & Time FE			YES			YES
Panel C - Treated and matched control sample based on sustainable investment attribute, fund size and fees						
GNPO Label x Post	1.470***	1.547***	0.956**	4.720**	4.586**	3.665**
	(0.467)	(0.516)	(0.429)	(2.100)	(2.318)	(1.590)
Observations	12,814	12,267	12,814	12,814	12,267	12,814
R-squared	0.096	0.213	0.131	0.195	0.301	0.253
Controls	YES	YES	YES	YES	YES	YES
Category & Family & Time FE	YES			YES		
Family & Category * Time FE		YES			YES	
Fund & Time FE			YES			YES

This table reports results of difference-in-difference regressions of monthly fund flows from January 2019 to March 2021 on GNPO Label and its interaction with a Post dummy variable that is equal to 1 for the months following the awarding of the GNPO label (Equation 3). Panel A presents the results for the treated and control samples. Panel B presents the estimation considering a matched control sample based on fund size and Morningstar star ratings. Panel C presents the estimation considering a matched control sample based on the Sustainable Investment attribute, fund size and fees. Flows are computed as $(TNA_{i,t} - TNA_{i,t-1}(1 + r_{i,t}))/TNA_{i,t-1}$. Normalized Flows corresponds to percentiles of the net flows' rankings within fund size deciles. All regressions control for lagged fund characteristics, namely the log of aggregated size of the fund, the log of age, fees, past returns, volatility of past returns, star ratings and the globes. Robust standard errors in parentheses clustered at fund level. ***, **, and * denote statistically significance at the 1%, 5% and 10% level, respectively.

Table 8: The effect of the awarding GNPO labels on fund flows - institutional investors

VARIABLES	Flows	
	(1)	(2)
GNPO Label x Post	1.175***	1.109***
	(0.331)	(0.322)
GNPO Label x Post x Institutional	1.457**	1.332**
	(0.638)	(0.633)
Observations	138,048	137,867
R-squared	0.072	0.117
Controls	YES	YES
Family & Category & Time FE	YES	
Family & Category * Time FE		YES

This table reports results of difference-in-difference regressions of monthly fund flows from January 2019 to March 2021 on GNPO Label interacted with a Post variable and an Institutional variable. Post is a dummy variable equal to 1 for the months following the awarding of the GNPO label and Institutional is a dummy variable equal to 1 for funds with more than 50% of assets stemming from institutional share classes. The regressions control for lagged fund characteristics, namely the log of aggregated size of the fund, the log of age, fees, past returns, volatility of past returns, star ratings and the globes. Robust standard errors in parentheses clustered at fund level. ***, **, and * denote statistically significance at the 1%, 5% and 10% level, respectively.

Table 9: The effect of the awarding of GNPO labels to funds holding other sustainability labels (single label effects)

VARIABLES	Flows					
	LCD		Globes		ESG Name	
	(1)	(2)	(3)	(4)	(5)	(6)
GNPO Label x Post	2.198***	2.017***				
	(0.524)	(0.517)				
GNPO Label x Post x LCD	0.949**	0.870**				
	(0.378)	(0.374)				
GNPO Label x Post			1.799***	1.737***		
			(0.420)	(0.316)		
GNPO Label x Post x Top Globes			0.955**	0.862***		
			(0.381)	(0.249)		
GNPO Label x Post					0.825***	0.796***
					(0.297)	(0.294)
GNPO Label x Post x ESG Name					3.015***	2.711***
					(0.988)	(0.988)
Observations	138,048	137,867	138,048	137,867	138,048	137,867
R-squared	0.073	0.117	0.072	0.117	0.073	0.117
Controls	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES		YES		YES	
Family & Category * Time FE		YES		YES		YES

This table reports results of difference-in-difference regressions of monthly fund flows from January 2019 to March 2021 on GNPO Label interacted with a Post variable and each of the other sustainability labels: the LCD, Top Globes and ESG Name. Post is a dummy variable equal to 1 for the months following the awarding of the GNPO label. LCD is a dummy variable taking the value of 1 if the fund holds the LCD, Top Globes is a dummy variable taking the value of 1 if the fund holds 4 or 5 globes. ESG Name is a dummy taking the value of 1 if the fund name contains ESG-related designations. The regressions control for lagged fund characteristics, namely the log of aggregated size of the fund, the log of age, fees, past returns, volatility of past returns, star ratings and the globes. Robust standard errors in parentheses clustered at fund level. ***, **, and * denote statistically significance at the 1%, 5% and 10% level, respectively.

