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Responsible Investing and Stock Allocation

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Responsible Investing and Stock Allocation

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Abstract

We analyze the portfolio choices of approximately 913,000 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 2.1% higher equity allocation by plan participants. Compared to an average equity asset allocation of 12.1%, it represents a material increase (17% in relative terms). Difference-in-differences analyses confirm that the introduction of a responsible equity option to a saving plan is followed by an increase of 7.2% in participants' appetite for stocks, contrary to what happens with conventional equity funds. We discuss the role of personal values in explaining this phenomenon. Responsible investment products may reduce the gap preventing many retail investors from more actively participating in the stock market.

Keywords: Behavioral finance, household finance, investor preferences, socially responsible investments, sustainable finance

JEL classification: A13, D14, G11, G41, G50.

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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. Our findings stem from the analysis of more than 900,000 participants in approximately 6,500 employer-sponsored retirement saving plans in France. We obtained data from one of the main managers 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 offering a company or a retirement saving plan ("*Plan d'Epargne Entreprise*" (PEE) or "*Plan d'Epargne pour la Retraite Collectif*" (PERCO)), 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. Our sample is composed of companies whose saving plans include at least one responsible fund, either equity (64% of the firms) or balanced (78%)[1]. In line with the regulation, all firms with a company or a retirement saving plan (PEE or PERCO) offer at least one solidarity fund, either equity (44%) or balanced (65%).

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 2.1% higher annual contributions to equity (in absolute percentage growth), equal to one-tenth of a standard deviation. When compared with an average stock exposure of 12.1%, this represents a 17% increase in relative terms. Restricting to firms with a company or retirement saving plan, the estimated effect is even larger (3.2% in absolute terms, representing a 26% relative increase). 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 7.2% higher average equity allocation (in absolute percentage growth) of new money invested, compared to the

[1]For a comparison, only 38% of the saving plans in our sample include SRI equity funds.

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.

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).

A second explanation could be that responsible funds make equity appealing to specific categories of investors who have not otherwise invested in equity because of social and cultural reasons. For example, 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.

Our paper brings two 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 (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-

[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.

[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.

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.

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 (''*Plan d'Epargne pour la Retraite Collectif*'', or PERCO) and company saving plans (''*Plan d'Epargne Entreprise*'', or PEE). These plans benefit from fiscal advantages to promote the accumulation of pension savings. According to French

[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.

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 company or retirement 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 d'utilité sociale*").[5] 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 firms in France with more than 50 participants must offer a PEE or a PERCO and 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 Epargne Salariale et Retraite (ESR) on the investment decisions of individual participants in defined contribution plans in France.

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

We obtain 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 ESR. 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 913,000 participants in around 6,500 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 6 and the average 158. 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 5.8. The proportion of equity funds in the fund menu (*%EQOffered*) is on average 20%. Crucially for our analyses, around 64% 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, 4% of funds introduced a new responsible equity fund (Δ *Responsible* EQ_{2017}) and 9% introduced a new conventional equity fund (Δ *Conventional* EQ_{2017}) .

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

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.

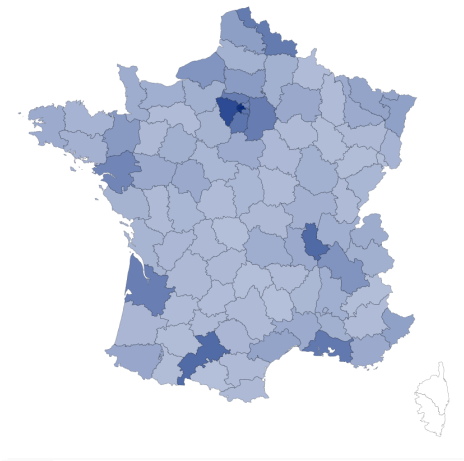
- Table 2 -

Table 2 shows summary statistics of the individual-level variables used in our study. The sample is composed of 36% female and 64% male participants, with a median age of 46 years old. The mean account value is around EUR 6,500. The average share of the portfolio allocated to equity at year-end 2016 ($\%EQ_{2016}$) is 12.1%, while the average share of new 2017 contributions allocated to equity ($\%EQ_{\Delta 2017}$) is 13.3%. 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 ($\%\ EQ_{\Delta 2017}$ - EQ_{2016}) has a slightly positive mean value (+2.7%). Around 2% of participants in 2017 invested in responsible equity funds ($Responsible\ EQ\ investor_{2017}$), while around 23% invested in any type of responsible funds, equity or diversified ($Responsible\ investor_{2017}$).

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 95 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:

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

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 2.1% higher average stock allocation (in absolute percentage growth). Compared to an average equity asset allocation of 12.1% at the end of 2016, it represents a 17% increase in relative terms. 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).[6] 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 1.5 standard deviation of stock allocations in 2017.

