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Personal values, Responsible investing and stock allocation

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Personal Values, Responsible Investing

and Stock Allocation[*]

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Abstract

We analyze the portfolio choices of approximately 965,500 active participants in employee saving plans in France. Looking at the cross-section of equity exposure, we find that the inclusion of responsible equity options in the menu of available funds is associated with a 2.4% higher equity allocation by plan participants. Difference-in-differences analyses confirm that the introduction of a responsible equity option to a saving plan is followed by an increase of 6.5% in participants' appetite for stocks, contrary to what happens with conventional equity funds. Additional analyses along the geographical variation in political preferences indicate that the observed effect is driven by social and cultural factors.

1 Introduction

Socially responsible investing has become increasingly popular in recent years, especially among retail investors. According to Global Sustainable Investment Alliance (2019), assets invested according to responsible strategies increased by 34% from 2016 to 2018, standing at USD 30.7 trillion worldwide. In Europe, retail products accounted for more than 30% of responsible investment assets in 2018, compared to only 3.4% in 2013 (Eurosif, 2019). Similar trends are observed in the US (USSIF, 2019). How is this proliferation of responsible funds affecting investors' portfolio choices?

This paper provides first evidence that the offering of responsible investment options significantly increase the propensity of individual investors to take risks on financial markets by investing in equity products. It shows that this effect is likely driven by personal value, rather than by risk-return considerations. Our findings stem from the analysis of more than 965,000 participants in approximately 18,700 employer-sponsored retirement saving plans in France. We obtained data from Amundi, one of the main manager of employee saving plans in France.

Our definition of responsible funds include a distinct type of investment products specific to the French retail investment market, solidarity funds. Solidarity funds are vehicles that invest between 5 and 10% of assets in accredited social enterprises, and the rest in conventional listed firms, mostly following environmental, social, and governance (ESG) criteria. The advantage of focusing on solidarity funds is twofold. First, solidarity funds all have some clear standard features defined by law, contrary to the more variegate category of self-labeled socially responsible investment (SRI) funds. Second, since 2010, all firms with

more than 50 employees must include at least one solidarity option in their employee saving plans. This requirement mitigates concerns on the possible endogeneity nature of responsible fund offering, and significantly increases the fraction of individuals with responsible options available in their defined contribution plans. Around half of the saving plans in our sample include at least one responsible fund, either equity (22.4%) or balanced (27%)[1]. In line with the regulation, all firms with more than 50 employees offer at least one solidarity fund, either equity (27%) or balanced (78%).

We start our analyses with a cross-sectional study of the portfolio choices in 2017. We find that saving plans offering at least one responsible equity funds display a higher share of stock allocation compared to other plans. The effect is sizeable. Controlling for plan- and individual-level characteristics, participants in plans offering responsible equity funds allocate a 2.2% higher annual contributions to equity, equal to one-tenth of a standard deviation. Further analyses confirm that this effect is driven by actual investments in responsible equity funds, not by general differences in stock appetite between saving plans.

We then switch to a difference-in-differences setting, looking at how the changes in average stock allocation changes after the introduction of a responsible equity option into the saving plan. This analysis confirms the positive effect of responsible investing on stock allocation. The addition of a responsible equity fund is associated with a 6.8% higher average equity allocation of new money invested, compared to the prior portfolio exposure. Crucially, we do not identify any similar effect when the employer introduces a new conventional equity option to the fund menu. This enables us to attribute the increase in equity to the availability of "sustainable" assets.

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[1]For a comparison, only 13.3% of the saving plans in our sample include SRI equity funds.

We identify two possible reasons why responsible funds influence portfolio choices. The most in line with conventional financial reasoning would be that investors associate the sustainability features of responsible funds with lowering risk or increasing future returns. An increase in the appetite for stocks would be a natural effect of rational return-maximizing investing. This explanation is unlikely to drive our results, given the explicit dual-objective mandate of solidarity funds to combine financial return with societal impact (e.g., Barber, Morse, and Yasuda, 2018).

The second explanation is that responsible funds make equity appealing to specific categories of investors who have not otherwise invested in equity because of social and cultural reasons. Kaustia and Torstila (2011) show that left-wing and pro-social investors are less likely to invest in risky assets because of their generalized antipathy towards capital markets. This type of investors are exactly those more inclined to invest according to socially responsible criteria, according to Hong and Kostovetsky (2012). Our conjecture is that responsible equity funds may allow them to invest in the equity market without eroding their personal identity. In other words, responsible funds may have the ability to overcome the anti-finance sentiment of some individuals, and hence increase their level of stock market participation. We name this the "personal values" explanation.

To test for the role of personal values, through the personal ZIP code of individual participants, we match information on plan contributions with the department-level voting results at the 2019 European Parliament election. We find that the effect of responsible funds on equity allocation is stronger in departments with higher support to Green parties, controlling for geographical differences in wealth and social capital. The results indicate that cultural and behavioral factors are significant drivers of the effect of responsible investing on

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stock allocation.

Our paper brings three central contributions to the existing finance literature. First, it contributes to the literature on individual investors' portfolio choices. The standard financial theory states that all investors should be indifferent between financial products with identical cash flows. This assumption does not hold in the real world. Already Shefrin and Statman (1993) describe how systematic behavioral elements make the frame of financial products a critical factor in explaining portfolio choices. Many works use employee saving plans as an ideal empirical setting to investigate such type of behavioral frameworks in investment decision-making. Influential contributions in this area include Benartzi and Thaler (2001), Huberman and Jiang (2006), and Brown, Liang, and Weisbenner (2007).[2] We contribute to this literature by showing that social and environmental responsibility -- nowadays an important feature in the design of many financial products -- influences the portfolio choices of investors with pro-social preferences.

Second, our paper contributes to the strand of literature studying the heterogeneity of portfolio choices of individual investors, and in particular their stock-market participation. The (limited) participation to the equity markets is known to be driven by several factors, including trust (Guiso, Sapienza, and Zingales, 2008), financial literacy (Van Rooij, Lusardi, and Alessie, 2011), informational costs (Bonaparte and Kumar, 2013), political preferences (Kaustia and Torstila, 2011), peer effects (Brown et al., 2008), and early life experience

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[2]Benartzi and Thaler (2001) provide evidence that participants in defined contribution plans often make decisions driven by naive notions of diversification. For instance, some investors allocate their contributions evenly across all available funds ("1/n heuristic"), causing their equity exposure to depend on the number of equity funds included in the plan. Huberman and Jiang (2006) find that the fraction of equity funds offered in saving plans is overall only weakly correlated with the share of equity allocation. Brown, Liang, and Weisbenner (2007) show that the share of investment options in a particular asset class has a significant effect on the aggregate participant's allocation to that asset class.

