Individual investors' preferences for corporate social responsibility: Evidence from a trading experiment[1]

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Abstract

We advance the debate about corporate social responsibility (CSR) by integrating both macro-level (firms) and micro-level (individual investors) perspectives. We introduce a novel financial market simulation tool designed to investigate the trading behavior of individual investors and probe their preferences. Specifically, we examine whether investor behavior is more closely related to a monetary objective only (wealth maximization) aligned with the shareholder approach, or both monetary and social objectives (welfare maximization) aligned with the stakeholder approach. Our trading simulation experiment analyzes the impact of CSR-related events on investor trading actions, thus uncovering their intrinsic preferences towards CSR. This investigation offers valuable insights into how individual investor behavior at the micro level can inform and shape firm-level CSR policies, thereby addressing corporate fiduciary duties.

Keywords: asset management firms, corporate philanthropy, corporate social responsibility, environment social governance criteria, experiment, fiduciary duties, individual investors, institutional investors, investor behavior, preferences, shareholders, socially responsible investing, shareholders, stakeholders, trading simulation.

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INTRODUCTION

In 1915, Henry Ford, founder and largest shareholder of the Ford Motor Company, wanted to diminish the company's dividends and reinvest that money to hire more employees, to increase their salaries, and to expand the production of the legendary Ford T at a lower price for consumers. This strategy in favor of these stakeholders was however not appreciated by the Dodge brothers, minority shareholders, who preferred instead to continue to receive dividends, and consequently sued the Ford company. The court decided in favor of the Dodge brothers (Michigan, 1919), thus affirming shareholder primacy. A few decades later, in 1970, in a provocative article published in The New York Times, Milton Friedman stated that "the social responsibility of business is to increase its profits"; this "Friedman doctrine" seemed to close the debate about the fiduciary duties of corporate managers towards shareholders.

However, during the last few decades, the belief that a corporation's primary responsibility is to maximize shareholder value – shareholderism – has been questioned because of the neglect of interests of other stakeholders, the focus of corporate decisions on short-term profits over long-term sustainability, and the increasing environmental and social concerns. In 2019, the Business Roundtable, which gathers around 200 CEOs from leading US companies, released its new Statement on the Purpose of a Corporation, adopting a "fundamental commitment to all of stakeholders" and abandoning their previous shareholder focus. In reality, from the companies whose CEOs sat on the board of the Business Roundtable, only one (S&P Global) changed its governance guidelines towards the stakeholder view (Bebchuk and Tallarita, 2020).

In financial markets, ESG[4] criteria have now become mainstream, a normal consideration for

[4] Environmental, Social and Governance (ESG) are a set of criteria used for financial market investors, while Corporate Social Responsibility (CSR) corresponds to companies' voluntary initiatives in environmental or social areas. Social responsibility can be defined as business obligations that ultimately benefit society. ESG corresponds to the viewpoint of investors, while CSR to that of managers.

long-term investing, both for individual investors and for asset management firms. For instance, in 2020, Larry Fink, founder and chief executive of BlackRock, claimed that "a company cannot achieve long-term profits without embracing purpose and considering the needs of a broad range of stakeholders". BlackRock along with Vanguard and State Street – the 'Big Three' – represent more than $10trn assets under management (AUM) giving them the means to exert outsized influence on the companies they invest in; such a concentration of a few, large institutional investors, may end up having immense, uncontested influence in society, a situation dubbed as the "problem of twelve" by Coates (2023). These Big Three have increasingly used their votes to push companies on issues such as environmental and societal stewardship, thus leading to questions about the fiduciary duties of those asset management firms to their individual investors and to their legitimacy to influence companies' CSR policies. As Charles Munger (2022), business partner of Warren Buffet at Berkshire Hathaway, puts it: "We have a new bunch of emperors, and they're the people who vote the shares in the index funds. I think the world of Larry Fink, but I am not sure I want him as my emperor". In this sense, Edmans (2022) warns about the "politicization of ESG" (p. 10), that is, its undue identification with progressive politics (particularly in the US), this leading to backlash from conservative politicians.

These cases show that the public debate about the objective of companies remains open, involving not only corporate managers but also institutional investors (asset managers), who act on behalf of individual investors. A key point corresponds to the fiduciary duties of board directors of both corporations and asset management firms to individual investors. A narrow interpretation of those fiduciary duties would consider financial performance only, while a broader interpretation may include individual investors' preferences as well. As pointed out by Hart and Zingales (2019), individual investors may have a monetary objective only (wealth maximization), or both monetary and social objectives (welfare maximization). In relation to the firm objectives previously discussed, profit maximization aligns with the principles of shareholder capitalism, while welfare

maximization is consistent with the tenets of stakeholder capitalism. Hart and Zingales (2019) conclude that firms, in order to better align their objectives with those of their investors, should understand which are the preferences of their individual investors in relation to ESG issues. More than an academic research exercise, we develop a tool that may help companies and asset management firms (macro level) to better know their investors' expectations in terms of CSR policies (micro level). This knowledge would allow companies and asset management firms to align their fiduciary duties with those expectations, by engaging more or less in CSR policies.

This paper explores whether the preferences of individual investors are closer to the shareholder or stakeholder view. Far from the old notion of a hypothetical "representative agent", that is, an average investor that would count for any investor (Lucas, 1978), investors in financial markets are heterogeneous, having different expectations, opinions and needs (Kirman, 1992). What one usually calls "the market" is in reality an aggregation of the behavior of heterogeneous individual investors, with different risk preferences (Ebrahim and Mathur, 2001), personal preferences (Fama and French, 2007), and diverse opinions about managers (Huang and Thakor, 2013). Heterogeneity also comes from the socio demographic differences among individual investors. Age and gender are particularly relevant, as young and old investors as well as female and male investors may have different preferences. Those two variables may serve as moderators of the trading reaction following CSR events. Women have been associated with communal traits, that is "a concern for the welfare of other people" (Eagly and Karau, 2002, p. 574), an orientation towards relations and to others' needs (Rosette and Tost, 2010), while men have been associated with agentic traits, that is, an orientation to results and action. Even if such associations remain debated (Abele, 2017), one can expect that the preferences of female investors lean to the stakeholder view, and conversely, the preferences of male investors lean to the shareholder view. Furthermore, some studies indicate that young investors' investment behavior could be more aligned with the stakeholder view (Krause and Battenfeld, 2019; Bauer and Smeets, 2015 and

Riedl and Smeets, 2017), which makes sense, as young investors will presumably stay longer on the planet and may be reasonably more oriented to environmental protection and climate issues than older investors.

To thoroughly explore our research question: "What are the preferences of individual investors regarding CSR?", we opted for an experimental approach based on a trading simulation. This research design is particularly well-suited as it facilitates an in-depth investigation of investor preferences at the individual level. By replicating real-world trading scenarios within a controlled environment, our simulation enables us to observe and analyze the decision-making process of investors when confronted with CSR-related events. This approach not only offers direct insights into their preferences but also allows us to isolate and understand the specific influences of CSR on individual investment choices, providing a robust framework to examine the intricate dynamics between CSR and investor behavior. We collect individualized data about participants (including their age and gender) and their trading reaction to two simulated CSR-events. The first event is the announcement of a corporate donation, whose amount may differ in the variants of the simulation. The second event is the announcement by the exchange authorities of a change in the composition of a sustainability index, which may be either the inclusion or exclusion of the company from the index.[5] The corporate donation is a direct result of an internal decision-making process led by company managers. The inclusion or exclusion from the sustainable index results from an evaluation of the company CSR profile made by third-party entities, such as exchanges or index companies. The use of these two events allows us to test the assumption of the preference consistency of individuals. This approach allows us to compare and contrast the impact of self-driven versus externally influenced perceptions of CSR on investor behavior. With the first event,

[5] Sustainability indexes attempt to choose a portfolio of stocks deemed to be better aligned with CSR, according to a set of criteria, for instance, environmental performance, social impact, governance (Bohringer and Jochem, 2007).

market participants evaluate themselves the corporate donation and then trade according to their preferences. For the second event, an external actor (instead of market participants) evaluates the whole CSR policy of the firm leading to a change in the sustainability index, and then market participants trade according to their preferences. Our methodology allows us to make causal inferences by manipulating independent variables in a controlled setting (Kagel and Roth, 1995). We observe trading decisions at the individual level, allowing us to infer whether the preferences of each participant are closer to a monetary objective only and or to both monetary and social objectives.

Exploring the preferences of investors according to their age and gender matters because both age and gender may be driving forces for change in the market. Regarding age, young investors, with the mere passage of time, will presumably increase their income and hold a larger share of the market. Regarding gender, Baghai, Howard, Prakash and Zucker (2020) present "women as the new face of wealth" (p. 2), because of demographics (men passing away before their wives in baby-boomer households), and because of the higher participation of women in the workforce. Both combined trends (age and gender), would increase the relative proportion of wealth held by investors presumably aligned with the stakeholder view. If (or indeed, when) the amount of wealth held by these investors exceeds that of investors aligned with the shareholder view, the long-term balance between buyers and sellers in the financial market will change, spurring the relative demand for shares for CSR-oriented firms, with durable effects on companies' value (Hart and Zingales, 2019).

THEORY

We delve into the intricate dynamics of CSR by engaging with established theories to comprehensively understand the interplay between firm CSR behaviors (macro level) and investor preferences (micro level). We also consider the interactions between them, examining how macro-level CSR actions of firms influence and are perceived by individual investors, and conversely, how the aggregated preferences and reactions of these investors at the micro level can shape and inform the CSR policies of firms.

At the macro level, the variety of corporate behavior with a more or less emphasis of CSR can be explained by shareholder theory and stakeholder theory. *Shareholder theory* posits that companies should strive only for financial performance (Jensen, 2002). Such view has been personified by Milton Friedman (1970), who claimed that there was only one social responsibility for businesses – to increase their profits. This "Friedman doctrine" calls for an extremely focused mission, easier to measure and to monitor by shareholders. Note also that Friedman himself admits some nuances, acknowledging the need to comply with "basic rules of the society, both those embodied in law and those embodied in ethical custom" (this part of his NYT article has been largely ignored).

Stakeholder theory contends instead that managers should pay attention to "those groups who can affect the achievement of the firm's objectives" (Freeman and Reed, p. 91). By that doing, the company will be more successful on the long run, benefitting all involved parties beyond shareholders, which is a point emphasized by the instrumental version of stakeholder theory (Donaldson and Preston, 1995; Jones, 1995). In that sense, CSR could create corporate value by improving relations with stakeholders (Freeman and Dmytriyev, 2017).

