The Greta effect in investors' perception of corporate social responsibility events:

Evidence from a lab experiment[1]

by François Longin[2] and Adrian Zicari[3]

August 19, 2022

Abstract

We study the reaction of individual market participants to the announcement of a CSR-related event–a corporate donation–as the potential causes for change in corporate value. While existing studies focused on the market reaction, we know little about how individual investors react to such events. We explore whether younger investors are more prone to consider CSR events when investing, reflecting a "Greta" effect. As younger generations are beginning to invest in financial markets, it matters to know whether such a generation effect exists. We adopt this individual focus by means of an experiment based on a trading simulation platform, which presents participants with a realistic trading environment.

Keywords: corporate philanthropy, corporate social responsibility, investor behavior, lab experiment, market simulation, shareholders, stakeholders.

JEL: J16, M14.

[1] We would like to thank + Ceressec.

[2] ESSEC Business School, Professor of Finance, 3 Avenue Bernard Hirsch, 95021, Cergy-Pontoise, France. E-mail: longin@essec.edu. Tel: +33 (0)1 34 34 30 40.

[3] ESSEC Business School. Professor of Management. 3 Avenue Bernard Hirsch, 95021, Cergy-Pontoise, France. E-mail: zicari@essec.edu. Tel: +33 (0)1 34 34 31 39.

INTRODUCTION

This paper explores investors' perceptions of corporate social responsibility (CSR) events and their subsequent investment decisions. Our original research design, focused at the level of individual investors, permits us to explore whether there is a *"generation effect", that is, it younger generations of investors would be more prone to consider CSR events.* As younger generations are beginning to invest in financial markets, and considering the potential role of those markets in the green transition, it matters to know whether such a generation effect exists.

For this purpose, we created an experiment based on a trading simulation platform called SimTrade. This simulator presents participants with a realistic trading environment. By programming different events during a simulated trading day, we take note of how participants react to those events. Besides, at the end of the simulation, we survey participants' motivations (i.e. why each participant reacted the way he or she did). Our research design allows us to explore perceptions of experiment participants, not only as an aggregate (i.e. population) but most interestingly, at an individual level. Thus, instead of studying the reaction of a whole market to an event (i.e. event studies), we explore the perceptions and reactions of *individual participants* to simulated events. As each participant runs the simulation independently, we are able to collect detailed, rich information, about investors' perceptions and decisions. Our individual-level focus permits a further understanding of participants' perceptions and motivations, particularly as we collect demographic data about experiment participants (e.g. gender, age, work experience, academic background).

This particular focus allows us complement previous studies done with other methods. For instance, Krause and Battenfield (2016) indicate that clients of social banks in Germany tend to be younger, while Riedl and Smeets (2017) point that younger people are more likely to make socially responsible investments. Other demographic factors about investors, not only age, have

also been studied. Concerning gender, Cheah et al (2011) found female investors to more frequently care about social responsibility, while Riedl and Smeets (2017) and Krause and Battenfield (2016) found an opposite trend. Finally, socially responsible investors will more likely be college educated (Riedl and Smeets 2017, Pérez-Gladish et al, 2012). We attempt to complement those studies with rigorous insights coming from a controlled experiment focused on participant's age, while we also collect other demographic variables (e.g. gender, nationality, academic background) as potential moderators.

Compared to conventional event studies, our experiment brings three advantages: first, a more individualized understanding of participants' reactions; second, the possibility of exploring moderating variables corresponding to the participants' demographics and third, the opportunity to explore of different values for the same event (i.e. amount of donations). By using this methodology, we answer to the calls from Colquitt (2008) for increased use experiments in management studies, while following the recommendations of Lonati et al. (2018), Podsakoff and Podsakoff (2019) for doing rigorous experiment studies.

Contribution to the literature

This paper complements the existing body of literature that explores the link between CSR and investors' perceptions and decisions, an issue that is both intriguing and relevant for both investors and managers.

