

Is Sustainable Investing Driven by Social Preferences?

Evidence from Shocks to Philanthropy

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Abstract: We show that social preferences do not drive sustainable investing (SI) by examining the response of SI flows to exogenous shocks that activate pro-social motives. Our design capitalizes on the inherently social nature of philanthropy to identify which shocks genuinely activate social preferences and then tests whether these same shocks also affect SI flows. A set of environmental shocks trigger social preferences, as evidenced by a significant effect on granular US charity flows, but do not elicit a response in SI. A negative shock to the tax shield benefits of philanthropy results in outflows in charitable donations but these are not redirected towards SI as might be anticipated if both avenues serve to fulfil social preferences. Our tests are very strict in the sense that we define treated and control charities and SI funds based on their detailed classification and style. We offer additional supporting evidence by performing event studies on SI fund net asset values. Furthermore, we address several alternative explanations, including considerations of reputation, risk-return effects, and institutional and informational differences between SI and philanthropy. Whilst we do not observe a market-wide effect, our analysis based in the US Federal Reserve Survey of Consumer Finance reveals transfers between philanthropy and SI among Millennials. The absence of a market-wide effect may be attributed to the relatively small proportion of capital flows generated by the demographic group most interested in SI. We show that our findings also hold in the UK. Policy makers considering higher ESG mandates should recognise that appealing to social preferences may be less effective than risk/return-based incentives in redirecting investment flows.

Keywords: SI, philanthropy, ESG, charity, mutual funds, social preferences
JEL Classifications: A13, G11, G23, D64

Online appendix: <https://edin.ac/3hUIBWl>

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1. Introduction

ESG considerations in corporate decision making and portfolio selection have become politicised and distorted amid the ongoing culture wars in the US. For example, the California state law for board diversity, initially enacted during the period 2019-2021, was later ruled unconstitutional by a federal court in 2022 (Elsesser, 2023). Similarly, the SEC climate disclosure requirements, adopted on March 6, 2024, faced scrutiny during congressional hearings in 2023, and despite being watered down, are currently subject to an unprecedented number of lawsuits (Webb, 2024). One of the most politically contentious aspects under the ESG umbrella is whether pension savings should be allocated according to ESG principles. As of January 2024, sixteen states have adopted statutes limiting such allocations, while four states have passed statutes encouraging them (Yousofi and Connolly, 2024). The necessity of these interventions significantly hinges on how investors typically make allocation decisions otherwise. Our findings suggest that flows to US active equity mutual funds are not driven by social preferences, rendering limitations on such investments unnecessary. Furthermore, the backlash against sustainable investing in the US is even less justified considering the small share of sustainable funds out of the net asset value of US equity mutual funds – ranging from 0.5% in 2012 to 3% in 2022 (UNCTAD, 2023). Our findings align with recent surveys among US retail investors, which document that they react rationally, rather than emotionally, to ESG information (Li, Watts, and Zhu, 2023) and expect ESG investments to do at least as well as the market (Mottola et al., 2022). However, Giglio et al. (2023) find that retail investors expect ESG investments to underperform the market, consistent with experimental evidence suggesting that the interest in sustainability is partly driven by non-pecuniary motives (Hartzmark and Sussman, 2019; Humphrey et al., 2021; Riedl and Smeets, 2017).¹ Unlike experimental studies, our approach enables us to transition from the laboratory to the real world and to mitigate the attitude-behavior gap (i.e. stated-revealed preference) typically encountered in surveys (Kitzmueller and Shimshack, 2012; De Pelsmacker, Driesen, and Rayp, 2005).

Empirically determining whether social or monetary motives primarily drive overall market movements is crucial. This understanding is essential for crafting successful policy interventions, especially in response to pressing challenges like climate change and post-COVID global issues. Effective policies must align with actual investor preferences to maximize their impact and efficacy. We show that SI is unlikely to be driven by social

¹ In line with the literature (see, for example, List, 2009) we use nonpecuniary motives and social preferences as synonyms.

preferences in market-wide data of equity mutual funds in the US. To isolate social preferences, we turn to philanthropy, as many aspects of social preferences – such as altruism, fairness, reciprocity, inequity aversion, guilt, and spitefulness – are known drivers of philanthropic behaviour (Fehr and Schmidt, 2006). To illustrate the relationship between SI and philanthropy consider a consumer choosing between fair-trade and less expensive, unethically sourced coffee. These choices parallel SI and conventional investing, respectively. If the consumer is motivated by inequity aversion, they may choose fair-trade coffee that is more expensive, but they accept the premium in exchange for restoring fairness. Suppose an award-winning documentary reveals the hardships of coffee-pickers and receives extensive media coverage. Consumers who initially chose the unethically sourced coffee might switch to fair-trade, or, alternatively, continue buying the cheaper choice but donate to a charity supporting coffee pickers. In the investment context, we exploit similar shocks that activate social preferences (akin to the documentary example) and trigger significant responses in targeted donations to relevant causes (such as coffee picker welfare). Importantly, our findings show that these shocks do not affect SI flows (fair-trade coffee consumption), indicating that social preferences do not drive SI. To address some alternative explanations for our findings, we consider the US Tax Cut and Jobs Act 2017 that keeps social preferences constant but removes the tax deduction incentives of philanthropy. We find that while donation flows are reduced, flows are not redirected to SI.

We define social preferences in the investment decision-making context as supporting environmental and/or social and/or governance (ESG) causes even if this means sacrificing returns (LeClair, 2014). Socially-driven investors accept investments performing at a discount (i.e. willingness to pay, see Barber, Morse, and Yasuda, 2021; Bialkowski and Starks, 2016; Geczy, Stambaugh, and Levin, 2021; Renneboog, Ter Horst, and Zhang, 2008, 2011; Riedl and Smeets, 2017) and are less sensitive to poor past returns (Bollen, 2007; Renneboog et al., 2011). By contrast, for some investors who see SI primarily as a profitable investment strategy, altruism is a secondary motivation (20% in a Merrill Lynch survey and 52% in a BNP survey choose a risk-return motivation as a primary driver). There is some empirical evidence that investment strategies based on SI aspects provide positive returns (Edmans, 2011; Gibson, Krueger, and Mitali, 2021). Potential explanations for these findings are initial mispricing and expected future performance by investors, but not necessarily social preferences. Both groups of investors (socially-driven and risk-return-motivated) contribute to the total investment flows we see in the data. The fact that there is no significant reaction by SI even in periods when

social preferences are activated, suggests that socially-motivated investors are unlikely to drive SI flows.

Fama and French (2007) compare socially responsible assets to consumption bundles satisfying both monetary motives, as well as investor tastes that are unrelated to returns. Recent theoretical work studies investor preferences for sustainable (or “green”) as opposed to conventional assets and derives market equilibrium results with a new sustainable priced factor (or an ESG factor) (Heinkel, Kraus, and Zechner, 2001; Baker et al., 2022; Pástor, Stambaugh, and Taylor, 2021; Pedersen, Fitzgibbons, and Pomorski, 2021; Bauer, Ruof, and Smeets, 2021; De Angelis, Tankov, and Zerbib, 2022). These models derive optimal portfolio allocations with tilts towards SI depending on the strength of ESG tastes.

In the context of consumer choice, many theoretical models consider a product with a sustainability component as an equivalent to a regular product plus a charitable donation, for example: fair-trade coffee (Dragusanu, Giovannucci, and Nunn, 2014) or carbon offset programs (Marron and Toder, 2014). Moving to investment choices in firms, Graff Zivin and Small (2005) introduce a Modigliani-Miller framework where in satisfying their mix of monetary and social preferences investors will be indifferent between a combination of conventional investments and philanthropy on the one hand (Friedman, 1970), and socially responsible assets (Vogel, 2006), on the other. Extending this paradigm from firms to portfolios, one can see a share in an SI fund as a charity-investment bundle. However, substitutability could be imperfect, because purely profit maximizing corporate activities impose negative social externalities. Thus, the charity-investment bundle becomes inferior and socially conscious investors (for example, Millennials) would lean in favor of SI funds (Hart and Zingales, 2017). On the other hand, if some investors have a strong loss aversion (for example, Baby Boomers, who are retired) or others are skeptical about the ability of corporations to credibly deliver altruistic goals, they would prefer the conventional-philanthropy bundle (Kotchen, 2006). The presence of socially responsible investors with heterogeneous preferences means that a sudden increase in the desire to contribute to a cause, for example environmental protection, would be reflected in both environmentally oriented philanthropy and SI.

Most research in finance does not specify the source of investor preferences for sustainability. Recent studies that attempt to isolate social preferences are based on experiments (Hartzmark and Sussman, 2019; Humphrey et al., 2021), survey data (Giglio et al., 2023; Li, Watts, and

Zhu, 2023; Bauer, Ruof, and Smeets, 2021) and surveys combined with experimental evidence from the Netherlands (Riedl and Smeets, 2017). Our study focuses on social preferences in a non-experimental setting and in the wider investor universe, whereby we choose a set of exogenous shocks, ascertain that they affect philanthropy and study their effect on SI flows (the shocks we examine are listed in Table 1).

Our research design has several benefits, the first of which is that we directly isolate social preferences. The typical design used in existing research explains differences in investment outcomes between SI vs conventional funds with observables, which control for their common monetary motive. Any conclusions about alternative explanations (including social preferences) are based on the part of the variation that is unexplained and remains in the residual (Geczy, Stambaugh, and Levin, 2021; Renneboog et al., 2008; 2011; Barber, Morse, and Yasuda, 2021). An improvement on the typical design is to exploit shocks to the preferences for sustainable investments, especially climate related (Bialkowski and Starks, 2016; Kim et al., 2019; Ramelli et al., 2021). Our approach is similarly shock-based, exploiting a variety of quasi-natural experiments (both environmental catastrophes and policy changes), but, crucially, we first establish their relevance to social preferences. We only interpret SI flow results as driven by shocks to social preferences if they are also shown to have impacted philanthropy. Importantly, by explicitly including shocks to social preferences in our regressions, we do not rely on the residual variation but are able to directly measure their effect on SI. Another benefit of our approach is that we consider a second type of shock affecting the overall attractiveness of the charity sector in delivering pro-social goals: a shock to the tax shield of philanthropy.² Tests based on this shock enable us to rule out alternative explanations, such as shock irrelevance to SI, and strengthen our conclusions of whether social preferences are behind the demand for SI, instead of risk/return motives. To illustrate this, consider a humanitarian disaster that triggers an increase in philanthropy. On the one hand, finding no effect on SI flows could mean that either social preferences are not a driver of SI, or that the shock activates an aspect of social preferences that is better satisfied by philanthropy, rather than SI. Consider, instead, a shock that does not activate social preferences, but rather makes philanthropy less attractive than SI, for example, reducing the tax shield of philanthropy. In this case, finding a reduction in charitable giving, but no effect on SI cannot be attributed to shock irrelevance to SI. On the

² We also consider a reputation scandal in robustness analysis for external validity in the UK setting in section 4. For evidence that donation decisions are influenced by the efficiency of charities see Chen, 2009; Berman et al., 2018; Michel and Rieunier, 2012.

other hand, finding an effect of an environmental disaster on SI flows could mean that either investors are driven by social preferences, or they are motivated by strategic forward-looking risk/return implications on the firms in their SI portfolios. However, finding an effect of the tax shield shock on SI flows is independent of a particular risk exposure, as it affects only the philanthropy sector and not the constituent firms of SI portfolios.

The third benefit of our empirical design stems from the granularity of our philanthropy data, which allows us to use a strict definition of treated and control charities, match them based on multiple pre-shock covariates and therefore design as stringent tests as possible. Consider the different existing preference orderings of investors among charitable causes: climate change, social justice, animal welfare, arts, etc. An exogenous shock such as an environmental crisis would trigger compassion and enhanced altruistic behavior in donors who prioritize the environment (treated) relative to the ones who prioritize the arts (control). Thus, we would expect a stronger demand for donating to charities with an environmental focus and a possible corresponding increase in flows towards SI funds supporting the same cause. We start with the population of US charities and then use the charity primary purpose classification to perform shock strength tests on carefully defined treated and control groups. Our SI flow analysis is as detailed as our philanthropy analysis. We examine the differences in flows not only between SI and conventional funds but also between environment-focused SI funds and other SI funds, whenever the data allows.

In attributing the charity flow effects of our shocks to social preferences we make sure to exclude several alternative possibilities. First, both philanthropy and SI are driven by at least two other motives beyond social preferences: monetary (returns for SI and tax shield for philanthropy - Feldstein and Taylor, 1976; Clotfelter, 1980; Auten, Sieg, and Clotfelter, 2002; List, 2011; Hickey, Minaker, and Payne, 2019) and reputational goals (Glazer and Konrad, 1996). In addition to addressing risk/return considerations (monetary drivers) with our second type of shocks, we also control for contemporaneous and pre-shock risk and performance measures in all regressions. To exclude the other common motive (reputation) we employ a separate test on the change in the volume of named vs anonymous donations around one of our shocks.

A lack of a significant effect on SI fund flows could be the result of institutional and informational differences between philanthropy and SI rather than the irrelevance of social motives. One might argue that pension funds are important potential contributors to SI

investing (Eurosif, 2016), while contributors to philanthropy are mostly individuals (Del Guercio and Tkac, 2002; James and Karceski, 2006) and there is little overlap between them. First, we note that during the period of our analysis, these large, regulated institutions in the US had to be careful not to sacrifice returns for their investors in the name of ESG considerations (there are no ESG funds available in the vast majority of 401(K) retirement plans in the period of our analysis; Quinson, 2020). Therefore, the US investors holding SI funds are less likely to be such regulated institutions. Second, the US Federal Reserve Survey of Consumer Finance shows that the value of employer-sponsored pension savings (which are subject to a restriction on using ESG criteria) are miniscule relative to overall investments in equity funds and stocks, where investors have discretion over the nature of the characteristics of their chosen instruments. We still differentiate the effects on retail and institutional investors in our regressions to address this potential concern.

Another difference between philanthropy and SI that could explain the lack of an effect on SI flows is that philanthropy is often episodic or one-time in nature (CAF, 2019), whereas SI is typically conducted through regular paycheck withdrawals. A related distinction might be that charity giving is spontaneous, while a decision to rebalance one's investment portfolio might happen only once a year (Jagannathan et al., 2012). We address this concern by performing robustness tests with different numbers of post-shock years when analyzing SI flows. Alternatively, one may be concerned that the lack of effect on SI flows could be due to the annual frequency of our baseline analysis, whereas an effect might exist on a shorter-term scale. We show that this is not the case using a daily frequency event study.

A fourth difference is visibility and search costs. While charitable giving is often encouraged by well-publicized appeals (Bendapudi, Singh, and Bendapudi, 1996), SI funds prospectuses may be less accessible to investors. It may be less costly and time-consuming for individuals to search for charities with environmental protection goals, through news agencies, charity websites or word of mouth, than to search for sustainable investment funds with an environment focus through a proprietary database, financial advisors, or individual fund website. Search costs have been shown to be relevant to mutual fund investor decisions (Hortacsu and Syverson, 2004; Roussanov, Ruan, and Wei, 2021) and therefore fund flows (Sirri and Tufano, 1998). We minimize this concern implicitly by performing tests only after a sudden increase in the visibility of SI funds. Specifically, while the Morningstar database includes an SI classification for the entire period of our analysis, the designation of sustainability at the fund level became especially detailed at the start of 2016 with the

introduction of Morningstar sustainability globe ratings, which resulted in a surge in SI flows, as shown by Hartzmark and Sussman (2019).

We find that charity flows react strongly and in the expected direction to the 2016 US presidential election results and the 2017 US withdrawal from the Paris Climate Agreement.³ On the other hand, SI fund flows in all our tests never show a significant reaction to any of these shocks. Taken together, this first set of results suggest that although social preferences are triggered by the environmental shocks we analyze, they are unlikely to be a strong determinant of SI flows. Further analysis based on the Tax Cut and Jobs Act strengthens our conclusion by showing that donations are not re-allocated to SI. All baseline results are summarized in Table 2.

Our work contributes to existing research on investor preferences for SI. We show that social preferences are unlikely to be a primary driver of SI fund flows, at least within the data spanning from 2008 to 2018. If SI flows differ from conventional flows, it is likely for reasons other than social preference motivations. This finding is consistent with Ramelli et al. (2021), who show that, following the 2016 US presidential election, any investor rewards towards climate-responsible firms were more likely driven by strategic considerations rather than concerns about global warming. Our results can inform policy discussions surrounding restrictions on regulated investment institutions incorporating ESG factors. Given that most other motives behind philanthropy and SI, excluding social preferences, can be linked to financial benefits, the absence of a significant effect of social preferences suggests that financial considerations already drive the decision-making process, rendering such restrictions potentially unnecessary.

Furthermore, if policymakers contemplate implementing higher ESG mandates in line with the recommendations of Hong et al.'s (2021), and seek to garner increased political and societal backing for such measures, our findings suggest that relying solely on appeals to social preferences may not be as effective in incentivizing shifts in investment flows as incentives based on risk and return.