(Malmendier and Nagel, 2011).[3] In recent work, Calvet, Célérier, Sodini, and Vallée (2017) document the possibility to increase households' stock market participation through financial innovation (under the form of structured retail products) by offering a pre-package risk-return profile compatible with household preferences. In a similar fashion, our paper provides evidence that the reluctance of individuals to take risks in financial decision-making is mitigated by the offering of financial products bundling equity exposure with responsibility features and societal impact.[4] Our results confirm the importance of cultural and behavioral factors in driving the heterogeneity in portfolio choice.

Finally, we add to the literature on the role of culture and personal values in financial decision making (which in turn it is related to the broader economics literature pioneered by Akerlof and Kranton (2000) on how personal identity influence economic decisions). Two papers closely related to our work are Kaustia and Torstila (2011) and Hong and Kostovetsky (2012). Kaustia and Torstila (2011) show that left-wing investors are less inclined to invest in stocks because they associate the stock market with negative features, such as greed and speculation, that do not abide to their identity. The reluctance of left-wing individuals to invest in the stock market is also confirmed in more recent studies, including D'Acunto (2019) and Ke (2019).[5] Hong and Kostovetsky (2012) find that Democratic portfolio managers are more likely to invest in socially responsible firms, documenting the influence of political values

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[3]Choi and Robertson (2018) and Kaustia et al. (2019) provide excellent overviews of the institutional, traditional, and behavioral factors that are known to drive the heterogeneity of stock-market participation, and investigations of their relative importance.

[4]In an experimental setting, D'Acunto (2019) provide evidence that subjects exposed to anti-market ideology invest less in risky financial opportunities than controls. Under this perspective, our findings indicate that the reverse effect is also possible: Subjects exposed to the ''socially bright side'' of finance may invest more in risky options.

[5]A related literature -- in particular D'Acunto et al. (2018) and Kumar et al. (2011) -- explore the role of religion, instead of political preferences, as a driver of anti-finance attitudes and hence lower stock market participation.

on investment decisions. Our work is the first to show that the availability of responsible investment products may help a significant fraction of the population overcoming a generalized antipathy towards the stock market, and hence towards risky financial assets. More broadly, we contribute to the fast-growing literature on the drivers of retail investor preferences for sustainable investment products (e.g., Anderson and Robinson, 2019, Barber et al., 2018, Bauer and Smeets, 2015, Bauer et al., 2018, Renneboog et al., 2011 Riedl and Smeets, 2017).

The paper is organized as follows. Section 2 discusses the empirical setting and data. Section 3 documents the effect of the offering of responsible equity funds on the extensive margin of stock markets participation. Section 4 discusses and explores the main possible channels driving the main results. Section 5 draws the practical implications of the study and concludes.

2 Empirical setting and data

2.1 Saving plans and responsible investing in France

Our study covers the investment decisions of individual participants in employer-sponsored defined contribution plans in France. France's employee saving framework is not too different from the more-extensively-studied 401(k) system in the USA.

The most important types of employee saving programs in France, and in our sample, are retirement saving plans ("*Plans dèpargne pour la retraite collectif*", or PERCOs) and company saving plans ("*Plan d'èpargne d'entreprise*", or PEE). These plans benefit from fiscal advantages to promote the accumulation of wealth and the creation of a complementary

pension system. According to French government's data, in 2016, around 56% of French employees had access to at least one form of such saving schemes; around half of them made voluntary contributions, with an average amount of approximately EUR 4,000 per year (DARES, 2018). On average, two-third of the contributions originated from profit-sharing and incentive programs (*participation et intéressement*) and one-third from employees' additional contributions, possibly matched with additional money by the employer (DARES, 2018).

French legislation provides specific frameworks and rules on employee saving plans. Such schemes are mandatory for all firms with at least 50 employees and must offer at least three investment options to allow a minimum level of diversification. The amounts invested are blocked for a fixed retention period (5 years under PEEs and until the retirement age under PERCOs), except for a limited number of circumstances. Each participant is informed at least once a year about the status and the total value of its account.

Default options are known to have a powerful role in shaping decisions in employee saving plans (Madrian and Shea, 2001). In France, when a participant does not express any preferences, her or his contributions are automatically invested in low-risk default funds (lifecycle-managed, balanced, fixed-income, or money market funds). Importantly for our purposes, the default options cannot be risky equity funds, being responsible or not.

Our study exploits a unique feature of France's employee saving system. The Economic Modernisation Act (*Loi de Modernisation de l'Économie*, 2008-776) of August 2008, which came into force in January 2010, introduced the obligation for all firms offering saving plans (PEE or PERCO) to include at least one *solidarity fund* among the investment options available to employees. Solidarity funds, also known as '90/10' funds, are funds required to invest 5 to 10% of asset under management in accredited solidarity-based enterprises of social

utility ("*entreprise solidaire dutilité sociale*").[6] These solidarity enterprises are firms with a clear social mission (e.g., services in support to vulnerable persons, promotion of inclusive housing, development of renewable energies), as defined by France's Framework Law on Social and Solidarity Economy of 2014.

On average, solidarity funds hold around 6% of solidarity-based assets, and invest a large part of the remaining assets according to ESG criteria, with an average share of responsible assets of 83.4% (Finansol, 2018). At the end of 2017, the total assets invested in solidarity funds through employee saving schemes amounted to EUR 7.4 billion (Finansol, 2018) and 22% of the active participants in our sample invested in solidarity funds.

In this paper, we define responsible investing as investments made through solidarity funds. There are at least two main advantages of such an approach. First, solidarity funds all have some common characteristics defined by law, contrary to the more general and variegated category of SRI funds. Second, all employee saving plans in France with more than 50 participants must include at least one solidarity option, and this mitigates the concerns on the endogeneity nature of this offering. Our regressions will investigate the effects on the stock allocation of the offering of solidarity funds combining the support to the solidarity economy with an exposure to the stock markets.

2.2 Data

This study is based on data provided by Amundi Tenue de Comptes (TC) on the investment decisions of individual participants in defined contribution plans in France. We obtain

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[6]For a detailed overview of solidarity funds and the French regulatory framework in support of social enterprises, see Finansol (2018).