Table 10: The effect of the awarding of GNPO labels based on prior sustainability levels

VARIABLES	Flows					
	Low priors		High priors		Medium priors	
	(1)	(2)	(3)	(4)	(5)	(6)
GNPO Label x Post	1.186***	1.103***				
	(0.354)	(0.345)				
GNPO Label x Post x Low priors	1.410**	1.279**				
	(0.560)	(0.606)				
GNPO Label x Post			1.740***	1.686***		
			(0.395)	(0.405)		
GNPO Label x Post x High priors			1.104**	0.949**		
			(0.436)	(0.422)		
GNPO Label x Post					0.996***	0.879**
					(0.368)	(0.360)
GNPO Label x Post x Medium priors					1.772***	1.764***
					(0.494)	(0.499)
Observations	138,048	137,867	138,048	137,867	138,048	137,867
R-squared	0.072	0.117	0.073	0.117	0.072	0.117
Controls	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES		YES		YES	
Family & Category * Time FE		YES		YES		YES

This table reports results of difference-in-difference regressions of monthly fund flows from January 2019 to March 2021 on GNPO Label interacted with a Post variable and a variable measuring prior sustainability levels. Post is a dummy variable equal to 1 for the months following the awarding of the GNPO label. Low priors is a dummy variable taking the value of 1 if the fund holds three or fewer globes, does not hold the LCD and does not have an ESG name. High priors is a dummy taking the value of 1 if the fund holds two out of the three labels: 4 or 5 globes, the LCD and an ESG name. Medium priors is a dummy taking the value of 1 if the fund holds only one of the other sustainability labels. The regressions control for lagged fund characteristics, namely the log of aggregated size of the fund, the log of age, fees, past returns, volatility of past returns, star ratings and the globes. Robust standard errors in parentheses clustered at fund level. ***, **, and * denote statistically significance at the 1%, 5% and 10% level, respectively.

Table 11: The flow effect of the SFDR classification

VARIABLES	Flows			Normalized Flows		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A - Article 8						
Article 8	0.628***	0.617***		2.218***	2.147***	
	(0.090)	(0.091)		(0.500)	(0.506)	
Article 8 x Post	0.659***	0.674***	0.296***	2.970***	3.047***	1.455***
	(0.097)	(0.098)	(0.091)	(0.585)	(0.593)	(0.478)
Observations	92,396	92,273	92,797	92,396	92,273	92,797
R-squared	0.070	0.097	0.225	0.113	0.150	0.278
Controls	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES			YES		
Family & Category * Time FE		YES			YES	
Fund & Time FE			YES			YES
Panel B - Article 9						
Article 9	1.310***	1.160***		4.800***	4.463***	
	(0.308)	(0.314)		(1.389)	(1.420)	
Article 9 x Post	0.971***	1.175***	0.329	5.899***	6.099***	2.450**
	(0.273)	(0.272)	(0.251)	(1.487)	(1.537)	(1.212)
Observations	61,429	61,280	61,676	61,429	61,280	61,676
R-squared	0.075	0.112	0.225	0.121	0.166	0.280
Controls	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES			YES		
Family & Category * Time FE		YES			YES	
Fund & Time FE			YES			YES

This table reports results of difference-in-difference regressions of monthly fund flows from July 2020 to December 2021 on SFDR classification as Articles 8 or 9 and its interaction with a Post dummy variable that is equal to 1 for the months following the SFDR label (Equation 4). Panel A presents the results for Article 8 and Panel B for Article 9. Flows are computed as $(TNA_{i,t} - TNA_{i,t-1}(1 + r_{i,t}))/TNA_{i,t-1}$. Normalized Flows corresponds to percentiles of the net flows' rankings within fund size deciles. All regressions control for lagged fund characteristics, namely the log of aggregated size of the fund, the log of age, fees, past returns, volatility of past returns, star ratings and the globes. Robust standard errors in parentheses clustered at fund level. ***, **, and * denote statistically significance at the 1%, 5% and 10% level, respectively.

Table 12: The effect of the SFDR classification: institutional investors

VARIABLES	Flows	
	(1)	(2)
Panel A - Article 8		
Article 8 x Post	0.556***	0.572***
	(0.110)	(0.113)
Article 8 x Post x Institutional	0.818***	0.805***
	(0.147)	(0.147)
Observations	89,783	89,660
R-squared	0.070	0.098
Controls	YES	YES
Family & Category & Time FE	YES	
Family & Category * Time FE		YES
Panel B - Article 9		
Article 9 x Post	0.514	0.725**
	(0.335)	(0.341)
Article 9 x Post x Institutional	1.220***	1.442***
	(0.384)	(0.379)
Observations	59,652	59,503
R-squared	0.074	0.112
Controls	YES	YES
Family & Category & Time FE	YES	
Family & Category * Time FE		YES