Some SI skeptics question whether SI is really a fundamentally different type of investment compared to a conventional portfolio, as opposed to merely a marketing ploy and a well-

³ We perform analyses on a number of other shocks: for example, three more charity scandals, the Haiti earthquake and the Syrian refugee crisis. They either did not pass the shock strength test, or we had contamination with other shocks or insufficient data.

sounding label (Agnew et al, 2022). These doubts are justified by evidence that most widely used ESG ratings are inconsistent (Gibson et al., 2021) and some have been adjusted ex post to appear to better predict future returns (Berg, Fabisik, and Sautner, 2021). Recent regulatory initiatives in the EU, US and UK towards greater transparency and compliance on ESG dimensions are likely to result in better discernment between SI and conventional instruments. In this case, SI may show worse risk-return performance at least in the short term, if true ESG commitment is costly. Our findings suggest that existing SI investors may abandon these assets because their main motivation is not pro-social.

2. Empirical Analysis

2.1 Survey Data of investors and donors

Before we proceed to our main analysis using aggregated market-wide data, we examine an individual-level survey. This survey reveals investor preferences and illustrates how these preferences manifest in investment decisions and charitable donations. This initial analysis supports our conceptual framework and provides preliminary evidence for the interplay between charity, investment, and their combination. The US Federal Reserve Survey of Consumer Finance (SCF) is a representative triennial cross-sectional survey of U.S. families. It interviews heads of households and collects information on their balance sheets, pensions, income, and demographic characteristics. Importantly, the SCF reveals the overlap between individuals who invest and those who give to charity, as it provides responses from the same participants regarding stock and mutual fund ownership as well as charitable donations. This allows us to observe each individual's revealed preferences for various types of investments and philanthropy. Additionally, it highlights the heterogeneous preference patterns across different age groups.

We classify as investors in our context, respondents who hold stocks either directly or through pension funds or mutual funds. Figure 1 illustrates the proportions of investors (dashed line), donors (solid line) and their overlap in three survey years (2012, 2015, 2018). The top row shows that the proportion of respondents who both invest and donate is the highest at 35%-37%, while the groups who only invest (18%-19%) or only donate (11%-12%) are much smaller. The SCF does not distinguish SI among all the savings and investment instruments respondents report. Thus, SI can be part of both groups: investor-only and investor-and-donor. We obtain an indication about SI by focusing on the subset of respondents who have been

repeatedly shown to be most interested in SI – the Millennials (among many others, see MSISI, 2019). On the bottom row of Figure 1, we note that a higher proportion of Millennial respondents belong to the investor-only group (22% going up to 30% in 2018). Thus, we regard the investor-only group among Millennials as most likely to contain a large portion of SI.

In Table 3 we report the total dollar amounts in millions in the three groups: investor-only, investor-and-donor and donor-only, split by the four commonly defined generations: Millennials (born after and in 1981); Generation X (born between 1965 and 1980); Baby Boomers (born between 1956 and 1964); and the Golden Generation (born before or in 1955).⁴ If social preferences are behind flows to SI, we should see shifts between SI and the investment-philanthropy bundle over time. Although the low frequency in the SCF data does not allow us to isolate changes around particular shocks, we can still document whether there are changes in flows between survey years that are three years apart. The shifts we find in the SCF data cannot be reliably attributed to a given shock but are useful as suggestive evidence. In bold we report the changes in flows between 2015 and 2018 for the different generations. There are many sizable shifts in and out of the different age and investor-donor groups. We continue to focus on the Millennials, as they are the only group for which we can confidently identify SI. Between 2015 and 2018, we notice Millennials shifting away from the investor-and-donor bundle (which we posit represents the conventional investment and donation bundle – akin to purchasing non-trade coffee and donating to charities that support coffee pickers) toward the investor-only group (which we argue is SI –akin to purchasing fair-trade coffee) between 2015 and 2018. The shocks that take place during this period are the withdrawal from the Paris Agreement (expected to redirect flows into both philanthropy and SI) and the TCJA (expected to redirect flows out of philanthropy and into SI). The observed flow transfers indicate that the tax effect outweighs the impact of social preferences on philanthropy, leading to an overall negative effect. By moving to aggregate market data with annual frequency in the following section, we aim to identify specific shifts attributed to social preference shocks and evaluate whether the observed behavior among Millennials extends to the broader investor population.

2.2 US charity and SI data

In the US, non-profit organizations file Form 990 to the US Internal Revenue Service (IRS) to report income, expenses, and other relevant evidence for their tax-exempt status. The data is publicly available from the National Center for Charitable Statistics (NCCS). In particular, the

⁴ The detailed definitions of investors and donors in the SCF data are given in Appendix 1.

NCCS provides pre-built datasets for charities that are electronic filers (Efilers) of Form 990, which represents approximately 65% of all nonprofits as of 2016 (Karol and Mayo, 2023). We employ the NCCS datasets to construct our sample since it offers details on more data items from charities filings than data available from the IRS websites. In our full sample, there are 138,763 unique charities between 2012-2018 after removing religious charities, governmental bodies, universities, hospitals, and mutual-benefit nonprofits such as retirement funds. For our baseline analysis, we focus on charities from the middle two quartiles by total revenue, representing 48,120 US charities, out of which we define treated (environmental and animal) and controls (arts and culture).⁵ The resulting sample of 1514 charities, for which we show summary statistics in Table 3, is used for our difference-in-difference regressions.⁶

From Panel A of Table 4, we observe that during 2013 to 2018, the number of charities in our final sample increased from 593 to 946, along with increase in total revenue. This is consistent with the documented sector-wide growth in the number of US charities (USAFacts, 2023), and the amounts donated (Giving USA, 2016; 2017; 2018). Panel B of Table 4 shows that although on average, voluntary contributions (defined as total contributions minus government grants) account for just over 50% of total revenue (line 1 and 3), there appears to be substantial variations in income sources (standard deviation is \$198,600 for voluntary contribution). This could be attributable to heterogeneity in the accessibility of government support, or the efficiency in attracting private donations (line 5 and 8 of Panel B). Overall, Table 4 illustrates that despite the common growth trend, our treatment and control groups of charities are unlikely to be homogenous in their operations given their distinct charitable objectives and the causal inference design requires careful balancing.

We construct the sample of open-end equity funds from Morningstar Direct. It classifies funds into Sustainable Investing or not and offers further details on the sustainable investing focus based on the fund prospectus. For example, the category “Sustainable Investment – Environmental” is used to define environmentally focused SI funds. Following Renneboog et al. (2008, 2011), Pástor, Stambaugh, and Taylor (2021) and Pástor and Vorsatz (2020), our sample excludes index funds, bond funds, money market funds, real estate funds and funds with less than 75% allocation to equity. We exclude international and non-domestic funds from

⁵ We explain the rationale for concentrating on the middle two quartiles in Section 2.3.

⁶ We present summary statistics on the full sample by year and size groups in Online Appendix 1

the US sample. We also obtain fund financial data including annual net flow, return, expense ratio and inception date.⁷

Table 5 describes the fund data. The full sample contains 404 SI funds, of which 246 had an environmental focus, and 12,715 US conventional funds. Over time, while both SI and conventional funds decreased their charge for portfolio management, investing in SI funds is almost always more costly with higher expense ratio and slightly lower Fama-French four factor alpha compared to conventional funds (Panel A of Table 5). In absolute terms, the overall mean and median of fund flows are comparable between SI and conventional funds such that both experienced net outflow (Panel B of Table 5). However, cross-sectional flow variation and cross-sectional return variation are higher for conventional funds than for SI funds over the sampling period. This fact is consistent with SI funds being more similar to each other based on their mandate. Fund age in Table 5 is calculated as of year-end 2018, we observe that SI funds tend to be younger than conventional ones, given the recent growth in SI investing.

2.3 Shock strength test design

We introduce two sets of shocks. In the first set are the events that activate social preferences. The first shock is the unexpected election of Donald Trump in 2016 – a well-known climate change sceptic who repeatedly signaled his intent to pull the United States from the Paris Agreement if elected. Trump also did not include any environment-related topics in his platform at the time (Harrington, 2016). His election can be seen as an environmentally damaging event because it was accompanied by an announcement nominating Scott Pruitt, an opponent to the Obama administration measures to tackle climate change, as the director of the Environmental Protection Agency (Volcovici and Shepardson, 2016). This nomination led to concerns from environmentalists; for example, 447 former EPA employees wrote a joint letter opposing the nomination (Henry, 2017). It is worth noting that the 2016 election might not have been unexpected for all investors, especially those who voted for the Republican party. However, even if they anticipated the outcome, Republican investors are in general less interested in SI than Democratic investors (Saad, 2020). In other words, those who are more likely to allocate capital to SI are also more likely to consider the 2016 election outcome as unexpected. Furthermore, even Republican voters may not have expected the election outcome

⁷ Mutual funds issue multiple share classes over time; different share classes hold the same underlying assets but have different fee structures for different types of investors. Therefore, fund flows differ at the share class level (Franzoni and Schmalz, 2017). In our study we abstain from aggregating multiple share classes as our purpose is to focus on flows from retail investors.

since the democratic candidate's consistent lead in the national popular vote based on pre-election polls is usually a precursor of winning (Erikson and Wlezien, 2012). Major prediction sites such as the New York Times, FiveThirtyEight and 7 others all predicted a Clinton administration (Katz, 2016; Wright and Wright, 2018). Meanwhile, in Pennsylvania, Michigan, and Wisconsin that broke unexpectedly for Trump saw a combined margin of only 0.56% (Kennedy et al., 2018). Overall, based on the available information from pre-election polls, it is unlikely that the relevant investors for our tests anticipated the election outcome.

The second environmental shock we investigate is the announcement made by the US President on 1st June 2017 that the US would cease all participation in the Paris Agreement on climate mitigation. The announcement spurred a national and international outcry (Fox News, 2017).

In addition, we use a second type of shock, that keeps social preferences constant but alters the attractiveness of philanthropy, to strengthen our conclusions. This shock is a regulatory reform to tax policy in the US that negatively affects the attractiveness of charitable giving in its ability to shield income from taxes. Using Canadian data, Hickey, Minaker, and Payne (2019) show that allowing taxpayers in Quebec to claim tax credit earlier than in other provinces led to 9% more donations. This result is suggestive of the impact of a positive tax policy. In December 2017, the Trump administration signed the Tax Cut and Jobs Act (TCJA) into law. Under the new tax policy, the standard deduction increased from \$6,350 to \$12,000 (and from \$12,700 to \$24,000 for couples). However, a taxpayer can only claim charitable contributions through itemizing deductions from taxable income, not through the standard deduction. The doubling of the standard deduction removes the benefit of itemizing deductions and the earmarking of certain funds for philanthropy by individuals.⁸ According to a report by Giving USA (2019), inflation-adjusted individual giving declined by 3.4% in 2018 after implementation of the policy.

⁸ According to IRS income tax return data for tax year 2017, the top three itemised deduction categories (medical expenses, state tax and interest paid) accounted for 26% of annual gross income (AGI), while charitable contributions were the fourth highest category with 5%. Consider a taxpayer at the lower bound of the median tax bracket (\$38,700 – unchanged by TCJA, but the upper bound and tax rate are reduced from \$93,700 to \$82,500 and from 25% to 22% respectively). Before TCJA, she would claim \$10,062 for the top three itemised deduction categories ($38,700 \times 0.26$) and \$1,939 for charitable contributions ($38,700 \times 0.05$). This amounts to \$12,000.60 in total deductions, which is \$5,650.60 above the standard deduction of \$6,360 and provides an additional tax shield of \$1,412.70 ($\$5,650.60 \times 0.25$), which incentivises her to itemise. After TCJA her total deductions are fully covered by the increased \$12,000 standard deduction and there is no longer an incentive to itemise, nor contribute to charity as a way to shield income from taxes.

We scrutinize the years around all shocks and make sure there are no contaminating events that would compromise the clean definition of pre- and post-shock years.

To establish shock strength, we perform difference-in-differences (DiD) analysis with the US charity income data.

We run the following DiD model:

$$\text{Equation (1): } Vol_contri_{i,t} = \alpha + \beta_0 Treat_i + \beta_1 (Post_t \times Treat_i) + \beta_2 Post_t + \sum \gamma X_{i,t} + \varepsilon_{i,t}$$

In Equation (1), the dependent variable $Vol_contri_{i,t}$ refers to the inflation adjusted total voluntary contributions received by US charity i in year t .

In the baseline model, we exploit differences in charity objectives and use their classification to define the treatment and control charities. The definition of $Treat_i$ reflects the classes of charities closest to the set of values most affected by each of our shocks. After environmental shocks, individuals may become more passionate about environmental protection, thus donating more to environment-focused charities. In this case, we define $Treat_i$ to be equal to one for environmental and animal protection charities and zero for art and culture related charities, as their objectives are in stark contrast to those of the treated charities.

We employ the US National Taxonomy of Exempt Entities (NTEE) IRS activity codes to identify charity objectives and define $Treat_i$. Each charity is assigned a unique NTEE code for its primary purpose. Large charities operating with multiple charitable purposes will only have a single NTEE classification category. Oxfam America for example, is classified as “International Development, Relief Services” with NTEE code Q30, yet its website also clearly disclosed their work on climate change issues. The lack of an accurate classification would be more problematic for larger charities as they are more likely to be multi-objective. To minimize this concern, we exclude the top quartile of US charities by total revenue. In addition, we exclude the smallest US charities in the bottom size quartile for two reasons: 1) they represent only 0.3% of the total revenue of all charities in the US sample and 2) they do not receive third-party ratings and therefore have extremely low visibility (Krasteva and Yildirim, 2016).

Next, we conduct a covariate balance test for each shock examined. We first run logit regressions based on a list of 1-year lagged pre-shock charity financial variables: total revenue, total expense, total assets, total government grants, fundraising expenses, and payroll tax. We then match each treated charity with the closest control charity based on their estimated propensity scores. Covariate balance and parallel trend test results are shown in Appendix 2.

Our definition for the post-shock year, *i.e.*, $Post_t$, differs depending on the setting of each shock. For most shocks, we employ a two-year post-shock period after the event. X_{it} is a matrix of control variables that includes total income and number of volunteers as proxies for charity size. Andreoni and Payne (2003, 2011) show that a \$1,000 increase in government grants leads to a significant drop in charitable contributions; thus, government grants is included as a control variable. We also control for fundraising expenses, which List (2011) documents vary substantially among charities. Definition of control variables are presented in Appendix 1.⁹

2.4 Shock strength test results

Table 6 shows the baseline results from our two sets of tests. The first two columns indicate an increase in donations made to shock-relevant charities after the 2016 presidential election: donors respond to the shock by donating \$23,510 more to environment and animal focused charities compared to art and culture related charities. The relative size of the treatment effect is 11% of the average annual donations (line one in Panel A of Table 4). Similarly, columns (3) and (4) of Table 6 show an increase in donations to affected charities after the Paris Agreement withdrawal shock in 2017. We control for four different types of expenses (payroll, total functional expenses, and direct fundraising event expenses in all specifications and indirect fundraising expenses, such as non-employee travel and lobbying in columns (2), (4) and (6)). The relationship between voluntary contributions and direct fundraising expenses is positive as expected, but functional expenses and payroll are negative and significant, while indirect fundraising expenses is insignificant (in columns (2) and (4)). This finding is consistent with the criticism by some observers that charities are run inefficiently, *i.e.*, greater total functional expenses, payroll, and indirect fundraising costs may capture organizational inefficiency, which may also be evident in lower ability to attract donations compared to less inefficient charities with lower functional expenses. In addition, our results indicate minimal level of crowding out of private giving by public funding for environmental and animal-focused charities, as shown by the positive treatment effect and the much smaller negative coefficient on total government grants (line seven of Table 6). We also find that more “popular” (receiving higher cumulative contributions over the past five years), or larger charities do not receive substantially higher donations post-shock (line 3 and 5 of Table 6).

⁹ Charity classification codes, definitions of $Treat_t$ and $Post_t$ are available under table footnotes in Online Appendix 2.

We also assess the reaction of philanthropy to changes in tax exemptions following the US Tax Cut and Jobs Act 2017. Figure 2 plots the adjusted gross income and taxpayer charitable contribution deductions over time. We observe a clear drop in total charitable contributions made by taxpayers (in the form of itemized deductions). We further note that both the contribution by taxpayers in their annual tax filings (left-hand side axis) and the total adjusted gross-income from returns filed (right-hand side axis) decreased dramatically after 2017. The same pattern is shared across taxpayers in different tax bands.¹⁰ Using charity voluntary income data, we show consistent evidence that TCJA reduced donations received by US charities (see last two columns of Table 6). Overall, Figure 2 and the last two columns of Table 6 illustrate that the TCJA had a clear negative impact on philanthropy: there was a sizable reduction in donations made by US individuals after its implementation.

To summarize, we have shown that even under our stringent specifications, donation behavior reacts to environmental shocks. We also find that donations by individuals are strongly sensitive to changes in tax incentives.

If SI and charitable donations were both driven by pro-social motives, we would expect a reaction in SI flows as well. In the next section, we present our analysis of SI fund flows.

2.5 SI flows empirical design

Consistent with our shock strength tests, our SI flows analysis estimates the following DiD model:

$$\text{Equation (3): } Flow_{i,t} = \alpha + \beta_0 \text{Treat}_i + \beta_1 (\text{Post}_t \times \text{Treat}_i) + \beta_2 \text{Post}_t + \Sigma_{\gamma} X_{i,t} + \varepsilon_{i,t}$$

where $Flow_{i,t}$ is the annual net flows towards fund i at the end of year t , obtained from Morningstar.

In Equation (3), the chosen shocks are exogenous in the sense that they are unexpected; however, in an econometric sense, they do affect flows through other channels in addition to social preferences, for example risk. Therefore, we include in the control vector $X_{i,t}$, all factor betas and alpha from the four factor Fama-French-Carhart model, and other exhaustive controls.