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cross-sectional data on portfolio decisions at year-end 2016 and year-end 2017, covering individual contributions to employees saving plans. We start from an initial data-set covering records of approximately 3.7 million individuals (active and non-active) whose accounts are managed by Amundi TC. We classify as plan participants all employees who actively contributed to the saving plan during the period under study (as done, e.g., by Huberman and Jiang, 2006). The resulting data-set covers around 965,500 participants in around 18,700 saving plans.

- Table 1 -

Table 1 shows summary statistics of the saving plans included in our sample. Our sample is composed by many small saving plans and a relatively low number of larger funds. The sample median of plan participants is 3 and the average 61. We decide not to exclude small funds to preserve the diversity and uniqueness of our sample, which also covers employees in small enterprises and business activities throughout France. (In section 3.2, we check and ensure the robustness of our main findings when focusing exclusively on relatively larger saving plans.)

The number of funds included in the saving plans is on average 4.6. The proportion of equity funds in the fund menu (*%EQOffered*) is on average 16%. Crucially for our analyses, around 22% of the saving plans in our sample included at least one responsible equity investment option, as indicated by our dummy variable of interest *Responsible EQ*. In 2017, 1.4% of funds introduced a new responsible equity fund (Δ *Responsible EQ$_{2017}$*) and 10% introduced a new conventional equity fund (Δ *Conventional EQ$_{2017}$*) .

We also obtain information on the average match rate (*Mean match rate*) and the

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maximum matching amount (*Max match*) in each saving plans, both of which may influence participants' risk-taking decisions. No saving plans in our sample matches individual contributions to pure equity funds, being responsible or not.

- Table 2 -

Table 2 shows summary statistics of the individual-level variables used in our study. The sample is composed of 34% female and 66% male participants, with a median age of 46 years old. The mean account value is around EUR 27,000. The average share of the portfolio allocated to equity at year-end 2016 ($\%EQ_{2016}$) is 13%, while the average share of new 2017 contributions allocated to equity ($\%EQ_{\Delta2017}$) is 14%. We compute both variables by considering the exposure to both pure (diversified) equity funds or the precise equity component in balanced funds.

The shift towards equity between 2016 and 2017 ($\% EQ_{\Delta2017}$ - EQ_{2016}) has a slightly positive mean value (+4.3%). Around 2.2% of participants in 2017 invested in responsible equity funds (*Responsible EQ investor*$_{2017}$), while around 22% invested in any type of responsible funds (*Responsible investor*$_{2017}$).

Table 3 reports the correlation between individual-level variables.

Figure 1: Geographical distribution of the sample
This map show the geographical distribution of the 950,828 individuals included in our main sample, using the available ZIP code of their residency. The sample covers 94 departments, with a standard deviation of frequency of 1.27%.
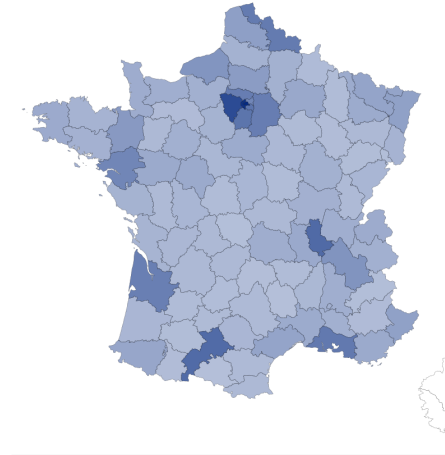
We also obtain the ZIP code of each participant' private address. As shown by Figure 1, our sample is geographically distributed throughout France, covering all Metropolitan France's departments except Corsica.

3   The relation between responsible investing and stock allocation

This section explores whether the possibility to invest in equity responsibly influences the equity allocation decisions of individual investors.

3.1   Cross-sectional regression results

We start our analyses by examining the cross-section of individual-level investment decisions in 2017. Specifically, we run the following regression model:

$$\%EQ_{i,j,\Delta 2017} = \alpha + \beta_1 \times ResponsibleEQ_j + X_i' \times \beta_2 + F_j' \times \beta_3 + \varepsilon_{i,j} \qquad (1)$$

where the dependent variable, $\%EQ_{i,j,\Delta 2017}$, represents the percentage of individual's contribution allocated to equity in 2017; $ResponsibleEQ_j$ is a dummy variable equal to 1 if the saving plan includes a responsible equity option, and 0 otherwise. X_i and F_j are, respectively, sets of available individual-level (gender, age, account size, equity exposure in 2016) and plan-level (%EQOffered, Number of funds, Employees, Mean match, and Max match) attributes that, based on previous literature, are likely to influence equity allocation decisions.

Looking at the allocation of new contributions -- rather than at the allocation of total account -- has two main advantages. First, it allows us to study active investment decisions, net of the effects on the total stock allocation of reinvested returns and price changes. Second, the allocation of total holdings may not represent a clear indication of current preferences, because investors are known to be slow in rebalancing portfolios (e.g., Samuelson and Zeckhauser, 1988, Madrian and Shea, 2001).

- Table 4 -

Column 1 in Table 4 shows the regression results using specification 1. The coefficient on the dummy variable *Responsible EQ* is positive and highly statistically significant. It suggests that participants in saving plans including a responsible equity option exhibit a 2.2% higher average stock allocation. This explains more than one-tenth of the standard deviation of stock allocation in 2017.

The coefficients on control variables are in line with previous literature. In particular, the propensity of individuals to invest in equity is positively associated with the share and

number of equity funds included in the plan (e.g., Brown et al., 2007), by the mean matching rate offered by the employer (e.g., Huberman et al., 2007), and by the total account size of the employees (e.g., Agnew et al., 2003).[7] Moreover, female employees are less likely to take risks (e.g., Calvet et al., 2017).

In Columns 2, 3, and 4, we interact the indicator variable for responsible equity funds with individual-level variables: age, gender, and account size. We find that the effect of responsible investing on risk-taking is more pronounced for male and younger participants, and for those with relatively larger accounts.