LITERATURE REVIEW / THEORY AND HYPOTHESES DEVELOPMENT

For a long time, scholars have discussed about the purpose of the company and its objectives. Chester Barnard emphasized the social role of companies (Barnard, 1938), while Howard

Bowen put forward that businesspersons have "social responsibilities that transcend obligations to owners or stockholders" (Bowen, 1953, p. 4). However, that viewpoint was far from being universally shared. Levitt (1958) famously alerted about the "dangers of social responsibility", while Friedman (1970), in an article provocatively titled "The social responsibility of business is to increase its profits", only has a responsibility to shareholders. For both Levitt and Friedman, the argument is similar: companies (and their managers) should have only one objective, namely financial performance. Such an extremely focused mission would be easier to measure and monitor by shareholders. Otherwise said, giving managers two objectives (profits and social responsibility) instead of only one (profits) would imply a difficult, perhaps unattainable goal.

Consequently, there are two competing schools of thought, each one of them with different and conflicting implications for managerial decisions. On one hand, the "Friedman doctrine" calls for the primacy of shareholders. According to this view, managers should focus on the long-term increase of shareholder value. On the other hand, the stakeholder theory presents a broader perspective about managers' responsibilities. For Freeman and Reed (1983), managers should pay attention to "those groups who can affect the achievement of the firm's objectives" (p. 91). In a similar tone, Stout (2012), in her book "The shareholder value myth", argues that managers should address the expectations of several stakeholders, not only shareholders. Furthermore, Bower and Paine (2017) contend that maximizing shareholder value is not the main objective of managers and that they should focus instead on the company's long-term success.

There have been some attempts to find a common ground between the two perspectives. For instance, Jensen (2002) calls for an "enlightened value maximization", where long-term value remains the corporate objective while accepting some tradeoffs in order to accommodate for stakeholder's demands. Moskowitz (1972) points to the long-run benefits of addressing stakeholder's demands, an argument frequently echoed by most proponents of the stakeholder view (e.g. Stout, 2012). Besides, Porter and van der Linde (1995) identify some win-win

situations where environmental improvements can lead to higher profits. More recently, Handy contends that focusing only on shareholder returns is "to mistake a necessary condition for a sufficient one…" (Handy, 2002, p. 51). Thus, profits would be the consequence of the company's success at satisfying clients, but not an end in itself. Indeed, Levitt and Friedman admit some limits to the notion of profit-only corporate goal. Friedman (1970) acknowledges that managers have to comply with (the) "basic rules of the society, both those embodied in law and those embodied in ethical custom". On his part, Levitt concedes that some donations or social initiatives from companies are acceptable "*if* it makes good economic sense" (1958, p 48, italics in the original).

This conceptual, mainly normative debate about what companies (and their managers) should be doing, gradually led to an array of empirical studies, with different methods, all of them exploring the possible links between CSR and profits. Many of these studies were later considered in a classical meta-analysis of Margolis and Walsh (2003), who reviewed 127 published studies, not finding a conclusive relation between CSR and financial results. Many of those studies are event studies, that explore the link between an exceptional occurrence (e.g. an environmental crisis) and a broad indicator of financial performance.

Some years later, Margolis and Elfenbein (2008) suggest that where positive relation exist, it could simply be an issue of "deep pockets… (that gives) a company the wherewithal to contribute to society". This point is particularly intriguing; as it casts doubt on the direction of the causal link, (i.e. CSR leads to financial performance or the other way round?). Moreover, the question is far from being an academic curiosity. Indeed, the very rationale for CSR is at stake. Is CSR a driver for value, or is merely a policy that a successful company can afford doing? This "causal ambiguity" (Orlitzky 2013) is an issue also raised by Devinney (2009) and consistent with the results of the Waddock and Graves (1997) study. Indeed, King and Lenox (2001) point that a mere correlation between CSR and financial performance would suffice to investors (who

pick stocks), but to not managers, who need to prove causation between CSR policies and financial performance.

Valuable as the aforementioned studies are, they share two limitations. First, their market-level focus blinds them to the behavior of individual investors. Consequently, while those studies give information about how the whole community of investors behave, one does not yet know how different kinds of investors behave. Second, those studies are dependent on the information that is available in financial markets. 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. In case of event studies, they are frequently unusual and non-repeatable. Except for some events are controlled by the firm (e.g. a dividend announcement), many 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. Researchers who fail to consider those confounding variables could end up with a spurious correlation.