As part of our design, we ensure that pre-shock differences in fund characteristics do not drive our results by conducting covariance balance tests using the full sample and the following variables winsorized at the top and bottom 2.5% as covariates: one-year lagged fund-level

¹⁰ See Online Appendix 3

Fama-French four factor betas: β_{mkt} , β_{smb} , β_{hml} , β_{mom} and alpha; one-year lagged holding period returns and fund age (see Appendix 1 for definitions). Our analysis excludes funds that are less than three years old at the year of each shock to avoid incubation bias (Evans, 2010). At the fund level, we first calculate each fund's monthly excess returns, then run a Fama-French four factor model using the past 24 months of data. Factor returns and the risk-free rate are obtained from Kenneth R. French's website. We then proceed with logit propensity score matching based on pre-shock fund financial characteristics and fund specific sustainability attributes classification relevant to the different shocks. The matching process is described under the table notes in Appendix 2.

For the two environmental shocks, withdrawal from the Paris Agreement and the 2016 US presidential election, we define treatment and control groups as follows:

$Treat_i = 1$ if fund i is identified as an environment-focused SI fund, and 0 if fund i is identified as a non-environment focused SI fund.

Because the US Tax Cut and Jobs Act policy affects the overall attractiveness of the entire charity sector, we cannot separate SI funds into shock related versus non-related subgroups. Instead, we define $Treat_i = 1$ if fund i is identified as an SI fund, and 0 if fund i is identified as a conventional fund. $X_{i,t}$ is a matrix of control variables for fund i , which includes fund age, and other variables to control for risk and return of funds: one-year lagged returns, contemporaneous Fama-French four factor betas and alpha, and an institutional dummy variable. We follow prior literature, such as Chevalier and Ellison (1997) and Hartzmark and Sussman (2019), on the selection of these controls. Data on control variables except for betas and alpha are obtained from Morningstar.

$Post_t$ is a dummy variable equal to zero for pre-shock years and one for post-shock years. If a shock takes place at the start of a year, we expect changes in fund flows or donations to materialize by the end of the same year. If a shock takes place towards the end of a year, any changes may materialize in the following year. For example, when examining the US presidential election shock, which took place in November 2016, our baseline model uses:

$Post_t = 1$ for years 2016 and 2017 and $= 0$ for year 2015.

In appendices 2 and 3, we show evidence that all matched samples satisfy the parallel trend assumption; thus, the results are not driven by differences in pre-shock trends between treated and control groups.

2.6 SI flows test results

Table 7 through Table 9 show the results from our fund flow analysis. Table 7 presents the effect on environmental SI fund flows compared to non-environment-focused SI fund flows in response to our first set of shocks: the 2016 US presidential election (first two columns of Table 7) and the Paris Agreement withdrawal (last two columns of Table 7). We note negative and insignificant investment flows towards SI funds after both shocks in columns (1) and (3) of Table 7, which means that although the two shocks were shown to trigger donation changes, they do not have any significant impact on SI investment after controlling for risk and return factors, fund age, size and expense ratio. In addition, we note that investors prefer younger funds with lower expense ratios as indicated in line six and eight of Table 7, which is consistent with prior literature where newer, therefore younger funds are more likely to benefit from marketing efforts, attracting greater investor flows (Sirri and Tufano, 1998; Roussanov, Ruan, and Wei, 2021).

We address the fact that during the period of our analysis certain institutional investors did not invest in SI funds (pension funds) and this might result in lack of an effect. By including an institutional dummy variable and its interactions with the *Post* and *Treat* variables (columns (2) and (4) of Table 7) we control for this possibility. In these specifications, the baseline *Post* \times *Treat* interaction captures the effect on retail-investors-focused funds and remains insignificant. Therefore, retail investors, who have complete control over the allocation of their resources, do not respond to these shocks. Table 7 shows that, overall, we do not find a positive and significant effect of the two environmental shocks on the flows to environmental SI funds.

Both shocks examined in Table 7 take place after the introduction of the Morningstar globes ratings, which dramatically enhance visibility and diminish search costs, as corroborated by Hartzmark and Sussman (2019). Hence, the lack of significance in Table 7 cannot be credibly attributed to the low visibility of SI funds. Ramelli et al. (2021) perform firm-level event study analysis following the election as well as the nomination of Scott Pruitt to head the EPA and show that the cumulative abnormal returns were higher for both carbon-intensive firms and firms with climate-responsible strategies. In further analysis, they suggest that institutional investors value a firm's climate responsibility for strategic reasons rather than for pro-social motives. While their results and ours are not comparable because they use individual firm stock returns and holdings, whereas we analyze flows to mutual funds, their finding that the main

driving force behind the market reactions following the 2016 US presidential election is strategic rather than pro-social is in line with our results.

Our insignificant results in Table 7 could be due to the nature of the shocks examined. One could argue that while social preferences are still a common motive for both philanthropy and SI, the 2016 US presidential election and the Paris Agreement shocks may not be as relevant to SI investing as they are to donating. To address this, we examine a shock which focuses on one of the common characteristics that philanthropy and SI share: monetary benefit. A sudden decrease in the tax shield benefit of philanthropy can make it less attractive relative to SI. In this case, if investors want to continue promoting pro-social goals, they are more likely to choose to invest in SI instead. This mechanism fits the Modigliani-Miller type theoretical framework in Graff Zivin and Small (2005) and Hart and Zingales (2017), where investors are indifferent between SI and a philanthropy-conventional bundle, because both satisfy a combination of risk/return and social preferences.

Figure 2 and the last two columns of Table 6 illustrate that the TCJA shock has a negative impact on philanthropy: i.e., there is a sizable reduction in donations made by US individuals after its implementation. Keeping social preferences constant, this would imply a redirection of resources away from the philanthropy-conventional bundle and towards an alternative vehicle like SI. Yet, US SI funds did not experience a significant change after TCJA. Controlling for a range of fund characteristics, we do not find a significant impact on post-shock fund flows for institutional or retail SI funds (columns (1) and (2) of Table 8). If a redirection from philanthropy to SI was partially funded with a reduction in conventional investing, this would make it more likely for our regressions to detect an effect. The lack of significance, therefore, strengthens our conclusions. In fact, when examining the change in flows to conventional funds and SI funds separately in the first two columns of Table 9, we find that instead of a reduction, the TCJA shock induced increased investment in conventional funds, while having no effect on SI. Therefore, the greater disposable income some investors enjoyed after TCJA went mostly to conventional investing. In terms of coefficients on control variables, consistent with previous literature on fund flows, such as Renneboog et al. (2011) and Bialkowski and Starks (2016), we find that across almost all shocks, investors are attracted to younger and smaller funds. In addition, we control for the Fama-French four factor betas and alpha and find similar results to Benson and Humphrey (2008) – the one-year lagged returns are not strongly and persistently associated with fund flows in Table 7 when examining SI funds alone (comparing environmental and non-environmental SI) but they are in columns

(1) and (2) of Table 8 and Table 9, potentially reflective of the higher return-sensitivity for conventional funds.

To summarize, we do not find that environmental shocks or reduced tax benefits of philanthropy translate into increased post-shock period SI flows.

3. Additional tests

An alternative explanation to our shock strength test result, which shows that charities receive more donations after the examined shocks, is a reputation effect. Instead of altruism, fairness, reciprocity, etc. a desire to have a better “reputation” could also drive more donations after salient shocks. To address this concern, we examine whether donation flows are driven by reputation instead of social preferences around the Paris Agreement withdrawal. Andreoni (1990) and Harbaugh (1998) show that a taste for prestige affects giving. The authors examined predicted donations made to a non-profit organization before and after it decides to publicly report names of donors. Our reputation test follows this idea and studies anonymous versus named donations to a large charity: Oxfam America. Oxfam America publishes a donor list for the period 2015-2018, which reports the names of all donors, plus the number of anonymous donors in seven groups of annual donation amounts in US dollars (<5K; 5K-9,999; 10K-24,999; 25K-49,999; 50K-99,999; 100K-499,999; 0.5-1mil; >1mil). We count the number of named donors (foundations, estates, and other charitable organizations) and anonymous donors, then estimate the total donation amount for both donor types by multiplying the number of donors times the midpoint of the annual donation amount band. Then we run a standard difference-in-difference specification, with outcome variables: total donation amount or number of donors; and independent variables: a dummy variable for named donors, i.e., $Treat_t$; a dummy variable $Post_t$ equal to one for years 2017 and 2018, and zero for years 2015 and 2016; and their interaction. In Table 10, we show that having named donors does not lead to more donations (column 1) nor more donors (column 2), which indicates that our results are not likely to be driven by a reputation effect.

In the first group of tests where the baseline results consider environmentally-focused SI funds as the treated group and non-environmentally-focused SI funds as the control group (Table 7), we also present results (Table 11) based on SI vs conventional funds. This addresses the possibility that investors may treat all SI as the same instrument, without discerning

environment-specific funds from SI funds focusing on other pro-social goals. These results are consistent with our baseline analysis.

With regards to our SI flow analysis, the lack of significance of our results could be attributed to lack of statistical power, or an ambiguous control group since Morningstar SI designation may not be able to identify conventional funds who also incorporate ESG factors in their investment decisions if they do not explicitly label themselves as “sustainable”. We address these two possibilities by using the Morningstar Globes rating instead (Hartzmark and Sussman, 2019). Morningstar Globes rating is a portfolio-weighted measure for mutual fund ESG performance, and we classify as treated those funds with a 5-globe rating and as controls those funds with 1 and 2-globe ratings. This approach produces a much larger sample of treated and control candidate funds which overcomes the problem of potential low statistical power. Results are shown in Table 12.

In addition, our main results are based on a two-year post-shock period, which one may argue dilutes any treatment effect and would explain finding no significance. We address this potential concern by using an alternative one-year post-shock period definition.¹¹

We further use event studies to complement and verify our analysis of SI investor demand. In an event study setting, if investors demand SI in response to pro-social motives following the shocks, this impact should manifest in the cumulative abnormal returns on the treated, shock-relevant SI funds. Consequently, this would validate our DiD findings. The advantage of an event study also lies in that it utilizes data on daily as opposed to annual frequency, thus strengthening the test. We first obtain fund net asset value data (NAV) from Bloomberg and construct two equally weighted portfolios of the same treated and control funds used in each baseline test. The two portfolios then form a long-short portfolio. For example, with respect to the Paris Agreement withdrawal shock, we calculate the return from an equally weighted portfolio with a long position in environmentally focused SI funds and a short position in non-environmentally focused SI funds. We use the Standard & Poor’s 500 Index as the market benchmark. Under a 250-days estimation window and a 30-day event window setting, we estimate the abnormal returns and cumulative abnormal returns of the long-short portfolios.¹² Figure 4 shows that the difference between abnormal returns of environmental and non-

¹¹ See Table 3 through 6 in Online Appendix 2.

¹² We also graph CARs separately for environmental SI funds, non-environmental SI funds, SI funds and conventional funds (see Online Appendix 4). Our conclusion does not change.

environmental SI funds is not distinguishable from zero (the 95% confidence interval bands are always far from 0). Therefore, there is no relative short-term surge in demand for environmental SI funds. Figure 5 demonstrates that SI funds relative to conventional funds did not receive significantly higher abnormal returns after the TCJA shock (0 is always included in the 95% confidence intervals). Both figures confirm our results from the DiD analysis that SI flows do not react to the shocks we study.

Lastly, due to the proximity of the 2016 presidential election result and the Paris Agreement withdrawal announcement, we design a “composite shock” test, where both events are captured in the post-shock years. Results are presented in Table 13 and are consistent with the baseline findings for charitable donations and SI fund flows, respectively.

4. External validity in the UK

We assess whether our findings are specific to the US market by redoing some of our tests on the UK, which has a distinct institutional and cultural setting in terms of attitudes towards sustainability and charitable giving by private donors versus the government (de Tocqueville, 1835; 1840) compared to the US. We note that the US and UK ranked first in the world and in Europe respectively by percentage of GDP donated to non-profit organizations by individuals (CAF, 2016).¹³ In addition to the UK’s importance in global philanthropy, the UK also accounts for substantial portions of the global active fund management industry. Europe is a leader in ESG investing, representing 69.4% vs 20.9% for North America (PwC, 2020). Out of the top 10 European asset management firms by assets under management, UK accounts for 40% (Waite, Massa, and Cannon, 2019).¹⁴

Ideally, we would like to use UK-specific shocks that trigger social preferences and carry out similar tests to the ones reported for the US. However, given the global economic importance of the US and its close links to the UK, shocks in the US are likely to also affect UK donors and investors. Further, these shocks are contaminated by other events like Brexit, which have further ramifications in the economy and individuals than the ones we can foresee. Thus, in this section, we concentrate on a shock that keeps social preferences constant but alters the

¹³ The top ten countries are as follows: US, New Zealand, Canada, UK, Republic of Korea, Singapore, India, Russia, Italy, Netherlands (CAF, 2016).

¹⁴ followed by France (34%), Germany (16%), Italy (4%) and Switzerland (3%).

attractiveness/effectiveness of the whole philanthropy sector (similar to the TCJA in the US). We select the scandal involving a large charitable institution in the UK over the last decade that received the most media attention. This scandal took place in October 2011, when Oxfam Great Britain’s director in Haiti reportedly resigned after an internal investigation of serious misconduct allegations. This scandal affected a large influential charitable institution in the UK and reflected badly on the whole charity sector (Green, 2018). If donations were affected by the scandal, and SI was an alternative vehicle to satisfy social preferences, we would expect a transfer from charities to SI.

4.1 Data and Summary Statistics

We obtain UK charity data from the UK Charity Commission (CC), which is the regulatory body of all registered charities in England and Wales. The dataset covers the years 2005-2018 and provides granular data on different income sources for charities with an annual total income greater than £500,000. We use the data item “voluntary income” as our variable of interest, which is defined by CC as total donations received by the charity from the public. In our full charity sample, we have data from 2008 to 2018 for 12,895 unique UK charities.¹⁵

Similarly to the approach taken for the US, we compile a sample of UK open-end equity funds sourced from Morningstar Direct. Our sample excludes index funds, bond funds, money market funds, real estate funds and funds with less than 75% allocation to equity. Since the UK was still part of the European Union around the time of the Oxfam misconduct scandal, we include UK-domiciled funds with a European focus along with UK domestic equity funds. We also obtain fund financial data including annual net flow, return, expense ratio and inception date. Table 5 Panels C and D describe the fund data. The full sample contains 1,031 UK SI funds (out of which 568 are identified by Morningstar as environment-focused) and 7,639 UK conventional funds. Unlike the US, SI funds in our UK sample have comparable expense ratios as their conventional counterparts over time (Panel C of Table 5). We also note that on average, SI and conventional funds share similar risk-return profiles in absolute value (Panel D of Table 5). Covariate balance and parallel trend tests for UK funds are shown in Appendix 2.

4.2 UK Empirical Results

We examine a shock that focuses on a characteristic that is crucial for philanthropy and SI: their credibility in achieving pro-social goals. When the charity sector loses its reputation for

¹⁵ We show summary statistics on UK charities in Table 2 of Online Appendix 1.

delivering pro-social goals, then donors who place sufficiently high value on these goals, might choose to redirect resources to SI funds instead.

Since the Oxfam scandal shock involves only a single institution, it is not possible to construct a treated sample of charities for the DiD analysis. Instead, we construct a time-series plot in Figure 3 and observe that the scandal is associated with a subsequent decrease in Oxfam's voluntary income (income received from donations and contributions) in 2012. Another large charity, the British Red Cross, with similar objectives and size as Oxfam also received less voluntary income in 2012. This indicates that funds that might be withdrawn from Oxfam did not flow to another similar large charity. Further, the voluntary income of all other UK charities also decreased in the same year, which is in line with a general negative effect on the whole sector. We argue that there was an overall decrease in donations in the charity sector as a result of the scandal.

In Figure 3, we find that the reputation shock to Oxfam that propagated to the entire UK charity sector induced a reduction in donations post-scandal in 2011 and 2012. Keeping social preferences constant, if SI was driven by social preferences, we would expect a redirection of resources away from the philanthropy-conventional bundle and towards an alternative vehicle like SI. Nonetheless, we do not find increased flows to SI funds versus conventional ones in the UK (columns (3) and (4) of Table 8 and Table 9).

5. Conclusion

We show that SI fund flows do not appear to be affected by social preferences. We first isolate social preferences by examining environmental shocks that trigger philanthropy. We test for the possibility that social preferences could still be a common motive for SI and philanthropy, and the lack of an SI effect may be due to the low relevance of the specific shocks we choose. When we examine shocks that are unrelated to a particular charitable cause – i.e., a shock to the tax shield of philanthropy, which makes charity-giving less attractive in the US, and a shock to the reputation of charitable institutions in the UK, which reduces the perceived effectiveness of the whole charitable sector to satisfy social preferences, there is still no impact on SI, which supports the conclusion that social motives are unlikely to drive SI flows.

One can see the two sets of shocks we examine as tests for complementarity (environmental shocks) and tests for substitutability (charity reputation and tax shield shock). In either case, if

philanthropy and SI had a common pro-social motive, either complementarity or substitutability or both should manifest, but we find evidence for neither.