Beyond the different perspectives that shareholder and the stakeholder approach have about the possible relation between CSR and profits, empirical studies cast a nuanced view. Margolis and Walsh (2003) and also Albertini (2013) observe that sometimes (but not always) empirical studies

found a positive relationship between CSR and profits. There would be a tension between the beneficial effects of CSR actions and their cost. Beyond a certain point, those benefits of CSR would not compensate for their cost. Sun, Yao and Govind (2019) find that the relation between CSR engagement and shareholder value follows an inverse U-shaped curve, while Ma and Yasir (2023) find similar results. Zhang et al. (2020) identify a similar relation for environmental performance and profits.

The discourse around shareholder and stakeholder engagement, predominantly conducted at the macro-level within firms, can exert significant influence on investors at the micro-level. This transmission of influence from the macro-level to the micro-level manifests through a variety of channels. These include the disclosure of Environmental, Social, and Governance (ESG) information by companies, the introduction of Socially Responsible Investing (SRI) products by financial institutions, modifications in regulatory frameworks, heightened political debate, and the narrative presented by business media. Each of these channels plays a critical role in shaping investors' preferences and decisions at the individual level.

At the micro level, we study the individual investors' preferences in relation to specific firm CSR behaviors. It allows us to find the match between investors' preferences and firms' objectives. Note that the firms CSR behavior and its debate around it may have some influence about the preferences of investors at the micro level. This influence may come from the diffusion of ESG information by the firms, the commercialization of SRI products and the debate of the media and in politics. While economic models tend to assume homogeneity among investors, which would be "representative agents", recent studies acknowledge for heterogeneity among investors. For instance, Pastor, Stambaugh and Taylor (2021) hold that investors may have different appreciations about CSR, a point shared by Baker et al. (2018) and Pedersen et al. (2021). Building on that notion of investor heterogeneity, we explore how the preferences of investors would differ among investors. Following Hart and Zingales (2017), we contend that the preferences of

individual investors may reflect a monetary objective only (profit maximization) or both monetary and social objectives (welfare maximization). These preferences at the level of investors (micro level) are related to the objectives of firms (macro level). A pure monetary objective is consistent with the shareholder approach while monetary and social objectives together are consistent with the stakeholder approach. For instance, an individual residing in an area affected by job outsourcing may view a company's decision to relocate production to lower-cost regions unfavorably, particularly due to its adverse impact on local employment. Many individuals, as inhabitants of this planet, may favor corporations that invest in renewable energy for their production processes, despite the higher upfront costs, in a concerted effort to reduce their carbon footprint and enhance environmental sustainability.

In financial markets, a complex feedback loop often emerges, driven by certain market participants who actively consider and anticipate the behaviors and strategies of others. This phenomenon, rooted in the concept of rational expectations, suggests that individuals base their decisions not only on available market information but also on their predictions about other market players' actions and reactions. Such a feedback loop can lead to a self-reinforcing cycle where market trends and movements are both a response to and a catalyst for the expectations and behaviors of these participants. This dynamic interplay plays a crucial role in shaping market outcomes, potentially leading to situations where market trends align with collective expectations, or conversely, result in significant deviations when actual outcomes diverge from widely held beliefs.

To better understand investors' preferences related to CSR, we consider two socio demographic characteristics of investors: age and gender. Many studies suggest a relation between investor age and interest in CSR. Krause and Battenfeld (2019) find that customers of social banks in Germany tend to be younger, Bauer and Smeets (2015) observe that younger people tend to have stronger social identification in relation to CSR-related investments, while Riedl and Smeets (2017) notice

that old investors are less likely to have CSR-related investments. However, other studies found contrasting evidence (Berry and Yeung, 2013; Lewis and Mackenzie, 2000), or did not find investor age to be a relevant factor (Wins and Zwergel, 2016). Besides, some studies posit the higher interest of female investors for CSR (Dioub et al., 2016; Cheah, Jamali, Johnson and Sung (2011)), which could be related to the higher frequency of communal traits among females (Abele, 2017; Eagly and Karau, 2002), leading us to expect that the mental models of female investors would lean to the stakeholder view.

Corporate decisions and investors' reactions exhibit a reciprocal influence. Soros (1987) highlighted this interaction, noting that not only do corporate decisions impact financial markets, but these markets also play a pivotal role in shaping corporate strategies. This dynamic is particularly evident in the way board directors and corporate managers incorporate investor trading responses into their decision-making processes, a phenomenon known as the feedback effect, which is grounded in rational expectations. Chen, Goldstein, and Jiang (2007) find that company managers "learn from the information in the stock price about the prospects of their own firms" (p. 620) and act accordingly with these insights informing their strategic actions. Dow, Goldstein, and Guembel (2017) illustrate how firms may base investment decisions or project launches on information gleaned from the stock market reactions. In the specific context of our study, we posit that company managers are likely to adopt CSR policies in response to positive stock market reactions to CSR-related initiatives.

{Insert Figure 1 about here}

Our research connects and contrasts the macro-level (firms) and micro-level (individual investors) aspects of CSR, emphasizing the interaction between these two levels. Figure 1 represents the Coleman diagram which visually articulates the macro and micro theories used in our research. At the macro level, the fiduciary duties of firm managers and board directors may influence their actual CSR-related behavior. This macro relation may be better understood by studying the micro

behavior of individual investors as we do in our experiment. The corporate social responsibility of firms, which may be closer to the shareholder approach or the stakeholder approach, may influence the preferences of individual investors reflecting a monetary objective only (profit maximization) or both monetary and social objectives (welfare maximization). This macro-to-micro influence may take place through ESG information disclosure by firms, SRI products proposed by financial institutions, the regulatory changes, the political debate, and the business media. At the micro level, individual investors' preferences may have a direct impact on their trading reaction following firms' CSR-related events (studied in our simulation experiment). Moderating variables such as age and gender may help to better explain the mechanism at the micro level. A feedback loop from (some) market participants considering the behavior of other market participants (rational expectations) may take place. The micro-to-macro relationship corresponds to the feedback effect of the stock market (which results from the aggregation of the reactions of all market participants) on firms' CSR behavior.

HYPOTHESES DEVELOPMENT

Based on the theoretical perspectives exposed above, our experiment tests several hypotheses related to individual investors' reactions to two CSR-related events: the announcement of a corporate donation, and the announcement of a change in the composition of a sustainability index (inclusion or exclusion from the index). Among CSR-related events, we choose corporate donations, as they have polarized the discussion about CSR starting with the Friedman (1970) article, which has been widely influential both in business and in academia (almost 30,000 citations, source: Google Scholar, as of 01/15/2024). Thus, felt that an exploration about corporate donations was unavoidable, while acknowledging that the scope of CSR goes much further. Besides, the company can donate different amounts, allowing for an exploration of investors' reactions to those different donation amounts. We also chose a change in the composition of a

sustainability index because, differently from the previous event, it may have symmetrical results: either inclusion or exclusion.

Furthermore, both events differ in many aspects. The corporate donation results from an internal decision process, happening in the corporate world, a specific CSR-related event being evaluated directly by market participants. In contrast, inclusion or exclusion from the sustainable index results from an evaluation of the company CSR profile made by third-party entities, such as exchanges or index companies, done in the financial world. It is a global event, in the sense that the whole CSR profile of the firm is evaluated, and it relates to both primary stakeholders (investors, employees, customers, suppliers, local community, etc.) who have greater influence on the firm and can impact its long-term survival, and secondary stakeholders (interest groups and the media) whose communication can have an impact on the public perception.

The use of these two events also allows to test the assumption of the preference consistency of investors (across events) and to study their decision-making process (event complexity).

Corporate donation

Regarding the "corporate donation" event, the literature about corporate philanthropy has studied its motivations and practices. There would be a "duty of beneficence" (Margolis and Walsh, 2003), which Carroll (1991) identifies with philanthropic responsibilities, whose importance is secondary to other responsibilities (e.g., being profitable, complying with the law). Donations would help to establish or maintain legitimacy for the company, or to improve its image. Corporate donations would create an 'insurance' for the company's (Godfrey, 2005). For instance, American companies operating in countries with weak institutions tend to make donations to gain a social license to operate (Horstein and Zhao, 2018). Companies make corporate donations also as responses to critical events. For instance, in the wake of 9/11 (Crampton and Patten, 2008) or after the Hurricane Katrina (Muller and Kraussl, 2011).

Empirical studies have suggested that an optimal level of donation exists less than that would be too little, and more than that would be too much. For instance, Patten (2008), in his study of corporate donations related to the 2004 Tsunami, found that large companies making relatively small donations, of exactly $1 million, are perceived as insincere. In a large-scale study, Wang, Choi and Jiatao (2008) found an inverse U-shaped relation between corporate donations and company value.

Figure 2 below illustrates the impact of a corporate donation on firm value for different amounts of corporate donation. Our theoretical development identified two explanations, potentially concurrent, for the relationship between the CSR-related events and trading reaction.

{Insert Figure 2 about here}

The first explanation corresponds to the shareholder approach, which would contend that corporate donations tend to destroy company value (Friedman, 1970). Friedman point is not against donations, but against companies as vehicles of philanthropy, in lieu of their shareholders donating themselves. Corporate money not spent in CSR activities could increase dividends, and individual shareholders could then use the extra money to donate instead of the firm. Hart and Zingales (2017) argue that whenever company's externalities can be efficiently compensated by shareholders ("separability assumption"), Friedman's argument would hold. However, it would not be the case when the cost of compensating these externalities is higher than the benefit shareholders receive. For instance, when the cost of pollution remediation is higher than shareholder's benefit for that pollution. In our experiment, we are thus testing if Friedman's argument is correct. In this line, we formulate Hypothesis 1 as follows:

> **Hypothesis 1 (preferences for shareholder theory: always too much): The signed quantity of the market participants' orders is a decreasing function of the corporate donation amount. Market participants *always***

***sells* stocks when the company announces a corporate donation, and the higher the amount, the higher the quantity of their sell orders.**

The second alternative explanation corresponds to the stakeholder approach (Freeman, 1984), which contends that corporate donations can create value, and that received some support in empirical studies such as Cuypers et al. (2016) and Hogarth et al. (2018). This second alternative explanation postulate a tension. On one side, donations can benefit the company, as its relationship with stakeholders improves, while on the other side those donations have a cost (Wang et al., 2008). Gao et al. (2019) also find that both low and high levels of donations diminish corporate value, while an intermediate level of donations increase corporate value. Similarly, Zou (2020) posits that there would be an ideal level of donations, neither too little nor too much.