This table reports results of difference-in-difference regressions of monthly fund flows from July 2020 to December 2021 on SFDR classification as Articles 8 or 9 interacted with a Post variable and an Institutional variable. Post is a dummy variable equal to 1 for the months following the SFDR label and Institutional is a dummy variable equal to 1 for funds with more than 50% of assets stemming from institutional share classes. Panel A presents the results for Article 8 and Panel B for Article 9. The regressions control for lagged fund characteristics, namely the log of aggregated size of the fund, the log of age, fees, past returns, volatility of past returns, star ratings and the globes. Robust standard errors in parentheses clustered at fund level. ***, **, and * denote statistically significance at the 1%, 5% and 10% level, respectively.

Table 13: The effect of the SFDR classification for funds holding other sustainability labels (single label effects)

VARIABLES	Flows							
	GNPO Label		LCD		Globes		ESG Name	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A - Article 8								
Article 8 x Post	0.616***	0.634***						
	(0.101)	(0.102)						
Article 8 x Post x GNPO Label	0.868***	0.872***						
	(0.193)	(0.194)						
Article 8 x Post			0.807***	0.888***				
			(0.141)	(0.143)				
Article 8 x Post x LCD			0.569***	0.542***				
			(0.121)	(0.124)				
Article 8 x Post					0.572***	0.593***		
					(0.114)	(0.117)		
Article 8 x Post x Top Globes					0.724***	0.751***		
					(0.122)	(0.123)		
Article 8 x Post							0.530***	0.556***
							(0.102)	(0.103)
Article 8 x Post x ESG Name							1.142***	1.123***
							(0.203)	(0.205)
Observations	92,396	92,273	92,396	92,273	92,396	92,273	92,396	92,273
R-squared	0.071	0.098	0.070	0.098	0.070	0.098	0.071	0.099
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES		YES		YES		YES	
Family & Category * Time FE		YES		YES		YES		YES
Panel B - Article 9								
Article 9 x Post	0.704**	0.868**						
	(0.341)	(0.348)						
Article 9 x Post x GNPO Label	1.281***	1.506***						
	(0.339)	(0.336)						
Article 9 x Post			1.256**	1.678***				
			(0.577)	(0.543)				
Article 9 x Post x LCD			0.854***	0.995***				
			(0.282)	(0.280)				
Article 9 x Post					0.955**	1.079**		
					(0.422)	(0.422)		
Article 9 x Post x Top Globes					1.034***	1.285***		
					(0.290)	(0.286)		
Article 9 x Post							0.941***	1.053***
							(0.336)	(0.342)
Article 9 x Post x ESG Name							1.249***	1.515***
							(0.367)	(0.360)
Observations	61,429	61,280	61,429	61,280	61,429	61,280	61,429	61,280
R-squared	0.075	0.112	0.075	0.112	0.075	0.112	0.075	0.113
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES		YES		YES		YES	
Family & Category * Time FE		YES		YES		YES		YES

This table reports results of difference-in-difference regressions of monthly fund flows from July 2020 to December 2021 on SFDR classification as Articles 8 or 9 interacted with a Post variable and each of the other sustainability labels: the GNPO label, the LCD, Top Globes and ESG Name. Post is a dummy variable equal to 1 for the months following the SFDR label. GNPO Label is a dummy variable taking the value of 1 if the fund was awarded a GNPO label. LCD is a dummy variable taking the value of 1 if the fund holds the LCD, Top Globes is a dummy variable taking the value of 1 if the fund holds 4 or 5 globes. ESG Name is a dummy taking the value of 1 if the fund name contains ESG-related designations. Panel A presents the results for Article 8 and Panel B for Article 9. The regressions control for lagged fund characteristics, namely the log of aggregated size of the fund, the log of age, fees, past returns, volatility of past returns, star ratings and the globes. Robust standard errors in parentheses clustered at fund level. ***, **, and * denote statistically significance at the 1%, 5% and 10% level, respectively.

Table 14: The effect of the SFDR classification considering prior sustainability levels