To discard alternative explanations for our results, the following possibilities for not finding a significant effect on fund flows but finding one in charitable giving, are embedded in our research design/setting or dealt with additional tests: (1) the possibility that reputational benefits and not social preferences are behind charitable flows – by analyzing anonymous vs named contributions around one of our shocks; (2) the possibility that lower visibility and higher search costs are associated with selecting charitable institutions instead of SI – by considering periods of high visibility for SI funds; (3) the possibility that environment-related shocks affect not just social preferences but the risk-return profile of SI funds – by analyzing shocks exogenous to firm risk exposures and explicitly controlling for risk and return variables; (4) low statistical power – by examining an alternative approach to the treated-control definition that produces a much larger number of observations; (5) the possibility that there are different motivations behind individual vs institutional investor SI flows – by including a retail vs institutional interaction in our regressions; (6) the presence of a short-term effect instead of a long-term one – by performing both a daily frequency event study and an annual frequency difference-in-difference regression analysis.

The mechanisms behind our findings that social preferences do not affect SI flows could be either that these preferences are not a strong enough driver for SI flows to be detected or that investors do not see SI as a vehicle for satisfying them. For example, philanthropy may be better at providing the sense of “warm glow” as opposed to SI (Andreoni, 1989). Regardless of the mechanism, our results suggest that policies designed to appeal to investor social preferences are unlikely to be effective in redirecting investment flows.

A number of recent studies examine the drivers of SI theoretically and empirically. The novelty in our approach is to analyze SI in relation to philanthropy instead of to conventional funds, as is the typical approach in existing work. By doing so, we narrow in on social preferences as a possible explanation behind the recent surge in SI flows and products, which has been hard to isolate (Hartzmark and Sussman, 2019). Our empirical design has the advantage of being able to circumvent some of the econometric challenges that researchers typically encounter, as it benefits from the use of separate exogenous shocks of different nature that affect social preferences: political events, a tax reform affecting philanthropy and a misconduct scandal. We

are also careful to perform clean balancing of treated and control samples of charity institutions and SI funds given the richness and granularity of our data.

The rise of SI can be seen as a marketing strategy by active fund managers in response to the overwhelming shift towards passive management in recent years (Waite, Massa, and Cannon, 2019). Fund managers offer increasing numbers of SI products as a way of distinguishing themselves from competitors (Cao et al., 2021). This trend could reflect changing investor tastes, as modelled by Fama and French (2007). We show, however, that social preferences are not the key force behind these changing tastes, at least in the period 2013-2018. For example, Ramelli et al. (2021) also find that institutional investors choose to hold climate-responsible firms for strategic reasons.

In light of the recommendations in Hong, Wang, and Yang (2021) for higher regulatory ESG mandates in the interest of first-best societal welfare outcomes, our results support the necessity for intervention, since social preferences alone appears not to be sufficient to drive SI investment flows.

If the need to protect the environment or reduce inequality is not a driver of SI, then socially responsible consumers should rely on direct transfers of resources to these causes rather than using market-based solutions. It has long been recognized that direct transfers are likely to distort incentives (Economides, Kalyvitis, and Philippopoulos 2008). Therefore, improving the trust towards SI and its disclosure and reducing the heightened expectations in terms of its risk-return properties are both important measures to inform and empower socially conscious investors in choosing these investments to satisfy their social preferences and contribute to a more sustainable economy.

The transformative changes that the Covid pandemic brought about in 2020 resulted in a much greater increase in both preferences for ESG and resulting SI directed investment flows (Pástor and Vorsatz, 2020; UBS Investor Watch, 2020). The largest asset management companies took an active stand at the time: BlackRock's Larry Fink urged companies to disclose how they are preparing for a "net zero world", while the main stewardship priorities in 2021 for State Street Global Advisors were the systemic risks associated with climate change and a lack of racial and ethnic diversity on company boards (Fink, 2021; Taraporevala, 2021). The following two years, however, saw a reversal of these trends and a surge in state-level policies to curtail SI. It would be interesting to revisit our research question at a future time, when the global economy has recovered from the recent geopolitical turmoil and other policies or natural shocks

can help with inference to see if stronger social preferences are making a difference. For now, the recent growth in SI does not seem to reflect pro-social motives. Therefore, the recent state-level SI restrictions are targeting a perceived problem that does not exist in the data.

Future work may focus on the remaining possible motives behind the surge in SI. Some of them are nonpecuniary (reputation, peer effects or other behavioral explanations like affect); others are efficiency based. For example, the model in Pedersen, Fitzgibbons, and Pomorski (2021) allows for a group of investors who are only motivated by risk and return but are conscious of recent ESG trends and adjust their investment decisions based on an expectation of future appreciation of these assets.

In our descriptive analysis we zoomed in on the investors who are strongly motivated by social preferences. The trend among millennials has been acknowledged by the media and academics alike (Petruno, 2014; Friedman and Heinle, 2016). In the data through 2018 their role has not been large enough, but it could become important with time. In fact, multiple recent surveys provide an indication of this but given that millennials are still a small part of the investor pool, their effect is not strong enough to be detected.

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Table 1: Shocks to altruism

Date	Country	Shock/Scandal	News Agency
<i>A. Environment-related shocks</i>			
1 st June 2017	US	US announced withdrawal from Paris Agreement	The Guardian The New York Times BBC Reuters
8 th November 2016	US	The election of Donald Trump and subsequently the nomination of Scott Pruitt as head of EPA	The New York Times Reuters
<i>B. Charity attractiveness shocks</i>			
6 th September 2011	UK	Allegations of Oxfam International managers' 'inappropriate behaviour'	Guardian
22 nd December 2017	US	The announcement of US Tax Cut and Jobs Act 2017, to be implemented for tax year 2018	The New York Times Fortune

Table 2: Evidence on the effect of shocks to charity and SI fund flows

	US		UK	
	Donations	SI flows	Donations	SI flows
<i>Environmental Shocks</i>				
US presidential election 2016	+	0	NA	NA
US withdrawal from Paris Agreement 2017	+	0	NA	NA
<i>Shocks to charity attractiveness</i>				
Tax Cut and Jobs Act 2017	-	0	NA	NA
Oxfam misconduct scandal 2011	NA	NA	-	0

This table shows the direction of effect of shocks to charities and SI fund flows. "+" indicates positive change (increase) for the relevant treated group due to shocks, and "-" indicates negative change (decrease) for the relevant treated group due to shocks. Effects of the 2011 Oxfam misconduct scandal on charity flow is observed from time series plot of voluntary income received by UK charities in Figure 3. "NA" cells indicate that no test is possible due to lack of data availability, or inapplicable shocks.

Table 3: US Survey of Consumer Finance - Respondent Investment and Donation Behavior

	Survey year	Millennials (1981 or later)	Gen X (1980-1965)	Baby Boomers (1956-1964)	Golden Gen (1955 or earlier)
INVESTOR ONLY					
Investment	2012	3.7	22	23	83
	2015	5.7	40	40	179
	2018	12.6	59	73	106
	Δ flows '15 to '18	5.0	1	16	-169
INVESTOR AND DONOR					
Investment	2012	5.4	1,385	1,814	7,542
	2015	42.7	1,206	3,208	11,378
	2018	43.0	2,147	3,133	9,590
	Δ flows '15 to '18	-37.0	1,119	-1,469	-5,624
Donation flows	2012	0.2	17	53	231
	2015	1.8	22	102	520
	2018	0.8	38	79	353
	Δ flows '15 to '18	-1.0	16	-23	-167
DONOR ONLY					
Donation flows	2012	0.1	1.2	12.7	2.9
	2015	0.2	0.7	1.3	15.1
	2018	0.3	1.4	3.7	16.1
	Δ flows '15 to '18	0.1	0.7	2.4	1.0

This table presents number of respondents (Panel A), investment and donation amounts (Panel B) and proportions (Panel C) by age group as reported in the Survey of Consumer Finance (SCF), executed by the Federal Reserve every three years among US households. The generation groups are constructed based on respondent birth year: Millennials (1981 to 1996); Gen X (1980 to 1965); Baby Boomers (1956 to 1964); and Golden Generation (1928 to 1945). To obtain the amounts in Panel B we add up the total dollar value of all investments by household. To obtain the donation amount for each respondent, we add the value of the contribution (X5823) with the value of the charitable trust or foundation (X7661). A respondent is in the Invest&Donate group if he/she is both an investor and a donor as defined above; the Invest (Donate) Only group includes those who are investors (donors) but not donors (investors).

Table 4: Charity summary statistics

<i>A. US charity sample (in thousands of \$) – mean by year</i>						
	2013	2014	2015	2016	2017	2018
Voluntary contributions	211.1	206.5	209.6	202.3	223.2	226.4
Total assets	449.6	482.9	492.4	462.1	505.3	496.1
Total revenue	370.0	369.0	380.2	379.6	392.2	392.2
RecentTotal_contributions	811.4	873.9	881.2	931.5	970.9	1,028.2
Total government grants	19.2	20.6	18.5	26.6	16.0	19.5
Total_functional_expense	343.0	346.5	346.4	347.5	352.6	358.1
Payroll Tax	7.0	7.1	7.0	7.7	7.4	7.4
Direct_Fundraisingevent_Expense	6.1	5.9	7.2	8.3	7.1	7.8
Indirect_Fundraising_Expense	9.0	9.8	9.1	9.0	7.7	8.4
<i>Number of charities</i>	593	680	729	802	903	946
<i>B. US Charity Sample (in thousands of \$) – overall summary statistics</i>						
	Mean	Median	Min	Max	Standard Deviation	
Voluntary contributions	214.7	180.1	-4,711.0	1,011.2	198.6	
Total assets	483.6	194.0	-14.8	22,296.0	1,171.0	
Total revenue	381.9	313.8	153.9	1,013.9	195.2	
RecentTotal_contributions	927.2	722.5	0.0	17,817.7	946.1	
Total government grants	20.0	0.0	0.0	5,437.6	110.9	
Total_functional_expense	349.8	284.5	0.0	1,953.0	210.4	
Payroll Tax	7.3	3.3	-0.0	130.0	10.4	
Direct_Fundraisingevent_Expense	7.1	0.0	0.0	803.8	27.8	
Indirect_Fundraising_Expense	8.7	0.0	0.0	495.4	30.3	
<i>Number of charities</i>			1,514			

Panel A reports the means of financial variables for each tax year for US charities that are ranked in the 2nd and 3rd quartile by charity size measured by total revenue. Panel B reports the overall summary statistics for US charities for that are ranked in the 2nd and 3rd quartile by charity size measured in total revenue. Both panels only cover charities selected in our diff-in-diff analysis of charity flows: environmental and animal charities (treatment group) and art and culture charities (control group) over the period 2013 to 2018. Full sample summary statistics of all size groups, charity purposes and years are shown in the Online Appendix 1, UK charity summary statistics are also shown in Online Appendix 1. In the US, yearly financial data extract of non-profit organisations is publicly available starting in tax year 2012 from NCCS.

Table 5: Fund summary statistics

<i>A. US fund sample (million \$) – mean by year</i>							
		2013	2014	2015	2016	2017	2018
SI Funds	Flow	7.3	3.0	-8.5	-7.6	-6.8	-6.3
	RTN	33.6	9.5	-1.4	9.8	19.5	-6.7
	Fund size	752.1	834.3	726.9	667.8	713.7	648.9
	Expense Ratio	1.3	1.3	1.2	1.2	1.1	1.1
	α	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2
	β_{mkt}	1.0	1.0	1.0	1.0	0.9	1.0
	β_{smb}	0.1	0.1	0.1	0.1	0.1	0.1
	β_{hml}	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
	β_{mom}	-0.0	-0.1	0.0	-0.0	-0.0	-0.1
	Age	10.1	10.5	9.9	9.9	10.4	11.0
Number of funds		404					
Conventional Funds	Flow	11.2	0.5	-8.3	-21.7	-20.5	-18.5
	RTN	32.1	7.8	-2.1	11.3	19.1	-8.1
	Fund size	2,124.1	2,146.7	1,932.7	1,954.3	2,228.7	1,955.5
	Expense Ratio	1.2	1.1	1.1	1.1	1.0	1.0
	α	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2
	β_{mkt}	1.0	1.0	0.9	0.9	0.9	0.9
	β_{smb}	0.2	0.2	0.2	0.2	0.2	0.1
	β_{hml}	-0.0	-0.0	-0.0	-0.0	-0.1	-0.0
	β_{mom}	-0.0	-0.1	-0.0	-0.0	-0.0	-0.1
	Age	10.6	10.9	11.1	11.4	11.8	12.4
Number of funds		12,715					
Environment-focused SI funds	Flow	13.4	5.8	-2.0	-5.1	-4.7	-3.5
	RTN	33.7	8.9	-1.3	10.0	18.9	-6.6
	Fund size	700.0	797.2	676.6	628.3	673.6	651.6
	Expense Ratio	1.4	1.3	1.2	1.2	1.1	1.1
	α	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2
	β_{mkt}	1.0	1.0	1.0	0.9	0.9	0.9
	β_{smb}	0.2	0.2	0.2	0.1	0.1	0.1
	β_{hml}	-0.1	-0.1	-0.1	-0.0	-0.1	-0.0
	β_{mom}	-0.0	-0.1	0.0	-0.0	-0.0	-0.1
	Age	9.3	9.5	8.8	9.0	9.7	10.6
Number of funds		246					
<i>B. US fund sample (million \$) – overall summary statistics</i>							
		Mean	Median	Minimum	Maximum	Standard Deviation	
SI Funds	Flow	-3.1	0.0	-553.4	627.9	87.8	
	RTN	8.5	10.4	-51.4	65.3	17.6	
	Fund size	661.6	196.7	2.6	16,157.3	1,238.9	
	Expense Ratio	1.3	1.2	0.1	2.5	0.5	
	α	-0.1	-0.1	-0.8	0.7	0.2	
	β_{mkt}	1.0	1.0	0.5	1.4	0.1	
	β_{smb}	0.1	0.0	-0.4	1.0	0.3	
	β_{hml}	-0.1	-0.0	-0.8	0.5	0.2	
	β_{mom}	-0.0	-0.0	-0.5	0.7	0.1	
	Age	9.2	8.0	0.0	47.0	7.2	
Number of funds		404					
Conventional Funds	Flow	-5.6	-0.0	-553.4	627.9	114.7	
	RTN	8.5	9.8	-51.4	65.3	18.3	
	Fund size	1,853.2	547.9	2.6	20,121.9	3,533.6	
	Expense Ratio	1.2	1.1	0.1	2.5	0.5	
	α	-0.1	-0.1	-0.8	0.7	0.2	
	β_{mkt}	1.0	1.0	0.5	1.5	0.1	
	β_{smb}	0.2	0.1	-0.4	1.0	0.3	
	β_{hml}	-0.1	-0.1	-0.8	0.6	0.3	
	β_{mom}	-0.0	-0.0	-0.6	0.7	0.1	
	Age	10.3	9.0	0.0	94.0	9.5	
Number of funds		12,715					

Environment- focused SI funds	Flow	0.4	0.0	-553.4	477.7	92.9
	RTN	8.6	10.3	-51.4	65.3	17.7
	Fund size	604.4	164.7	2.6	16,157.3	1,232.4
	Expense Ratio	1.3	1.2	0.1	2.5	0.6
	α	-0.1	-0.1	-0.8	0.7	0.2
	β_{mkt}	1.0	1.0	0.5	1.4	0.1
	β_{smb}	0.2	0.1	-0.4	1.0	0.3
	β_{hml}	-0.1	-0.0	-0.8	0.5	0.2
	β_{mom}	-0.0	-0.0	-0.5	0.7	0.1
Age	8.7	7.0	0.0	34.0	7.0	
Number of funds				246		

C. UK fund sample (million \$) – mean by year

	2009	2010	2011	2012	2013	
SI Funds	Flow	1.9	-4.1	-9.2	-4.4	-4.8
	RTN	38.5	9.8	-12.8	20.9	26.9
	Fund size	517.1	450.9	359.0	380.2	408.5
	Expense Ratio	1.5	1.6	1.5	1.5	1.5
	α	-0.1	-0.1	0.1	-0.0	-0.0
	β_{mkt}	0.9	0.9	0.9	1.0	1.0
	β_{smb}	0.5	0.5	0.3	0.2	0.2
	β_{hml}	-0.1	-0.0	-0.1	-0.1	-0.2
	β_{mom}	-0.0	-0.0	-0.0	0.0	-0.0
Age	8.3	8.7	9.0	7.9	7.9	
Number of funds			1,031			

Conventional Funds	Flow	3.5	-1.2	-5.3	-0.9	11.1
	RTN	42.1	12.1	-11.0	22.0	27.8
	Fund size	566.9	572.5	499.0	608.9	859.3
	Expense Ratio	1.6	1.6	1.5	1.5	1.6
	α	-0.0	0.0	0.2	0.1	0.1
	β_{mkt}	0.9	0.9	0.9	1.0	1.0
	β_{smb}	0.5	0.5	0.4	0.2	0.1
	β_{hml}	-0.1	-0.0	-0.1	-0.2	-0.3
	β_{mom}	-0.1	-0.0	-0.0	0.0	-0.0
Age	8.0	8.1	8.1	7.4	7.0	
Number of funds			7,639			

D. UK fund sample (million \$) – overall summary statistics

	Mean	Median	Min	Max	Standard Deviation	
SI funds	Flow	-1.8	-0.0	-443.4	568.5	45.9
	RTN	5.4	3.4	-61.6	82.7	22.5
	Fund size	406.2	160.5	0.2	6,394.0	732.3
	Expense Ratio	1.5	1.5	0.1	3.2	0.7
	α	-0.1	-0.1	-0.9	1.2	0.3
	β_{mkt}	1.0	1.0	0.6	1.3	0.1
	β_{smb}	0.3	0.2	-0.6	1.5	0.4
	β_{hml}	-0.1	-0.1	-0.8	0.6	0.3
	β_{mom}	-0.1	-0.0	-0.8	0.6	0.2
Age	7.9	5.0	0.0	61.0	8.3	
Number of funds			1,031			
Conventional Funds	Flow	-0.3	-0.0	-589.7	1,049.5	58.7
	RTN	6.0	4.3	-61.6	82.7	22.5
	Fund size	749.7	259.5	0.2	9,006.0	1,203.4
	Expense Ratio	1.5	1.6	0.1	3.2	0.6
	α	-0.0	-0.0	-0.9	1.2	0.3
	β_{mkt}	1.0	1.0	0.6	1.3	0.1
	β_{smb}	0.3	0.2	-0.6	1.5	0.4
	β_{hml}	-0.1	-0.2	-0.8	0.6	0.3
	β_{mom}	-0.1	-0.0	-0.8	0.6	0.2
Age	7.7	5.0	0.0	85.0	8.5	
Number of funds			7,639			

This table shows the cross-sectional mean of each fund-level variable listed for the full sample (winsorised at top and bottom 2.5%). Fund size is valued at each fiscal year end and the numbers are in millions of USD. The variable Flow (fund flow) is expressed in millions of USD.