Overall, our cross-sectional analyses show that employees in saving plans with a responsible

[6] 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.

equity option allocate a higher share of their contribution to stocks, and this effect is actually driven by their investments in responsible equity funds.

3.2 Robustness check: Restricting to firms offering a company or retirement saving plan

We now investigate the robustness of our results by focusing on the sub-sample of saving plans of firms offering a company or a retirement saving vehicle.

Since 2010, all France-based firms offering a company or a retirement saving vehicle (PEE or PERCO) are required by law 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 firms with a company or retirement saving plan include a responsible option: 44% offer a solidarity equity fund and 65% offer a solidarity balanced fund (9% 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 3.2% higher average equity exposure (in absolute percentage growth). Compared to an average 11.3% stock allocation at the end of 2016, this represents a 26% relative increase.

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:

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

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. $\Delta ResponsibleEQ_{j,2017}$ ($\Delta ConventionalEQ_{j,2017}$) 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. $\Delta ResponsibleEQ_{j,2017}$ ($\Delta ConventionalEQ_{j,2017}$) 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 230,000 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 $\Delta ConventionalEQ_{j,2017}$ 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 7.2% (in absolute percentage growth), 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 5.5%.

This difference-in-differences exercise confirms the results obtained with the broader cross-sectional setting: The possibility to invest in equity ''responsibly'' makes stock allocation more appealing to a significant fraction of individual investors.

4 Discussion of results

In this section, we formulate hypotheses on the possible causes driving our findings. 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?

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.[7] 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.[8] In particular, responsible equity funds

[7]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).

[8]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

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 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.[9] 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.

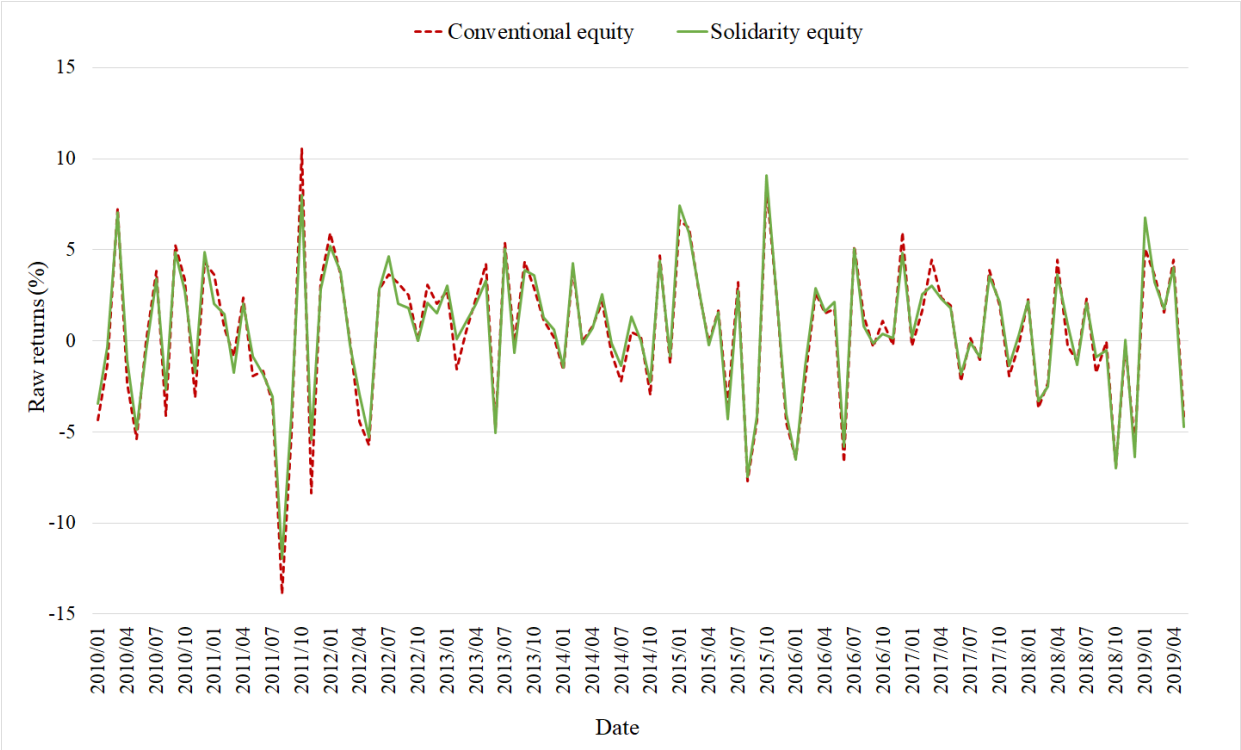
This willingness-to-pay for impact seems to hold also for the responsible investors in our sample. Figure 2 shows the evolution of the average raw returns on conventional equity vs. solidarity equity funds offered by Amundi between January 2010 and May 2019. Over this period, solidarity equity funds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

In our work in progress, we are preparing a survey of plan participants that will allow us to replicate our main findings in a controlled environment, and then to identify the main channels driving the relation between responsible investing and risk taking.

equity exposure with societal impact.