In Column 5, we investigate whether our main result is driven by participants' investments in responsible equity funds. In this regression, we introduce the individual-level dummy variable $Responsible\ investor_{2017}$, equal to 1 for participants who invested in responsible funds in 2017, and 0 otherwise. With this specification, instead of comparing average portfolio choices between plans, we compare the portfolio choices of individuals who invested in responsible equity funds with the choices of individuals who did not (including those who did not have the option of doing so). As expected, the coefficient on $Responsible\ EQ$ is largely absorbed by the coefficient on $Responsible\ investor_{2017}$, which is highly statistically-significantly positive and can explain around 1.3 standard deviation of stock allocations in 2017.

Overall, our cross-sectional analyses show that employees in saving plans with a responsible equity option allocate a higher share of their contribution to stocks, and this effect is actually driven by their investments in responsible equity funds.

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[7]A larger account size can be interpreted as a proxy for education and financial sophistication (Agnew et al., 2003), both of which are normally correlated positively with stock allocation.

3.2 Robustness check: Excluding small plans

We now investigate the robustness of our results by focusing on the sub-sample of saving plans of firms with more than 50 employees.

Since 2010, all France-based firms with more than 50 employees are required to include at least one solidarity option in their saving plan. This unique institutional setting helps mitigating the concerns that the link between responsible funds and stock allocation is driven by the endogeneity nature of the decision to offer responsible options. Indeed, in our sample, all plans of firms with more than 50 employees include a responsible option: 27% offer a solidarity equity fund and 78% offer a solidarity balanced fund (5% offer both).

The results of this exercise are reported in Table 5 and confirm our main findings. Participants in saving plans offering a responsible equity fund (rather than a responsible balanced fund) exhibit a 0.49% higher average equity exposure.

3.3 Difference-in-differences regression results

The analyses so far showed that investors who are offered a responsible equity funds allocate a higher share of their contributions to stocks, and that actual investments in responsible equity drive this effect. A possible concern is that employers' decision to offer equity rather than balanced funds is endogenously determined by the equity appetite of plan participants.

To mitigate such concerns, we investigate the change in stock allocation decisions following the introduction of new equity options to the fund menu. Specifically, we run the following

difference-in-differences regression model:

$$\%EQ_{i,j,\Delta 2017} - \%EQ_{i,j,2016} = \alpha + \beta_1 \times \Delta Responsible EQ_{j,2017} + X_i' \times \beta_2 + F_j' \times \beta_3 + \varepsilon_{i,j} \quad (2)$$

where the dependent variable, $\%EQ_{i,j,\Delta 2017} - \%EQ_{i,j,2016}$, captures the revealed shift in preferences for equity in 2017 compared to the portfolio allocation at the end of 2016. $\Delta Responsible EQ_{j,2017}$ ($\Delta Conventional EQ_{j,2017}$) is a dummy variable equal to 1 if a responsible (conventional) equity fund is added to the saving plan j in 2017, and 0 otherwise. $\Delta Responsible EQ_{j,2017}$ ($\Delta Conventional EQ_{j,2017}$) is equal to 1 for approximately 1.4% (9.7%) of the plans in our sample. X_i is a set of available individual-level variables. F_j is a set of firm- and saving plan-level controls.

- Table 6 -

Table 6 reports the results. Standard errors are clustered at the plan level to account for correlation across time for a given plan (as in, e.g., Brown et al., 2007). Compared to Table 4, in the difference-in-differences setting, we lose some 240,000 observations on new plan participants, for whom the 2016 portfolio is not available. We start by showing in Column 1 the effect of the addition in 2017 of a conventional equity fund. The coefficient on the indicator variable $\Delta Conventional EQ_{j,2017}$ is not statistically significant, indicating that on average, the addition of new conventional equity funds does not lead *per se* to an increase in stock allocation. This placebo test indicates that the introduction of new equity funds in the saving plans is not determined by an anticipation of increased equity appetite by plan participants.

In Column 2, we investigate the effects of new responsible equity funds. The coefficient on the variable of interest -- $\Delta ResponsibleEQ_{j,2017}$ -- indicates that the introduction of a responsible equity fund to the saving plan is associated with an increase in stock allocation of approximately 6.8%, representing around one-half of the standard deviation of the shift towards equity in 2017. When excluding the level of stock allocation at the end of 2016 in Column (3), the difference-in-differences effect is quantifiable in 5.8%.

This difference-in-differences exercise confirms the results obtained with the broader cross-sectional setting: The possibility to invest in equity ''responsibly'' make stock allocation more appealing to a significant fraction of individual investors. The next section provides an investigation of the possible channels driving this finding.

4   Discussion of results and channels

According to standard financial theory, investors should be indifferent between financial products with identical cash flow. Thus, as long as equity investing is already feasible, the offering of responsible equity funds should not affect stock allocation decisions. The same holds when allowing for altruistic preferences: Rational altruistic investors could always invest in conventional equity funds and, separately, make direct transfers to projects with positive societal impacts. Why, then, does responsible investing increase stock allocation?

4.1   Risk-return expectations and personal values

The literature suggests two reasons why investment products bundling equity exposure and social responsibility may lead to an increase in stock allocation.

First, investors may perceive the sustainability features of responsible funds with a superior future risk-adjusted performance, leading them to increase their exposure to equity. This explanation is consistent with the "doing well by doing good" view of sustainable investing and the idea that the integration of extra-financial considerations in the investment process generates alpha.[8] As such, responsible funds should appeal to all investors as an enhanced form of rational investing.

Second, our results may be driven by different personal values among individual investors. According to this explanation, responsible funds have the ability to attract investors who, no responsible funds being available, would have been reluctant to significantly enter the stock markets on the stance of cultural elements.[9] In particular, responsible equity funds may help pro-social investors to overcome their aversion to the stock market (Kaustia and Torstila, 2011), allowing them to take advantage of stock returns while avoiding the cognitive dissonance of investing against their identity. Related interpretation may also be that responsibility features increase the trustfulness of stock funds (Guiso et al., 2008) in the eyes of pro-social investors and/or reduce their anxiety when making financial decisions (Shapiro

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[8]Various studies support the idea that firms adopting more advanced policies on environmental and social dimensions enjoy a better economic and financial performance in the long-run, e.g., Edmans (2011), Lins, Servaes, and Tamayo (2017). Whether this type of firm-level out-performance translates into an out-performance of responsible funds is less clear (Renneboog et al., 2008).