Table 6: US charity voluntary income flow

	2016 US presidential election		Paris Agreement Withdrawal		Tax Cut and Jobs Act	
	(1)	(2)	(3)	(4)	(5)	(6)
Post _{<i>t</i>}	-32.31*** (8.20)	-32.32*** (8.20)	-4.41 (7.93)	-4.84 (7.94)	-1.63** (0.78)	-1.63** (0.78)
Treat _{<i>t</i>}	11.94 (8.97)	11.92 (8.98)	11.40 (8.93)	10.99 (8.94)		
Post _{<i>t</i>} × Treat _{<i>t</i>}	23.50** (11.33)	23.51** (11.33)	18.26* (11.12)	18.69* (11.14)		
Total_assets _{<i>i,t</i>}	-0.01*** (0.00)	-0.01*** (0.00)	-0.01** (0.00)	-0.01** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)
Total_revenue _{<i>i,t</i>}	0.36*** (0.02)	0.36*** (0.02)	0.57*** (0.02)	0.57*** (0.02)	0.57*** (0.01)	0.57*** (0.01)
RecentTotal_contributions _{<i>i,t</i>}	0.11*** (0.00)	0.11*** (0.00)	0.13*** (0.00)	0.13*** (0.00)	0.09*** (0.00)	0.09*** (0.00)
Total_government_grants _{<i>i,t</i>}	-0.67*** (0.04)	-0.67*** (0.04)	-0.73*** (0.04)	-0.73*** (0.04)	-0.73*** (0.01)	-0.73*** (0.01)
Total_functional_expense _{<i>i,t</i>}	-0.04 (0.02)	-0.04 (0.02)	-0.36*** (0.03)	-0.36*** (0.03)	-0.19*** (0.01)	-0.19*** (0.01)
Payroll_Tax _{<i>i,t</i>}	-2.64*** (0.36)	-2.64*** (0.36)	-1.18*** (0.35)	-1.17*** (0.35)	-2.00*** (0.13)	-1.99*** (0.13)
Direct_fundraising_event_expenses _{<i>i,t</i>}	0.63*** (0.06)	0.67*** (0.23)	0.59*** (0.07)	0.03 (0.66)	0.26*** (0.03)	0.11* (0.06)
Indirect_Fundraising_expense _{<i>i,t</i>}		-0.04 (0.25)		0.56 (0.66)		0.16*** (0.06)
Number of observations	2290	2290	2453	2453	62052	62052
Adjusted R-squared	0.590	0.590	0.642	0.642	0.507	0.507

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. 2016 US presidential election shock: Post_{*t*} = 1 if year = 2016, 2017 and Post_{*t*} = 0 if year = 2015. US Paris Agreement withdrawal shock: Post_{*t*} = 1 if year = 2017, 2018 and Post_{*t*} = 0 if year = 2016. Tax Cut and Jobs Act shock: Post_{*t*} = 1 if year = 2017, 2018 and Post_{*t*} = 0 if year = 2016; all variables are detrended and winsorized at top and bottom 2.5%. For the first two shocks, our results are based on one-to-one, propensity score matched treated and control charities using their pre-shock covariates. The treated and control charities are ranked between the 25th to 75th percentile of all US charities as of pre-shock years. Definitions of control variables are available in Appendix 1. Definition of treatment versus control groups is available in Online Appendix 2 under table notes. The TCJA shock affects all charities, therefore, there are no treated and control groups.

Table 7: US SI fund flow – environmental shocks

	2016 US presidential election		Paris Agreement Withdrawal	
	(1)	(2)	(3)	(4)
Post _{<i>t</i>}	10.94 (18.32)	-1.57 (19.65)	0.23 (20.06)	-3.58 (21.54)
Treat _{<i>t</i>}	-9.53 (24.09)	-33.09 (25.49)	-69.18** (33.64)	-98.06*** (35.60)
Post _{<i>t</i>} × Treat _{<i>t</i>}	-11.12 (18.08)	-6.84 (20.74)	-9.53 (18.61)	-11.25 (21.94)
lagged_RT <i>N</i> _{<i>i,t</i>}	0.29 (0.73)	0.24 (0.72)	1.42 (0.95)	1.45 (0.94)
RT <i>N</i> _{<i>i,t</i>}	0.67 (0.67)	0.67 (0.66)	0.25 (0.54)	0.27 (0.54)
Age _{<i>i</i>}	-4.94*** (0.82)	-4.82*** (0.81)	-4.40*** (0.81)	-4.12*** (0.81)
Lagged Fundsize _{<i>i,t</i>}	-0.01*** (0.00)	-0.01*** (0.00)	-0.03*** (0.00)	-0.03*** (0.00)
Expense Ratio _{<i>i,t</i>}	41.03*** (15.69)	43.57*** (15.48)	27.59 (16.95)	31.36* (16.83)
Lagged α _{<i>i,t</i>}	21.23 (40.52)	18.67 (39.96)	49.13 (47.66)	47.63 (47.41)
Lagged β _{<i>mkt,i,t</i>}	4.16 (90.70)	-32.44 (90.01)	24.61 (113.10)	1.79 (112.20)
Lagged β _{<i>smb,i,t</i>}	-68.53 (41.61)	-55.20 (41.19)	-108.48** (54.45)	-101.73* (53.95)
Lagged β _{<i>hml,i,t</i>}	93.89* (48.21)	89.70* (47.58)	81.14 (60.21)	73.10 (59.74)
Lagged β _{<i>mom,i,t</i>}	-62.49 (82.63)	-42.67 (81.65)	-41.75 (193.91)	-19.23 (192.50)
Institutional	N	Y	N	Y
Fund Family Fixed Effects	Y	Y	Y	Y
Number of observations	385	385	354	354
Number of treated funds	68	68	62	62
Number of control funds	64	64	62	62
Adjusted R-squared	0.356	0.374	0.258	0.273

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. 2016 US presidential election shock: Post_{*t*} = 1 if year = 2016, 2017 and Post_{*t*} = 0 if year = 2015. US Paris Agreement withdrawal shock: Post_{*t*} = 1 if year = 2017, 2018 and Post_{*t*} = 0 if year = 2016. In US Paris Agreement withdrawal shock and 2016 US presidential election shock, we employ 1(treated)-to-1(control) matching for environmental SI (treated) and non-environmental SI (control) funds without replacement. Control variables include 1-year lagged holding period return (Lagged_RT*N*_{*i,t*}), contemporaneous return (RT*N*_{*i,t*}), 1-year lagged fund size (Lagged Fundsize_{*i,t*}, in millions), expense ratio (Expense Ratio_{*i,t*}) and fund age (Age_{*i*}). Institutional dummy and its interaction term with Post_{*t*} × Treat_{*t*} are included in our specification; the coefficients are insignificant. Number of treated and control funds reflect those used in the estimation sample of each model. Results and estimation sample size from models with less control variables are shown in Online Appendix 2.

Table 8: US and UK SI fund flows –TCJA and Oxfam scandal

	US – Tax Cut and Jobs Act 2017		UK – Oxfam Scandal	
	(1)	(2)	(3)	(4)
Post _{<i>t</i>}	-24.58*	-24.25	16.45	23.40*
	(14.26)	(15.31)	(12.41)	(13.03)
Treat _{<i>t</i>}	18.21	21.86	-10.20	-3.83
	(15.52)	(16.86)	(8.62)	(9.17)
Post _{<i>t</i>} × Treat _{<i>t</i>}	-8.88	-15.29	3.80	-0.43
	(13.92)	(16.20)	(8.05)	(8.70)
lagged_RT <i>N</i> _{<i>i,t</i>}	3.22***	3.23***	0.52**	0.58**
	(0.68)	(0.69)	(0.25)	(0.25)
RT <i>N</i> _{<i>i,t</i>}	1.09***	1.10***	0.49**	0.53***
	(0.39)	(0.39)	(0.19)	(0.19)
Age _{<i>i</i>}	-5.22***	-5.20***	-1.13***	-1.07***
	(0.63)	(0.63)	(0.38)	(0.38)
Lagged Fundsize _{<i>i,t</i>}	-0.01***	-0.01***	-0.02***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Expense Ratio _{<i>i,t</i>}	12.54	12.66	-6.95	-7.15
	(10.63)	(10.66)	(5.04)	(5.03)
Lagged α _{<i>i,t</i>}	-20.07	-20.67	9.76	8.72
	(26.54)	(26.62)	(7.08)	(7.20)
Lagged β _{<i>mkt,i,t</i>}	-82.89*	-84.01*	30.46	30.01
	(43.62)	(43.69)	(20.74)	(20.69)
Lagged β _{<i>smb,i,t</i>}	3.99	4.18	-23.45**	-24.90**
	(21.20)	(21.23)	(9.94)	(9.94)
Lagged β _{<i>hml,i,t</i>}	47.39**	46.81**	13.89	12.32
	(20.36)	(20.40)	(15.01)	(15.05)
Lagged β _{<i>mom,i,t</i>}	92.14	91.51	-16.43	-24.41
	(60.22)	(60.54)	(28.49)	(28.67)
Institutional	N	Y	N	Y
Fund Family Fixed Effects	Y	Y	Y	Y
Number of observations	967	967	408	408
Number of treated funds	170	171	79	79
Number of control funds	161	161	85	85
Adjusted R-squared	0.250	0.248	0.254	0.258

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Oxfam scandal shock: Post_{*t*} = 1 if year = 2011, 2012 and Post_{*t*} = 0 if year = 2010. Tax Cut and Jobs Act shock: Post_{*t*} = 1 if year = 2017, 2018 and Post_{*t*} = 0 if year = 2016. In both shocks, we employ 1(treated)-to-1(control) matching for SI funds (treated) and Conventional funds (control) with replacement. Control variables include 1-year lagged holding period return (Lagged_RT*N*_{*i,t*}), contemporaneous return (RT*N*_{*i,t*}), 1-year lagged fund size (Lagged Fundsize_{*i,t*}, in millions), expense ratio (Expense Ratio_{*i,t*}) and fund age (Age_{*i*}). Institutional dummy and its interaction term with Post_{*t*} × Treat_{*t*} are included in our specification; the coefficients are insignificant. Number of treated and control funds reflect those used in the estimation sample of each model. Results and estimation sample size from models with less control variables are shown in Online Appendix 2.

Table 9: US and UK fund flows – subsample Analysis –TCJA and Oxfam scandal

	US – Tax Cut and Jobs Act		UK – Oxfam Scandal	
	Conventional	SI funds	Conventional	SI funds
	Funds	Funds	Funds	Funds
	(1)	(2)	(3)	(4)
Post _t	53.51*** (6.64)	13.73 (39.20)	25.58*** (7.87)	-28.08 (28.24)
lagged_RT <i>N</i> _{<i>i,t</i>}	0.97*** (0.15)	2.00*** (0.75)	0.19 (0.22)	-0.78 (0.70)
RT <i>N</i> _{<i>i,t</i>}	1.76*** (0.23)	1.31 (1.41)	1.00*** (0.18)	-0.28 (0.43)
Age _{<i>i</i>}	-3.84*** (0.16)	-3.57*** (0.76)	-0.90*** (0.16)	-0.97** (0.48)
Lagged Fundsiz <i>e</i> _{<i>i,t</i>}	-0.01*** (0.00)	-0.01 (0.01)	-0.01*** (0.00)	-0.03*** (0.01)
Expense Ratio _{<i>i,t</i>}	12.74*** (2.17)	-2.99 (10.90)	0.14 (2.10)	7.73 (6.87)
Lagged α _{<i>i,t</i>}	54.02*** (5.87)	-12.99 (37.56)	22.73*** (4.95)	22.98 (17.69)
Lagged β _{<i>mkt,i,t</i>}	-17.26** (8.69)	-24.11 (39.07)	-8.51 (11.91)	-24.45 (30.85)
Lagged β _{<i>smb,i,t</i>}	4.04 (3.69)	-13.83 (20.97)	-13.79*** (5.25)	26.68* (15.92)
Lagged β _{<i>hml,i,t</i>}	22.75*** (5.15)	-9.65 (22.79)	-9.92 (7.14)	18.73 (23.58)
Lagged β _{<i>mom,i,t</i>}	-5.33 (7.50)	-2.52 (39.74)	-7.28 (14.56)	-70.64 (48.09)
Institutional	Y	Y	Y	Y
Number of observations	13224	331	1343	119
Adjusted R-squared	0.170	0.100	0.103	0.266

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Oxfam scandal shock: Post_{*t*} = 1 if year = 2011 and Post_{*t*} = 0 if year = 2010. Tax Cut and Jobs Act shock: Post_{*t*} = 1 if year = 2018 and Post_{*t*} = 0 if year = 2017. Control variables include 1-year lagged holding period return (Lagged_RT*N*_{*i,t*}), contemporaneous return (RT*N*_{*i,t*}), 1-year lagged fund size (Lagged Fundsiz*e*_{*i,t*}, in millions), expense ratio (Expense Ratio_{*i,t*}) and fund age (Age_{*i*}). Institutional dummy and its interaction term with Post_{*t*} × Treat_{*t*} are included in our specification; the coefficients are insignificant. Results and estimation sample size from models with less control variables are shown in Online Appendix 2. Additional results using funds from 1(treated)-to-3(control) and 1(treated)-to-4(control) matching for SI funds (treated) and Conventional funds (control) with replacement are available upon request.

Table 10: Test for Reputation Effect

	Total Donation Amount	Number of donors
Post _t	-1035.02 (2278.71)	4.73 (37.99)
Treat _t	-3272.56 (2449.54)	29.00 (39.42)
Post _t × Treat _t	1671.17 (3345.56)	62.29 (53.73)
Number of observations	56	52
R-squared	0.042	0.152

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. US Paris Agreement withdrawal shock: Post_t = 1 if year = 2017, 2018 and Post_t = 0 if year = 2016. Observations are group total amount and number of donors in each of seven groups by annual donation in US dollar amounts to the charity: Oxfam America (<5K; 5K-9,999; 10K-24,999; 25K-49,999; 50K-99,999; 100K-499,999; 0.5-1mil; >1mil). Treat = 1 for groups of named donors and 0 for anonymous donors. The number of observations differ because for the first group (<5K) the number of donors is not known and the total amount is deduced from the annual report minus the total of all other groups.

Table 11. US SI fund flow - alternative Treat_t definition using SI and Conventional funds

	2016 US presidential election		Paris Agreement Withdrawal	
	(1)	(2)	(3)	(4)
Post _t	56.04** (24.52)	52.83** (25.21)	-17.92 (16.08)	-17.57 (17.08)
Treat _t	2.22 (14.67)	4.21 (15.50)	19.82 (16.56)	23.97 (18.03)
Post _t × Treat _t	-6.10 (11.34)	-10.10 (12.94)	-5.92 (14.70)	-13.40 (17.03)
Lagged_RT <i>N</i> _{<i>i,t</i>}	-0.65* (0.34)	-0.62* (0.34)	3.21*** (0.80)	3.21*** (0.80)
RT <i>N</i> _{<i>i,t</i>}	0.08 (0.26)	0.05 (0.26)	0.92* (0.47)	0.92* (0.47)
Age _{<i>i</i>}	-5.30*** (0.51)	-5.31*** (0.51)	-5.40*** (0.70)	-5.38*** (0.71)
Lagged Fundsize _{<i>i,t</i>}	-0.01** (0.00)	-0.01** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)
Expense Ratio _{<i>i,t</i>}	-10.43 (7.56)	-10.50 (7.57)	13.60 (11.58)	13.81 (11.63)
Lagged α _{<i>i,t</i>}	68.16*** (15.92)	67.90*** (15.94)	0.23 (29.21)	-0.17 (29.34)
Lagged β _{<i>mkt,i,t</i>}	11.03 (33.48)	10.65 (33.70)	-82.24* (47.85)	-83.58* (47.93)
Lagged β _{<i>smb,i,t</i>}	23.50* (12.04)	23.46* (12.10)	19.34 (29.62)	18.86 (29.67)
Lagged β _{<i>hml,i,t</i>}	19.58 (20.47)	19.66 (20.57)	59.36*** (22.50)	58.72*** (22.55)
Lagged β _{<i>mom,i,t</i>}	60.55* (33.80)	62.38* (34.05)	183.41*** (64.98)	182.55*** (65.34)
Institutional	N	Y	N	Y
Fund Family Fixed Effects	Y	Y	Y	Y
Number of observations	688	688	842	842
Number of treated funds	134	134	148	148
Adjusted R-squared	0.343	0.342	0.281	0.280

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Paris Agreement shock: Post_t = 1 if year = 2017, 2018 and Post_t = 0 if year = 2016. 2016 US presidential election shock: Post_t = 1 if year = 2015, 2016 and Post_t = 0 if year = 2014. For Paris Agreement Withdrawal and 2016 US presidential election shock, we employ 1(treated)-to-1(control) matching for SI funds (treated) and conventional funds (control) with replacement. Control variables include 1-year lagged holding period return (Lagged_RT*N*_{*i,t*}), contemporaneous return (RT*N*_{*i,t*}), 1-year lagged fund size (Lagged Fundsize_{*i,t*} in millions), expense ratio (Expense Ratio_{*i,t*}) and fund age (Age_{*i*}). Institutional dummy and its interaction term with Post_t × Treat_t are included in our specification, the coefficients are insignificant.