VARIABLES	Flows					
	Low priors		High priors		Medium Priors	
	(1)	(2)	(5)	(6)	(3)	(4)
Panel A - Article 8						
Article 8 x Post	0.633***	0.632***				
	(0.105)	(0.107)				
Article 8 x Post x Low priors	0.821***	0.894***				
	(0.180)	(0.181)				
Article 8 x Post			0.601***	0.629***		
			(0.100)	(0.102)		
Article 8 x Post x High priors			0.964***	0.924***		
			(0.205)	(0.207)		
Article 8 x Post					0.744***	0.765***
					(0.142)	(0.143)
Article 8 x Post x Medium priors					0.460***	0.469***
					(0.123)	(0.126)
Observations	92,396	92,273	92,396	92,273	92,396	92,273
R-squared	0.070	0.098	0.070	0.098	0.070	0.098
Controls	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES		YES		YES	
Family & Category * Time FE		YES		YES		YES
Panel B - Article 9						
Article 9 x Post	0.892***	1.096***				
	(0.271)	(0.267)				
Article 9 x Post x Low priors	2.600**	2.799**				
	(1.277)	(1.310)				
Article 9 x Post			0.989***	1.146***		
			(0.360)	(0.363)		
Article 9 x Post x High priors			1.100***	1.330***		
			(0.325)	(0.321)		
Article 9 x Post					1.027***	1.258***
					(0.343)	(0.341)
Article 9 x Post x Medium priors					0.617*	0.766**
					(0.358)	(0.356)
Observations	61,429	61,280	61,429	61,280	61,429	61,280
R-squared	0.075	0.112	0.075	0.112	0.075	0.112
Controls	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES		YES		YES	
Family & Category * Time FE		YES		YES		YES

This table reports results of difference-in-difference regressions of monthly fund flows from July 2020 to December 2021 on SFDR classification as Article 8 or 9 interacted with a Post variable and a variable measuring prior sustainability levels. Post is a dummy variable equal to 1 for the months following the SFDR label. Low priors is a dummy variable taking the value of 1 if the fund holds three or fewer globes, does not hold a GNPO label, the LCD and does not have an ESG name. High priors is a dummy taking the value of 1 if the fund holds three out of the four labels: the GNPO label, 4 or 5 globes, the LCD and an ESG name. Medium priors is a dummy taking the value of 1 if the fund holds only one of the other sustainability labels. The regressions control for lagged fund characteristics, namely the log of aggregated size of the fund, the log of age, fees, past returns, volatility of past returns, star ratings and the globes. Robust standard errors in parentheses clustered at fund level. ***, **, and * denote statistically significance at the 1%, 5% and 10% level, respectively.

Appendixes

Appendix 1

Description of variables

Variables	Description	Source
Fund flows	Monthly net change (in the local currency) in fund assets beyond asset appreciation, computed as $Flows_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1}(1+r_{i,t})}{TNA_{i,t-1}}$	Authors
Normalized fund flows	Percentiles of the net flows' rankings within fund size deciles. Each month funds are allocated to deciles based on fund size and we rank funds based on their net flows and compute percentiles of the rankings.	Authors
GNPO Label	A dummy variable that indicates if the fund holds a government or Non-Profit Organization sponsored label, 0 otherwise.	Authors
Post (GNPO)	A dummy variable identifying the period after the award of a GNPO Label	Authors
Sustainable	A dummy variable that indicates if the fund is flagged as having sustainable intentions by Morningstar	Morningstar
LCD	A dummy variable indicating if the fund is awarded Morningstar LCD, zero otherwise. LCD is awarded to funds with a Portfolio Carbon Risk Score below 10 for the trailing 12 months, and exposure to companies with fossil-fuel involvement below 7% over the same trailing 12 months.	Morningstar
ESG NAME	A dummy variable indicating if the fund has ESG jargon in the name, zero otherwise. We consider the following words: ESG, Sustainable, Social, Environment, Socially Responsible, Climate, Impact, and Green, and SDG.	Morningstar
Morningstar Globes (MSR)	Morningstar sustainability ratings ranging from 1 to 5 globes based on ESG risks. A fund exposed to high (low) ESG risks relative to its Morningstar global category will receive 1 globe (5 globes).	Morningstar
TOP MSR	A dummy variable indicating if the fund has MSR equal to 4 or 5 globes, zero otherwise.	Morningstar
Article 8/ Article 9 SFDR	Dummy variables indicating if the fund is classified as Article 8 (Article 9), zero otherwise. Article 8 funds are those that promote environmental or social characteristics but do not have them as the overarching objective, and Article 9 funds are those having sustainable goals as their objective.	Morningstar
Post (Article 8/ Article 9)	A dummy variable identifying the period after the classification as Article 8 (Article 9).	Authors
Institutional	A dummy variable identifying institutional funds, zero otherwise. Funds considered to targeting Institutional investors are those with more than 50% of assets stemming from institutional share classes.	Morningstar
12-month returns	Fund returns (in local currency) over the prior 12 months	Morningstar
Stars	Fund's Morningstar star rating in the prior month	Morningstar
12-month volatility	Standard deviation of returns over the past 12 months	Morningstar
Fund size	Fund size is measured by the log of aggregate Net Asset Value (measured in million USD dollars).	Morningstar
Fund age	Fund age is measured by the log of the years since fund inception date until March 2021 (or December 2021).	Morningstar
Fund fees	Fund fees refer to management fees, the costs shareholders paid for management and administrative services.	Morningstar