[9]Responsible equity funds are basically a product bundling equity exposure and positive societal and environmental impact, as fair-trade coffee, for instance, is essentially a bundle between a base product (coffee) and a direct transfer to the farmers' community (Reinstein and Song, 2012). One might then wonder why investors do not replicate such type of product on their own, by appropriately mixing investments in conventional funds and direct investments in social enterprises (what Zivin and Small, 2005 call the Modigliani-Miller theory of altruistic investing). The economics and marketing literature indicates many reasons why the demand for bundled products usually differs from the aggregated demand for their individual components (e.g., Drumwright, 1992, Johnson et al., 1999). In the context of the marketing financial products, Shefrin and Statman (1993) argue that, assuming that people value benefits and costs according to the Prospect theory (Tversky and Kahneman, 1981) and treat each account separately (Thaler, 1985), the bundling of two financial products allows investors to reach a utility greater than it would have been possible by investing in two products separately. Similar behavioral factors are likely to be at play also when bundling equity exposure with societal impact.

and Burchell, 2012).

The above explanations -- risk-return expectations and personal values -- are not necessarily exclusionary. It may be that responsible funds increase the appeal of equity to both profit-seeking and values-driven investors (Derwall et al., 2011, Riedl and Smeets, 2017), but for different reasons.[10] That said, we argue that risk-return considerations are unlikely to significantly drive our results. Previous studies -- see, in particular, Barber et al. (2018) -- show that investors in products explicitly combining financial return with societal impact *intentionally* trade expected return in exchange for non-pecuniary benefits.

This willingness-to-pay for impact seems to hold also for the responsible investors in our sample. Figure 2 shows the evolution of the average raw returns on conventional equity vs. solidarity equity funds offered by Amundi between January 2010 and May 2019. Over this period, solidarity equity funds do not appear to deliver higher performance compared to conventional equity funds.

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[10]Indeed, they could even be complementary. Different categories of investors -- along their political affiliation or pro-social preferences, for instance -- are likely to have different opinions about what is financially smart or not (e.g., Meeuwis et al., 2018).

Figure 2: Performance of conventional vs. solidarity equity funds
This graph show the average net raw returns of conventional and solidarity equity funds, between January 2010 and May 2019. The sample includes 13 solidarity equity funds and 107 conventional equity funds offered by Amundi.
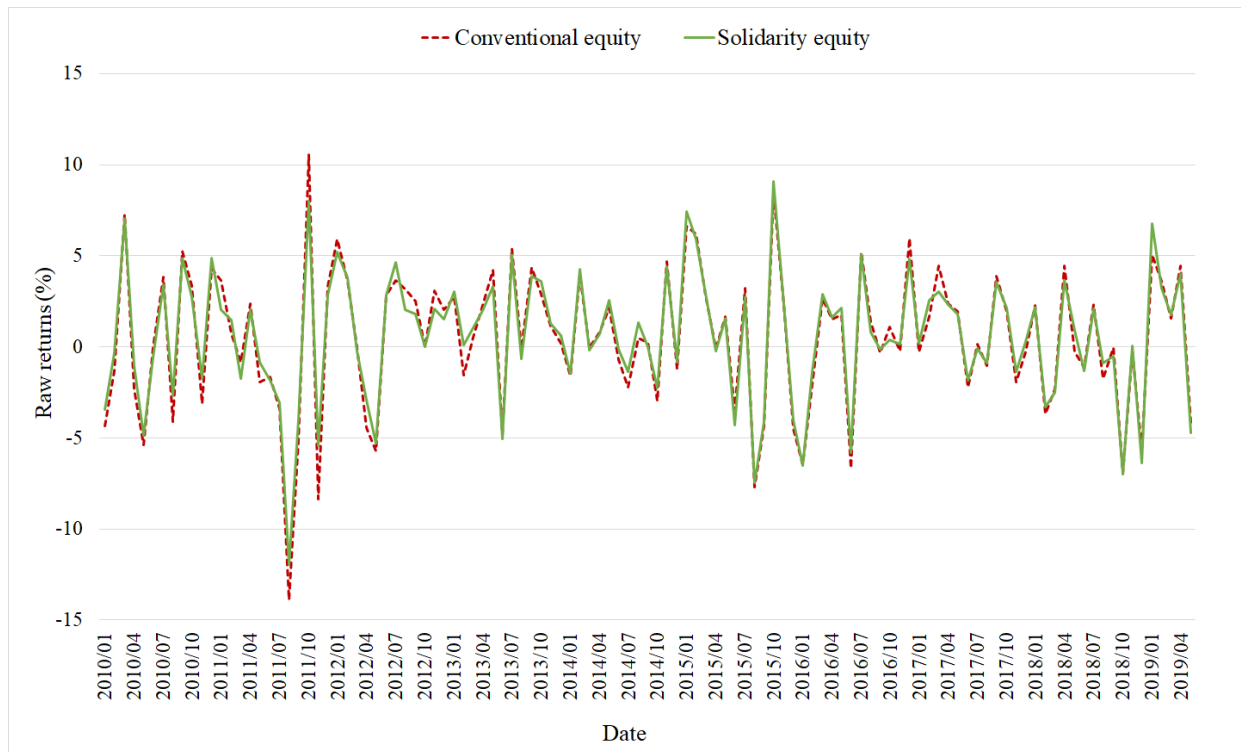
Given the explicit dual-objective nature of the responsible funds we analyze, and their observed financial performance, we posit that our results are likely to be driven by cultural reasons and pro-social preferences. We investigate this hypothesis in the next sub-subsection.

4.2   Geographical variation in political preferences

To test for the personal-values explanation, we investigate whether the link between responsible equity funds and stock allocation is mediated by political preferences. The literature supports the existence of a robust correlation between voting behavior and pro-social preferences (e.g., Fisman, Jakiela, and Kariv, 2017), and between political preferences and the

propensity to invest socially responsibly (e.g., Hong and Kostovetsky, 2012, Bauer and Smeets, 2015, Borgers et al., 2015, Bauer, Ruof, and Smeets, 2018).

We match information on individual portfolio choices with geographical variation in political preferences, leveraging on the availability of the ZIP codes of the participants' residency (an approach also used, e.g., in Kaustia and Torstila, 2011). As already shown in Figure 1, the distribution of our sample is quite geographically balanced, and it covers all France's metropolitan departments except from Corsica.

Our main focus is on the percentage of votes obtained by French green parties at the 2019 European Parliament election, at the departments level. France's green parties did particularly well in the 2019 election. *Éurope Écologie Les Verts* (EELV) gained a total of around 13.5% of total votes, making it the first left-wing party in France. When adding the votes of Urgence Écologie (a list of smaller green parties), green votes accounted for more than 15.3% of total votes. Figure 3 shows the distribution of French departments by quartiles of 2019 votes to green parties.