Taking stock of that literature, we assume an inverse U-shaped function: the company value increases as the level of donation increases, till a tipping point when further increases in the level of donations decreases corporate value. We further hypothesize that a corporate donation of low amount is considered too little and consequently decreases company value while a corporate donation of high amount is considered too much and decreases as well company value. We call this explanation "too little or too much" and we consequently formulate Hypothesis 2 as follows:

Hypothesis 2 (preferences for stakeholder theory: too little, too much): The signed quantity of the market participants' orders is an inverse U-shaped function of the corporate donation amount. Market participants *sell* stocks when the company announces a corporate donation with a *low* amount, *buy* stocks when the company announces a corporate donation with a *medium* amount, and *sell* stocks when the company announces a corporate donation with a *high* amount.

At the same time, we contend that gender may act as a moderating variable in the relation between

the level of donation and company value. Being women associated with communal traits, while men being associated with agentic traits (Eagly and Karau, 2002; Rosette and Tost, 2010), we expect that the preferences of male investors lean to a monetary objectives (in line with a shareholder approach for the firm) and the preferences of female investors lean to both monetary and social objectives (in line with a stakeholder approach for the firm). Thus, we posit the following hypothesis:

Hypothesis 3 (gender effect): male participants follow H1, and female participants follow H2.

By the same token, we contend that age may also act as a moderating variable. As younger people will stay longer in the planet, we expect that the preferences of old investors lean to a monetary objective and the preferences of young investors lean to both monetary and social objectives. Thus, we posit the following hypothesis:

Hypothesis 4 (age effect): old participants follow H1, and young participants follow H2.

Furthermore, if both our hypotheses 3 and 4 (gender and age effects) hold, we should observe a more pronounced effect for young female participants and old male participants.

Change in the composition of a sustainability index

Our second event consists in the change in the composition of a sustainability index. Instead of an internal CSR decision by the company, as it was with the corporate donation, this event corresponds to an external decision motivated by the CSR behavior of the company. Endrikat (2016), in a meta-analysis, explored the relation between external CSR-related events and company value, finding a consistent relationship between external CSR-related events and market reactions, both for positive and for negative CSR-related events, being the impact higher for negative ones. Amer (2018) measures the market penalization for companies that fail to comply

with reporting commitments to the UN Global Compact. Both studies agree on CSR-related events having an impact on value, being this impact higher for negative events.

There are several empirical studies about the inclusion / exclusion of companies from sustainability indices. Becchetti et al. (2012) study the market reaction to companies entering and exiting from the Domini 400 Social Index, finding a negative impact on the value of companies that exit. Similarly, Consolandi et al. (2009) find small reactions to both inclusions and exclusions of a company, while those reactions are more important for exclusions. Besides, Krueger (2015) in his study of market reaction to news disseminated by a social rating agency, finds that investors react more to bad than to good news. Cheung (2010) finds a temporary market impact after the announcement of inclusion or exclusions from a sustainability index. With contrasting results, Oberndorfer et al. (2013) find that companies that were included in two major sustainability indices in Germany actually *lost* value after their inclusion. Setting aside the last study, all the aforementioned studies point to a positive (negative) market reaction to inclusion (exclusion) from a sustainability index, while such a reaction would be more important for an exclusion.

Moreover, a change in the composition of an index usually leads to the rebalancing of portfolios. The exclusion of a company from the index leads to stock selling and results in a negative price impact (at least in the short term for liquidity reasons). Inversely, the inclusion of a company in the index leads to buying and results in a positive price impact(Jain, 1987).[6] However, this effect should be relatively less important for a sustainability index than for a general index like the S&P 500 index, as a change in the composition of a major index, largely used for passive investing worldwide, has arguably higher impact than a comparable change in the composition of a much less ~~traded~~ followed sustainability index. Besides, we can assume that such a change in the index

[6] Interestingly, Jain (1987) also found some asymmetric results following exclusion and inclusion as stocks included in the S&P 500 index experienced an excess return of + 3 per cent on the first trading day after the announcement, while stocks excluded from the index experienced a - 1 per cent excess return.

composition is considered in the same way by all participants whatever their preferences are.

Figure 3 below illustrates the impact of a change in the composition of a sustainability index (exclusion or inclusion) on firm value according to the preferences of investors.

{Insert Figure 3 about here}

Consequently, the same event (inclusion/exclusion) includes two different, but interconnected levels: the company itself and the index. First, investors seem to rely on the value information of an inclusion / exclusion of the company form the index, while apparently giving more weight to exclusions (Becchetti et al. 2012), that is, more selling after an exclusion that buying after an inclusion. That effect would be asymmetrical. Second, some portfolios may track the index, their asset managers will rebalance these portfolios after the inclusion (buying) and after the exclusion (selling). That effect would be symmetrical, and more or less important depending on the volume of those portfolios. Third, individual investors may have different preferences. If they agree with the shareholder approach consistent with a monetary objective, they will sell after an inclusion or buy after an exclusion from the index. If they agree instead with the stakeholder approach consistent with both monetary and social objectives, they will buy after an inclusion and sell after an inclusion from the index. It is also possible that investors, whatever their convictions are, decide to follow the aforementioned portfolio rebalancing of large portfolios that track the index.

Shareholder theory would contend that any corporate objective alien to profits would be again shareholders' interests. Thus, shareholders would sell their shares when the company is included in a sustainability index, as this inclusion would signal that the company is following a CSR strategy and buy shares when the company is excluded from the index. Consequently, we formulate Hypothesis 5 as follows:

Hypothesis 5 (preferences for shareholder theory): market participants *sell* stocks after the *inclusion* of the company in the sustainability index

and *buy* stocks after the *exclusion* of the company from the index.

Stakeholder theory would instead contend that paying attention to stakeholders would benefit the company and in the long run shareholders as well. Thus, shareholders would buy shares when the company is included as this inclusion would signal that the company is following a CSR strategy and sell their shares when the company is ~~included~~ excluded. Consequently, we formulate Hypothesis 6 as follows:

Hypothesis 6 (preferences for stakeholder theory): market participants *buy* stocks after the *inclusion* of the company in the sustainability index and *sell* stocks after the *exclusion* of the company from the index.

Regarding the age and gender effects, we can hypothesize that older persons would tend to agree with the shareholder approach, while younger persons would tend to agree with the stakeholder approach. By the same token, males would tend to agree with the shareholder approach, while females would tend to agree with the stakeholder approach. All this leads us to posit the following hypotheses:

Hypothesis 3 (gender effect): male participants follow H5, and female participants follow H6.

Hypothesis 8 (age effect): younger participants follow H5, and older participants follow H6.

Underlying the test of our hypotheses, trading is considered as a medium of expression of participants' values and expectations. A convinced participant would show the intensity of his/her reaction by the direction of the order (sell/buy) and its size (volume of shares). Our experiment, designed to collect data at the level of individual participants, allows for inferences about the moderating effect of generations on the relation between CSR and corporate value.

RESEARCH DESIGN AND METHODS

An experiment may have some advantages over conventional empirical studies. For instance, some studies are longitudinal comparisons between a sustainability index and a conventional one, where a correlation is identified, but causation can only be hypothesized (King and Lenox, 2001). In the case of event studies, the events are frequently unusual and non-repeatable, and except for some events controlled by the company (e.g., a dividend announcement), most events remain unexpected (e.g. an accident, an economic crisis). Worse indeed, events are never isolated – they happen in a real-life context, surrounded by a myriad of other confounding factors. For instance, macroeconomic variables, competitors' actions, and other factors coming from the company itself. Thus, failing to consider those confounding variables could end up with having a spurious correlation.

We created an experiment based on a trading simulation platform called SimTrade. This simulator represents a trading day in a stock market. During the simulated trading day, participants make investment decisions about the stock of NutriFood, a fictitious company based in France, that operates several chains of bio fast foods in several countries, catering to all ages. We chose a non-controversial industrial sector as food, so not to have a confounding factor. By the same token, our results may not generalize to other industries.

We conducted this experiment in a business school in France with programs at several levels (undergraduate, graduate, executive education), allowing us to address generations X, Y and Z. Being enrolled in any of these academic programs, our experiment participants share a common knowledge of financial markets before doing the simulation.

At the beginning of the simulation, instructors present the experiment as a research study on behavioral finance, without entering into further details. They read aloud the guidelines for the simulation, including a briefing about the company, and comments about the events that may arise

during the trading day. All the information is written in the simulator webpage and is always available to students during the experiment. All participants receive a virtual portfolio of cash and NutriFood shares. During the trading day (that takes 10 minutes in the simulation), different events appear, and those events may have an impact on the share price and the traded volume. Participants can decide where to trade or not, the direction of their trading (buying or selling), the quantity of shares bought or sold, the kind of order (market order or limit order). At the end of the simulation, participants are evaluated on three elements. First, their performance: how their portfolio increased compared to a "passive portfolio" benchmark. Second, their trading activity: doing the simulation till the end and sending of at least one order to the market. Third, their participation in a survey after the simulation.

During the simulation, four events are expected. The first event is the announcement of a corporate donation. This donation is expected, but participants ignore its size (higher to, lower than or as expected) till it is announced. The second event is the announcement of profits. While there is a market consensus for profits, participants ignore how much profits will be (higher to, lower than or as expected). The third event is the announcement of a fictitious macroeconomic indicator, the Household Confidence Index, which would affect the prospects of NutriFood. While there is a market consensus for this index, participants ignore how much this index will be (higher to, lower than or as expected). Any participant would of course expect that the two latter events (announcement of profits and publication of a macroeconomic indicator), both being "conventional" events, unrelated to CSR, would have an obvious impact on the company's value. Lonati et al. (2018) suggest having this kind of control events to check the rationality of participants' decisions. Finally, there is the announcement of the composition of the fictitious 100 Global Sustainability Index. The outcome of this event is binary, either NutriFood enters the Index or not.

After the simulation, we give students a memory check (Abbey and Meloy, 2017) to confirm that

they understood well the information provided in the simulation. Besides, we ask students to explain their motivations for their reactions and we invite them to write open comments on their experience.

In terms of internal validity, we follow Lonati et al. (2018) prescription of assigning different scenarios to participants in a random way. We also addressed other threats to internal validity (Podsakoff and Podsakoff, 2019) by randomly assigning students to scenarios (selection risk), making the simulation short and not repeating it with the same population (maturation risk), giving scarce information before the simulation (test risk) and penalizing students who abandon the simulation (mortality risk).

Besides, we refrain from explaining in detail the purpose of our research, and we just explain that we study how people make investment decisions. Sharing with participants just the necessary information helps to prevent demand effects (Podsakoff and Podsakoff, 2019) and social desirability bias (Fisher, 1993). These risks are further diminished as the simulation has real consequences for students (Lonati et al., 2018), as its result impacts (moderately) their academic grades. Moreover, the between-subject design (Charness et al, 2012) of this simulation diminishes the risk of demand effects.