Supplementary Appendices

Table A1 – Tetrachoric correlation

	GNPO Label	LCD	Sustainable	ESG Name	Article 8	Article 9
GNPO Label	1.0000					
LCD	0.1622*	1.0000				
Sustainable	0.6900*	0.2172*	1.0000			
ESG Name	0.4007*	0.1775*	0.7866*	1.0000		
Article 8	0.3338*	0.2005*	0.7158*	0.3704*	1.0000	
Article 9	0.5060*	0.2930*	0.7909*	0.6307*	-0.2203*	1.0000

Table A2 – Fund flows and sustainability signals: robustness with country and fund family and category by time FE

VARIABLES	Flows			
	2019-2021		April-Dec 2021	
	(1)	(2)	(3)	(4)
GNPO Label	0.604***	0.738***	0.382***	0.343**
	(0.091)	(0.099)	(0.139)	(0.147)
LCD	0.019	0.030	-0.194**	-0.195**
	(0.055)	(0.057)	(0.083)	(0.086)
ESG Name	0.686***	0.843***	0.439***	0.701***
	(0.104)	(0.110)	(0.147)	(0.158)
Article 8			0.337***	0.444***
			(0.075)	(0.090)
Article 9			0.307*	0.193
			(0.182)	(0.211)
1 Globe	0.028	0.065	0.233	0.327**
	(0.096)	(0.097)	(0.142)	(0.151)
1 Globe	0.045	0.037	-0.018	-0.008
	(0.055)	(0.056)	(0.082)	(0.086)
2 Globes	-0.015	-0.004	-0.020	0.005
	(0.050)	(0.049)	(0.078)	(0.080)
4 Globes	0.075	0.068	-0.021	0.019
	(0.075)	(0.074)	(0.106)	(0.109)
5 Globes	0.026	-0.007	-0.031	-0.080**
	(0.018)	(0.024)	(0.032)	(0.039)
12-month volatility	0.043***	0.061***	0.024***	0.029***
	(0.002)	(0.003)	(0.003)	(0.003)
12-month return	0.068***	0.042**	-0.064***	-0.098***
	(0.016)	(0.019)	(0.023)	(0.027)
Log size	-0.356***	-0.394***	-0.326***	-0.349***
	(0.035)	(0.039)	(0.048)	(0.053)
Log age	0.043	-0.101**	0.033	-0.044
	(0.038)	(0.045)	(0.056)	(0.071)
Fees	-0.621***	-0.441***	-0.605***	-0.456***
	(0.079)	(0.080)	(0.116)	(0.120)
1 Star	-0.341***	-0.290***	-0.495***	-0.450***
	(0.047)	(0.047)	(0.074)	(0.077)
2 Stars	0.376***	0.311***	0.306***	0.304***
	(0.047)	(0.047)	(0.074)	(0.077)
4 Stars	1.382***	1.229***	1.001***	0.943***
	(0.073)	(0.072)	(0.101)	(0.108)
5 Stars	-1.584***	-0.870**	1.065**	1.788***
	(0.336)	(0.393)	(0.493)	(0.566)
Observations	198,414	198,166	50,550	50,493
R-squared	0.053	0.108	0.038	0.094
Family & Category * Time FE		YES		YES
Category & Country & Time FE	YES		YES	