[9]They could even be complementary. Different categories of investors -- along their 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.



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 913,000 individual participants in 6,500 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 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, in the absence of such responsible funds offering, would undertake substantially different asset allocation choices.

Second, the paper contributes to the long-standing policy debate concerning how to foster a broader retail investors' participation in financial markets.[10] Households' limited stock market participation may have significant adverse long-term effects in terms of wealth accumulation and inequality, especially in light of the possibly increasing privatization of pension provision systems. Our results indicate that responsible investment products may represent a practical tool to reduce the obstacles preventing many retail investors from more actively participating in financial markets.

[10]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 ESR in 2017 offering a responsible fund option in their menu. *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	6,498	0.00	0.00	0.64	1.00	1.00	1.00	0.48
Responsible balanced	6,498	0.00	1.00	0.78	1.00	1.00	1.00	0.42
Δ Conventional EQ_{2017}	6,498	0.00	0.00	0.09	0.00	0.00	1.00	0.28
Δ Responsible EQ_{2017}	6,498	0.00	0.00	0.04	0.00	0.00	0.00	0.19
%EQ offered 2016	6,498	0.00	0.00	20.00	20.00	33.33	50.00	19.91
Number funds	6,498	1.00	3.00	5.79	5.00	7.00	15.00	5.02
Mean match rate	6,498	0.00	0.00	127.15	50.71	300.00	300.00	137.60
Max match	6,498	0.00	0.00	2,921.39	600.00	3,138.24	9,414.72	3,761.47
Number employees	6,498	1.00	1.00	158.04	6.00	20.00	400.00	1,820.69

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. $\%EQ_{\Delta 2017}$ is the percentage of new contributions allocated to equity funds during 2017. $\%EQ_{\Delta 2017} - \Delta\%EQ_{2016}$ 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. $ResponsibleEQinvestor_{2017}$ is a dummy variable equal to 1 for individual who invested part of their 2017 contributions to responsible equity funds. $Responsibleinvestor_{2017}$ is a dummy variable equal to 1 for individual who invested part of their 2017 contributions to any responsible funds (equity, balanced, or fixed-income). *Female* and *Age* provide basic demographic information of participants.

	N	p5	p25	mean	p50	p75	p95	sd
% $EQ_{\Delta 2017}$	913,190	0.00	0.00	13.31	0.00	19.50	62.53	22.28
% EQ_{2016}	679,696	0.00	0.00	12.11	1.45	18.32	51.29	18.84
% $EQ_{\Delta 2017}$ - % EQ_{2016}	679,696	-23.67	-0.75	2.72	0.00	4.44	38.91	19.18
Responsible EQ $investor_{2017}$	913,190	0.00	0.00	0.02	0.00	0.00	0.00	0.15
Responsible $investor_{2017}$	913,190	0.00	0.00	0.23	0.00	0.00	1.00	0.42
Age	913,190	27.00	36.00	45.44	46.00	55.00	63.00	11.35
Female	913,190	0.00	0.00	0.33	0.00	1.00	1.00	0.47
Account size (ln)	913,190	5.13	7.44	8.78	9.07	10.28	11.61	2.04

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. % $EQ_{\Delta 2017}$							
2. % EQ_{2016}	0.60*						
3. % $EQ_{\Delta 2017}$ - EQ_{2016}	0.67*	-0.25*					
4. Responsible EQ $investor_{2017}$	0.21*	0.09*	0.16*				
5. Responsible $investor_{2017}$	0.22*	0.25*	0.16*	0.28*			
6. Age	0.05*	0.05*	-0.05*	0.04*	0.01*		
7. Female	0.01*	0.00	0.00	0.00	-0.04*	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 ($\%EQ_{\Delta 2017}$) 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.