Davis et al. (2007) point to the possible limited external validity of simulations. In this sense, two points are worth noting. First, while acknowledging that computational models remain necessarily a simplification of the real world (Chen, 2010), we claim that this simulator remains realistic, as its underlying logic is grounded on the literature (Davis et al., 2007). Besides, this simulation has been used frequently for training purposes in executive education, in many cases with professional traders, with different scenarios, and in several countries. Thus, we can reasonably assume that the simulation represents the dynamics of a stock market realistically.

Second, experiment participants are enrolled at different levels in a major business school in Paris.

This kind of population is appropriate for our study as their background is close to that of investment professionals (Lonati et al., 2018). Besides, all of them follow courses in finance, which makes them familiar with the trading activity. As Gordon et al (1986) indicate, we are "employing subjects with demographic and interest profiles similar to the nonstudents" whose behavior we would like to infer (investors).

We run this simulation with all students in the same cohort, instead of having students "hired", thus preventing risks of self-selection (Falk, Meier and Zehnder, 2013). Besides, participants in each cohort share a similar background, thus potential confounding factors such as age and academic level are minimized *inside of each cohort.* We run the simulation in several cohorts at different educational levels (bachelor, master and executive education), which allows us to explore differences in age, work experience and academic background.

We contend that our experiment can cast new light to investors' perceptions and reactions to CSR-related events. Compared to conventional survey studies, our experimental approach brings several advantages:

- A focus on what participants *do* in a simulation, instead of what they *say they would do* (i.e. behaviors instead of declarations). Besides, participant trading decisions remain anonymous, thus preventing social desirability bias.
- A focus on the reactions for individual participants, instead of a perspective on the whole market. Participants' trading decisions (i.e., buy, hold or sell) reveal their CSR preferences. Besides, a post-experiment survey explores several possible motivations for trading, for instance, a social responsibility motivation (i.e., reactions to the event according to the participant's values) or a profit motivation (i.e., a belief that the event will eventually influence market prices).
- Richer demographical data. Our simulation allows collecting demographical information and information about relevant personal characteristic, such as risk preferences.

- Events can be tailored to create different scenarios, for instance, different amounts for donations. Independent variables can be changed and graded as much as necessary. For instance, an experiment can simulate events of different characteristics, in different moments, contexts and situations. In an event study instead, data is necessarily limited to what happened in reality, and we can only speculate about counterfactuals.
- Causal relations are easier to infer. In a simulation, confounding factors can be isolated, as researchers can plan for several rounds with different people. Consequently, we may more confidently claim cause-to-consequence relations.

DATA AND STATISTICAL MODEL

Data collection and measures

In order to collect data at an individual level, we asked participants to complete their profile before launching the simulation.[7] During the simulation, we collected data about participants' trading activity: the characteristics of the orders sent by market participants, especially their direction (buy/sell) and quantity, the portfolio composition and performance. Besides, we collected data about the events that each participant had in its simulation (defined by the low, medium or amount of the corporate donation for the internal event and the inclusion or the exclusion of the company from the sustainability index for the external event). We consequently measure each participant's trading reaction following each of the two events (our dependent variables), the amount of the corporate donation and the change in the composition of the sustainability index (our independent variable manipulated in our experiment), and the generation of the participant based on its age (our moderating variable). Figure 4 illustrates the links among these variables and the theoretical

[7] Our experiment complied with the French law about the use of personal data and was approved by the school's Research Ethics Committee.

hypotheses.

{Insert Figure 4 about here}

Figure 4 summarizes our experiment. Our experiment presents the same set of simulated CSR-events to participants who make investment decisions (i.e., buy, hold, and sell) and then answer to a post-experimental survey. Data about participants' decisions and answers allow us to explore whether their preferences are closer to either a monetary objective or both monetary and social objectives. Besides, we collect demographic data about each participant in order to explore the role of investors' generation as potential moderator.

The amount of the corporate donation *Donation amount* is a quantitative variable. The change in the sustainability index composition and the generation of the participants are coded with dummy variables as follows: *Index change* (0 for exclusion and 1 for inclusion) and *Participant generation* (0 for X and Y and 1 for Z). A participant belongs to the X and Y (Z) generation if its date of birth before (after) January 1, 1997.

The trading reaction of each participant who participated in the market after the event is measured by the signed quantity of the order. The *Trading activity* variable is given by:

Trading activity = Order direction × Quantity of stocks

where *Order direction* is buy (+1) or sell (-1) and *Quantity of stocks* is the number of stocks indicated in the order sent by the participant.

Our first control variable is *Participant generation*, a possible moderator. As the literature shows gender differences in trading behavior, we also consider *Participant gender* as a control variable. For instance, Barber and Odean (2001) find that men tend to be more optimistic, even overconfident when trading stocks. We included the performance of participants (*Trading performance*) to control for the trading skills and experience, which may change among generations.

Statistical models and hypotheses

Regarding the first event (the corporate donation which is an internal event), our theoretical development identified three explanations, potentially concurrent, for the relationship between the CSR-related events and trading reaction. Hypothesis 1, consistent with a monetary objective, posits a negative relation between corporate donation and trading activity (signed quantity of the orders). On the opposite, Hypothesis 2, consistent with both monetary and social objectives, posits a positive relation between corporate donation and trading activity. Finally, Hypothesis 3 posits an inverse U-shaped relationship. Furthermore, we also consider the presence of generations as a moderating variable, otherwise said, that different generations may having different preferences concerning CSR investing (Hypothesis 4).

While Hypotheses 1, 2 and 3 imply that different levels of donations (our independent variable) will lead to the same trading reaction for *all* participants (our dependent variable), Hypothesis 4 implies that this impact is moderated by the participants' generation (our moderating variable). Statistically, therefore, testing our theoretical hypotheses requires the analysis of the impact of our independent variable (IV) on our dependent variable (DV), for all hypotheses, and for Hypothesis 4, the impact of the moderating variable (MV) on the relationship between the independent variable (IV) and the dependent variable (DV). To do so, we use three "simple slope" models estimated separately for the whole sample and for the subsamples of Gen X and Y, and Gen Z participants. We aim to test whether a different relation exists between independent variable IV and depending variable DV for each group (MV) by testing the difference in the "simple slopes" in both subsamples.[8]

For each set of participants (all, Gen X and Y, and Gen Z), we run linear regressions given by

[8] Following Robinson, Tomek and Schumacker (2013) this is preferable than the interaction model which may have problems of multicollinearity.

Equation (1):

$$\textbf{\textit{Trading activity}}_i = \alpha_0 + \alpha_1 \cdot \textbf{\textit{Donation amount}}_i + \alpha_2 \cdot \textbf{\textit{Donation amount}}^2_i + \beta_1 \cdot \textbf{\textit{Participant gender}}_i + \beta_2 \cdot \textbf{\textit{Trading performance}}_i + \varepsilon_i$$

Mirroring our theoretical hypotheses (Hypotheses 1, 2 and 3 about shareholder theory, stakeholders' theory, and too little, too much, and Hypothesis 4 about the generation effect), we test the following statistical hypotheses. Using the data of all participants to run the regressions, Hypothesis 1 (shareholder theory) predicts that the coefficient for the constant, *Donation amount* and *Donation amount*^{2} satisfy the condition: $\alpha_0 = 0$, $\alpha_1 < 0$ and $\alpha_2 < 0$ (a decreasing function); Hypothesis 2 (stakeholder theory) predicts: $\alpha_0 < 0$, $\alpha_1 > 0$ and $\alpha_2 > 0$ (an increasing function); Hypothesis 3 (too little, too much) predicts: $\alpha_0 < 0$, $\alpha_1 > 0$ and $\alpha_2 < 0$ (an inverse U-shaped relationship); Hypothesis 4 (generation effect) predicts: $\alpha_0^Z < \alpha_0^{XY}$, $\alpha_1^Z > \alpha_1^{XY}$ *and* $\alpha_2^Z > \alpha_2^{XY}$.

Regarding the second event (the change in the composition of the sustainability index which is an external event), our theoretical development identified three explanations, potentially concurrent, for the relationship between the CSR-related events and trading activity. Hypothesis 5, based on shareholder theory, posits a negative relation between index change and company value. On the opposite, Hypothesis 6, based on stakeholder theory, posits a positive relation between index change and trading activity. Finally, Hypothesis 7 implies that this impact is moderated by the participants' generation (our moderating variable).

For each set of participants (all, Gen X and Y, and Gen Z), we run a linear regression given by Equation (2):

$$\textbf{\textit{Trading activity}}_i = \gamma_0 + \gamma_1 \cdot \textbf{\textit{Index change}}_i + \delta_1 \cdot \textbf{\textit{Participant gender}}_i + \delta_2 \cdot \textbf{\textit{Trading performance}}_i + \nu_i$$

Hypothesis 5 (shareholder theory) predicts that the coefficient for *Index change* is negative: $\gamma_1 < 0$;

Hypotheses 6 (stakeholder theory) predicts: $\gamma_1 > 0$; Hypotheses 7 (generation effect) predicts: $\gamma_1^Z > \gamma_1^{XY}$.

RESULTS FOR THE CORPORATE DONATION

Descriptive statistics

{Insert Table 1 about here}

Table 1 presents descriptive statistics for both the main variables and for the control variables in our sample for the internal event (corporate donation). The donation amount is almost equally distributed among the three amounts: 31 percent of the simulations have a low amount, 35 percent a medium amount, and 34 percent a high amount. A total of 38 percent of the participants reacted to the news of the corporate donation by either buying or selling stocks. Participants tend on average to buy stocks (the mean of *Order direction* is slightly positive). The average quantity of stocks traded is 340, representing around 34 percent of the initial available cash for a buy, and a similar proportion of their stocks in the case of a sell order. The average standardized time lapse is 1.52, as participants reacted halfway through the time window posterior to event. Participants' average trading performance is negative with a high standard deviation.

Table 1 also gives detailed data by generation. By construction, the age of Gen X and Y participants (35.70) is higher than the age of Gen Z participants (21.44). A marked difference is the market participation after the event: 51 percent for Gen X and Y participants and only 32 percent for Gen Z participants. Another difference is in the quantity traded: 237 shares for Gen X and Y participants and 397 shares for Gen Z participants. While only a minority of Gen Z participants reacted, there were more engaged. Table 1 also gives detailed data by the amount of the corporate donation (low, medium, and high). While the participation is stable whatever the amount, the order direction (buy or sell) varies greatly with the amount: -0.04 for a low amount, 0.04 for a medium amount, +0.32 for a high amount. Based on these data, we can compute the

average signed quantity for Gen X and Y and Gen Z participants: -103 vs -121 for a low amount, 25 vs -213 for a medium amount, and -88 vs 24 for a high amount of corporate donation. The initial results show a non-linear relationship between the signed quantity and the amount of corporate donation and differences between the two generations. The use of statistical model will allow us to rigorously study this relationship.