We contend that an experiment based on a trading simulation platform, which represents a trading session in a realistic way, can cast new light to investors' perceptions and reactions to CSR-related events. More specifically, a simulation seems appropriate for this purpose because of:

a- Data availability. In a simulation, independent variables can be changed and graded as much as necessary. For instance, if we want to explore the impact of an oil spill in the sea on market prices, a simulation allows studying the impact of a larger or smaller oil spill, 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.

b- Clearer causal inferences. 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.

c- Individual level focus. In a simulation, researchers collect information about individual trading decisions. We assume that participants' trading decisions (i.e. buy, hold or sell) reveal both their preferences in terms of CSR and their mental models (Pedersen, 2009) about the relation of CSR and profits. A post-experiment survey attempts to distinguish among 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).

d- Demographical data. Linked with the previous point, our simulation allows collecting demographical information about participants (e.g. different backgrounds, gender, educational level or work experience). Furthermore, the survey at the end of the simulation also collects information about personal characteristics that can be relevant, such as risk preferences.

Our study specifically explores investors' perceptions and reactions to two kinds of CSR events: *corporate donations* and *inclusion/exclusion from a Sustainability Index*. Both events differ in their discrecionality. Donations are corporate decisions which are part of the CSR activities of a firm (Halme and Laurila, 2009), while the inclusion/exclusion from an index is a decision made by an external party (even if one can argue that this kind of external decision would sanction by the success or failure of ongoing corporate policies).

Some studies have explored corporate philanthropy. There would be "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). Cuypers et al. (2016) pose that more generous giving can increase the company's

reputation, a view shared by Hogarth et al. (2018). Wang et al. (2008) points to a tension between two arguments: philanthropy can benefit the firm as it improves its relationship with stakeholders, while philanthropy also costs to the firm. Thus, they propose an inverted-U curve, where increasing philanthropic contributions are positive for the company's profits up to a point where these contributions become too much, thus having a negative impact on profits. This relation has been supported by other studies, like Gao et al. (2019) and Zou (2020). Beyond corporate giving, some studies have found a similar inverted U-curve for CSR and profits (Sun et al, 2019) and for environmental performance and profits (Trumpp and Guenther, 2017; Zhang et al, 2020).

Taking stock of that literature, we may assume that 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 propose going a step further by an experimental study that goes beyond aggregate results (i.e. the form of the curve for the whole market), looking at individualized information (i.e. how different generations of investors behave vis-à-vis different levels of corporate donations). Thus we can describe hypothesis 1 as: *For younger generations, the inverted U-curve between corporate donations and corporate value is more pronounced.*

We also study how investors react to another type CSR-related event. Instead of an event decided by the firm, as it is the case of a donation, we want now to explore events not chosen by the firm. For instance, Endrikat (2016) in a meta-analysis of event studies, founds a consistent relationship between comparable external CSR-related events and market reactions. These reactions happen both for positive and negative CSR-related events, while the impact would be higher for negative ones. With a similar focus on events, Amer (2018) measures the market penalization for companies that become "non-communicating" vis-à-vis the UN Global Compact, (i.e. companies that fail to provide a Communication on Progress report). Both studies

seem to support the idea of a market impact due to CSR-related events, being this impact higher for negative events.

For our simulation, we imagined a positive (negative) event, the inclusion (exclusion) of the company in a prestigious (and fictitious) CSR index. Consistent with our experimental design, we will collect data at the level of individual participants, which will allow us to make more detailed inferences about investors' perceptions and reactions. Thus we can describe hypothesis 2 as: *Younger generations, will comparatively react more positively (negatively) to an inclusion (exclusion) from a sustainability index.*

In conclusion, our study explores two issues: how investors perceive and react to a company-controlled CSR-event (e.g. corporate donations, which can be simulated at different levels) and non-controlled external CSR events (e.g. inclusion or exclusion from a sustainability index). For both issues, our experimental design allows to collect data at the level of individual participants, thus allowing for inferences about demographical characteristics of investors, most notably age.

METHODS

We prepared a simulation environment that replicates a trading day in a stock market. This simulation runs on SimTrade, a market simulation platform.

During the simulated trading day, participants have to make investment decisions regarding the stock of a fictitious company, named NutriFood. This company is French–firm 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 that we do not have a confounding factor. However, our results may not necessarily generalize to other industries.