Figure 3: Sample distribution and votes to green parties

This maps show the geographical variation in the support to Green parties (Éurope Écologie Les Verts + Urgence Écologie) at the 2019 European Parliament election by Metropolitan France's departments. The green parties obtained less than 12.2% of votes in the bottom quartile departments, and more than 16.57% of votes in the top quartile departments, with a median result of 14.13% and a mean of 14.51%. The percentage of total votes to Green parties by number of votes on the entire population was 15.3%.
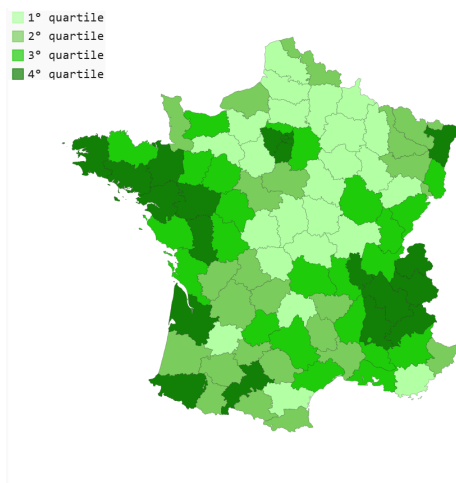
	N	p25	mean	p50	p75	sd
% Green votes	96	12.20	14.13	14.51	16.57	3.13

Table 7 investigates whether this geographical variation in political preferences explains variations in the effects of responsible investments on stock allocation. Guiso et al. (2004) show that households in high-social-capital areas are more likely to invest in stocks and less likely to invest in cash, because of the role of trust for the development of financial markets. Hence, to control for social capital, we include in the regressions the voting turnout, following the approach in Guiso et al. (2004). More recently, Das, Kuhnen, and Nagel (2017) provide evidence that people with higher socioeconomic status (higher income or higher education) are more optimistic about future macroeconomic developments, and thus more inclined to invest in the stock market. To control for regional differences in socioeconomic status, we

control for the department-level 2017 GDP per capita from Eurostat, which proxies also for differences in households' financial sophistication.

Our variable of interest is the interaction term $Responsible\ EQ\ \#\ \%Green$ in Column 2. The results indicate that the effect of responsible equity funds on stock allocation is concentrated in areas with high support to Green parties, controlling for differences in wealth and social capital.

- Table 7 -

As a robustness check, in Columns 3 and 4, we replicate the results using a more traditional left/right political spectrum, hence combining the preferences for Green parties with the preferences for the French Socialist Party. Not surprisingly, the results are in line with the ones discussed above.

Table 8 replicates the exercise in our difference-in-differences setting, exploiting the introduction in 2017 of new responsible equity funds in a small fraction of saving plans in our sample. The coefficients in Column 1 confirm that the introduction of conventional equity funds does not lead to any significant changes in stock allocation, not even in departments with high support to Green parties. On the contrary, the interaction coefficient in Column 2 -- $\Delta Responsible EQ_{2017}\ \#\ \%Green$ -- is positive and statistically significant. When considering the effect of left-wing political preferences (Column 3), the interaction coefficient is again positive and statistically significant at 5% statistical level.

- Table 8 -

Overall, the observed geographical variations in the influence of responsible investing on stock allocation confirms the important role of personal values in driving this effect.

Responsible investing is likely to affect stock allocation decisions by attracting into the stock markets individuals who are generally reluctant to invest in equity.

5   Conclusion

In recent years, responsible funds have become a common element in the offering of retail investment products, with further growth expected in the future. However, still very little is known regarding how and why the increasing offering of these products is influencing the portfolio decisions of individuals. This paper attempts to shed some light on these open questions.

We analyze the portfolio choices of around 965,500 individual participants in 18,700 employee saving plans in France. The results of cross-sectional and difference-in-differences regressions show that the inclusion of responsible equity options in these saving plans influences the portfolio decisions of participants, leading them to increase their overall exposure to equity. The heterogeneity of the effect along political affiliations indicates that our results are driven by the role of personal values and cultural factors, rather than by mere risk and return considerations.

The paper has important implications for regulators and asset managers. First, it suggests that the attractiveness of responsible funds should not be exclusively assessed against their return difference compared to traditional alternatives. A major benefit of responsible funds is their ability to respond to the needs of individuals who, not these funds being available, would undertake substantially choices in term of asset allocations.

Second, the paper contributes to the long-standing policy debate concerning how to

foster a broader retail investors' participation in financial markets.[11]. Households' limited

stock market participation may have significant adverse long-term effects in terms of wealth

accumulation and inequality, especially in light of the increasing privatization of pension

provision systems. Our results indicate that responsible investment products may represent a

practical tool to reduce the cultural gaps preventing many retail investors from more actively

participating in financial markets.

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[11]For instance, this is an explicit policy objectives of European institutions in the context of the EU
Capital Markets Union project. See: IR Magazine, ''EC to examine hurdles to retail investment in EU capital
markets'', March 19, 2019.

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Tables

Table 1: Summary statistics of plan-level variables

This table shows the descriptive statistics of the plan-level variables used in the study. The sample includes all saving plans managed by Amundi in 2017. *Responsible EQ* is dummy variables equal to 1 for the plans including at least one solidarity equity fund, and 0 otherwise. *Responsible EQ (incl.SRI)* also includes the plans offering SRI equity funds. *Responsible balanced* and *Responsible fixed-income* are dummy variables indicating funds offering balanced and fixed-income solidarity funds, respectively. $\Delta ConventionalEQ_{2017}$ and $\Delta ResponsibleEQ_{2017}$ are dummy variables equal to 1 for plans that introduced, respectively, new conventional and solidarity equity funds in 2017, and 0 otherwise. *%EQoffered_{2016}* is the fraction of equity funds in the plans at the end of 2016. *Number funds* is the number of investment options included in the fund menu. *Mean match rate* and *Max match* are the average matching rate and the maximum annual matched amount offered by the employer. *Employees* is the number of firm's employees in 2017, as reported by the INSEE registry.