Regression analysis

{Insert Table 2 about here} {Insert Figure 5 and 6 about here}

Table 2 presents our results for the internal event (corporate donation). The dependent variable is the participant's trading reaction measured by the signed-quantity of the order. All regressions include *Donation amount* and its square as our manipulated variable, *Participant generation* as our moderating variable. The regressions are run for all participants (Columns (1) and (2)), and separately for Gen X and Y participants (Columns (3) and (4)), and for Gen Z participants (Columns (5) and (6)). The regressions are run without control variables (Columns (1), (3) and (5)) and with control variables (Columns (2), (4) and (6)).

Hypothesis 1 (based on shareholder theory) predicts a decreasing function between the signed quantity of the order and the amount of the corporate donation. In columns (1) and (2), the estimates of α_0 is negative and significant at the 10 percent level, the estimates of α_1 is negative as expected but not significantly different from zero, and α_2 positive but not significantly different from zero. The function is decreasing for low amounts but increasing for high amount of corporate donation. Hypothesis 1 is not supported by the data.

Hypothesis 2 (based on stakeholder theory) predicts an increasing function between the signed quantity of the order and the amount of the corporate donation (at least for reasonable amounts). This seems to be the case for high amounts of the corporate as the squared term dominates, α_2 being positive. Hypothesis 2 is not supported by the data either.

Hypothesis 3 (based on too little, too much) predicts an inverse U-shaped relationship for the function between the signed quantity of the order and the amount of the corporate donation. The sign of α_2 being positive (but not significantly different from 0) does not support this hypothesis.

Hypothesis 4 introduces a potential moderating variable with the generation of the participants. This hypothesis translates in terms of the inequalities between the coefficients α_0, α_1 and α_2 for regressions run separately for each group of participants. This is the case: α_0 is equal to -93.064 for XY and -129.000 for Z, α_1 is equal to 6.942 for XY and -5.690 for Z, α_2 is equal to -0.065 for XY and 0.069 for Z. The test based on the difference between the two estimates of coefficient α_0 is equal to -0.372 with a p-value of 0.355 (similar reaction for a low amount of corporate donation). The test based on the difference between the two estimates of coefficient α_1 is equal to -2.359 with a p-value of 0.009 (different reaction for a medium amount of corporate donation). The test based on the difference between the two estimates of coefficient α_2 is equal to 2.866 with a p-value of 0.002 (different reaction for a high amount of corporate donation).

RESULTS FOR THE CHANGE IN THE COMPOSITION OF THE SUSTAINABILITY INDEX

Descriptive statistics

{Insert Table 3 about here}

Table 3 presents descriptive statistics for both the main variables and control variables in our sample for the external event (change in the composition of the sustainability index). The occurrence of inclusions and exclusions is almost equally distributed: 51 percent of the simulations have the inclusion of the company in the sustainability index. A total of 26 percent of the participants reacted to the news of the change in the composition of the sustainability index by either buying or selling stocks. Regarding the participants' trading activity, on average, the

participants tend to sell stocks (the mean of *Order direction* is slightly negative). The average quantity of stocks traded is 484, which is approximately 25 percent of their initial cash for a buy order or of their stocks for a sell order. The average standardized time lapse is 1.85, indicating that the participants reacted more than halfway through the time window defined to study the event. The participants' average trading performance is negative with a high standard deviation.

Table 3 also gives detailed data by generation. As for the internal event, a marked difference is the market participation after the event: 42 percent for XY gen participants and only 21 percent for Gen Z participants. Another difference is in the quantity traded: 374 shares for Gen X and Y participants and 550 shares for Gen Z participants. Table 3 also gives detailed data by the change in the composition of the sustainability index (inclusion or exclusion of the company from the index). While the participation is stable whatever the change in the index, the order direction (buy or sell) varies greatly with the change: -0.00 for an inclusion and -0.31 for an exclusion. Based on these data, we can compute the average signed quantity for Gen X and Y and Gen Z participants: -117 vs -146 for the inclusion, and -219 vs -483 for the exclusion. The use of statistical models will allow us to rigorously study this relationship.

Regression analysis

{Insert Table 4 about here} {Insert Figures 7 and 8 about here}

Table 4 presents our results for the internal event. The dependent variable is the participant's trading reaction measured by the signed quantity of the order. All regressions include *Index change* as our manipulated variable, and *Participant generation* as our moderating variable. The regressions are run for all participants Columns (1) and (2), and separately for XY gen participants Columns (3) and (4), for Gen Z participants Columns (5) and (6). The regressions are run without control variables (Columns (1), (3) and (5)) and with control variables (Columns (2), (4) and (6)).

The coefficient for the *Index change* variable is positive (267.688) and highly significant (a p-

value less than 1 percent). This empirical result allows us to reject Hypothesis 5 (based on shareholder theory) and supports Hypothesis 6 (based on stakeholder theory).

Hypothesis 7 introduces a potential moderating variable with the generation of the participants. Although the sign for coefficient γ_1 is positive for both generations, it is not significant for Gen X and Y participants but significant for Gen Z participants. The test based on the difference between the two estimates of coefficient γ_1 is equal to -1.723 with a p-value of 0.043, indicating significant differences between the two generations as predicted by Hypothesis 7.

Marrying the CSR literature and the prefrences' literature, this work sheds much-needed light on how firms can get the feedback from financial markets, and asset managers can market their financial product to their clients.

Our study brings a deeper understanding of investor's behavior in relation to generation. Our experimental approach allows us to explore this behavior at the individual level, instead of remaining at the aggregate level of financial markets. Thus, our experiment permits a comparison between younger and older generations concerning their investment behavior in relation to CSR-related events. Furthermore, the design of this experiment involves two different events which refers to different evaluation processes of the company CSR behavior by market participants (with or without intermediation). For each event we explore a wide range of possibilities (various amounts of donation for the first event, inclusion or exclusion for the second event).

Our most important result is the support for an age effect for both events. Younger and older generations differ in the sense that they tend to hold different preferences about CSR: Gen Z investors react more closely to the stakeholder approach by the firm, and Gen X and Y investors react more closely to the shareholder approach. Furthermore, and following Duffy (2021), it is possible that generations keep some attitudes or behaviors over the decades. If that were the case, Gen Z having a higher adherence to preferences coherent with stakeholder theory would possibly

shape the markets of the future. With the passage of time, as Gen Z will gradually increase their participation in stock market while possibly keeping their initial preferences, it is likely that stakeholder theory may one day become predominant.

LIMITATIONS AND FUTURE WORK

Our study has nevertheless some limitations. While we had participants of different genders and ages, all of them are in the same business school, thus necessarily sharing some common background. In order to generalize our results, this experiment could be run in different countries, with different cultures and certainly, with participants from other backgrounds, not only business schools' students and executive education participants. Such international comparisons can be enlightening and particularly interesting to scholars in international business. To that end, the experiment we developed on the SimTrade platform is available for the research community upon request.

The replication of our experiment may be valuable to confirm our results or

Beyond the usual external validity issues with experiments, we call for the replication of our experiment in different contexts because we can expect different results. We first ran our experiment with participants from a business school in Europe, where there is a political consensus about the importance of ESG criteria and CSR, and where individuals do not depend on financial markets for the funding of their pensions and may agree to bear a cost by trading off less financial results for more social impact. The situation is different in the United States where the importance of ESG criteria and CSR is a dividing political issue and individuals heavily rely on the performance of financial markets for their pensions.

Studying Asian countries, Puchniak (2023) observes that shareholderism is not the norm, the Friedman doctrine has not been much relevant in Asian countries, and different jurisdictions have different understandings of the purpose that corporations should serve. For example, in China,

Puchniak (2023) notes that the Communist party is the largest controlling shareholder, and the real purpose of corporate governance may be to reinforce its ultimate control. Similarly, in Japan, the economic system has been stakeholder-oriented with lifetime employment, low inequality, long term orientation, and crossed holdings. In India, the economic system has also been stakeholder-oriented with a law mandating a 2% of profits expense in CSR for large firms.

MANAGERIAL TAKEAWAYS

While this focus is obviously relevant for investors, it also matters to managers, being that financial markets may influence corporate decisions (Soros, 1987). Moreover, our focus on individual investors and consequent insights for different generations is useful for practice. First, investors themselves can realize that different perspectives coexist in the same market, that market participants may tend to behave differently regarding CSR-related events, and that that difference may be related to their respective generation. Second, financial institutions would benefit from taking into consideration this generation perspective when creating investment products that target younger and older groups of investors. Third, financial advisors may factor in this generation viewpoint when accompanying clients from different ages. Finally, the investing behavior of younger market participants and their impact on market prices will guide capital and investment in the future; this paper is an effort to understand what to expect.

We contribute the on-going debate on the fiduciary duty of both corporate directors and investment managers, and their need to better understand their shareholders and investors. Our experiment based on a market simulation (realistic setting / relevant context)is a practical tool to gives both qualitative and quantitative answers to the question of the preferences of individuals regarding CSR.

To be used: This may also help financial institutions to design financial products, e.g., green finance, targeting those categories of investors. Forward looking, the evolution in the composition

of market participants will possibly influence the strategy of companies and the marketing of financial products, while contributing to the transition to a more sustainable economy.

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TABLES AND FIGURES

Table 1. Descriptive statistics for the variants of the simulation for the corporate donation.