Table 12. US high vs low Morningstar Sustainability Globes rating funds – 2016 US presidential election

	2016 US presidential election		Tax Cut and Jobs Act 2017	
	(1)	(2)	(3)	(4)
Post _t	-38.99*** (8.39)	-42.59*** (8.99)	47.56 (37.07)	62.38 (38.11)
Treat _t	-2.53 (8.48)	0.08 (9.36)	15.04 (16.82)	28.06 (19.31)
Post _t × Treat _t	14.67 (9.08)	11.20 (10.29)	-34.81 (24.32)	-34.65 (28.13)
Lagged_RT <i>N</i> _{<i>i,t</i>}	0.30 (0.25)	0.29 (0.25)	1.28 (0.87)	1.26 (0.87)
RT <i>N</i> _{<i>i,t</i>}	1.38*** (0.29)	1.36*** (0.29)	0.94 (1.21)	1.03 (1.22)
Age _{<i>i</i>}	-3.90*** (0.27)	-3.90*** (0.27)	-12.59*** (0.73)	-12.64*** (0.73)
Lagged Fundsize _{<i>i,t</i>}	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)
Expense Ratio _{<i>i,t</i>}	32.63*** (6.61)	32.37*** (6.63)	38.00*** (9.28)	37.80*** (9.28)
Lagged α _{<i>i,t</i>}	89.45*** (13.69)	88.91*** (13.68)	61.00** (29.90)	62.17** (29.91)
Lagged β _{<i>mkt,i,t</i>}	17.38 (30.81)	16.21 (30.81)	34.54 (48.50)	34.66 (48.49)
Lagged β _{<i>smb,i,t</i>}	-38.79*** (8.33)	-38.76*** (8.33)	11.43 (20.88)	9.49 (20.90)
Lagged β _{<i>hml,i,t</i>}	21.70** (11.06)	21.21* (11.08)	8.32 (29.43)	10.62 (29.46)
Lagged β _{<i>mom,i,t</i>}	-36.49* (20.83)	-35.22* (20.84)	-2.82 (44.51)	-6.41 (44.54)
Institutional	N	Y	N	Y
Fund Family Fixed Effects	Y	Y	Y	Y
Number of observations	2974	2974	3604	3604
Number of treated funds	507	507	1039	1039
Adjusted R-squared	0.308	0.309	0.173	0.174

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. For the 2016 US presidential election shock, Post_t = 1 if year = 2017 or 2018 and Post_t = 0 if year = 2016. For Tax Cut and Jobs Act shock in 2017, Post_t = 1 if year = 2017 and Post_t = 0 if year = 2016. To define treatment group, we obtain monthly Morningstar Sustainability Globes rating (earliest available from August 2018), which scales from 1 to 5 globes (indicating Low, Below-average, Average, Above-average, and High sustainability grades). Treat_t = 1 if a fund is rated with “Above Average” or “High” consistently by Morningstar Sustainability Globes rating for the 24 months period starting from August 2018 (when the rating is first accessible); Treat_t = 0 if fund is rated with “Below Average” or “Low” by Morningstar Sustainability Globes rating consistently for the 24 months period starting from August 2018. We employ 1(treated)-to-1(control) matching for treated funds and control funds with replacement. Control variables include 1-year lagged holding period return (Lagged_RT*N*_{*i,t*}), contemporaneous return (RT*N*_{*i,t*}), 1-year lagged fund size (Lagged Fundsize_{*i,t*} in millions), expense ratio (Expense Ratio_{*i,t*}) and fund age (Age_{*i*}). Institutional dummy and its interaction term with Post_t × Treat_t are included in our specifications; the coefficients are insignificant.

Table 13: US charity voluntary income flow and SI fund flow – Composite Shock

<i>A. US charity voluntary income flow</i>				
	(1)	(2)	(3)	(4)
Post _t	-19.33*** (7.28)	-18.59*** (6.75)	-15.61** (6.61)	-15.47** (6.61)
Treat _t	-9.25 (10.76)	13.94 (10.06)	20.18** (9.83)	20.11** (9.83)
Post _t × Treat _t	38.44** (16.04)	29.06* (14.89)	25.85* (14.54)	25.69* (14.55)
Total_assets _{i,t}	-0.01*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)
Total_revenue _{i,t}	0.32*** (0.01)	0.37*** (0.02)	0.38*** (0.02)	0.38*** (0.02)
RecentTotal_contributions _{i,t}	0.10*** (0.00)	0.10*** (0.00)	0.10*** (0.00)	0.10*** (0.00)
Total_government_grants _{i,t}		-0.67*** (0.04)	-0.69*** (0.04)	-0.69*** (0.04)
Total_functional_expense _{i,t}		-0.06*** (0.02)	0.02 (0.02)	0.02 (0.02)
Payroll_Tax _{i,t}			-3.63*** (0.38)	-3.62*** (0.38)
Direct_fundraising_event_expenses _{i,t}			0.25*** (0.07)	-0.07 (0.55)
Indirect_Fundraising_expense _{i,t}				0.33 (0.55)
Number of observations	1981	1981	1981	1981
Adjusted R-squared	0.580	0.639	0.656	0.656
<i>B. US SI fund flow</i>				
	(1)	(2)	(3)	(4)
Post _t	16.88 (16.91)	19.95 (15.93)	21.43 (15.94)	10.84 (17.22)
Treat _t	26.31 (27.58)	-30.43 (27.09)	-35.53 (27.10)	-70.12** (28.58)
Post _t × Treat _t	-10.32 (16.79)	-14.41 (15.83)	-15.43 (15.79)	-12.53 (18.48)
lagged_RTNI _{i,t}	0.74 (0.90)	0.65 (0.85)	0.74 (0.84)	0.79 (0.83)
RTNI _{i,t}	0.36 (0.55)	0.09 (0.52)	0.11 (0.52)	0.14 (0.51)
Age _i	-5.53*** (0.74)	-5.30*** (0.70)	-4.98*** (0.71)	-4.66*** (0.71)
Lagged Fundsize _{i,t}		-0.03*** (0.00)	-0.03*** (0.00)	-0.03*** (0.00)
Lagged Expense Ratio _{i,t}			32.77** (14.82)	37.31** (14.65)
Lagged α _{i,t}	2.13 (38.55)	22.35 (36.42)	40.02 (37.19)	34.14 (36.77)
Lagged β _{mkt,i,t}	3.12 (80.50)	39.03 (75.99)	50.30 (75.91)	33.42 (74.92)
Lagged β _{smb,i,t}	-6.64 (41.50)	-73.62* (40.13)	-74.17* (40.00)	-67.77* (39.45)
Lagged β _{hml,i,t}	92.91* (54.86)	64.06 (51.83)	70.60 (51.77)	61.56 (51.15)
Lagged β _{mom,i,t}	-80.41 (80.63)	-7.79 (76.59)	-1.46 (76.43)	10.65 (75.38)
Institutional	N	N	N	Y
Fund Family Fixed Effects	Y	Y	Y	Y
Number of observations	474	474	473	473
Number of treated funds	62	62	62	62
Adjusted R-squared	0.162	0.257	0.263	0.285

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Post_t = 1 if year = 2017, 2018 and Post_t = 0 if year = 2015, 2016. In Panel A, Treat_t = 1 if a charity is environmental/animal focus, and Treat_t = 0 if a charity is art/art/culture focused. We employ logit propensity score matching using 1-year lagged covaraites. In Panel A, we use Total assets_{i,t}, Total revenue_{i,t}, Total functional expense_{i,t}, Total government grants_{i,t}, Fundraising expense_{i,t}, Payroll tax_{i,t}, as of the year 2015 for propensity score matching. In Panel B, we include 1-year lagged holding period return (Lagged_RTNI_{i,t}), contemporaneous return (RTNI_{i,t}), 1-year lagged fund size (Lagged Fundsize_{i,t} in millions), expense ratio (Expense Ratio_{i,t}) and fund age (Age) for propensity score matching. Matched sample is obtained by truncating the full sample to keep observations with logit propensity score between 0.57 and 0.78 (inclusive) for charities in Panel A. In Panel B, we employ 1(treated)-to-

1(control) matching for environmental SI (treated) and non-environmental SI (control) funds without replacement. Logit regression results, covariate balance test results and parallel trends are available upon request.

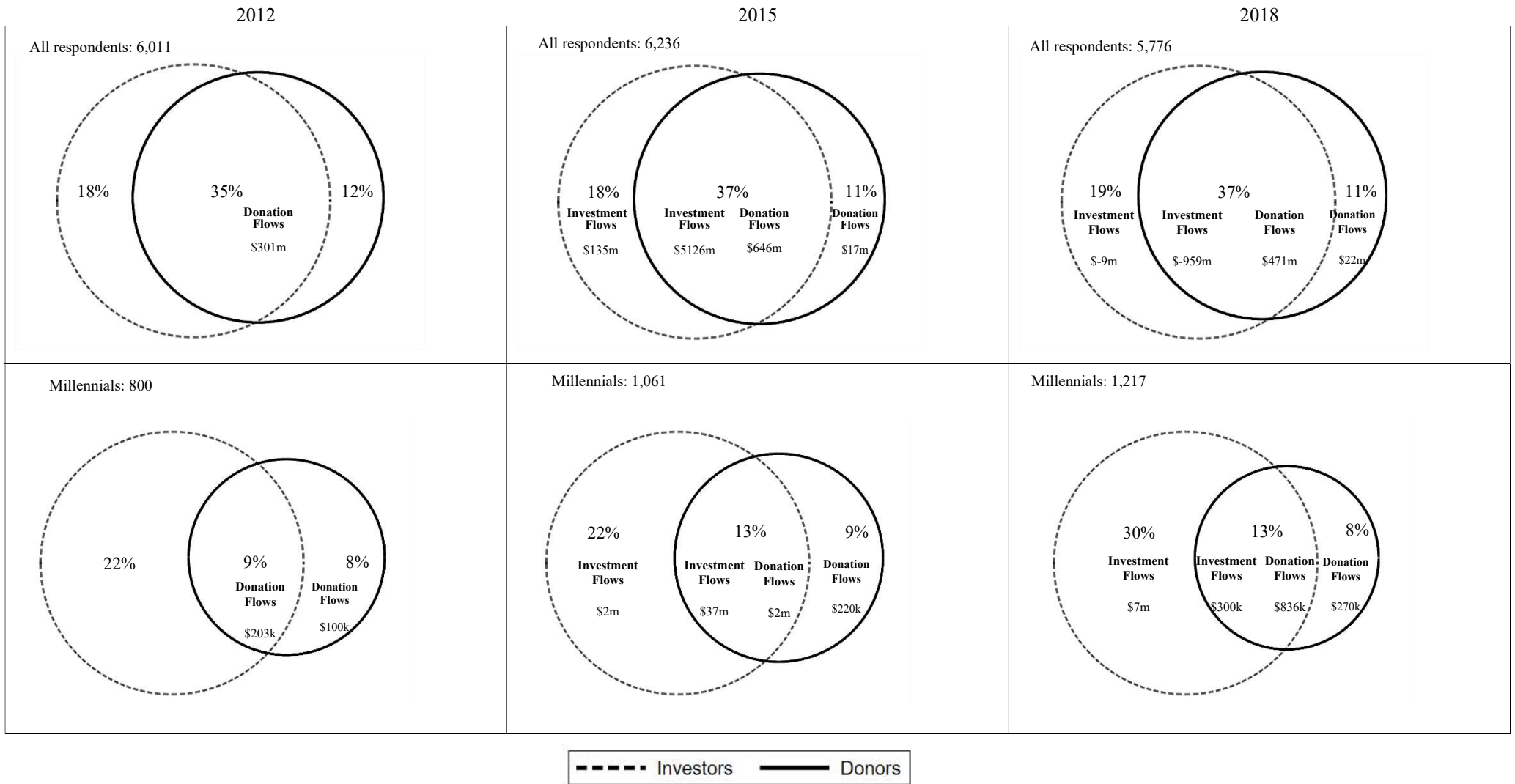


Figure 1. Proportion of respondents who invest and donate among all US families from the Survey of Consumer Finance

The graph shows the proportions of investors and donors among the respondents of the Survey of Consumer Finance (SCF) executed by the Federal Reserve every three years among US households. The intersection between the dashed and solid circles represents those who invest in the stock market and donate to charities. Inside the circles, we report the dollar amounts of flows to charity and investment instruments. The investment flows are missing in the year 2012 because they are computed as changes between two consecutive survey years.

Source: US Survey of Consumer Finance

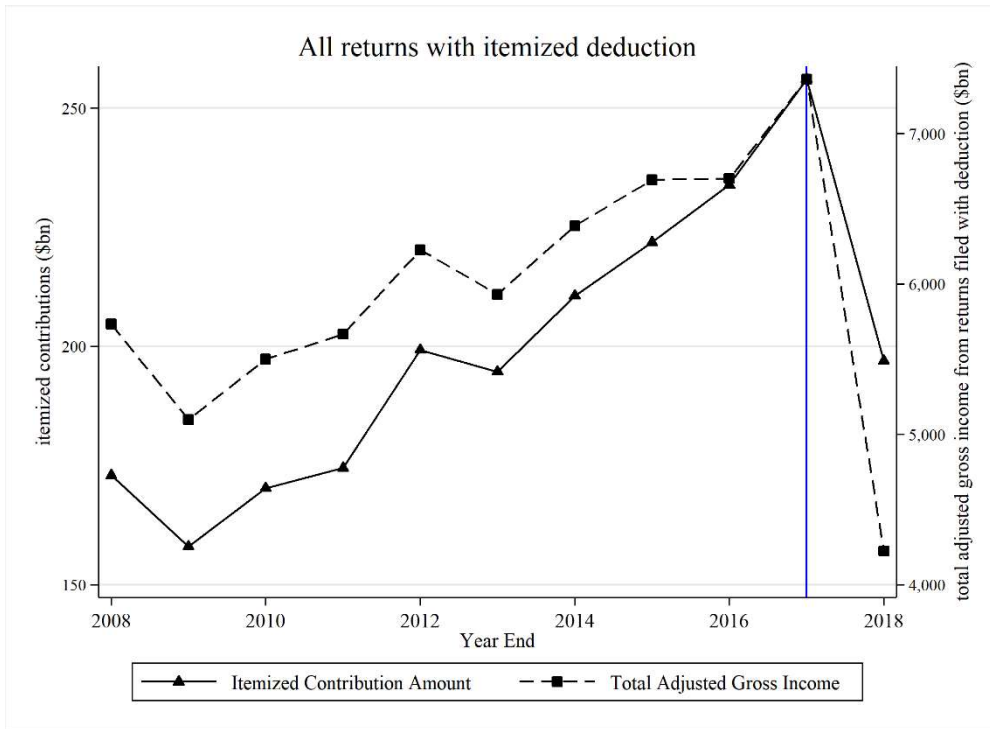


Figure 2. Itemized charitable contributions filed by US taxpayers over time

The figure shows the total amount of itemized charitable contribution deductions (inflation adjusted) claimed by US individuals who returned Form 990 tax filings, relative to their total gross income.
Source: US Internal Revenue Service (IRS)

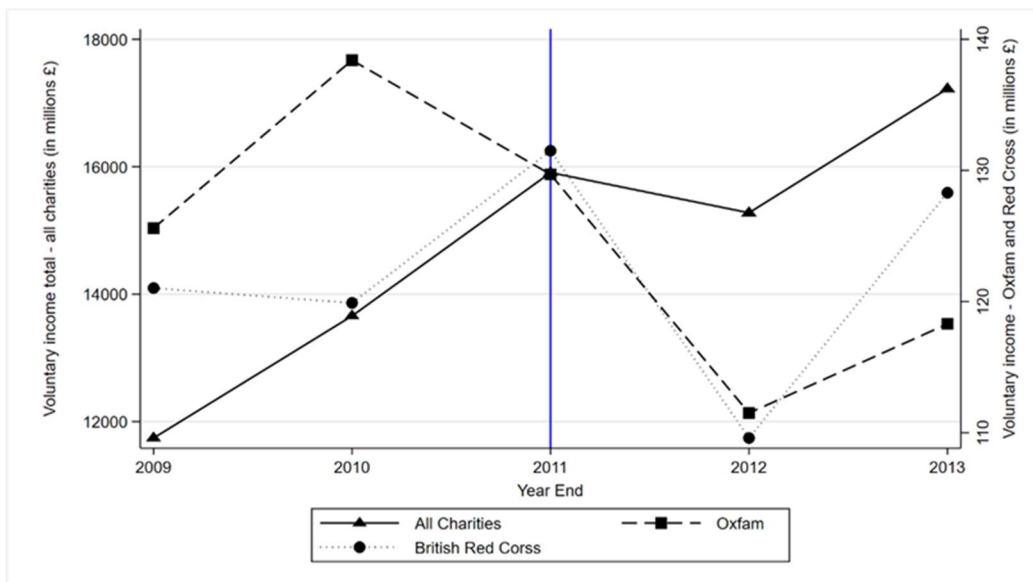


Figure 3. Total voluntary income received by Oxfam, British Red Cross, and all other UK charities after 2011 Oxfam Scandal

The graph shows the amount of voluntary income (inflation-adjusted) received by Oxfam, and British Red Cross around the year of Oxfam scandal outbreak in 2011. The graph also plots the total amount of voluntary income received by all reporting UK charities within the same period.