VARIABLES	(1) $\%EQ_{\Delta 2017}$	(2) $\%EQ_{\Delta 2017}$	(3) $\%EQ_{\Delta 2017}$	(4) $\%EQ_{\Delta 2017}$	(5) $\%EQ_{\Delta 2017}$
Responsible EQ	2.061***	2.882***	9.460***	-6.659***	0.687***
	(0.051)	(0.061)	(0.188)	(0.202)	(0.050)
Responsible EQ # Female		-2.393***			
		(0.097)			
Responsible EQ # Age			-0.163***		
			(0.004)		
Responsible EQ # Account size (ln)				0.997***	
				(0.022)	
Responsible EQ investor 2017					28.876***
					(0.149)
Female	-0.296***	0.737***	-0.289***	-0.376***	-0.287***
	(0.048)	(0.064)	(0.048)	(0.048)	(0.047)
Age	0.015***	0.015***	0.088***	0.012***	0.019***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Account size (ln)	0.541***	0.548***	0.550***	0.117***	0.378***
	(0.013)	(0.013)	(0.013)	(0.016)	(0.012)
Mean match rate	0.070***	0.069***	0.070***	0.070***	0.063***
	(0.001)	(0.001)	(0.001)	(0.001)	(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	0.207***	0.207***	0.207***	0.197***	0.209***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
% EQ offered 2016	12.943***	13.254***	13.281***	11.548***	11.338***
	(0.221)	(0.221)	(0.221)	(0.223)	(0.217)
Number Employees (ln)	-0.601***	-0.611***	-0.582***	-0.617***	-0.664***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Constant	3.608***	3.219***	0.129	7.938***	5.641***
	(0.131)	(0.132)	(0.156)	(0.163)	(0.129)
Observations	913,190	913,190	913,190	913,190	913,190
R-squared	0.075	0.075	0.076	0.077	0.111
Clustered SE plan	Yes	Yes	Yes	Yes	Yes

Table 5: Robustness check: Restricting to firms offering a company or retirement saving plan

This table replicates the results reported in Table 4 using the sub-sample of participants in firms offering a company or a retirement saving plan (PEE or PERCO). 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.

VARIABLES	(1) $\%EQ_{\Delta 2017}$	(2) $\%EQ_{\Delta 2017}$	(3) $\%EQ_{\Delta 2017}$	(4) $\%EQ_{\Delta 2017}$	(5) $\%EQ_{\Delta 2017}$
Responsible EQ	3.226***	4.387***	12.941***	-3.275***	1.351***
	(0.059)	(0.071)	(0.214)	(0.250)	(0.059)
Responsible EQ # Female		-3.245***			
		(0.108)			
Responsible EQ # Age			-0.212***		
			(0.004)		
Responsible EQ # Account size (ln)				0.714***	
				(0.027)	
Responsible EQ investor 2017					28.125***
					(0.156)
Female	-0.599***	0.608***	-0.595***	-0.614***	-0.495***
	(0.052)	(0.066)	(0.052)	(0.052)	(0.051)
Age	0.014***	0.014***	0.093***	0.010***	0.018***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Account size (ln)	0.441***	0.446***	0.463***	0.203***	0.316***
	(0.014)	(0.014)	(0.014)	(0.017)	(0.014)
Mean match rate	0.070***	0.070***	0.071***	0.070***	0.063***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Max match	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number funds	0.167***	0.167***	0.164***	0.167***	0.187***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
% EQ offered 2016	2.873***	3.058***	2.793***	3.100***	4.046***
	(0.272)	(0.272)	(0.271)	(0.272)	(0.266)
Number Employees (ln)	-0.501***	-0.515***	-0.471***	-0.515***	-0.551***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Constant	6.419***	6.033***	2.561***	8.713***	7.312***
	(0.152)	(0.152)	(0.172)	(0.174)	(0.149)
Observations	812,144	812,144	812,144	812,144	812,144
R-squared	0.058	0.059	0.060	0.059	0.094
Clustered SE plan	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.

	(1)	(2)	(3)
VARIABLES	%EQ d2017 – %EQ 2016	%EQ d2017 – %EQ 2016	%EQ d2017 – %EQ 2016
Delta Conventional equity	-1.030		
	(1.398)		
Delta Responsible equity		7.193***	5.555***
		(2.126)	(1.467)
%EQ 2016	-28.654***	-28.492***	
	(1.837)	(1.867)	
Female	-0.404	-0.389	-0.268
	(0.430)	(0.429)	(0.308)
Age	-0.044*	-0.042	-0.057***
	(0.026)	(0.026)	(0.019)
Account size (ln)	0.531**	0.500**	0.384**
	(0.221)	(0.230)	(0.163)
Mean match rate	0.033***	0.033***	0.019***
	(0.009)	(0.009)	(0.007)
Max match	0.000**	0.000**	0.000
	(0.000)	(0.000)	(0.000)
Number funds	0.113	0.121	0.096
	(0.092)	(0.096)	(0.065)
% EQ offered 2016	1.822	0.745	-1.381
	(4.646)	(4.673)	(3.201)
Number Employees (ln)	-0.035	-0.008	0.115
	(0.234)	(0.227)	(0.151)
Constant	0.694	0.638	-0.463
	(2.263)	(2.245)	(1.790)
Observations	679,696	679,696	679,696
R-squared	0.083	0.083	0.008
Clustered SE plan	Yes	Yes	Yes

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