Table A3 – Fund flows and sustainability signals: robustness with lagged flows

VARIABLES	Flows			
	2019-2021		April-Dec 2021	
	(1)	(2)	(3)	(4)
GNPO Label	0.665***	0.655***	0.313**	0.310**
	(0.087)	(0.087)	(0.129)	(0.130)
LCD	0.039	0.030	-0.161**	-0.153**
	(0.049)	(0.050)	(0.075)	(0.076)
ESG Name	0.734***	0.730***	0.619***	0.618***
	(0.096)	(0.096)	(0.139)	(0.140)
Article 8			0.410***	0.406***
			(0.080)	(0.080)
Article 9			0.159	0.147
			(0.177)	(0.178)
1 Globe	0.035	0.042	0.312**	0.285**
	(0.084)	(0.086)	(0.133)	(0.134)
2 Globes	0.040	0.027	0.019	0.002
	(0.049)	(0.049)	(0.076)	(0.076)
4 Globes	-0.019	-0.012	-0.006	-0.000
	(0.043)	(0.044)	(0.070)	(0.071)
5 Globes	0.041	0.050	0.002	0.010
	(0.065)	(0.065)	(0.096)	(0.096)
Flows t-1	0.133***	0.132***	0.123***	0.124***
	(0.005)	(0.005)	(0.009)	(0.009)
12-month volatility	0.022	-0.003	-0.026	-0.072**
	(0.016)	(0.021)	(0.031)	(0.035)
12-month return	0.036***	0.053***	0.016***	0.024***
	(0.002)	(0.003)	(0.002)	(0.003)
Log size	0.044***	0.029*	-0.090***	-0.089***
	(0.017)	(0.016)	(0.023)	(0.023)
Log age	-0.342***	-0.334***	-0.302***	-0.300***
	(0.034)	(0.035)	(0.048)	(0.048)
Fees	-0.052	-0.080**	-0.024	-0.039
	(0.039)	(0.040)	(0.062)	(0.063)
1 Star	-0.487***	-0.379***	-0.441***	-0.412***
	(0.070)	(0.071)	(0.107)	(0.108)
2 Stars	-0.295***	-0.260***	-0.416***	-0.401***
	(0.043)	(0.043)	(0.070)	(0.070)
4 Stars	0.304***	0.260***	0.265***	0.251***
	(0.042)	(0.042)	(0.069)	(0.069)
5 Stars	1.146***	1.054***	0.856***	0.829***
	(0.063)	(0.063)	(0.095)	(0.096)
Constant	-0.909***	-0.680**	1.758***	1.655***
	(0.345)	(0.346)	(0.475)	(0.481)
Observations	193,795	193,570	50,039	49,989
R-squared	0.084	0.125	0.086	0.108
Family & Category & Time FE	YES		YES	
Family & Category * Time FE		YES		YES

Table A4 – Results of logit regressions where the dependent is the probability of being a GNPO-labeled fund

VARIABLES	GNPO Label	
	Propensity to be treated	Propensity to be treated
	(1)	(2)
Log size	0.175***	0.131***
	(0.010)	(0.011)
Log age	0.041*	0.072***
	(0.023)	(0.023)
Stars	0.120***	0.035**
	(0.014)	(0.015)
Fees	0.061**	0.430***
	(0.027)	(0.029)
Globes		0.172***
		(0.016)
ESG Name		0.634***
		(0.040)
LCD		0.124***
		(0.034)
Sustainable		3.115***
		(0.056)
Constant	-7.264***	-9.543***
	(0.195)	(0.226)
Observations	138,074	138,074

Table A5 – Robustness tests on the effect of the awarding of GNPO labels on fund flows: institutional investors

VARIABLES	Flows		Normalized Flows		Flows			
	Institutional (75% threshold)				Matched sample 1		Matched sample 2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GNPO Label x Post	1.089***	1.036***	4.445***	4.212**	1.696***	1.530***	0.827*	1.044**
	(0.315)	(0.307)	(1.644)	(1.640)	(0.482)	(0.494)	(0.490)	(0.528)
GNPO Label x Post x Institutional	1.753**	1.573**	5.443**	5.123**	2.500***	2.451***	1.866**	2.045**
	(0.734)	(0.723)	(2.397)	(2.371)	(0.781)	(0.819)	(0.786)	(0.866)
Observations	138,048	137,867	138,048	137,867	15,331	14,597	12,256	11,708
R-squared	0.073	0.117	0.114	0.158	0.103	0.199	0.098	0.219
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES		YES		YES		YES	
Family & Category * Time FE		YES		YES		YES		YES

Table A6 – The effect of the awarding of GNPO labels to funds holding other sustainability labels (single label effects): robustness tests

VARIABLES	Normalized Flows			Flows					
				Matched sample 1			Matched sample 2		
	LCD	Globes	ESG Name	LCD	Globes	ESG Name	LCD	Globes	ESG Name
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GNPO Label x Post	8.828***			2.791***			2.435***		
	(1.917)			(0.610)			(0.687)		
GNPO Label x Post x LCD	3.621**			1.293**			1.422**		
	(1.743)			(0.553)			(0.575)		
GNPO Label x Post		6.375***			2.612***			1.943***	
		(2.136)			(0.538)			(0.546)	
GNPO Label x Post x Top Globes		4.919***			1.597***			0.977*	
		(1.686)			(0.524)			(0.534)	
GNPO Label x Post			3.127**			1.467***			0.877*
			(1.585)			(0.444)			(0.476)
GNPO Label x Post x ESG Name			12.467***			3.634***			3.217***
Observations	138,048	138,048	138,048	15,894	15,894	15,894	12,814	12,814	12,814
R-squared	0.114	0.114	0.114	0.104	0.104	0.105	0.097	0.096	0.097
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table A7 – The effect of the awarding of GNPO labels based on prior sustainability levels: robustness tests