	Pooled simulations			Variants of simulations by donation amount									Observations
				Low amount			Medium amount			High amount			
	Pooled participants	Gen X and Y participants	Gen Z participants	Pooled participants	Gen X and Y participants	Gen Z participants	Pooled participants	Gen X and Y participants	Gen Z participants	Pooled participants	Gen X and Y participants	Gen Z participants	
Market participation	0.38	0.51	0.32	0.38	0.62	0.30	0.38	0.60	0.30	0.38	0.51	0.33	745
	(0.48)	(0.49)	(0.46)	(0.48)	(0.48)	(0.46)	(0.48)	(0.49)	(0.46)	(0.48)	(0.50)	(0.47)	
Order direction	0.11	0.00	0.16	-0.04	-0.22	0.05	0.04	0.17	-0.04	0.32	0.03	0.47	286
	(0.99)	(1.00)	(0.98)	(1.00)	(0.99)	(1.00)	(1.00)	(0.99)	(1.00)	(0.95)	(1.01)	(0.88)	
Quantity of stocks	340	237	397	334	210	400	347	263	400	338	232	319	286
	(435)	(266)	(497)	(439)	(268)	(498)	(446)	(283)	(520)	(424)	(250)	(482)	
Time lapse	1.52	1.61	1.47	1.56	1.62	1.52	1.56	1.65	1.50	1.45	1.56	1.40	286
	(0.89)	(0.86)	(0.90)	(0.88)	(0.82)	(0.92)	(0.88)	(0.89)	(0.91)	(0.91)	(0.88)	(0.92)	
Trading performance	-463	-927	-319	-765	-1,320	-611	+209	-652	+487	-884	-900	-879	745
	(5,844)	(8,144)	(4,912)	(7,579)	(13,148)	(5,117)	(5,006)	(5,494)	(4,820)	(4,741)	(4,818)	(4,728)	
Participant age	24.83	35.70	21.44	24.80	36.86	21.46	24.59	34.36	21.43	25.10	36.16	21.43	745
	(7.54)	(8.91)	(1.23)	(8.08)	(10.51)	(1.26)	(6.82)	(7.77)	(1.17)	(7.75)	(8.62)	(1.26)	
Participant gender	0.45	0.48	0.44	0.41	0.42	0.41	0.46	0.51	0.44	0.47	0.48	0.46	745
	(0.49)	(0.50)	(0.49)	(0.49)	(0.50)	(0.49)	(0.49)	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	
Observations	745	177	568	226	49	177	262	64	198	257	64	193	

Note: This table gives the descriptive statistics (mean and standard deviation below in parentheses) of the observed variables of the experiment for the three variants of the event of the corporate donation (low, medium, and high amount). For each variant, we disaggregate statistics by participant generation (XY and Z). The *Market participation* dummy variable is equal to 0 if the participant did not trade after the announcement of the donation and to 1 otherwise. The *Order direction* dummy variable is equal to -1 for a sell order and to +1 for a buy order. The *Quantity of stocks* is the number of shares in the buy or sell order. The *Time lapse* is the standardized time-difference between the announcement of the donation and the order sent by the participant. The *Trading performance*, measured in euros, is the performance of the participant in the simulation. The *Participant gender* dummy variable is equal to 0 if the participant in the experiment is a male and to 1 if the participant is a female. The last column indicates the number of observations used: the number of participants who launched an order (for order characteristics) and the number of participants (for the other variables).

Table 2. Simple slope regression results for the participants' trading reaction following the announcement of the corporate donation.

	Dependent variable: signed quantity of the order					
	Pooled participants		Gen X and Y participants		Gen Z participants	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-112.894*	-118.533	-123.235*	-93.064	-105.097	-129.000
	(67.274)	(73.634)	(73.251)	(76.814)	(95.695)	(105.500)
Donation amount	-0.762	-1.979	6.942	5.515	-5.69	-7.209
	(4.458)	(4.093)	(4.418)	(4.150)	(6.004)	(5.955)
Donation amount^2	0.018	0.029	-0.065*	-0.053	0.069	0.085
	(0.037)	(0.037)	(0.039)	(0.37)	(0.054)	(0.537)
Trading performance		0.015***		0.012***		0.023***
		(0.004)		(0.003)		(0.008)
Participant gender		58.450		26.219		74.810
		(63.823)		(65.423)		(93.100)
R^2	0.001	0.165	0.027	0.165	0.025	0.060
Observations	286	286	103	103	183	183

Note: This table presents the simple slope regression results for the trading reactions of participants (XY/Z generations) following the announcement of the corporate donation in the trading simulations. Standard errors are given in parentheses below the coefficient estimates (following convention, *** represents a significant result at the 1% level, ** represents a significant result at the 5% level, and * represents a significant result at the 10% level). Our dependent variable is the participants' trading activity, which is measured by the signed quantity of the orders sent by participants to the market.

Table 3. Descriptive statistics for the variants of the simulation for the change in the composition of a sustainability index.

	Pooled simulations			Variants of simulations by change in the composition of a sustainability index						Observations
				Inclusion in the index			Exclusion from the index			
	Pooled participants	Gen X and Y participants	Gen Z participants	Pooled participants	Gen X and Y participants	Gen Z participants	Pooled participants	Gen X and Y participants	Gen Z participants	
Market participation	0.26 (0.44)	0.42 (0.49)	0.22 (0.41)	029 (0.45)	0.47 (0.50)	0.22 (0.42)	0.24 (0.43)	0.35 (0.48)	0.21 (0.41)	745
Order direction	-0.14 (0.99)	-0.12 (0.99)	-0.15 (0.99)	-0.00 (1.04)	-0.10 (1.00)	0.06 (1.00)	-0.31 (0.95)	-0.14 (1.00)	-0.38 (0.92)	201
Quantity of stocks	484 (584)	374 (397)	550 (664)	348 (440)	351 (394)	347 (474)	652 (690)	414 (406)	759 (765)	201
Time lapse	1.85 (0.77)	1.85 (0.74)	1.85 (0.78)	1.83 (0.77)	1.78 (0.76)	1.86 (0.79)	1.88 (0.76)	1.97 (0.70)	1.83 (0.79)	201
Trading performance	-463 (5,844)	-927 (8,144)	-319 (4,912)	-340 (6,406)	-1,438 (9,744)	+44 (4,669)	-589 (5,211)	-293 (5,555)	-670 (5,120)	745
Participant age	24.83 (7.54)	35.70 (8.91)	21.44 (1.23)	25.14 (7.78)	35.58 (9.01)	21.47 (1.29)	24.51 (7.27)	35.85 (8.84)	21.41 (1.16)	745
Participant gender	0.45 (0.49)	0.48 (0.50)	0.44 (0.49)	0.44 (0.49)	0.47 (0.50)	0.43 (0.49)	0.45 (0.49)	0.48 (0.50)	0.44 (0.49)	745
Observations	745	177	568	377	98	279	368	79	289	

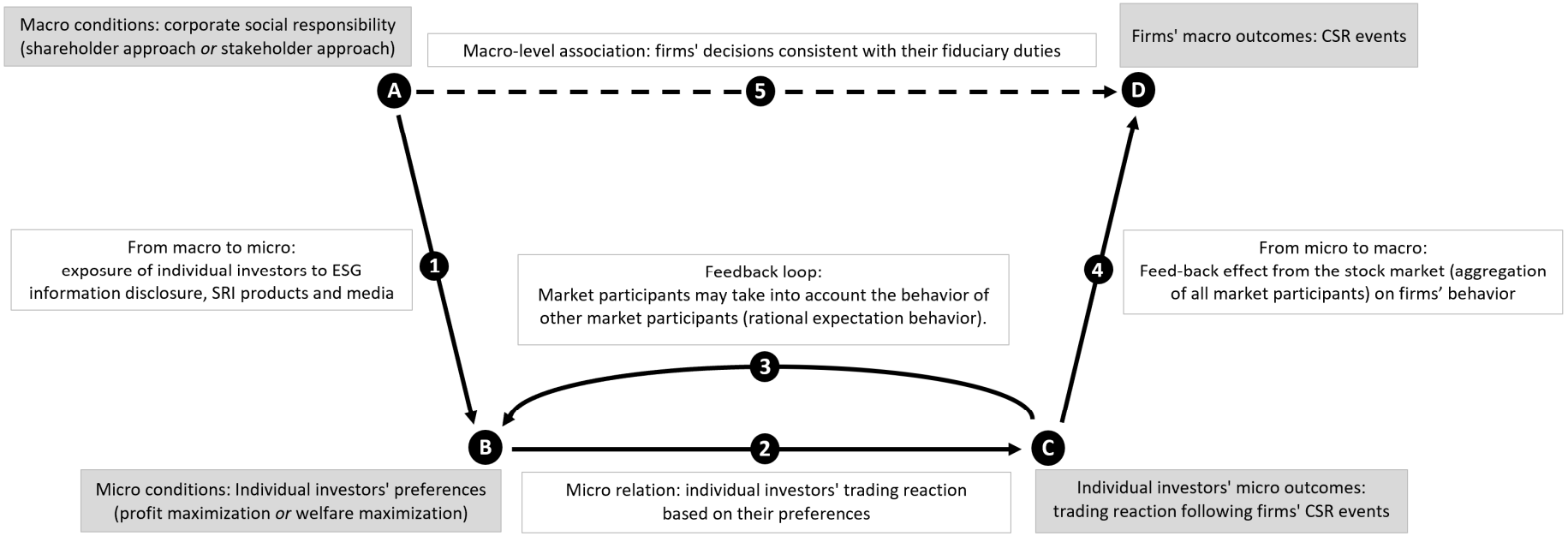
Note: This table gives the descriptive statistics (mean and standard deviation below in parentheses) of the observed variables of the experiment for the two variants of the change in the composition of a sustainability index (inclusion or exclusion). For each variant, we disaggregate statistics by participant generation (XY and Z). The *Market participation* dummy variable is equal to 0 if the participant did not trade after the announcement of the donation and to 1 otherwise. The *Order direction* dummy variable is equal to -1 for a sell order and to +1 for a buy order. The *Quantity of stocks* is the number of shares in the buy or sell order. The *Time lapse* is the standardized time-difference between the announcement of the donation and the order sent by the participant. The *Trading performance*, measured in euros, is the performance of the participant in the simulation. The *Participant gender* dummy variable is equal to 0 if the participant in the experiment is a male and to 1 if the participant is a female. The last column indicates the number of observations used: the number of participants who launched an order (for order characteristics) and the number of participants (for the other variables).

Table 4. Simple slope regression results for the participants' trading reaction following the announcement of the change in the composition of the sustainability index.