The experiment was conducted with both students sitting in the classroom and online, as the school has been using a hybrid-teaching model at that time. The experiment is the last stage of an online learning module, which cover topics of financial market organization, evolution of

stock market prices, market efficiency and market expectations. Thus, participants share a common knowledge base 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 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 have an impact on the share price and the traded volume. Participants have a realistic simulation setting where they 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 as investors, that is how their portfolio increased compared to a "passive portfolio" used as a benchmark, that is, the results that would have happened with the initial portfolio. Second, their trading activity, which includes ending the simulation and the sending of at least one order to the market. Third, their taking part in a survey at the end of the simulation.

During the simulation, there are five events. First, there is a neutral event, an information not directly related to NutriFood, which consequently should not have an impact on its stock prize. As mentioned before, this "control event" is a best practice suggested by Lonardi et al (2018), which allows to check out the rationality of participants' decisions. The second event is the announcement of a corporate donation. This donation is expected, but participants ignore its size (higher or lower than expected). The third event is the announcement of profits. While there is a market consensus for NutriFood profits, participants ignore how much profits will be (higher or lower than expected). The fourth 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 or lower than expected). Finally, there is the announcement of the composition of the fictitious 100 Global Sustainability Index. There is an expectation that NutriFood will enter this index for the first time. In this case, the event is binary, either NutriFood enters the Index or not. The first possibility is positive, while not entering the Index is a neutral situation.

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 Lonardi et al. (2018) prescription of assigning different scenarios to participants in a random way and including a "control event" (the first one), a neutral an event unrelated to the firm. For the same reason, we also prepared two purely economic events, which would impact the firm while they are not directly related to CSR (i.e. announcement of profits and the publication of a macroeconomic indicator).

Besides, we refrain from explaining in detail the purpose of our research, and we just explain that we study how people make investment decisions. This 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 (Lonardi 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. 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).

In terms of external validity, two points are worth noting. First, this simulation (albeit with different scenarios) has been used frequently for training purposes in executive education, in many cases with professional investors. Thus, we can safely assume that the simulation represents the dynamics of trading stocks in a realistic way.

Second, experiment participants are students at different levels of a major metropolitan business school in Paris. This kind of population is appropriate for our study as these students' background is close to that of investment professionals (Lonardi 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 (investment professionals).

As we run this simulation during academic courses (instead of having students "hired"), participant students in each cohort share a similar background, thus potential confounding factors such as age and academic level are minimized inside of each cohort of students. Having said this, we run the simulation in several cohorts at different educational levels (bachelor, master and executive education). This variety of population allowed us to explore differences in age, work experience and academic background as a potential moderator for our results.

Comments for the 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).

ACKNOWLEDGMENT

We received valuable feedback from fruitful discussions with … This research benefited from the financial support of Ceressec.

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TABLES AND FIGURES

Table 1. Descriptive statistics RESULTS OF 20/08/2022

	Mean	Median	Standard deviation	Min	Max	Observations
Participant age	24.705	21.410	7.580	0.960	60.733	733
Market participation	0.262	0.00	0.440	0	1	733
Order direction	0.010	0.00	0.512	-1	1	191
Quantity of stocks	84.03	0.00	243.37	0	2,021	191
Order type	0.165	0.00	0.3371	0	1	191
Time lapse	1.032	1.083	0.561	0.000	1.916	191
Trading performance	-338.90	0.00	4,312	-86,781	11,927	733
Gender	0.448	0.00	0.497	0	1	693
Other control variables: gender, risk, overconfidence						

Note: This table gives the descriptive statistics (mean, median, standard deviation, minimum and maximum) for the observed variables of the experiment. The participants in the experiment were recruited among students enrolled in the core finance course in undergraduate and executive programs at a French business school. The *Participant age* is the age at the time of the experiment. 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 *Order type* dummy variable is equal to 0 for a limit order and to 1 for a market order. The *Time lapse* is the standardized time-difference between the announcement of the new CEO 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.