Source: UK Charity Commission

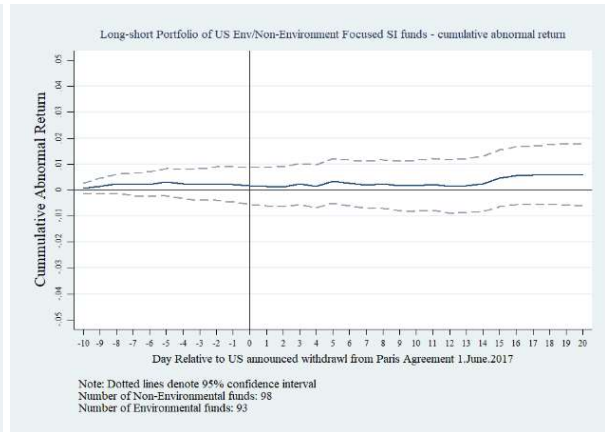
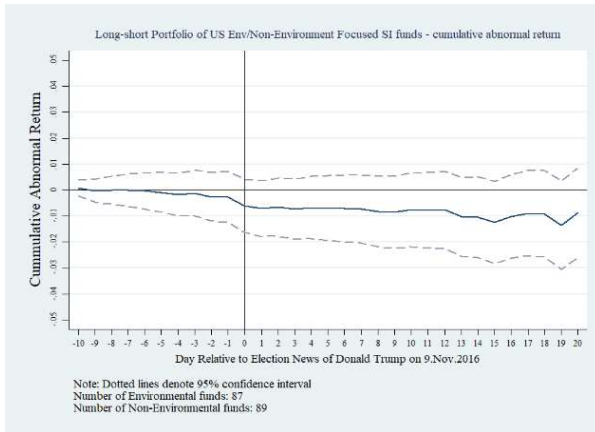


Figure 4. Long-short portfolio CAR – 2016 US presidential election and Paris Agreement Withdrawal

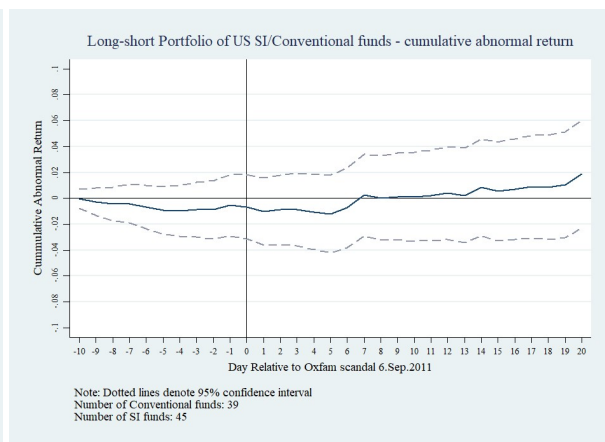
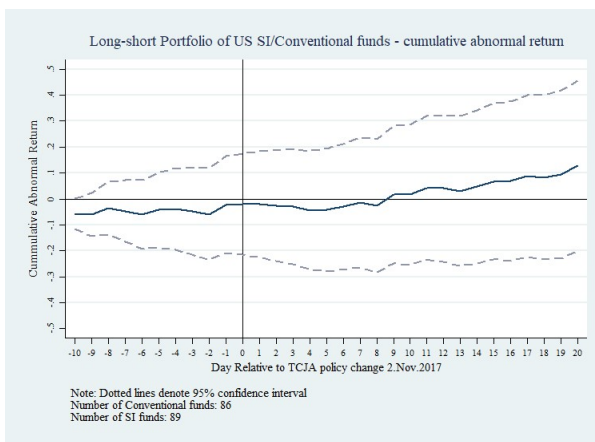


Figure 5. Long-short portfolio CAR – Tax Cut and Jobs Act & Oxfam scandal

Appendix 1. Variable and Concept Definitions

Variable Definitions	
<i>Notation</i>	<i>Definition</i>
Investor	A respondent to the Survey of Consumer Finance (SCF) is defined as an investor if he/she (and/or the respondent's family) holds a non-0 amount in stocks as part of any of the following accounts: stock mutual funds and ETFs (X3822, X6704), combination funds and ETFs (X3830), publicly traded stocks (X3915), or through the following means: Roth IRA (X6551, X6559, X6567), roll-over IRA (X6553, X6560, X6568), regular or other IRA (X6553, X6561, X6569), Keogh account (X6554, X6562, X6570), savings or money market accounts (X3730, X3736, X3742, X3748, X3754, X3760), annuities (X6577); managed investment accounts (X6587); and pension accounts (X11032, X11132, X11332, X11432). In addition, we require any holdings through pension plans to provide a choice about how the pension plan is invested. The SCF provides overall dollar amounts and the proportions of different instruments that are in stocks, which allows us to compute their corresponding dollar amounts.
Donor	A respondent to the Survey of Consumer Finance (SCF) is defined as a donor if he/she (or the respondent's family) made a charitable contribution of at least \$500 in the survey year (X5822) or had a charitable trust or foundation (X7660).
Voluntary_contribution _{<i>i,t</i>}	Voluntary income received by UScharity <i>i</i> in year <i>t</i> (in thousands of USD), which equals to total contributions minus total government grants, as obtained from Form 990 - Part VIII
Post _{<i>t</i>}	A dummy variable for the post-shock year. Shock year differs depending on the specification of the diff-in-diff shock; full description available under table notes in Online Appendix 2 for analysis on US charities, US funds, and UK funds.
Treated _{<i>i</i>}	For our charity flow analysis: a dummy variable for a charity <i>i</i> , defined based on shocks examined; full description available under table notes in Online Appendix 2. For our SI and conventional fund flow analysis: a dummy variable equal to 1 for UK/US open-ended equity fund <i>i</i> with a socially conscious mandate as defined by Morningstar, and 0 if fund <i>i</i> does not have a socially conscious mandate as defined by Morningstar and is thus a 'conventional' fund.
Post _{<i>t</i>} × Treated _{<i>i</i>}	Interaction term with dummy variables Post _{<i>t</i>} and Treated _{<i>i</i>}
Total_assets _{<i>i,t</i>}	Total assets of US charity <i>i</i> in year <i>t</i> (in thousands of USD) as reported in Form 990 - Part XI
Total_government_grants _{<i>i,t</i>}	Total government grants received by US charity <i>i</i> in year <i>t</i> (in thousands of USD), as reported in Form 990 - Part VIII
Direct_fundraising_expense _{<i>i,t</i>}	Fundraising expenses directly attributable to fundraising events of US charity <i>i</i> in year <i>t</i> (in thousands of USD), as reported in Form 990 - Part VIII
Payroll_tax _{<i>i,t</i>}	Total payroll tax of US charity <i>i</i> in year <i>t</i> (in thousands of USD), as reported in Form 990 - Part IX
Total_functional_expenses _{<i>i,t</i>}	Total functional expenses of US charity <i>i</i> in year <i>t</i> (in thousands of USD), as reported in Form 990 - Part IX
Indirect_fundraising_expense _{<i>i,t</i>}	Indirect fundraising expenses of US charity <i>i</i> in year <i>t</i> (in thousands of USD), as reported in Form 990 - Part IX
Flow _{<i>i,t</i>}	Calendar-year estimated share-class level net flow toward fund <i>i</i> (in millions of USD) at year <i>t</i> obtained from Morningstar
Lagged RTN _{<i>i,t</i>}	1-year holding period return for fund <i>i</i> in year <i>t-1</i>
RTN _{<i>i,t</i>}	1-year holding period return (in %) for fund <i>i</i> in year <i>t</i>
Age _{<i>i,t</i>}	Fund age in the nearest round year measured on 31 st December of the pre-shock year <i>t-1</i> depending on different diff-in-diff shock.
Lagged expratio _{<i>i,t</i>}	Lagged net expense ratio (in %) for fund <i>i</i> at year <i>t-1</i> , defined by Morningstar as: The percentage of fund assets used to pay for operating

	expenses and management fees, including 12b-1 fees, administrative fees and all other asset-based costs incurred by the fund, except brokerage costs. Fund expenses are reflected in the fund's NAV. Sales charges are not included in the expense ratio.
$\alpha_{i,t}$	Fama-French four-factor alpha of fund i at year t , estimated from running Fama-French four-factor model using fund i 's past 24 months of excess return and return on four-factor portfolios obtained from Ken-French online data library.
$\beta_{mkt,i,t}$	Market beta of fund i at year t , estimated from running Fama-French four-factor model using fund i 's past 24 months of excess return and return on four-factor portfolios obtained from Ken-French online data library.
$\beta_{smb,i,t}$	Size factor loading of fund i at year t , estimated from running Fama-French four-factor model using fund i 's past 24 months of excess return and return on four-factor portfolios obtained from Ken-French online data library.
$\beta_{hml,i,t}$	Value factor loading of fund i at year t , estimated from running Fama-French four-factor model using fund i 's past 24 months of excess return and return on four-factor portfolios obtained from Ken-French online data library.
$\beta_{mom,i,t}$	Momentum factor loading of fund i at year t , estimated from running Fama-French four-factor model using fund i 's past 24 months of excess return and return on four-factor portfolios obtained from Ken-French online data library.
Institutional _{i}	Defined by Morningstar as an indication that the share class is primarily aimed at institutional investors. Institutional _{i} = 1 if the Morningstar entry to this field for fund i is "Yes".

Appendix 2. Covariate Balancing and Parallel Trends

Table A2.1 2016 US presidential election – covariate balancing test – US charities

	Lagged Total Assets _{<i>i,t</i>}	Lagged Total Revenue _{<i>i,t</i>}	Lagged Functional Expenses _{<i>i,t</i>}	Lagged Government Grants _{<i>i,t</i>}	Lagged Payroll Tax _{<i>i,t</i>}	Lagged Direct Fundraising Expense _{<i>i,t</i>}
A. Before Matching						
Mean Test						
Control	407.04	222.35	213.22	10.28	7.15	2.70
Treated	291.81	236.70	218.23	15.89	10.90	2.13
t-stat	1.43	-0.54	-0.20	-0.88	-2.26	1.11
Median Test						
Control	54.85	83.42	77.08	0.00	0.00	0.00
Treated	61.44	99.99	91.92	0.00	0.00	0.00
z-score	-0.01	-4.28	-3.87	2.02	-1.87	-2.99
Number of control charities	1,011	1,011	1,011	1,202	425	1,877
Number of treated charities	2,286	2,286	2,286	2,397	917	3,568
B. After Matching						
Mean Test						
Control	502.41	362.93	324.55	19.07	6.13	9.11
Treated	609.80	390.77	354.29	20.39	6.58	8.20
t-statistic	-0.82	-0.76	-0.88	-0.30	-0.54	0.53
Median Test						
Control	155.55	234.83	198.79	0.00	0.76	0.00
Treated	174.08	241.44	218.55	0.00	0.00	0.00
z-score	5.94	3.06	3.02	6.26	-0.70	1.27
Number of control charities	720	720	720	720	720	720
Number of treated charities	720	720	720	720	720	720

This table shows balancing test results using 1-year lagged covariates as of year 2015. The number of treated and control charities reflect unique fund count in each group. In Panel B, sorting by propensity score, each environmental/animal-focused charity is matched by the closest one art/culture charity without replacement to obtain the matched sample, and obtained by truncating the before matching sample (Panel A) to keep observations with logit propensity score between 0.25 and 0.78 (inclusive).

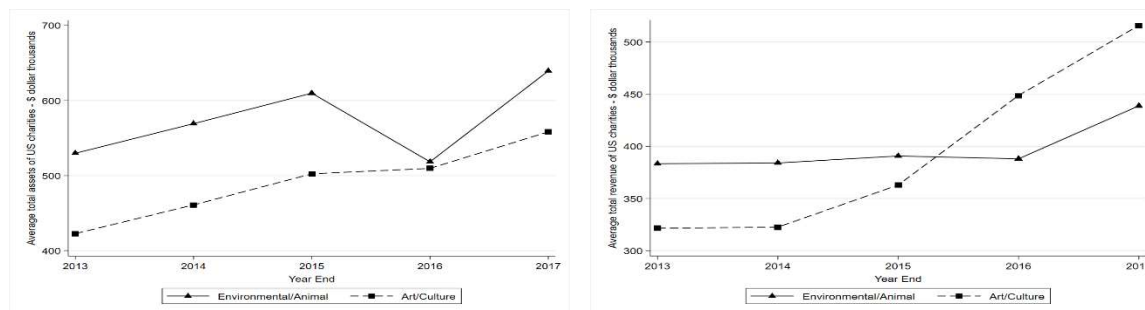


Figure A2.1 Parallel trends of US treatment and control charities – 2016 US presidential election

Table A2.2 Paris Agreement Withdrawal – covariate balancing test – US charities

	Lagged Total Assets _{i,t}	Lagged Total Revenue _{i,t}	Lagged Functional Expenses _{i,t}	Lagged Governmen t Grants _{i,t}	Lagged Payroll Tax _{i,t}	Lagged Direct Fundraising Expense _{i,t}
<i>A. Before Matching</i>						
Mean Test						
Control	369.22	211.59	202.60	11.20	7.85	3.21
Treated	322.70	240.30	221.48	13.22	10.79	2.81
t-stat	0.68	-1.27	-0.84	-0.42	-1.96	0.59
Median Test						
Control	50.78	79.13	73.63	0.00	0.00	0.00
Treated	63.97	99.89	93.33	0.00	0.15	0.00
z-score	-1.93	-6.06	-5.73	2.18	-2.67	-3.40
Number of control charities	1,145	1,144	1,144	1,357	480	1,877
Number of treated charities	2,405	2,404	2,404	2,649	985	3,568
<i>B. After Matching</i>						
Mean Test						
Control	384.10	258.57	256.49	12.50	5.07	10.03
Treated	489.20	314.71	299.43	21.81	4.48	8.16
t-statistic	-1.74	-2.54	-1.81	-2.16	1.34	1.16
Median Test						
Control	124.53	205.31	206.09	0.00	1.45	0.00
Treated	169.63	227.86	199.57	0.00	0.00	0.00
z-score	1.98	-0.14	0.59	6.54	-1.61	1.50
Number of control charities	722	722	722	722	722	722
Number of treated charities	722	722	722	722	722	722

This table shows balancing test results using 1-year lagged covariates as of year 2016. The number of treated and control charities reflect unique fund count in each group. In Panel B, sorting by propensity score, each environmental/animal-focused charity is matched by the closest one art/culture charity without replacement to obtain the matched sample, and obtained by truncating the before matching sample (Panel A) to keep observations with logit propensity score between 0.44 and 0.70 (inclusive).