	Dependent variable: signed quantity of the order					
	Pooled participants		Gen X and Y participants		Gen Z participants	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-401.462***	-362.192***	-219.893**	-200.469*	-483.461***	-460.401***
	(74.394)	(114.29)	(99.505)	(114.294)	(100.417)	(125.82)
Index change	267.688***	277.236***	102.82	125.795	337.415**	316.532**
	(100.110)	(98.815)	(125.69)	(126.117)	(140.897)	(138.212)
Trading performance		0.016***		0.009		0.032**
		(0.006)		(0.006)		(0.011)
Participant gender		-60.266		-21.63		-30.763
		(98.393)		(121.51)		(140.743)
R^2	0.035	0.073	0.009	0.045	0.044	0.107
Observations	201	201	75	75	126	126

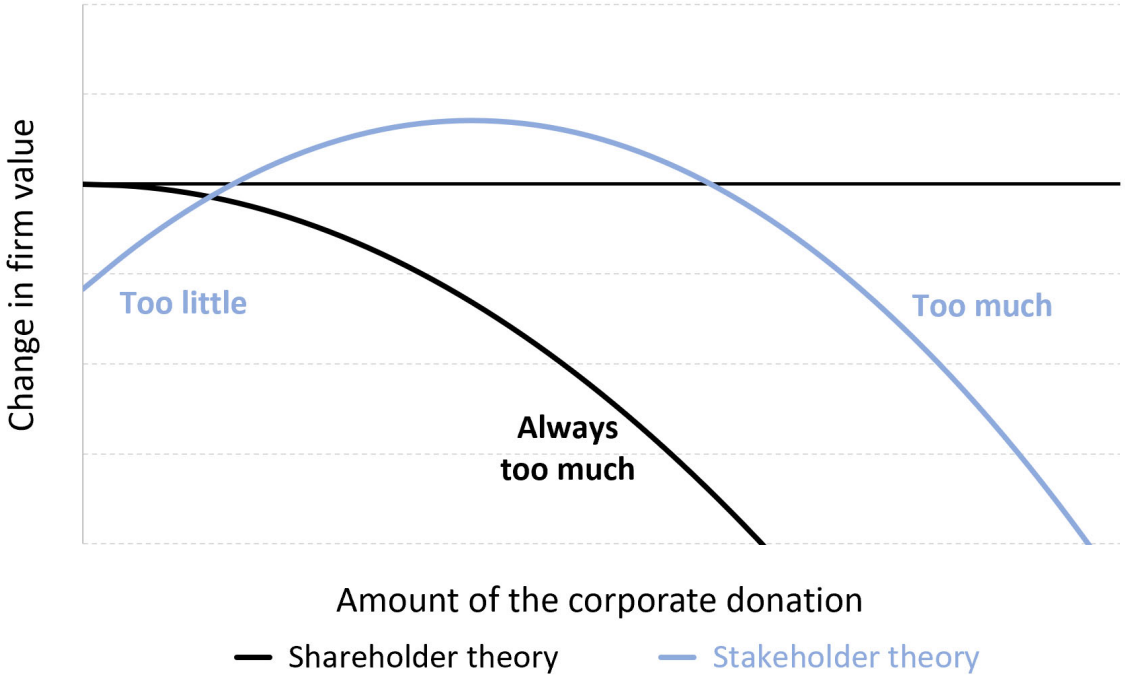
Note: This table presents the simple slope regression results for the trading reaction of participants (Gen X and Y/Gen Z) following the announcement of the change in the composition of the sustainability index in the trading simulations (inclusion/exclusion of the firm in the index). Standard errors are given in parentheses below the coefficient estimates (following convention, *** represents a significant result at the 1% level, ** represents a significant result at the 5% level, and * represents a significant result at the 10% level). Our dependent variable is the participants' trading reaction, which is measured by the signed quantity of the orders.

Figure 1. Coleman diagram: articulation between macro-level (firms) and micro-level (investors) perspectives



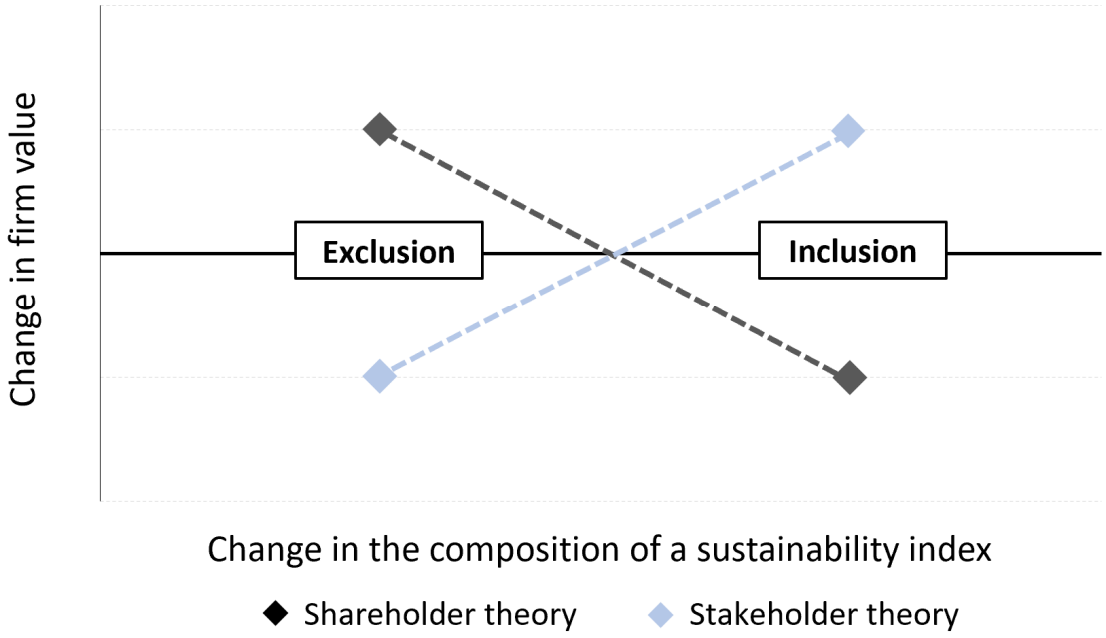
Note: We use the Coleman diagram to articulate the macro and micro theories used in our research. At the macro level (firms), Node A represents the corporate social responsibility of firms which may be closer to the shareholder approach or the stakeholder approach. At the micro level (individual investors), Node B corresponds to the preferences of individual investors which may reflect a monetary objective only (profit maximization) or both monetary and social objectives (welfare maximization). Arrow 1 represents the macro-to-micro relationship which corresponds to the impact of the debate about CSR at the firm level on individual investors. Individual investors get exposed to this debate through ESG information disclosure by firms, SRI products proposed by financial institutions, and the media. Node C corresponds to the trading reaction of individual investors following firms' CSR-related events. Arrow 2 represents the action mechanism at the micro level which corresponds to the trading reaction of individual investors according to their preferences and the firms' CSR-related events (in our simulation experiment). Moderating variables such as age and gender may help to explain the mechanism at the micro level. Arrow 3 represents the feedback loop from (some) market participants considering the behavior of other market participants (rational expectations). Node D represents the macro outcomes of firms' CSR-related events. Arrow 4 represents the micro-to-macro relationship which corresponds to the feedback effect of the stock market (which results from the aggregation of the reaction of all market participants) on firms' behavior. The macro-level association represented by Arrow 5 is about the link between the fiduciary duties of firm managers and board directors, and their actual CSR-related behavior. This macro-level association is influenced by the behavior of individual investors as previously described.

Figure 2. Relationship between the amount of corporate donation and the change in firm value.



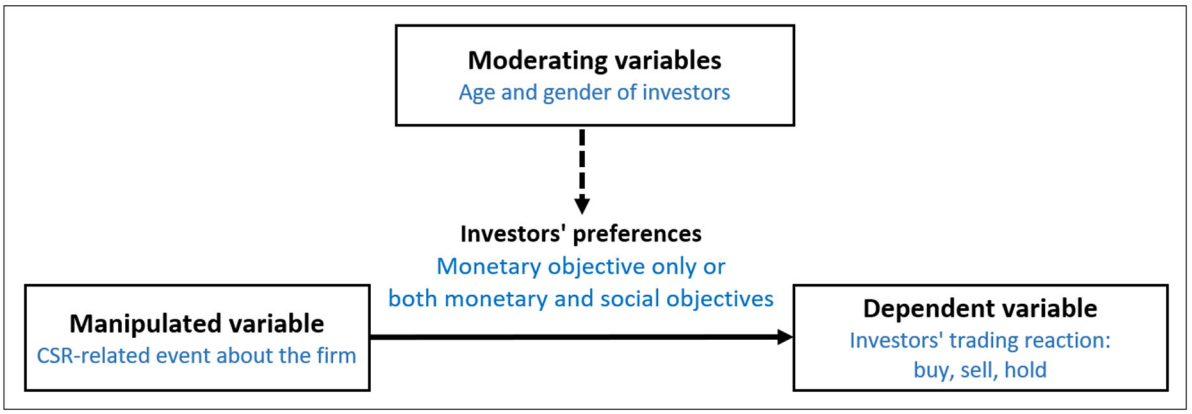
Note: This figure represents the relationship between the amount of corporate donation and the change in firm value according to the shareholder theory (always too much) and to the stakeholder theory (too little, too much).

Figure 3. Relationship between the change in the composition of a sustainability index and the change in firm value.



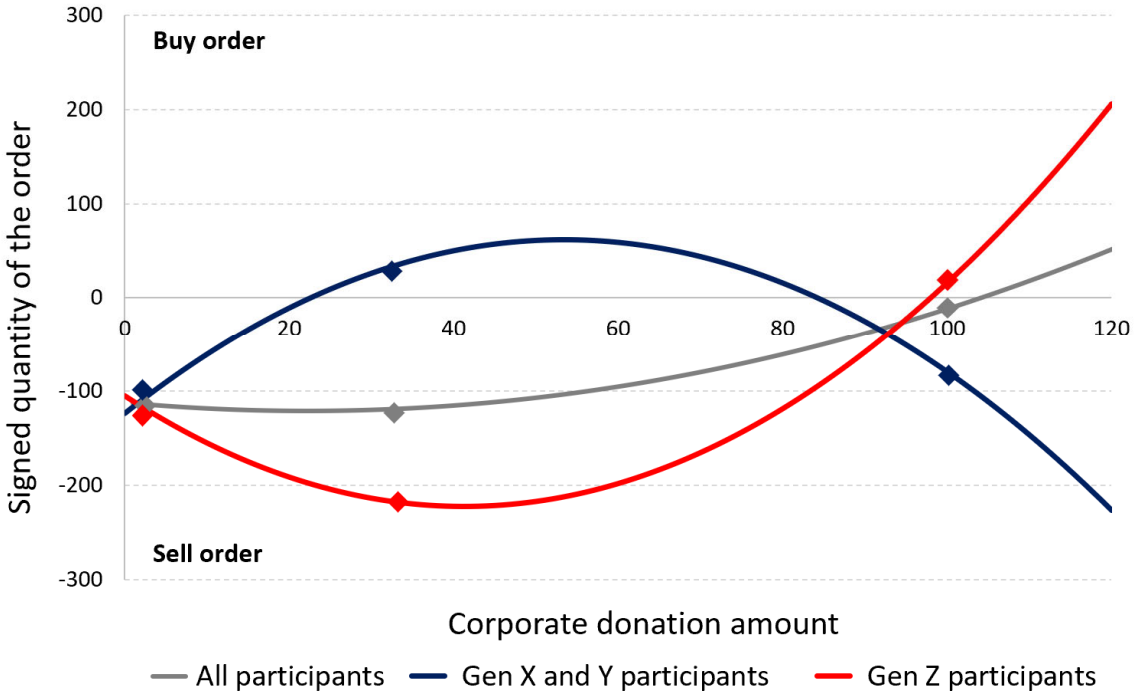
Note: This figure represents the relationship between the change in the composition of a sustainability index and the change in firm value according to the shareholder theory and the stakeholder theory.