Table 2. Descriptive statistics for the control and treatment groups for the variants of the simulation. RESULTS OF 20/08/2022

	Pooled simulations and pooled participants	Donation amount								
		Low			Medium			High		
		Pooled participants	XY	Z	Pooled participants	XY	Z	Pooled participants	XY	Z
Participant age	24.705	24.770	36.980	21.420	24.411	34.410	21.329	24.950	36.390	21.440
	(7.580)	(8.124)	(10.596)	(1.232)	(6.950)	(7.946)	(1.871)	(7.721)	(8.814)	(1.261)
Market participation	0.261	0.264	0.479	0.205	0.277	0.459	0.222	0.243	0.355	0.205
	(0.439)	(0.442)	(0.504)	(0.405)	(0.448)	(0.502)	(0.416)	(0.429)	(0.482)	(0.407)
Order direction	0.010	-0.076	-0.229	-0.034	0.061	0.163	0.030	0.035	-0.016	0.052
	(0.512)	(0.509)	(0.660)	(0.453)	(0.524)	(0.662)	(0.476)	(0.492)	(0.601)	(0.454)
Quantity of stocks	84.03	91.95	112.40	86.34	77.45	109.60	67.54	83.78	91.12	81.53
	(243.03)	(290.39)	(236.92)	(303.78)	(195.07)	(186.19)	(197.13)	(243.25)	(185.02)	(258.90)
Order type	0.165	0.198	0.395	0.137	0.158	0.295	0.116	0.147	0.254	0.114
	(0.375)	(0.395)	(0.494)	(0.344)	(0.365)	(0.459)	(0.321)	(0.355)	(0.439)	(0.319)
Time lapse	1.032	1.072	1.003	1.116	1.038	1.110	0.992	0.987	0.912	1.027
	(0.561)	(0.555)	(0.673)	(0.553)	(0.536)	(0.551)	(0.527)	(0.600)	(0.663)	(0.568)
Trading performance	-338.90	-630.20	-2,285.00	-176.30	6.88	-671.10	+215.70	-437.00	-691.70	-358.70
	(4,312)	(6,417)	(12,630)	(2,913)	(3,181)	(5,175)	(2,217)	(2,686)	(3,449)	(2,409)
Gender	0.448	0.412	0.413	0.419	0.445	0.489	0.441	0.478	0.545	0.463
	(0.497)	(0.493)	(0.491)	(0.494)	(0.498)	(0.505)	(0.497)	(0.500)	(0.503)	(0.499)
Observations	733	223	48	175	259	61	198	251	59	192

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 simulation (low, medium, and high levels of corporate donation). 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 *Order type* dummy variable is equal to 0 for a limit order and to 1 for a market 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.

Table 3. Regression results for the participants' trading reactions following the announcement of the corporate donation TO BE UPDATED

	Dependent variable: participants' trading reactions			
	Trading activity		Trading intensity	
	(1)	(2)	(3)	(4)
Intercept	0.241 (0.403)	0.578 (0.817)	2.642 (20.406)	-14.075 (39.240)
Donation amount	-0.860 (0.618)	-0.862 (0.621)	-47.367 (26.679)	-49.737 (29.822)
Donation amount^2	<0	-(x-alpha)2		
Participant generation		-0.608 (0.527)	-24.957 (26.531)	-26.836 (26.627)
Donation amount × Participant generation		1.711** (0.828)	78.123* (39.808)	80.472** (40.032)
Donation amount^2 × Participant generation				
Trading performance		$5.89 \cdot 10^{-6}$ $(1.96 \cdot 10^{-5})$		$1.02 \cdot 10^{-3}$ $(1.08 \cdot 10^{-3})$
Participant gender		-0.027 (0.063)		2.210 (2.996)
Pseudo R^2/R^2	0.14	0.15	0.03	0.05
Observations	126	126	126	126

Note: This table presents the regression results for the trading reactions of participants (XY/Z generations) following the announcement of the corporate donation in the trading simulations. The models in columns (1) and (3) present the results without control variables. The models in columns (2) and (4) present the results with control variables (*Trading performance* and *Participant gender*). Standard errors are given in parentheses below the coefficient estimates (following convention, ** represents a significant result at the 5% level, and * represents a significant result at the 10% level). Our dependent variable has two components: trading activity, which captures the qualitative aspect of the trading reaction, and trading intensity, which captures the quantitative aspect of the trading reaction. Trading activity is modeled with a multinomial logistic regression (we display the pairwise comparison between the buy order and the sell order—the base case of the model specification). Trading intensity is modeled using a linear regression.