	N	p05	p25	mean	p50	p75	p95	sd
Responsible EQ	18,699	0.00	0.00	0.22	0.00	0.00	1.00	0.42
Responsible balanced	18,699	0.00	0.00	0.27	0.00	1.00	1.00	0.44
Δ Conventional EQ$_{2017}$	18,699	0.00	0.00	0.10	0.00	0.00	1.00	0.30
Δ Responsible EQ$_{2017}$	18,699	0.00	0.00	0.01	0.00	0.00	1.00	0.12
%EQ offered 2016	18,699	0.00	0.00	16.31	0.00	28.57	50.00	20.45
Number funds	18,699	1.00	2.00	4.57	4.00	6.00	13.00	4.22
Mean match rate	18,699	0.00	0.00	153.30	150.00	300.00	300.00	140.83
Max match	18,699	0.00	0.00	3,520.02	2,744.00	9,414.72	9,4141.72	3,914.58
Number employees	18,699	1.00	1.00	60.76	3.00	6.00	100.00	1,087.80

Table 2: Summary statistics of individual-level variables
This table shows the descriptive statistics of the individual-level variables used in the study. $\%EQ_{2016}$ is the percentage of the total account allocated to equity at year-end 2016. $\%EQ_{\Delta2017}$ is the percentage of new contributions allocated to equity funds during 2017. $\%EQ_{\Delta2017} - \Delta\%EQ_{2016}$ is the difference between the percentage of new contributions allocated to equity in 2017 and the percentage of total account invested in equity in 2016. $Responsible EQ investor_{2017}$ is a dummy variable equal to 1 for individual who invested part of their 2017 contributions to responsible equity funds. $Responsible investor_{2017}$ is a dummy variable equal to 1 for individual who invested part of their 2017 contributions to any responsible funds (equity, balanced, of fixed-income). $Female$ and Age provide basic demographic information of participants.

	N	p5	p25	mean	p50	p75	p95	sd
% EQ$_{\Delta2017}$	965,563	0.00	0.00	13.96	0.00	21.65	63.78	22.67
% EQ$_{2016}$	725,340	0.00	0.00	12.88	1.83	20.20	52.56	19.44
% EQ$_{\Delta2017}$ - % EQ$_{2016}$	725,340	-18.70	0.00	4.28	0.00	5.06	40.95	19.14
Responsible EQ investor$_{2017}$	965,563	0.00	0.00	0.02	0.00	0.00	0.00	0.15
Responsible investor$_{2017}$	965,563	0.00	0.00	0.22	0.00	0.00	1.00	0.41
Age	965,563	27.00	36.00	45.53	46.00	55.00	63.00	11.35
Female	965,563	0.00	0.00	0.34	0.00	1.00	1.00	0.47
Account size (ln)	965,563	2.24	3.24	4.44	3.94	4.46	5.04	4.90

Table 3: Correlation between individual-level variables
This table shows the correlations between individual-level variables. * indicates that the parameter estimate is significantly different from zero at the 1% level.

Variables	1	2	3	4	5	6	7
1. % EQ$_{\Delta2017}$							
2. % EQ$_{2016}$	0.63*						
3. % EQ$_{\Delta2017}$ - EQ$_{2016}$	0.65*	-0.24*					
4. Responsible EQ investor$_{2017}$	0.20*	0.07*	0.15*				
5. Responsible investor$_{2017}$	0.19*	0.22*	0.16*	0.29*			
6. Age	0.05*	0.06*	-0.05*	0.04*	0.01*		
7. Female	0.02*	0.00	0.00	0.00	-0.05*	-0.04*	
8. Account size (ln)	0.06*	0.03*	0.01*	0.03*	0.01*	0.20*	-0.03*

Table 4: Offering of responsible equity funds and stock allocation

This table shows the results of OLS cross-sectional regressions of the percentage of equity allocation in 2017 ($\%EQ_{\Delta2017}$) on a variable indicating the presence in the saving plan of at least one responsible equity fund (*Responsible EQ*). The regressions control for a set of individual-level (gender, age, log account size) and plan-level (mean match rate, maximum match rate, number of funds, percentage of equity offered, employees) characteristics. The regressions in columns 2, 3, and 4 include the interactions of (*Responsible EQ*) with individual-level variables. The regression in column 5 includes the individual-level dummy variables *Responsible EQ investor*$_{2017}$, equal to 1 for participants who invested in responsible equity in 2017. Robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

Dependent variable:	(1) $\%EQ_{\Delta2017}$	(2) $\%EQ_{\Delta2017}$	(3) $\%EQ_{\Delta2017}$	(4) $\%EQ_{\Delta2017}$	(5) $\%EQ_{\Delta2017}$
Responsible EQ	2.200***	3.120***	9.420***	-5.150***	0.818***
	(0.051)	(0.061)	(0.187)	(0.201)	(0.050)
Responsible EQ # Female		-2.680***			
		(0.096)			
Responsible EQ # Age			-0.159***		
			(0.004)		
Responsible EQ # Account size (ln)				0.841***	
				(0.022)	
Responsible EQ investor$_{2017}$					29.000***
					(0.150)
Female	-0.194***	0.892***	-0.186***	-0.266***	-0.197***
	(0.047)	(0.061)	(0.047)	(0.047)	(0.046)
Age	0.023***	0.023***	0.089***	0.020***	0.026***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Account size (ln)	0.572***	0.580***	0.581***	0.227***	0.413***
	(0.012)	(0.012)	(0.012)	(0.015)	(0.012)
Mean match rate	0.062***	0.062***	0.063***	0.063***	0.058***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Max match	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number funds	0.194***	0.195***	0.195***	0.185***	0.193***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
%EQ offered$_{2016}$	0.154***	0.157***	0.157***	0.143***	0.139***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Number employees (ln)	-0.855***	-0.864***	-0.835***	-0.866***	-0.921***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Constant	4.960***	4.520***	1.720***	8.450***	6.950***
	(0.128)	(0.129)	(0.151)	(0.158)	(0.126)
Observations	965,563	965,563	965,563	965,563	965,563
R-squared	0.082	0.084	0.085	0.086	0.118

Table 5: Robustness check: Excluding small saving plans

This table replicates the results reported in Table 4 using the sub-sample of participants in saving plans of firms with more than 50 employees. Robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