Figure 4. Relationship between variables and preferences



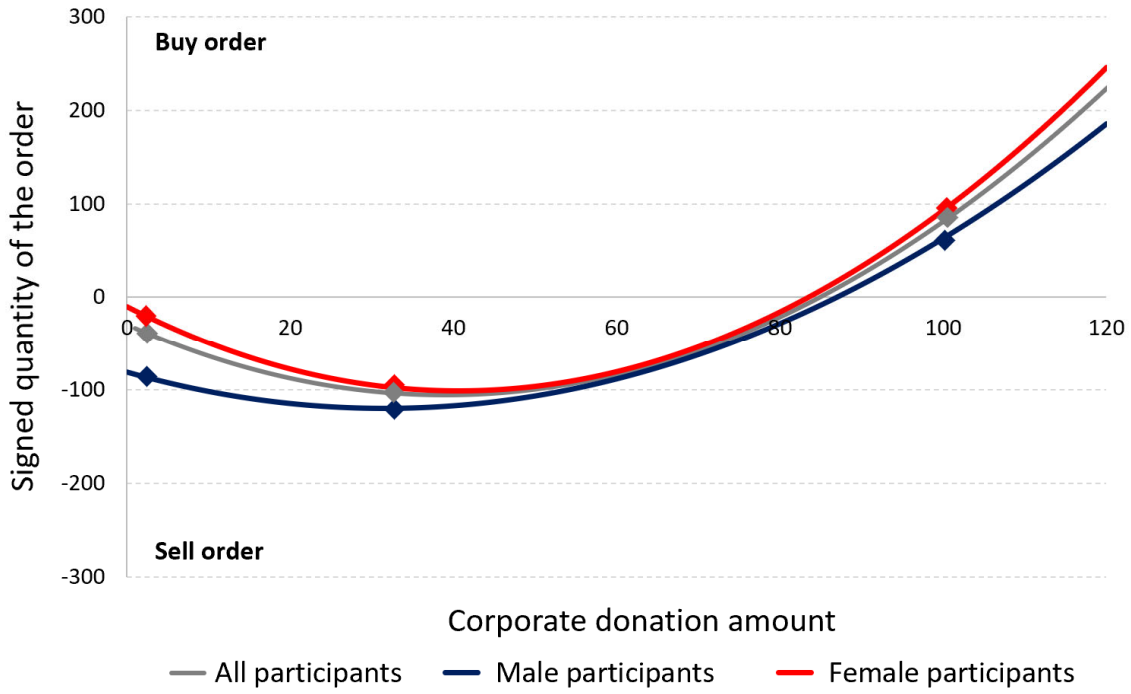
Note: This figure represents the relationship between the manipulated, moderating, and dependent variables, and the investors' preferences based on a monetary objective only (wealth maximization) aligned with the shareholder approach, or both monetary and social objectives (welfare maximization) aligned with the stakeholder approach. Figure 4 is a zoom of the action mechanism at the micro level (Arrow 2 in Coleman's diagram in Figure 1). For the corporate donation, the manipulated variable is the amount of the corporate donation. For the sustainability index, the manipulated variable is the change in the index composition (exclusion or inclusion of the firm in the index). The dependent variable is the trading reaction (buy, sell, hold) of investors following the announcement of the corporate donation by the firm, or the change in the sustainability index by the exchange. The moderating variables that could influence the relation between the manipulated variable and the dependent variable are the age and gender of investors. Each investor evaluates the news announcement according to his/her CSR preferences, and consequently reacts to it.

Figure 5. Modelling of the trading reaction of participants following the announcement of the corporate donation by generation.



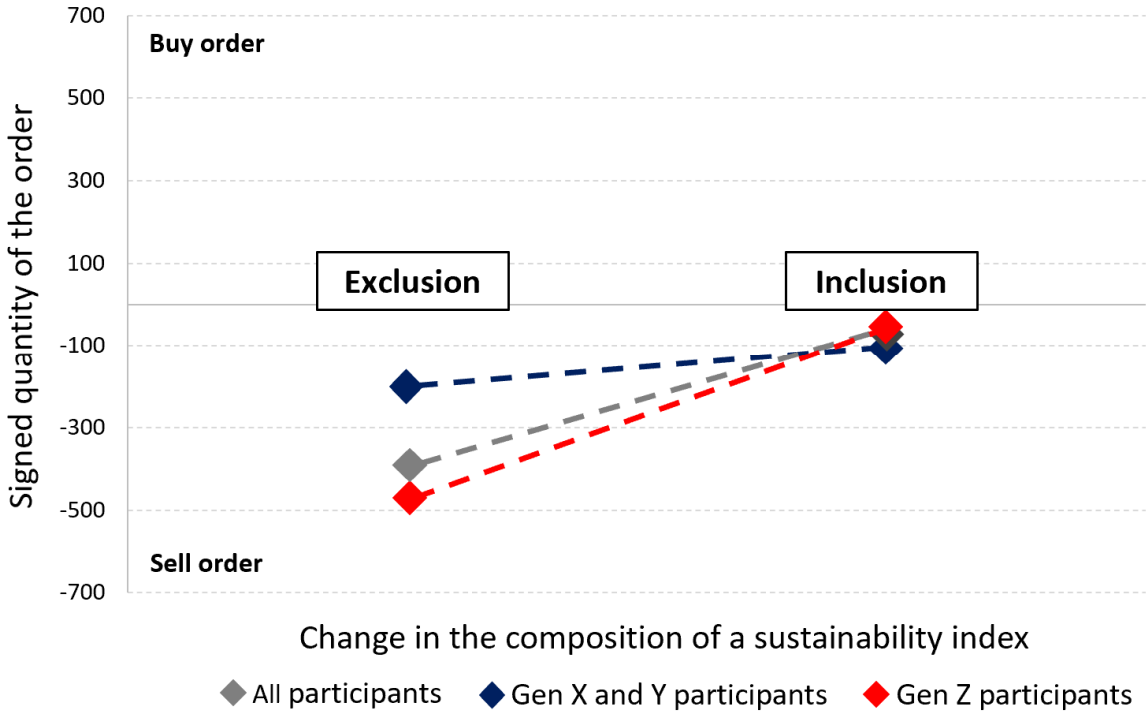
Note: this figure represents the quadratic modelling of the trading reaction of participants following the announcement of the corporate donation (the grey for all participants, the blue for Gen X and Y participants and the red for Gen Z participants). The trading reaction is measured by the signed quantity of the order sent to the market by a participant. The estimation of the function is based on the data of the participants' trading reaction after the event during the simulation, measured by the signed quantity of the order sent by participants to the market.

Figure 6. Modelling of the trading reaction of participants following the announcement of the corporate donation by gender.



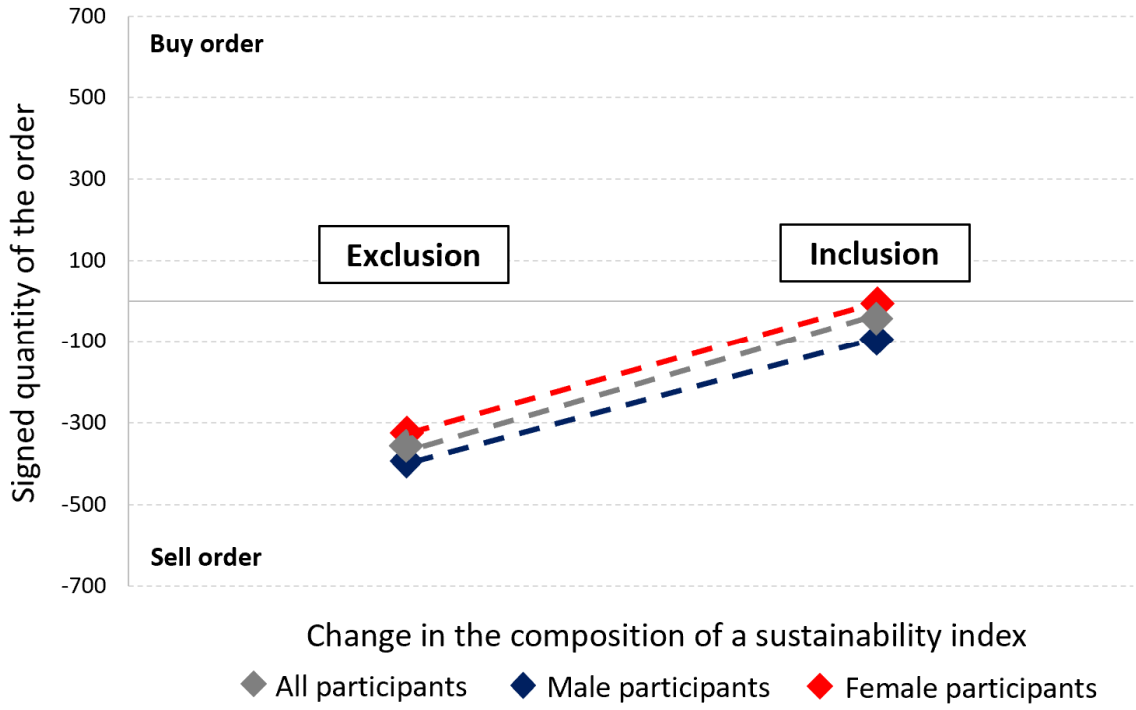
Note: this figure represents the quadratic modelling of the trading reaction of participants following the announcement of the corporate donation (the grey for all participants, the blue for male participants and the red for female participants). The trading reaction is measured by the signed quantity of the order sent to the market by a participant. The estimation of the function is based on the data of the participants' trading reaction after the event during the simulation, measured by the signed quantity of the order sent by participants to the market.

Figure 7. Modelling of the trading reaction of participants following the announcement of the change in the composition of the sustainability index by generation



Note: this figure represents the modelling of the trading reaction of participants following the announcement of the change in the composition of the sustainability index (the grey dot for all participants, the blue dot for Gen X and Y participants and the red dot for Gen Z participants). According to the variant of the simulation, the firm is either excluded or included in the index. The trading reaction is measured by the signed quantity of the order sent to the market by a participant.

Figure 8. Modelling of the trading reaction of participants following the announcement of the change in the composition of the sustainability index by gender.



Note: this figure represents the modelling of the trading reaction of participants following the announcement of the change in the composition of the sustainability index (the grey dot for all participants, the blue dot for male participants and the red dot for female participants). According to the variant of the simulation, the firm is either excluded or included in the index. The trading reaction is measured by the signed quantity of the order sent to the market by a participant.