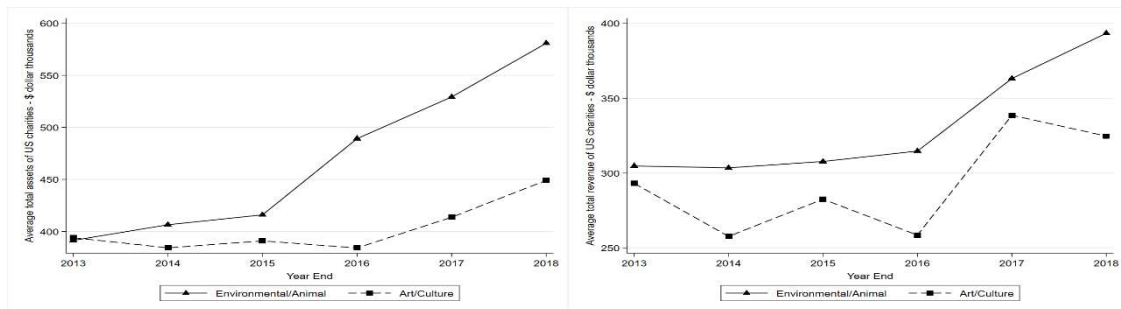


Figure A2.2 Parallel trends of US treatment and control charities – Paris Agreement Withdrawal

Table A2.3 2016 US presidential election – covariate balancing test – US funds

	Lagged RTN _{i,t}	Agc _{i,t}	Lagged $\alpha_{i,t}$	Lagged $\beta_{mkt,i,t}$	Lagged $\beta_{smb,i,t}$	Lagged $\beta_{hml,i,t}$	Lagged $\beta_{mom,i,t}$
<i>A. Before Matching (Environmental vs Non-Environmental SI funds)</i>							
Mean Test							
Control	-1.34	13.48	-0.10	1.00	0.04	-0.04	-0.00
Treated	-0.97	11.67	-0.08	0.95	0.19	-0.07	0.01
t-stat	-0.57	2.08	-0.87	3.91	-3.90	0.88	-1.04
Median Test							
Control	-0.60	12.00	-0.07	1.00	-0.02	0.07	-0.01
Treated	-1.66	10.00	-0.11	0.97	0.04	-0.01	0.01
z-score	1.46	2.56	0.46	3.56	-3.55	0.82	-0.66
Number of control funds	77	97	80	80	80	80	80
Number of treated funds	130	143	125	125	125	125	125
<i>B. After Matching (Environmental vs Non-Environmental SI funds)</i>							
Mean Test							
Control	-1.34	12.96	-0.11	1.00	0.05	-0.04	-0.00
Treated	-1.21	13.61	-0.11	0.99	0.06	-0.03	0.01
t-stat	-0.18	-0.58	0.05	1.21	-0.55	-0.22	-1.33
Median Test							
Control	-0.60	11.00	-0.07	1.01	-0.03	0.07	-0.01
Treated	-1.23	13.00	-0.11	1.00	0.01	-0.01	0.02
z-score	0.63	-0.40	0.88	1.45	-0.75	-0.13	-1.29
Number of control funds	77	77	77	77	77	77	77
Number of treated funds	77	77	77	77	77	77	77
<i>C. Before Matching (SI vs Conventional Funds)</i>							
Mean Test							
Control	-2.09	13.32	-0.14	0.94	0.17	-0.05	-0.00
Treated	-1.11	12.40	-0.09	0.97	0.14	-0.06	0.00
t-stat	-2.34	1.54	-3.19	-4.25	1.68	0.51	-0.77
Median Test							
Control	-1.75	12.00	-0.12	0.96	0.03	-0.04	0.00
Treated	-0.87	11.00	-0.09	0.99	0.03	0.02	0.01
z-score	-2.71	0.85	-2.93	-4.36	0.87	0.15	0.26
Number of control funds	7,577	8,652	7,622	7,622	7,622	7,622	7,622
Number of treated funds	207	240	205	205	205	205	205
<i>D. After Matching (SI vs Conventional Funds)</i>							
Mean Test							
Control	-0.90	12.31	-0.08	0.97	0.12	-0.07	0.01
Treated	-1.12	12.28	-0.09	0.98	0.15	-0.06	0.01
t-stat	0.37	0.04	0.28	-0.84	-0.91	-0.48	-0.06
Median Test							
Control	-0.64	11.00	-0.08	0.99	0.02	-0.00	0.01
Treated	-0.87	10.00	-0.09	0.99	0.03	0.04	0.01
z-score	0.78	-0.16	0.28	-0.41	-1.37	-0.08	0.08
Number of control funds	155	155	155	155	155	155	155
Number of treated funds	159	159	159	159	159	159	159

This table shows balancing test results using 1-year lagged covariates as of year 2016. Number of treated and control funds reflect unique fund count in each group. In Panel B, sorting by propensity score, each environmental SI fund is matched by the closest one non-environmental fund without replacement to obtain the matched sample. Sample in Panel D is obtained by truncating the before matching sample (Panel C) to keep observations with logit propensity score between 0.01 and 0.049 (inclusive). Sorting by propensity score, each SI fund is matched by the closest one conventional fund with replacement. Logit propensity score estimation results are shown in Online Appendix 6.

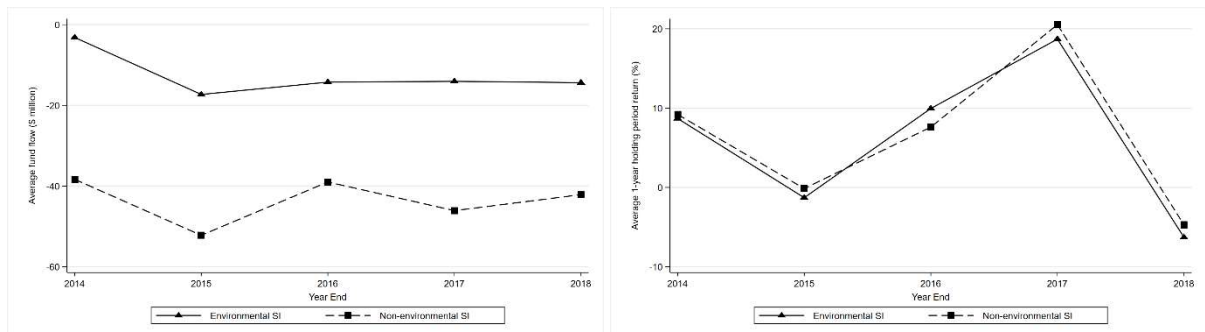


Figure A2.3 Parallel trends of US treatment and control funds – 2016 US presidential election

Table A2.4 Paris Agreement Withdrawal – covariate balancing test – US funds

	Lagged RTN _{i,t}	Ag _{Ci,t}	Lagged $\alpha_{i,t}$	Lagged $\beta_{mkt,i,t}$	Lagged $\beta_{smb,i,t}$	Lagged $\beta_{hml,i,t}$	Lagged $\beta_{mom,i,t}$
<i>A. Before Matching (Environmental vs Non-Environmental SI funds)</i>							
Mean Test							
Control	8.73	14.51	-0.16	0.99	0.03	-0.09	-0.03
Treated	9.76	12.28	-0.13	0.94	0.15	-0.05	-0.01
t-stat	-1.00	2.54	-0.88	2.97	-3.33	-1.09	-1.02
Median Test							
Control	9.09	13.00	-0.12	0.99	-0.04	-0.02	-0.00
Treated	10.27	11.50	-0.13	0.94	0.01	0.00	0.01
z-score	-1.38	2.96	-0.22	3.22	-2.44	-2.06	-1.94
Number of control funds	62	97	78	78	78	78	78
Number of treated funds	118	150	137	137	137	137	137
<i>B. After Matching (Environmental vs Non-Environmental SI funds)</i>							
Mean Test							
Control	8.73	13.95	-0.17	0.99	0.04	-0.08	-0.02
Treated	9.86	13.61	-0.18	0.98	0.01	-0.06	-0.04
t-stat	-1.03	0.25	0.57	0.35	0.88	-0.68	1.02
Median Test							
Control	9.09	12.00	-0.13	0.99	-0.04	-0.02	-0.00
Treated	10.27	12.00	-0.16	0.99	-0.02	-0.01	-0.00
z-score	-1.53	0.53	1.16	0.86	0.88	-1.30	0.10
Number of control funds	62	62	62	62	62	62	62
Number of treated funds	62	62	62	62	62	62	62
<i>C. Before Matching (SI vs Conventional Funds)</i>							
Mean Test							
Control	11.22	13.60	-0.15	0.94	0.16	-0.04	-0.02
Treated	9.40	13.15	-0.14	0.96	0.11	-0.06	-0.02
t-stat	3.07	0.74	-0.50	-2.13	2.35	1.49	-0.22
Median Test							
Control	9.83	12.00	-0.14	0.97	0.01	-0.05	-0.00
Treated	9.74	12.00	-0.13	0.98	-0.00	-0.01	0.00
z-score	2.29	-0.29	-0.73	-1.52	1.54	0.73	0.25
Number of control funds	7,013	9,257	8,094	8,094	8,094	8,094	8,094
Number of treated funds	180	247	215	215	215	215	215
<i>D. After Matching (SI vs Conventional Funds)</i>							
Mean Test							
Control	7.83	11.97	-0.13	0.95	0.04	-0.11	-0.01
Treated	8.10	13.16	-0.16	0.96	0.05	-0.08	-0.01
t-stat	-0.43	-1.46	1.49	-0.94	-0.36	-1.31	-0.25
Median Test							
Control	7.26	10.00	-0.14	0.98	-0.03	-0.11	-0.01
Treated	9.11	12.00	-0.14	0.99	-0.02	-0.01	-0.00
z-score	-1.32	-1.52	1.18	-0.82	-0.92	-1.83	-0.52
Number of control funds	148	148	148	148	148	148	148
Number of treated funds	148	148	148	148	148	148	148

This table shows balancing test results using 1-year lagged covariates as of year 2017. Number of treated and control funds reflect unique fund count in each group. In Panel B, sorting by propensity score, each environmental SI fund is matched by the closest one non-environmental fund without replacement to obtain the matched sample. Sorting by propensity score, each environmental SI fund is matched by the closest one non-environmental fund with replacement. Sample in Panel D is obtained by truncating the before matching sample (Panel C) to keep observations with logit propensity score between 0.02 and 0.07 (inclusive). Sorting by propensity score, each SI fund is matched by the closest one conventional fund with replacement. Logit propensity score estimation results are shown in Online Appendix 6.

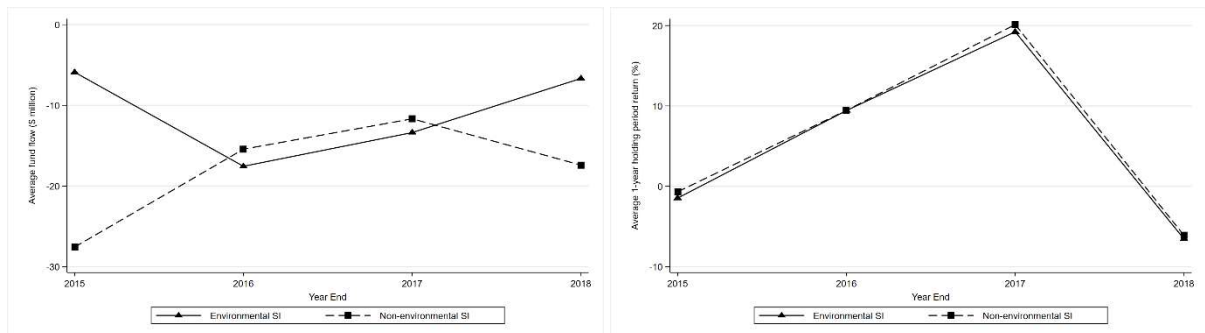


Figure A2.4 Parallel trends of US treatment and control funds – Paris Agreement Withdrawal

Table A2.5 Tax Cut and Jobs Act 2017 – covariate balancing test – US funds

	Lagged RTN _{i,t}	Agc _{i,t}	Lagged $\alpha_{i,t}$	Lagged $\beta_{mkt,i,t}$	Lagged $\beta_{smb,i,t}$	Lagged $\beta_{hml,i,t}$	Lagged $\beta_{mom,i,t}$
<i>A. Before Matching (SI vs Conventional Funds)</i>							
Mean Test							
Control	11.22	13.60	-0.15	0.94	0.16	-0.04	-0.02
Treated	9.40	13.15	-0.14	0.96	0.11	-0.06	-0.02
t-stat	3.07	0.74	-0.50	-2.13	2.35	1.49	-0.22
Median Test							
Control	9.83	12.00	-0.14	0.97	0.01	-0.05	-0.00
Treated	9.74	12.00	-0.13	0.98	-0.00	-0.01	0.00
z-score	2.29	-0.29	-0.73	-1.52	1.54	0.73	0.25
Number of control funds	7,013	9,257	8,094	8,094	8,094	8,094	8,094
Number of treated funds	180	247	215	215	215	215	215
<i>B. After Matching (SI vs Conventional Funds)</i>							
Mean Test							
Control	8.50	12.14	-0.14	0.95	0.08	-0.10	-0.01
Treated	9.33	12.91	-0.15	0.95	0.08	-0.06	-0.02
t-stat	-1.25	-1.02	0.73	-0.16	0.18	-1.71	0.83
Median Test							
Control	7.64	10.00	-0.14	0.98	-0.02	-0.10	-0.01
Treated	9.67	12.00	-0.13	0.98	-0.01	-0.01	-0.00
z-score	-1.80	-1.03	0.41	0.16	-0.89	-2.13	0.14
Number of control funds	166	166	166	166	166	166	166
Number of treated funds	171	171	171	171	171	171	171

This table shows balancing test results using 1-year lagged covariates as of year 2017. Number of treated and control funds reflect unique fund count in each group. Matched sample in Panel B is obtained by truncating the before matching sample (Panel A) to keep observations with logit propensity score between 0.01 and 0.1 (inclusive). Sorting by propensity score, each SI fund is matched by the closest one conventional fund with replacement. Logit propensity score estimation results are shown in Online Appendix 6.

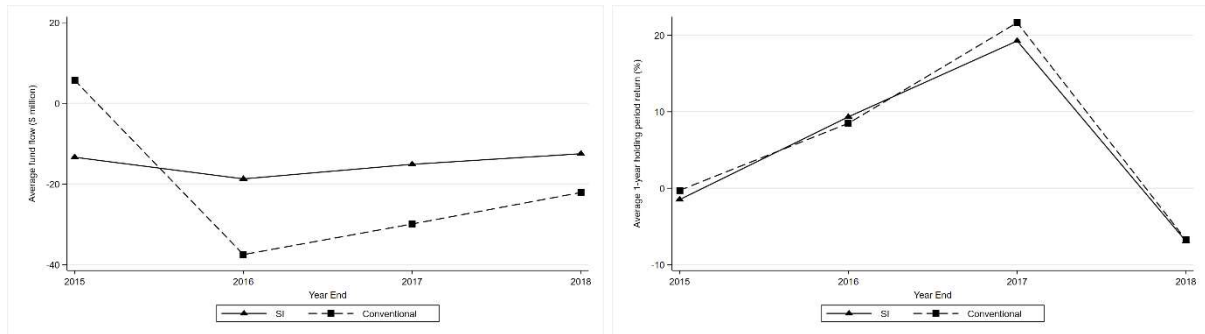


Figure A2.5 Parallel trends of US treatment and control funds – Tax Cut and Jobs Act 2017

Table A2.6 Oxfam scandal 2011 – covariate balancing test – UK funds

	Lagged RTN _{i,t}	Agc _{i,t}	Lagged $\alpha_{i,t}$	Lagged $\beta_{mkt,i,t}$	Lagged $\beta_{smb,i,t}$	Lagged $\beta_{hml,i,t}$	Lagged $\beta_{mom,i,t}$
<i>Panel A. Before Matching (SI vs Conventional Funds)</i>							
Mean Test							
Control	11.73	10.21	0.03	0.94	0.45	-0.03	-0.01
Treated	11.23	10.50	-0.15	0.92	0.50	-0.00	-0.02
t-stat	0.61	-0.43	5.82	2.12	-1.21	-1.87	0.69
Median Test							
Control	10.39	8.00	-0.02	0.94	0.41	-0.04	-0.01
Treated	11.05	8.00	-0.22	0.90	0.41	0.04	-0.00
z-score	-0.10	-1.61	6.38	2.01	-1.86	-3.02	0.46
Number of control funds	1,761	2,045	1,641	1,641	1,641	1,641	1,641
Number of treated funds	153	177	149	149	149	149	149
<i>Panel B. After Matching (SI vs Conventional Funds)</i>							
Mean Test							
Control	13.08	10.99	-0.02	0.92	0.54	-0.01	-0.01
Treated	10.97	10.81	-0.08	0.94	0.46	-0.03	-0.00
t-stat	1.72	0.16	1.26	-0.60	1.46	1.13	-0.71
Median Test							
Control	11.10	8.00	-0.08	0.92	0.45	0.02	-0.01
Treated	10.42	10.00	-0.13	0.93	0.39	-0.02	0.01
z-score	1.46	-0.57	1.53	-0.77	1.01	0.77	-0.81
Number of control funds	118	118	118	118	118	118	118
Number of treated funds	118	118	118	118	118	118	118

This table shows balancing test results using 1-year lagged covariates as of year 2011. Number of treated and control funds reflect unique fund count in each group. Matched sample in Panel B is obtained by truncating the before matching sample (Panel A) to keep observations with logit propensity score between 0 and 0.25 (inclusive). Sorting by propensity score, each SI fund is matched by the closest one conventional fund with replacement. Logit propensity score estimation results are shown in Online Appendix 6.

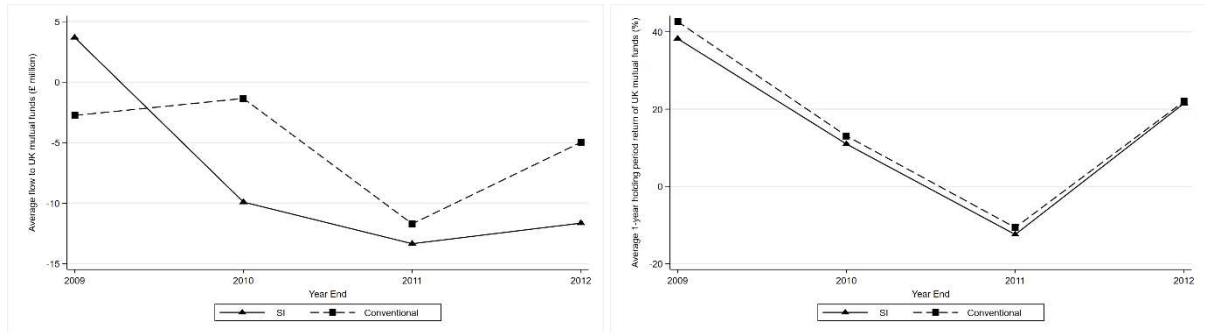


Figure A2.6 Parallel trends of UK treatment and control funds – Oxfam scandal 2011