Dependent variable:	(1) $\%EQ_{\Delta 2017}$	(2) $\%EQ_{\Delta 2017}$	(3) $\%EQ_{\Delta 2017}$	(4) $\%EQ_{\Delta 2017}$	(5) $\%EQ_{\Delta 2017}$
Responsible EQ	0.488***	1.123***	8.249***	-9.283***	-0.324***
	(0.058)	(0.066)	(0.192)	(0.203)	(0.057)
Responsible EQ # Female		-1.908***			
		(0.099)			
Responsible EQ # Age			-0.172***		
			(0.004)		
Responsible EQ # Account size (ln)				1.127***	
				(0.023)	
Responsible EQ investor 2017					27.309***
					(0.156)
Constant	0.516***	0.207	-3.293***	5.707***	3.271***
	(0.149)	(0.149)	(0.173)	(0.181)	(0.147)
Observations	822,781	822,781	822,781	822,781	822,781
R-squared	0.070	0.071	0.072	0.073	0.104
Constant & controls	Yes	Yes	Yes	Yes	Yes

Table 6: Addition of responsible equity funds and changes in stock allocation

This table shows the results of OLS difference-in-difference regressions of investors' shift towards equity between 2016 and 2017 ($\%EQ_{\Delta 2017} - \%EQ_{2016}$) on dummy variables indicating the 2017 inclusion in the saving plan of a new conventional equity fund (columns 1) or a new responsible equity fund (columns 2 and 3). The models include a set of investor-level (gender, age, log account size, equity allocation at 2016-end) and firm-level (mean match rate, maximum match rate, number of funds in the menu, percentage of equity funds in the menu, number of employees) control variables. The model in column 3 exclude the prior equity allocation to allow a comparison of the effect with the results in Table 4 (also including observations with no 2016 data available). Standard errors, clustered at the firm level to account for correlation across time for a given plan, are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

Dependent variable:	(1) $\%EQ_{\Delta 2017} - \%EQ_{2016}$	(2) $\%EQ_{\Delta 2017} - \%EQ_{2016}$	(3) $\%EQ_{\Delta 2017} - \%EQ_{2016}$
Δ Conventional EQ$_{2017}$	-0.792		
	(1.516)		
Δ Responsible EQ$_{2017}$		6.784***	5.787***
		(2.066)	(1.463)
%EQ 2016	-0.267***	-0.267***	
	(0.177)	(0.179)	
Female	-0.294	-0.284	-0.195
	(0.425)	(0.424)	(0.301)
Age	-0.040*	-0.039	-0.055***
	(0.024)	(0.024)	(0.018)
Account size (ln)	0.500**	0.478**	0.353**
	(0.210)	(0.222)	(0.157)
Mean match rate	0.025***	0.025***	0.012***
	(0.006)	(0.006)	(0.005)
Max match	0.000	0.000*	0.000
	(0.000)	(0.000)	(0.000)
Number funds	0.125	0.129	0.111*
	(0.093)	(0.097)	(0.065)
% EQ offered 2016	3.682	2.840	-0.428
	(3.954)	(4.059)	(2.733)
Number Employees (ln)	-0.081	-0.061	0.138
	(0.214)	(0.208)	(0.138)
Constant	0.685	0.654	-0.607
	(2.000)	(1.989)	(1.613)
Observations	725,340	725,340	725,340
R-squared	0.077	0.077	0.007
SE clustered firm	Yes	Yes	Yes

Table 7: Effects of political preferences, cross-sectional setting

This table shows the results of OLS cross-sectional regressions of investors' share of stock allocation in 2017 ($\%EQ_{\Delta 2017}$) on the dummy variable indicating saving plans including at least one responsible equity option, and their interaction with the percentage of 2019 votes to green parties in the participants' department of residency. All models include a set of investor-level (gender, age, log account size), firm-level (mean match rate, maximum match rate, number of funds in the menu, percentage of equity funds in the menu, number of employees), and department-level (voting turnout, GDP per capita) control variables. Standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

Dependent variable:	(1) $\%EQ_{\Delta 2017}$	(2) $\%EQ_{\Delta 2017}$	(3) $\%EQ_{\Delta 2017}$	(4) $\%EQ_{\Delta 2017}$
Responsible EQ	2.177***	0.337	2.177***	-0.224
	(0.051)	(0.245)	(0.051)	(0.347)
%Green	17.712***	12.922***		
	(0.890)	(1.087)		
Responsible # %Green		11.392***		
		(1.486)		
%Left			1.328**	-1.591**
			(0.532)	(0.676)
Responsible # %Left				7.024***
				(1.003)
Voting turnout	3.898***	3.704***	4.510***	4.204***
	(0.737)	(0.737)	(0.738)	(0.739)
GDP pc	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	950,828	950,828	950,828	950,828
R-squared	0.086	0.086	0.086	0.086
Constant & controls	Yes	Yes	Yes	Yes

Table 8: Effects of political preferences, difference-in-differences setting

This table shows the results of OLS difference-in-differences regressions of investors' shift towards equity between 2016 and 2017 ($\%EQ_{\Delta 2017} - \%EQ_{2016}$) on dummy variables indicating the 2017 inclusion in the saving plan of a new conventional equity fund (columns 1) or a new responsible equity fund (columns 2), and their interaction with the percentage of 2019 votes to Green parties in the participants' department of residency. he models include a set of investor-level (gender, age, log account size, equity allocation at 2016-end) and firm-level (mean match rate, maximum match rate, number of funds in the menu, percentage of equity funds in the menu, number of employees) and department-level (voting turnout, GDP per capita) control variables. Standard errors, clustered at the firm level to account for correlation across time for a given plan, are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

Dependent variable:	$\%EQ_{\Delta 2017} - \%EQ_{2016}$	$\%EQ_{\Delta 2017} - \%EQ_{2016}$	$\%EQ_{\Delta 2017} - \%EQ_{2016}$
Δ Conventional EQ$_{2017}$	1.122		
	(1.642)		
Δ Conventional EQ 2017 # %Green	-11.442		
	(12.284)		
Δ Responsible EQ$_{2017}$		-2.306	-7.859
		(5.798)	(8.107)
Δ Responsible EQ$_{2017}$ # %Green		54.745*	
		(29.978)	
%Green	9.956	8.479	
	(7.333)	(6.724)	
Δ Responsible EQ$_{2017}$ # %Left			42.693**
			(21.491)
%Left			-0.614
			(5.218)
Voting turnout	-3.715	-3.634	-3.316
	(6.109)	(6.049)	(6.361)
GDP pc	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Observations	714,540	714,540	714,540
R-squared	0.078	0.078	0.078
Constant & controls	Yes	Yes	Yes
Clustered SE plan	Yes	Yes	Yes