	Normalized Flows			Flows					
				Matched sample 1			Matched sample 2		
VARIABLES	Low priors	High priors	Medium priors	Low priors	High priors	Medium priors	Low priors	High priors	Medium priors
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GNPO Label x Post	4.577***			1.954***			1.466***		
	(1.530)			(0.503)			(0.517)		
GNPO Label x Post x Low priors	6.998**			2.678***			1.106		
	(3.012)			(0.712)			(0.734)		
GNPO Label x Post		5.998***			2.530***			1.884***	
		(1.974)			(0.502)			(0.536)	
GNPO Label x Post x High priors		5.189***			1.804***			1.376**	
		(1.876)			(0.639)			(0.658)	
GNPO Label x Post			4.601***			1.592***			1.187**
			(1.634)			(0.509)			(0.517)
GNPO Label x Post x Medium priors			5.087**			2.252***			2.039***
			(2.315)			(0.594)			(0.618)
Observations	138,048	138,048	138,048	15,894	15,894	15,894	12,814	12,814	12,814
R-squared	0.114	0.114	0.114	0.104	0.104	0.104	0.096	0.096	0.096
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table A8 – The flow effect of the SFDR classification: robustness tests

VARIABLES	Flows					
	Matched sample 1			Matched sample 2		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A - Article 8						
Article 8	0.540***	0.527***		0.372*	0.356*	
	(0.096)	(0.097)		(0.190)	(0.195)	
Article 8 x Post	0.673***	0.682***	0.319***	0.547***	0.557***	0.198
	(0.104)	(0.105)	(0.095)	(0.200)	(0.203)	(0.136)
Observations	74,384	74,171	74,794	30,244	29,967	30,437
R-squared	0.075	0.106	0.219	0.090	0.139	0.234
Controls	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES			YES		
Family & Category * Time FE		YES			YES	
Fund & Time FE			YES			YES
Panel B - Article 9						
Article 9	0.795*	0.657		0.912**	0.798*	
	(0.423)	(0.447)		(0.439)	(0.459)	
Article 9 x Post	0.757*	0.924**	0.529*	0.760	1.034**	0.316
	(0.414)	(0.432)	(0.296)	(0.470)	(0.500)	(0.313)
Observations	12,143	11,771	12,205	8,511	8,263	8,539
R-squared	0.141	0.247	0.253	0.140	0.267	0.245
Controls	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES			YES		
Family & Category * Time FE		YES			YES	
Fund & Time FE			YES			YES

Table A9 – Robustness tests on the effect of the SFDR classification: institutional investors

VARIABLES	Flows Institutional (75% threshold)		Normalized Flows		Flows Matched sample 1		Flows Matched sample 2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A - Article 8								
Article 8 x Post	0.562***	0.579***	2.570***	2.649***	0.511***	0.529***	0.426**	0.459**
	(0.108)	(0.111)	(0.697)	(0.715)	(0.115)	(0.117)	(0.212)	(0.218)
Article 8 x Post x Institutional	0.836***	0.821***	3.436***	3.342***	0.853***	0.827***	0.754***	0.702***
	(0.152)	(0.151)	(0.861)	(0.860)	(0.156)	(0.155)	(0.259)	(0.263)
Observations	89,783	89,660	89,783	89,660	74,384	74,171	30,244	29,967
R-squared	0.070	0.098	0.113	0.151	0.075	0.106	0.091	0.140
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES		YES		YES		YES	
Family & Category * Time FE		YES		YES		YES		YES
Panel B - Article 9								
Article 9 x Post	0.447	0.649**	3.301*	3.426*	0.233	0.426	0.416	0.733
	(0.325)	(0.329)	(1.890)	(1.972)	(0.469)	(0.488)	(0.522)	(0.557)
Article 9 x Post x Institutional	1.350***	1.590***	6.844***	7.197***	0.845*	0.932*	1.199**	1.355**
	(0.399)	(0.394)	(2.012)	(2.045)	(0.490)	(0.513)	(0.591)	(0.625)
Observations	59,652	59,503	59,652	59,503	12,143	11,771	8,511	8,263
R-squared	0.075	0.112	0.120	0.166	0.142	0.247	0.140	0.267
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES		YES		YES		YES	
Family & Category * Time FE		YES		YES		YES		YES

Table A10 - The effect of the SFDR classification for funds holding other sustainability labels (single label effects): robustness tests

VARIABLES	Normalized Flows				Flows							
					Matched sample 1				Matched sample 2			
	GNPO Label	LCD	Globes	ESG Name	GNPO Label	LCD	Globes	ESG Name	GNPO Label	LCD	Globes	ESG Name
Panel A - Article 8												
Article 8 x Post	2.709***				0.618***				0.487**			
	(0.609)				(0.107)				(0.203)			
Article 8 x Post x GNPO Label	4.082***				0.912***				0.952***			
	(1.127)				(0.202)				(0.279)			
Article 8 x Post		3.202***				0.766***				0.622**		
		(0.814)				(0.149)				(0.274)		
Article 8 x Post x LCD		2.768***				0.555***				0.433		
		(0.753)				(0.133)				(0.264)		
Article 8 x Post			2.029***				0.568***				0.431*	
			(0.700)				(0.122)				(0.228)	
Article 8 x Post x Top Globes			4.136***				0.741***				0.719***	
			(0.727)				(0.130)				(0.238)	
Article 8 x Post				2.385***				0.534***				0.406*
				(0.620)				(0.109)				(0.209)
Article 8 x Post x ESG Name				5.616***				1.205***				1.098***
				(1.154)				(0.209)				(0.294)
Observations	92,396	92,396	92,396	92,396	74,384	74,384	74,384	74,384	30,244	30,244	30,244	30,244
R-squared	0.113	0.113	0.113	0.114	0.076	0.075	0.075	0.076	0.093	0.091	0.090	0.092
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Family & Caegory & Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Panel B - Article 9												
Article 9 x Post	6.373***				0.250				0.309			
	(1.980)				(0.521)				(0.582)			
Article 9 x Post x GNPO Label	5.917***				1.242***				1.897***			
	(1.837)				(0.474)				(0.576)			
Article 9 x Post		8.279***				1.179*				1.383*		
		(2.735)				(0.695)				(0.786)		
Article 9 x Post x LCD		5.167***				0.462				0.636		
		(1.630)				(0.443)				(0.601)		
Article 9 x Post			5.729**				0.986*				0.768	
			(2.324)				(0.503)				(0.593)	
Article 9 x Post x Top Globes			6.407***				1.007**				0.696	
			(1.599)				(0.452)				(0.480)	
Article 9 x Post				5.344***				0.736				0.773
				(1.887)				(0.455)				(0.548)
Article 9 x Post x ESG Name				7.910***				0.987*				1.346**
				(1.934)				(0.531)				(0.560)
Observations	61,429	61,429	61,429	61,429	12,143	12,143	12,143	12,143	8,511	8,511	8,511	8,511
R-squared	0.121	0.121	0.121	0.122	0.143	0.142	0.142	0.142	0.144	0.141	0.142	0.142
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Family & Caegory & Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table A11 – The effect of the SFDR classification considering prior sustainability levels: robustness tests

VARIABLES	Normalized Flows			Flows					
				Matched sample 1			Matched sample 2		
	Low priors	Medium priors	High priors	Low priors	Medium priors	High priors	Low priors	Medium priors	High priors
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A - Article 8									
Article 8 x Post	3.025***			0.376			1.089**		
	(0.639)			(0.372)			(0.539)		
Article 8 x Post x Low priors	3.133***			-0.202			0.012		
	(1.015)			(0.516)			(0.692)		
Article 8 x Post		3.263***			0.035			1.160*	
		(0.836)			(0.427)			(0.638)	
Article 8 x Post x Medium priors		1.996***			-0.463			0.912	
		(0.752)			(0.442)			(0.586)	
Article 8 x Post			2.582***			-0.322			0.802
			(0.607)			(0.341)			(0.498)
Article 8 x Post x High priors			5.101***			1.057*			2.045***
			(1.196)			(0.577)			(0.745)
Observations	92,396	92,396	92,396	9,862	9,862	9,862	7,759	7,759	7,759
R-squared	0.113	0.113	0.113	0.111	0.111	0.112	0.116	0.116	0.117
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Panel 8 - Article 9									
Article 9 x Post	5.559***			2.228**			-1.782*		
	(1.543)			(1.042)			(0.907)		
Article 9 x Post x Low priors	11.057**			3.539			0.427		
	(4.736)			(4.920)			(5.976)		
Article 9 x Post		6.264***			1.474			-1.536	
		(1.752)			(1.408)			(1.421)	
Article 9 x Post x Medium priors		4.866**			2.210***			-1.440	
		(2.208)			(0.847)			(1.195)	
Article 9 x Post			6.132***			2.415*			-0.742
			(2.002)			(1.362)			(1.383)
Article 9 x Post x High priors			6.611***			1.830			-1.233
			(1.775)			(1.392)			(1.195)
Observations	61,429	61,429	61,429	5,774	5,774	5,774	2,676	2,676	2,676
R-squared	0.121	0.121	0.121	0.138	0.136	0.136	0.155	0.153	0.155
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Family & Category & Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES