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CSR disclosures in buyer-seller markets: The impact of assurance of CSR disclosures and incentives for CSR investments

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ABSTRACT

This study examines how buyers and sellers react to CSR disclosures in competitive experimental markets. We examine the impact of two important policy interventions: whether assurance of CSR disclosures is present or not and whether sellers receive incentives to invest in CSR. Sellers, as preparers of the disclosures, reveal their levels of CSR investments (proxied by corporate giving), in addition to setting selling prices. These disclosures can be inaccurate. Buyers, as users of the disclosures, choose to do business with a seller and might do so for reasons beyond established prices (e.g., buy from sellers that invest more in CSR). The results of our market experiment show that assurance leads sellers to more accurately disclose their CSR investments. We further predict and find that the assurance of CSR disclosures affects economic outcomes (i.e., CSR investments and prices paid) in particular when sellers receive incentives to invest in CSR compared to when incentives are absent, because incentives can raise expectations among market participants that CSR is important. Results of an additional M-Turk experiment provide corroborating evidence that the use of sustainability incentives does raise social expectations among market participants with regard to CSR investments. We add new insights to the literature on economic effects of CSR reporting and the partner selection literature by showing when and how policy interventions can increase the impact of CSR disclosures.

1. Introduction

We study the effects of corporate social responsibility (CSR) disclosures on the behavior of participants in a competitive market. While voluntary CSR engagement and reporting strongly increased over the past decades, these practices are becoming more important than ever for market participants. Specifically, due to growing stakeholder demands and stronger CSR regulation, an increasing number of companies will have to report on CSR. For example, in March 2022, the SEC proposed a new rule regarding the enhancement and standardization of climate-related disclosures (SEC, 2022) and the European Parliament and Council issued a new directive on corporate sustainability reporting in December 2022 (European Parliament and Council, 2022).

Also many governments now use financial benefits to stimulate companies to invest in CSR (Bénabou & Tirole, 2010).[1] Companies that receive them do not bear the full cost of these investments. For example, the use of tax incentives constitutes a society-wide investment in CSR with the governing tax authorities sorting who pays what portion of the investment. Governments use CSR incentives to establish ethical norms, make the economy more green, stimulate CSR compliance, and increase international competitiveness of their domestic companies (Dentchev, Van Balen, & Haezendonck, 2015; Knudsen & Brown, 2015). However, the question as to whether such incentives are effective in motivating preparers to invest in CSR is up for debate as companies may engage in greenwashing,[2] which gives rise to calls for monitoring via assurance.

Misrepresentation of key assertions and greenwashing with regard to

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[1] For example, companies in the US receive tax deductions when donating cash or inventory to qualifying charities (Arya & Mittendorf, 2015; IRC §170).

[2] With greenwashing, we refer to companies' strategic and opportunistic disclosures of CSR information to present themselves as more responsible than they truly are (Bénabou & Tirole, 2010; Neu et al., 1998). This feature is captured in our experimental market. Examples of greenwashing include companies only disclosing positive CSR information but no negative news or companies misrepresenting CSR information (Lyon & Maxwell, 2011).

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CSR still frequently occurs (Bénabou & Tirole, 2010; Cho, Guidry, Hageman, & Patten, 2012; Cho, Laine, Roberts, & Rodrigue, 2015; Lane, 2016; Laufer, 2003; Lyon & Maxwell, 2011; Nyilasy, Gangadharbatla, & Paladino, 2014; Pinnuck, Ranasinghe, Soderstrom, & Zhou, 2020). Scandals, such as Volkswagen's manipulation of emission results of its cars, show that misrepresentations of CSR can entail drastic economic consequences for the companies involved (Lane, 2016). Research has not yet examined whether CSR can survive in competitive markets where CSR disclosures can be inaccurate.[3] The occurrence of frequent inaccurate disclosures of CSR has resulted in strong calls for enhanced credibility of CSR disclosures (Pinnuck et al., 2020). Companies increasingly provide assurance of their CSR disclosures (Dhaliwal, Li, Tsang, & Yang, 2011; Moroney & Trotman, 2016; O'Dwyer, 2011; Pflugrath, Roebuck, & Simnett, 2011; Simnett, 2014). However, research remains silent on when such assurance matters to market participants.

We therefore examine how the assurance of CSR disclosures and the provision of CSR incentives affect whether preparers of CSR disclosures are more likely to invest in CSR and whether they more accurately disclose investments. We also examine under which circumstances users of such disclosures ascribe value to CSR (by the prices they pay). Because studying the level of CSR investments, the accuracy of CSR disclosures, and resulting market behavior is difficult when using archival data, we use an experimental market approach. In buyer-seller markets, sellers, as preparers of the disclosure, invest in corporate giving (our proxy for CSR investments). Yet, sellers can make inaccurate disclosures by overstating their actual investments. Sellers also set a price for the product they offer. Buyers, as users of CSR disclosures, select their sellers based on selling prices and the CSR disclosures.

We develop theory to argue that assurance of CSR disclosures, relative to no assurance, can lead to higher CSR investments and higher prices paid when preparers of disclosures also receive incentives to invest in CSR. Recent studies have shown that assurance can enhance the credibility of CSR disclosures (Brown-Liburd & Zamora, 2015; Casey & Grenier, 2015; Cheng, Green, & Ko, 2015; Coram, Monroe, & Woodcliff, 2009; Dando & Swift, 2003; Moroney, Windsor, & Aw, 2012). Without assurance, we expect preparers to invest little in CSR and to significantly overstate their investments in disclosures (i.e., cheap talk). However, while assurance can enhance the credibility of disclosures, we argue that assurance is likely not sufficient for preparers to invest in CSR or for users to react to CSR disclosures. Based on recent insights of behavioral economics that buyers ascribe value to CSR and that incentives can crowd in social expectations in markets (Andreoni, Payne, & Smith, 2014; Borgonovi, 2006; Frey, 2012; Schokkaert, 2006; Vesterlund, 2003), we predict an ordinal interaction, suggesting that assurance of CSR reports will have a larger effect on market outcomes when markets also offer incentives.

While assurance can help preparers to credibly reveal their investments in CSR to users, absent any incentives, preparers of CSR disclosures may remain pessimistic about other preparers investing in CSR. Preparers may, as a result of assurance, not increase their actual investments because they still anticipate strong price competition. With incentives, preparers may, because of social expectations, anticipate that other preparers also invest more in CSR and quote higher prices (as they suspect users to value credible CSR), such that assurance of CSR reports relative to no assurance has a larger impact on actual investments. Given that incentives also create social expectations among users, users will accept higher prices when disclosures are assured compared to when they are not assured. Overall, we predict an ordinal interaction where we expect assurance to have more impact on investment levels (H1) and prices paid (H2) when markets offer incentives.

We test our predictions using a 2×2 laboratory market experiment with 192 participants. Our experimental markets consist of four sellers and four buyers. In each of the 16 periods, sellers offer a standard product, propose a price, and decide how much of their profit they want to invest in CSR (i.e., corporate giving). We also introduce a reporting feature, where sellers can misrepresent their CSR investments. Using information on prices and CSR disclosures, buyers each period choose whether they want to buy a product and, if so, from which seller. Between subjects we manipulate the presence/absence of (1) assurance (i.e., the donation amounts in the sellers' CSR report are subject to an audit where outcomes of the audit are publicly revealed to the market) and (2) incentives (i.e., whether sellers receive a tax deduction for their CSR investments).

Our results support our predictions. Sellers more accurately disclose their levels of CSR investments when CSR reports are assured. Without assurance, cheap talk dominates, as many sellers misrepresent their CSR investments. Findings further show that CSR investments by sellers increase when assurance is present compared to when it is absent, in particular when markets provide tax deductions as incentives for CSR investments (H1). We also show a similar ordinal pattern for buyers (H2) who pay higher prices as a result of assurance when markets offer incentives. Absent incentives, the effect of assurance is weaker. Results of an additional M-Turk experiment confirm that the presence of sustainability incentives indeed raises social expectations with regard to CSR investments among market participants. As our main experiment shows, these social expectations make assurance more valuable in markets that offer incentives to preparers. Another insight we gain from our results is that, when taking the government perspective, assurance can help to fully realize the potential of incentives provision. When CSR incentives are increasingly being provided by governments in market settings, it is important to know that on their own, they might only have limited results. While CSR incentives can help to create social expectations that CSR investments are important, assurance is needed to credibly disclose CSR investments and to convince users of the company's underlying CSR behaviors.

Additional analyses in markets that offer incentives show that buyers react more strongly to CSR disclosures when assurance is present. Analyses on seller selection further suggest a wider selection on CSR as buyers more often select sellers who make higher CSR disclosures, relative to the prices they ask, when both incentives and assurance are present. In sum, buyers ascribe value to CSR and CSR disclosures produce stronger market effects on seller selection when disclosures are assured, but to do so, markets should also offer incentives to preparers. Absent incentives, price competition prevails, and assurance of CSR disclosures has little effect on market outcomes.

This paper contributes to the CSR reporting literature in several important ways. We extend the literature by examining the joint impact of assurance and incentives in competitive markets where preparers can make inaccurate disclosures. Our results are informative for policy changes aimed at preparers, including mandatory assurance or providing incentives to invest in CSR. In doing so, we contribute to recent debates on when CSR affects economic outcomes (Bartling, Weber, & Yao, 2015; Christensen, Floyd, Liu, & Maffett, 2017; Falk & Szech, 2013; Kitzmueller & Shimshack, 2012; Martin & Moser, 2016). Specifically, we show that assurance increases CSR investments by preparers and that buyers pay higher prices when markets offer incentives to the preparers. Assurance of CSR has little impact on economic outcomes when incentives are absent.

Second, we also add to the supply chain literature (Govindan, Rajendran, Sarkis, & Murugesan, 2015) by providing evidence on the extent to which users act on CSR disclosures to do business with their sellers. Our results, showing that incentives lead to higher CSR

[3] It is important to examine when CSR investments are higher as many studies show a positive relationship between CSR and firm value (Albuquerque et al., 2019; Buchanan et al., 2018; Busch & Friede, 2018; Lins et al., 2017). While some authors consider CSR as a waste of corporate resources and thus an agency problem (Cheng, Hong, & Shue, 2013; Masulis & Reza, 2015), other studies argue that well-governed firms actually invest more in CSR and benefit from it (Albuquerque et al., 2019; Ferrell, Liang, & Renneboog, 2016).

investments, particularly when CSR disclosures are assured, inform the debate on when incentives can help to stimulate CSR efforts or move markets and their producers towards more CSR (Owen, 1990).

Third, we add insights to the extant literature into the value of assurance of CSR disclosures (Beyer & Guttman, 2012; Dando & Swift, 2003; Pflugrath et al., 2011; Trotman & Trotman, 2015) and how such assurance can reduce greenwashing (Bénabou & Tirole, 2010; Neu, Warsame, & Pedwell, 1998). Our results indicate that assurance can indeed enhance credibility and reduce greenwashing by making CSR disclosures more accurate, provided that preparers of CSR disclosures receive sufficient incentives to invest in the first place.

Finally, in contrast to prior research that suggests that CSR incentives may crowd out individuals' motivation to invest in CSR (Ariely, Bracha, & Meier, 2009; Bénabou & Tirole, 2006; Kitzmueller, 2008), we offer new evidence on the so-called "crowding in" hypothesis in buyer-seller markets (Borgonovi, 2006; Eckel, Grossman, & Johnston, 2005; Frey, 2012; Heutel, 2014; Schokkaert, 2006; Vesterlund, 2003). We find that, in competitive markets, offering financial tax incentives for sellers to invest in CSR may create expectations in the market that sellers will invest in CSR. Yet, for users to ascribe value to the CSR, policymakers should consider both incentives and verification mechanisms. From a government perspective, we thus highlight that the provision of assurance by a third party can, in effect, unlock the "ability" of incentives for companies to invest in CSR and for companies to be rewarded for their CSR efforts by users of the disclosure.

2. Literature review and hypothesis development

2.1. CSR in buyer-seller markets

Assuming that people value CSR investments (Barone, Miyazaki, & Taylor, 2000; Bartling et al., 2015; Bhattacharya & Sen, 2004; Brown & Dacin, 1997; Mohr, Webb, & Harris, 2001), CSR can render important benefits (Clarkson, Li, & Richardson, 2004; Dhaliwal et al., 2011; Elliott, Jackson, Peecher, & White, 2014). Martin and Moser (2016) show that managers anticipate users of CSR disclosures to have preferences for green investments with societal benefits. Managers therefore tend to highlight these societal benefits in their CSR disclosures, rather than disclosing the cost for the company. Balakrishnan, Sprinkle, and Williamson (2011) also show that employees expend more effort when companies engage in corporate giving. According to Lys, Naughton, and Wang (2015), CSR reporting can serve as a signaling device. Consistent with this idea, the supply chain and marketing literature argues that CSR may be helpful for partner selection (Govindan et al., 2015; Porter & Kramer, 2006) and that sellers can benefit from investing in CSR when buyers have a clear interest in it (Barone et al., 2000; Bhattacharya & Sen, 2004; Brown & Dacin, 1997; Elfenbein, Fisman, & McManus, 2012; Mohr et al., 2001). Archival evidence also shows a positive relation between CSR engagement and firm value, suggesting that investors value CSR efforts by firms (Albuquerque, Koskinen, & Zhang, 2019; Buchanan, Cao, & Chen, 2018; Busch & Friede, 2018; Lins, Servaes, & Tamayo, 2017)

However, greenwashing frequently occurs, significantly distorting companies' disclosures on CSR (Bénabou & Tirole, 2010; Lane, 2016; Laufer, 2003; Lyon & Maxwell, 2011; Nyilasy et al., 2014; Pinnuck et al., 2020). When misreporting is possible, it is not clear how certain policy interventions, such as the assurance of CSR reporting or provision of CSR incentives, affect market outcomes. Prior studies in this area do not feature this disclosure context, as they always operate in market contexts where CSR information is, by definition, accurate. These studies also disagree as to whether CSR behavior may actually persist in competitive markets. Some studies argue that the presence of market competitors may erode individual ethical concerns (Brandts, Riedl, & Van Winden, 2009; Roth, Prasnikar, Okuno-Fujiwara, & Zamir, 1991; Shleifer, 2004). Falk and Szech (2013), for example, show that people in competitive markets lower their own individual moral standards, compared to when they do not act in a market context. Bartling et al. (2015), however, offer experimental evidence indicating that CSR behavior is positively rewarded in markets that do not allow for misreporting. They show that when sellers invest in high-cost products with fewer negative environmental externalities, consumers tend to value the CSR efforts of the sellers.

Consequently, we offer new insights by examining under which policy interventions CSR investments are more likely to be made and valued in market settings with a disclosure feature where sellers, as preparers, can exaggerate their CSR efforts in their CSR disclosures.

2.2. Assurance of CSR disclosures

While CSR disclosures are important for communicating CSR efforts, they are often strategic, incomplete, and opaque and may be subject to cheap talk (Ackers & Eccles, 2015; Dubbink, Graafland, & Van Liedekerke, 2008; Hess, 2007; Lane, 2016; Laufer, 2003; Lyon & Maxwell, 2011; Nyilasy et al., 2014; Pinnuck et al., 2020). This has led some of the companies that engage in CSR to invest in voluntary assurance of their CSR disclosures by hiring professional accountants or sustainability consultants (Hodge, Subramaniam, & Stewart, 2009; Pflugrath et al., 2011).[4] Correlates of companies' propensity to invest in assurance are corporate visibility and the size of the company's "social footprint" as well as stakeholder orientation (Simnett, Vanstraelen, & Chua, 2009). Further, while some countries already mandate assurance of CSR reporting for listed companies, other governments explore the possibility of mandatory audits (Ackers & Eccles, 2015; Barth, Cahan, Chen, & Venter, 2017; Trotman & Trotman, 2015). For example, the SEC proposes mandatory assurance of greenhouse gas emissions disclosed by the largest companies (SEC, 2022).

Research on the value of assurance shows that assurance can make CSR disclosures more credible (Dando & Swift, 2003; Moroney & Trotman, 2016; Pflugrath et al., 2011). Casey and Grenier (2015) show that assurance can lower the cost of equity capital and lower analyst forecast errors in industries that demand more voluntary assurance. Experimental research also shows that assurance of CSR disclosures can affect users' judgments, because it increases stock price valuation estimates and leads to greater willingness to invest (Brown-Liburd & Zamora, 2015; Cheng et al., 2015; Coram et al., 2009; Pflugrath et al., 2011; Reimsbach, Hahn, & Gürtürk, 2018).

Prior research, however, has not examined how buyers and sellers react to assurance in a market context where preparers can misrepresent their CSR investments. Specifically, we compare a market with mandatory assurance to one without assurance. When assurance is present, CSR disclosures are assured via an audit and outcomes of the audits are publicly disclosed. Without assurance, preparers of CSR reports may, without reputational damage, use favorable disclosures to foster the belief that they invest in CSR without actually doing so. When markets offer assurance of CSR reporting, we predict a reduction in cheap talk because inaccurate CSR disclosures by preparers are more likely to be detected and revealed to the market. Because assurance reduces cheap talk, honest preparers of CSR disclosures can better communicate their genuine CSR investments to their potential trading partners. In line with prior work arguing that assurance of CSR reports offers greater credibility (e.g., Dando & Swift, 2003; Pflugrath et al., 2011), our baseline prediction is that preparers will make more accurate disclosures of their CSR investments in markets that provide assurance, compared to markets without assurance. Next, we develop theory on

[4] Common standards for assurance of CSR disclosures are the International Standard on Assurance Engagement (ISAE) 3000, "Assurance Engagements Other Than Audits or Reviews of Historical Financial Information," and ISAE 3410, "Assurance Engagements on Greenhouse Gas Statements," both set by the International Auditing and Assurance Standards Board, and AA1000AS, set by AccountAbility (Pflugrath et al., 2011; Simnett, 2014).

how this enhanced credibility through assurance will affect preparers' CSR investments in market settings.

2.3. Effect of assurance on CSR investments when markets offer (do not offer) CSR incentives

Assuming preparers will anticipate positive reactions by users to disclosed CSR investments (Martin & Moser, 2016), we develop theory that investment levels can rise when markets provide assurance. Without assurance, cheap talk is possible. Specifically, preparers can disclose high amounts of CSR without actually investing in CSR. Such actions do not directly damage their reputation. Consequently, without assurance, CSR investments in markets will be relatively low and users in turn will likely not be persuaded by high CSR disclosures. With assurance, in contrast, preparers run reputation risk and thus are stimulated to disclose their CSR investments more accurately. We, however, argue that assurance will not always lead to higher CSR investment levels. We predict the effect of assurance of CSR disclosures on CSR investments to be larger when CSR incentives are present than when CSR incentives are absent in the market.

Governments and tax authorities often provide incentives by subsidizing CSR investments or encouraging companies to engage in philanthropy (Barnea, Heinkel, & Kraus, 2013). Specifically, companies receiving these incentives do not bear the total cost of the investments themselves, but incentives entail a society-wide investment in CSR with the governing tax authorities sorting who pays what portion of the investment. As an example, US companies receive tax deductions when they donate cash or non-cash items (e.g., inventory) to qualifying charitable organizations (Arya & Mittendorf, 2015; IRC §170). Reasons for governments to intervene are to develop ethical norms and stimulate compliance (Dentchev et al., 2015). Further, Knudsen and Brown (2015) further show that governments use CSR incentives to enhance the international competitiveness of domestic companies. The literature shows that interventions are desirable to stimulate companies to invest because the alternative, whereby companies adopt CSR practices merely on a voluntary basis, is not always effective (González & Martinez, 2004).

However, debate exists over the effectiveness of these incentives. To the extent that they make CSR more attractive, companies may be less able to use CSR to build a reputation (Bénabou & Tirole, 2006). At the same time, some studies also highlight the existence of crowding-in effects (Andreoni et al., 2014; Borgonovi, 2006; Eckel et al., 2005; Frey, 2012; Heutel, 2014; Vesterlund, 2003). By incentivizing CSR, governments signal to the market that CSR investments are desirable (Schokkaert, 2006). Social expectations may then arise among market participants and preparers may anticipate more investments by their competitors. Preparers may respond to these expectations by increasing their CSR investments. Given these social expectations, assurance may have a stronger effect on CSR investments when markets offer incentives than when incentives are absent.

In markets without incentives, preparers have the possibility to disclose their investments in a more accurate way as a result of assurance and use it as a signaling device to buyers. Yet, in the absence of incentives, preparers might be pessimistic as they may expect that others—because of the lack of sufficient incentives—will be less likely to invest in CSR and thus will operate more selfishly (Camerer, 2003; Fehr & Schmidt, 1999). Then, preparers may be reluctant to increase their actual investments, even in the presence of assurance, as others would likely not do so either. Hence, preparers likely focus again on prices as they expect others to do the same. Higher CSR investments as a result of assurance will not sufficiently arise and price competition may prevail.

When incentives are present, preparers may form expectations that other preparers will also invest in CSR. At the same time, assurance of CSR disclosures offers preparers the opportunity to use these disclosures as a device to attract buyers. That is, sellers expect other preparers to also raise their levels of CSR investments, which now can be credibly revealed because of assurance. We also expect these higher CSR investment levels to be more persistent given that the presence of incentives as a government policy can further create similar social expectations among users that CSR investments are important. These users will now view disclosures of CSR investments in these markets as more credible because of assurance. In sum, because of social expectations, preparers will raise their investment levels when assurance is present.

Accordingly, in Hypothesis 1, we predict an ordinal interaction: Without assurance, we do not expect high CSR investments as people can engage in cheap talk without investing in CSR. When incentives are absent, we expect assurance to have a limited effect on increasing CSR investments. Assurance can, however, strongly increase CSR investments when markets offer incentives because incentives create social expectations of CSR investments.

Hypothesis 1. Relative to no assurance, assurance of CSR disclosures can increase preparers' CSR investments when markets offer incentives to preparers, but assurance will have limited effect on CSR investments by prepares when incentives are absent.

2.4. Effect of assurance on prices paid when markets offer (do not offer) CSR incentives

Users sourcing an identical product may not pay more to a company that invests more in CSR as compared to a company that invests less in CSR. Yet, there are reasons to believe that users, next to prices, also care about the CSR impact of products (Martin & Moser, 2016). Elliott, Fanning, and Peecher (2020), for example, show that investors attach value to cooperative behavior of companies. They show that companies' credible use of higher financial reporting quality can signal more cooperative behavior to investors, which in turn affects investors' willingness to pay. In a similar vein, companies' credible CSR investments may also signal cooperative behavior to a large set of stakeholders. Buyers might ascribe value to such actions that benefit society (Elliott et al., 2020), which may be, in turn, reflected in the prices paid. Also here, we expect assurance to matter.

When assurance is absent, it is hard to ascribe value to the disclosures of preparers, as users may suspect low investments because of cheap talk, even though preparers disclose high amounts of CSR in the hope to attract buyers valuing CSR. Because disclosures lack credibility without assurance (regardless of whether incentives are present), buyers will not pay higher prices for preparers that disclose high levels of CSR. When disclosures are assured, buyers can better assess what preparers actually invest in CSR. Yet, we also predict that the effect of assurance on prices paid is higher when markets offer incentives, compared to when such incentives are absent.

While assurance can increase prices paid, we expect the effect to be limited when incentives are absent. Without incentives, preparers might be pessimistic about other preparers investing in CSR, such that overall investments are low, even though buyers can better asses the credibility of these investments. As such, price competition might still prevail. That is, many preparers may not invest in CSR and ask low prices, resulting into low prices being paid by users. When assurance is present (relative to absent) in markets that offer incentives, preparers will invest more in CSR because of the social expectations such incentives create. As a result of higher CSR investments, preparers will ask higher prices for their products as these now might be perceived as having higher value by buyers. Specifically, we expect users to ascribe value to CSR disclosures

when assurance is present. Assurance makes disclosures more credible and incentives create social expectations among users that CSR investments are important. As such, users will accept higher prices set by preparers who invest in CSR (Bauernschuster, Falck, & Grosse, 2013; Settle & Golden, 1974). In H2, we thus predict a similar ordinal pattern for users of the CSR reports.[5]

Hypothesis 2. Relative to no assurance, assurance of CSR disclosures will lead users to pay higher prices when markets offer incentives to preparers, but assurance will have limited effect on prices paid by users when incentives are absent.

Another way to look at our ordinal patterns for H1/H2 is from the perspective of the incentive provider. We expect that absent any assurance, incentive provision will create social expectations among market participants that CSR investments are important, but because of lack of credibility, such incentive provision will not be as effective as intended as preparers can still disclose high amounts of CSR without actually investing in it. When assurance is present, disclosures become more credible, which may unlock the full potential of incentives. This would mean that the effectiveness of incentive provision will be enhanced when markets provide assurance. Our results will also explore simple effects from this angle.

3. Experimental design

3.1. Participants

For our theoretical constructs, "preparers" and "users," we refer to sellers and buyers in the actual experiment. We conducted the experiment in a PC lab using z-Tree software (Fischbacher, 2007). We use a 2 × 2 between-markets design where we manipulate assurance of sellers' CSR disclosures (with *Assurance* and *No Assurance* conditions) and incentives for CSR (with *Incentives* and *No Incentives* conditions). The research instrument can be accessed through Appendix A. Participants were randomly assigned to one of the four conditions across sessions.[6] In total, 192 business students from a Western European university participated. Participants' average age was 21 years and nine months, and 43.75 percent of them were female. On average, they had 10.5 months of part-time work experience. Participants indicated on a seven-point Likert scale their appreciation for the Red Cross (mean = 5.59) and their agreement with the item "In reality, I regularly donate to charity" (mean = 3.85).[7] ANOVAs of *Assurance* and *Incentives* show that most of the above variables do not significantly differ across conditions.[8]

3.2. Experimental task and procedures

Upon entering the PC laboratory, participants were randomly assigned to the role of buyer or seller in the market and kept their roles throughout the entire experiment. A market always consists of four buyers and four sellers. The computer screens offered detailed instructions about the experimental task and how payoffs for sellers and buyers were calculated. Participants also received the same set of instructions in a handout, so they could always refer to them. To ensure that instructions were clear, participants received a stall quiz, where a notification appeared when an answer was incorrect. Participants could only move forward when they gave a correct answer.

The experiment lasted 16 periods. The number of periods was known by all participants. Each period went as follows. In each market, sellers had to sell an identical product A. This product was described as an item having medical applications. First, sellers had to set a price for the product. Sellers also had a chance to donate part of their profit to charity by indicating how much they were planning to donate per product in each round. The instructions further describe that sellers must include a CSR disclosure that would be shown to the buyers.

Consistent with prior studies (Balakrishnan et al., 2011; Barone et al., 2000; Bhattacharya & Sen, 2004; Brown & Dacin, 1997; Martin & Moser, 2016; Mohr et al., 2001), and for reasons of experimental control, we use corporate giving as our proxy for CSR investment to introduce a utility for CSR among market participants. While corporate giving is only one possible CSR practice, participants clearly can relate to this and understand that it is a costly way for companies to assume social responsibility. The charity we used was the Red Cross.[9] All participants knew that their actual donations in the experiment would be converted and donated to the Red Cross, according to the exchange rate. One point earned in the experiment equals €0.025. We use the same exchange rate for buyers' and sellers' profits. The selling price could range between 1 and 40 points, and the donation could vary between 0 and 15 points per product sold, which we deducted from the sellers' profits (Gneezy, Gneezy, Nelson, & Brown, 2010).

Sellers committed to how much they planned to donate before transactions took place. Crucial for our theory is that sellers prepare CSR disclosures and buyers can use these disclosures to select sellers. The reporting feature allowed sellers to disclose an amount that deviated from the amount that they plan to donate. Sellers may thus present themselves as being more CSR oriented than they truly were (Bénabou & Tirole, 2010).[10] Buyers then received sellers' prices and CSR disclosures for that period. Buyers subsequently choose one seller from which they

[5] Tension exists with regard to both hypotheses. While users in general ascribe value to higher financial reporting quality (Elliott et al., 2020), the extent to which users ascribe value to CSR can vary considerably (given that some investments may come at the expense of firm profit). Therefore, if incentives can boost expectations among market participants that CSR investments are important, we expect assurance to have more value in markets where incentives are present (H1 and H2). If incentives are absent, people may be pessimistic about investment levels, such that assurance of CSR has limited value. While incentives may crowd out some motivation to invest in CSR at the level of the individual, prior work has documented crowding-in effects of using incentives in market settings (Andreoni et al., 2014; Borgonovi, 2006; Eckel et al., 2005; Frey, 2012; Heutel, 2014; Vesterlund, 2003).

[6] This experimental study is part of a research project funded by the host institution (project number OT/13/016). A detailed description of the method was part of the research proposal and reviewed by the host institution.

[7] Our subsequent analyses do not change when we control for these two variables. More specifically, contrast analyses testing the ordinal interaction that control for participants' appreciation for the Red Cross show that our results for H1 (gross donations) and H2 (prices paid) do not change ($F_{(1, 92)} = 11.73$, $p = 0.001$; $F_{(1, 92)} = 6.37$, $p = 0.013$). Controlling for participants' agreement with whether they often donate to charity lead to similar results with regard to donations made and prices paid, respectively ($F_{(1, 92)} = 20.58$, $p < 0.001$; $F_{(1, 92)} = 10.78$, $p = 0.002$).

[8] The following variables are exceptions. Participants in the role of buyers differ slightly in age across the main factor *Assurance* ($F = 3.715$, $p = 0.057$). For sellers, the *Assurance* condition contains more females, relative to the *No Assurance* condition ($F = 5.281$, $p = 0.024$). Results do not change significantly when we control for these variables.

[9] In reality, companies often select charities that relate to the product they sell. Given that we describe the product as having medical applications, the Red Cross was an appropriate choice. The Red Cross is also well-known and has a good reputation. As described earlier, participants' appreciation for the Red Cross is relatively high, and randomization of participants across conditions succeeded regarding their valuation of the Red Cross and their charitable giving.

[10] To make biased CSR disclosures salient enough to our participants, we focus on deliberate inaccurate reporting. However, other subtler forms of inaccurate disclosures exist. For example, metrics used to measure CSR performance may lack accuracy, which may result in unintentional biased reporting (Pinnuck et al., 2020).

wanted to buy product A. A seller could be selected by more than one buyer.[11] To promote reputation formation in markets, both sellers and buyers saw an overview of past transactions,[12] including sellers' prices, amounts reported in the CSR reports, and how many buyers had selected them (Basu, Dickhaut, Hecht, Towry, & Waymire, 2009). After making a choice for a seller or a choice not to buy, buyers indicated their satisfaction with their choice on a scale from one to 10. At the end of each period, each seller received feedback on how many buyers they attracted and how much they earned. Buyers, also received feedback on their individual payoffs and on how many other buyers selected the same seller. After the last period, participants filled out a post-experimental questionnaire containing manipulation checks and items related to demographics, personal characteristics, and decisions made in the experiment. Appendix A summarizes our experimental procedures.

3.3. Between-markets manipulations and main dependent variables

In the *No Assurance* condition, audits did not take place. In the *Assurance* condition, there was a 75 percent chance that an audit of the sellers' disclosures for the given period would take place.[13] This detection chance was known to both sellers and buyers. The *Assurance* condition proxies for a mandatory CSR assurance environment. Because we are mainly interested in comparing the absence and presence of assurance, we did not model an explicit audit cost in the *Assurance* condition. Yet significant reputational concerns are present, because the outcome of the audit is publicly revealed in the market. The audit report revealed whether the CSR disclosure was correct, what the disclosed amount was and what the seller was actually planning to donate (Appendix B, Panel A). Specifically, the external auditor judged the CSR disclosure to be correct when the reported amount was equal to the actual amount sellers planned to donate to the Red Cross. In the case of deviation from the true amount, the auditor deemed the disclosure to be incorrect.

If an audit had occurred, buyers learned the outcome for the seller of their choice only after the transactions had taken place. Prior to transactions, buyers thus did not know whether the information on corporate giving was correct or whether an audit would happen. This design choice allows us to examine the effect of the presence of assurance as a regulatory practice on market behavior, independent of the outcome of the audit. We did not use an explicit manipulation check to assess whether participants in the *Assurance* condition realized that there was a 75% chance of an audit in each period. The reason is that once an audit had taken place, the results of the audit were very prominently displayed during the experiment. In each period, participants received an overview of all past experimental periods, which included the results of the audits in the *Assurance* condition (Appendix B, Panel B). Given these overviews, the possibility and occurrence of audits should not have gone unattended to participants. Furthermore, as our results show (e.g., Fig. 2), we already observe differences among conditions in the early periods, which indicates that the possibility and presence of audits was already clear to participants early on in the experiment.

In the *No Incentives* condition, sellers did not receive incentives for donations to charity. In the *Incentives* condition, the incentive for sellers to donate to charity was that 50 percent of the donated amount would be paid back to them at the end of each period in the form of a tax return. Consequently, when sellers are selected, they bear 50 percent of the donated amount themselves.[14] Further, buyers were aware that sellers would receive incentives for making donations to charity and that these corresponded to 50 percent of the donated amount. Given that buyers only are able to observe disclosed amounts (which may deviate from the donated amounts per product sold), buyers can only assess the level of incentives with certainty in the *Assurance-Incentives* condition, for the periods in which audits have taken place.

Given that people often focus on the total amount of their donations (Davis, Millner, & Reilly, 2005; Eckel & Grossman, 2003; Gneezy & Rustichini, 2000) and because we are interested in how total CSR investments differ across conditions, we measure and analyze sellers' donations as the total (gross) investment value. We acknowledge that the cost of investments is not completely borne by sellers when incentives are present, but even then, investments entail a society-wide investment with tax authorities sorting who pays what proportion. Thus, our main dependent variables in the analyses below are gross donations made and prices paid by buyers. Prices could range between 1 and 40 points. Gross donations is measured as the actual amount sellers have donated in the given period. Sellers had to commit to whether and how much they were planning to donate per product before transactions happened. This amount ranged between 0 and 15 points. Price paid by buyers is equal to the average price that buyers pay for the purchase of product A from the chosen seller.

3.4. Payoff structure and actual earnings

All participants received 80 points at the start of the experiment. The profits realized in the 16 subsequent periods were added to these 80 points to calculate the final payoffs of both sellers and buyers (Brown, Falk, & Fehr, 2004). We calculate the payoff for sellers in the *No Incentives* condition as follows. In each period, the amount sellers were planning to donate to the Red Cross per product sold was subtracted from the price they asked for product A (Gneezy et al., 2010). When sellers did not sell a product, their profit was zero for that period. When more than one buyer bought a product from a seller, the difference between the price and the amount for donation was multiplied by the number of buyers. Product A had an intrinsic value of 40 points for every buyer. Buyers' payoff equaled 40 points minus the price paid for product

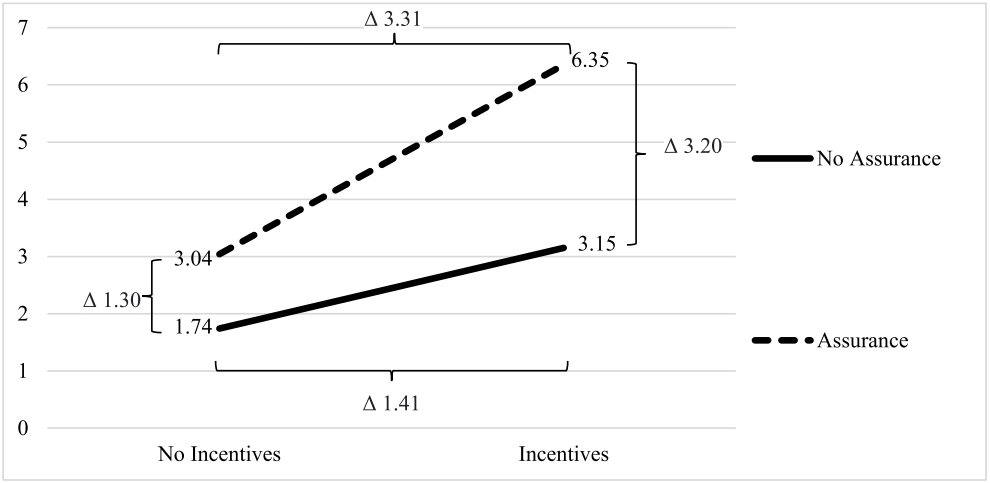
[11] A decision not to buy was made a total of seven times: three times in the *No Assurance–No Incentives* condition, two times in the *Assurance–Incentives* condition, and once in each of the other two conditions.

[12] This is an important design feature because reputational considerations are important determinants of choices made by market participants (Dwyer, Schurr, & Oh, 1987; Fombrun & Shanley, 1990; Wilson, 1985). Wilson (1985) argues that in markets where reputation building is possible, predictions better reflect real market behavior compared to more isolated settings. Also from an external validity viewpoint, we know that companies in real market settings often engage in CSR to strengthen their reputation (Miller, Eden, & Li, 2020; Tata & Prasad, 2015). Results of additional analyses indicate that reputation indeed played an important role in our markets as buyers' agreement in the post-experimental questionnaire with the statement 'The donation of the seller was important for his/her reputation in the market' on a seven-point Likert scale (mean = 4.86) is significantly higher than the midpoint 4 ($t_{(95)} = 5.71$, $p < 0.001$).

[13] For the *Assurance* condition, we follow the literature that operationalizes audits as a detection chance (e.g., Beck, Davis, & Jung, 1991; Cardinaels & Jia, 2016; Chow, Hirst, & Shields, 1995). Given that there is only a 75 percent chance that an audit will occur, there are experimental periods in which no audit takes place and buyers cannot be completely certain that a seller has never lied.

[14] Our manipulation of incentives is similar to practices such as tax benefits or rebate subsidies, where a certain amount is paid back after a person made a donation. In reality, other types of financial incentives exist to stimulate donations, for example matching subsidies, where a third party contributes an additional amount to a social cause when someone makes a donation. The literature shows that gross donations are higher in the presence of matching subsidies than in the presence of rebate subsidies (Davis et al., 2005; Eckel & Grossman, 2003). The reason is that people (in the presence of rebate systems) focus on the total amount they are donating, not on the cost they will have to bear. Similarly, when matching is present, people focus on the amount they are donating themselves, rather than on the total donation including the matched amount (Davis et al., 2005). Consequently, our choice to manipulate incentives in line with these prior studies is not only consistent with common practice in market settings, it is also from a theoretical point the more conservative choice as people focus their attention on the total amount they are donating.

Panel A: Effect of *Assurance* and *Incentives* on gross donations



Panel B: Effect of *Assurance* and *Incentives* on net donations

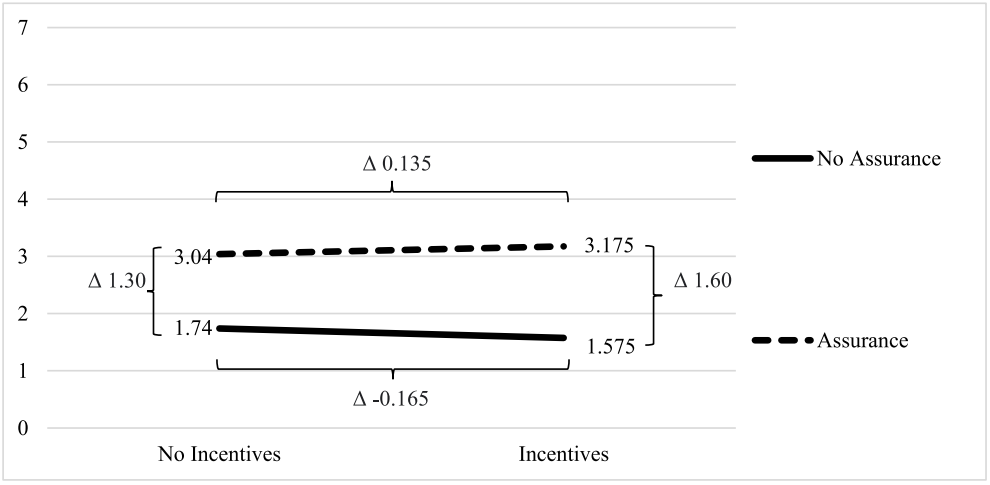


Fig. 1. Effect of *Assurance* [a] and *Incentives* [b] on gross donations [c] (H1) and net donations [d]

[a] Assurance is manipulated as a between-subjects factor at two levels: *No Assurance* and *Assurance*. In the *No Assurance* condition, CSR disclosures were not subject to an audit. In the *Assurance* condition, we operationalize assurance as a 75 percent chance per period that an audit of the CSR disclosure would take place.

[b] Incentives is manipulated as a between-subjects factor at two levels: *No Incentives* and *Incentives*. In the *No Incentives* condition, sellers did not receive incentives for donations to charity. In the *Incentives* condition, sellers received incentives for donations to charity. At the end of each period, they were reimbursed 50 percent of their donations during that period in the form of a tax rebate.

[c] Gross donations made by sellers represents the average amount sellers actually donated per period (measured for the products that are being sold).

[d] Net donations is measured as the net amount sellers donated on average per product sold per period, i.e., the amount sellers have donated out of pocket. In the *No Incentives condition*, there is no difference between gross donations made and net donations. In the *Incentives condition*, net donations equals gross donations minus the incentives received, i.e., 50 percent of the gross donations.

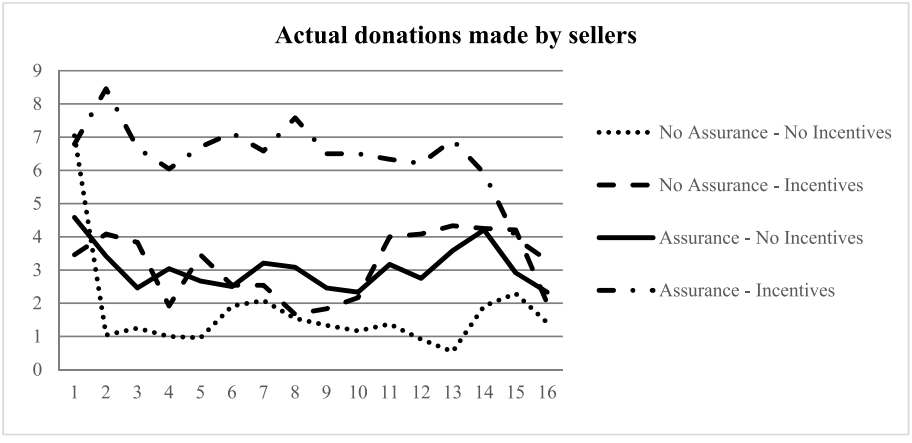


Fig. 2. Evolution over periods of the effect of *Assurance* [a] and *Incentives* [b] on gross donations [c] (H1)

[a] Assurance is manipulated as a between-subjects factor at two levels: *No Assurance* and *Assurance*. In the *No Assurance* condition, CSR disclosures were not subject to an audit. In the *Assurance* condition, we operationalize assurance as a 75 percent chance per period that an audit of the CSR disclosure would take place.

[b] Incentives is manipulated as a between-subjects factor at two levels: *No Incentives* and *Incentives*. In the *No Incentives* condition, sellers did not receive incentives for donations to charity. In the *Incentives* condition, sellers received incentives for donations to charity. At the end of every period, they were reimbursed 50 percent of their donations during that period in the form of a tax rebate.

[c] Gross donations made by sellers represents the average amount sellers actually donated per period (measured for the products that are being sold).

Table 1
Descriptive statistics

Panel A: Seller decisions				
	No Assurance		Assurance	
	No Incentives	Incentives	No Incentives	Incentives
	n = 24	n = 24	n = 24	n = 24
Inaccurate reports	70.05%	61.46%	13.54%	9.64%
Extent if lied	5.36 (4.59)	7.47 (4.63)	3.33 (5.31)	7.14 (5.28)
Audit correct	/	/	85.76%	90.97%
Price set	11.73 (7.80)	10.66 (7.67)	10.01 (6.29)	11.77 (6.94)
Planning to donate	3.11 (4.34)	3.91 (5.08)	4.28 (4.20)	6.76 (4.58)
Reported corporate giving	6.86 (4.72)	8.50 (4.81)	4.73 (4.17)	7.44 (4.39)
Gross donations made (H1)	1.74 (4.62)	3.15 (7.26)	3.04 (5.40)	6.35 (8.64)
Profit sellers (points)	6.48 (10.89)	5.10 (10.50)	4.30 (8.17)	4.13 (8.93)
Panel B: Buyer decisions				
	No Assurance		Assurance	
	No Incentives	Incentives	No Incentives	Incentives
	n = 24	n = 24	n = 24	n = 24
Price paid (H2)	8.22 (5.92)	8.25 (5.41)	7.35 (4.71)	10.48 (6.10)
Reported corporate giving	5.22 (3.89)	7.75 (4.78)	3.66 (3.64)	7.13 (4.32)
Profit buyers (points)	31.47 (6.51)	31.65 (5.63)	32.55 (4.98)	29.31 (6.41)
Sellers' altruism	3.29 (1.40)	3.13 (1.45)	3.54 (1.56)	4.42 (1.25)
Satisfaction	7.83 (1.58)	7.29 (2.11)	6.95 (2.00)	8.02 (1.51)

This table shows the means (standard deviations) per period of our dependent variables across the four experimental conditions. Panel A of the table contains the means (standard deviations) for all seller variables in each of the four conditions. Panel B contains the means (standard deviations) for all buyer variables in each of the four conditions. In total, every condition contained six markets of four sellers and four buyers and the experiment lasted for sixteen periods in all markets.
Seller variables in panel A are measured as follows. *Inaccurate reports* is the percentage of CSR reports that did not present what the seller was actually planning to donate. *Extent if lied* indicates the average difference between what the seller was planning to donate per product sold and the reported amount in the CSR report for those cases in which CSR reports were inaccurate. *Audit correct* gives the percentage of the CSR reports assessed to be correct by the audit. *Price set* is the price set by the seller for product A. *Planning to donate* is measured as the average amount that sellers are planning to donate per product sold. Sellers had to commit to whether and how much they were planning to donate before transactions took place. *Reported corporate giving* is the amount sellers were planning to donate per product sold as reported by sellers in the CSR disclosure. This amount could deviate from what preparers were actually planning to donate. *Gross donations made* represents the average amount sellers actually donated per period (measured for the products that are being sold). While planning to donate is a choice variable of sellers, buyers in fact determine how much is actually is donated to charity via their selection choices of sellers. *Profit sellers (points)* is measured as the average profit of sellers in points. Buyer variables in panel B are measured as follows. *Price paid* is the average price buyers have paid for the products bought. *Reported corporate giving* is measured as the amount buyers assume to be donated for the products bought by them, based on the seller's CSR disclosure. This variable can deviate from gross donations. *Profit buyers (points)* is measured as the average profit of buyers in points. *Sellers' altruism* represents the extent to which the altruism of sellers seems sincere to buyers. In the post-experimental questionnaire, buyers were asked to indicate their agreement with the statement "the altruism of the sellers seems sincere to me" on a seven-point Likert scale. *Satisfaction* is the satisfaction of buyers with the seller of their choice. After their choice for a particular seller (or for no seller in that period), buyers had to indicate their satisfaction with the seller of their choice on a scale from 1 (lowest possible satisfaction) to 10 (highest possible satisfaction).

A. When buyers chose not to buy, their profit for that period was zero. In the *Incentives* condition, the payoffs for sellers were calculated similarly except that 50 percent of the actual donated amount was added to the profits at the end of a period. Following standard procedures in experimental economics, participants knew they would not have to pay for profits below zero (i.e. losses) at the end of the experiment. Sellers can theoretically make a loss when their price does not cover their donation.[15]

We used the exchange rate of one point equaling €0.025 to convert the final pay-off of each participant and paid it by bank transfer. The average profit per period was 5.01 points for the sellers and 31.24 points for the buyers. The average payoff using the exchange rate equaled €4.00 for the sellers and €14.50 for the buyers (including 80 points or €2.00 as a starting fee). Sellers earned less than buyers because they had to compete for buyers. Based on actual play, we also transferred €137.08 to the Red Cross. On average, €1.40 per seller was donated to the Red Cross.

4. Results

4.1. Descriptive statistics

In the post-experimental questionnaire using seven-point Likert scales, participants demonstrated relatively high agreement with the statements that the instructions were clear enough (mean = 6.41), that they were motivated to perform their task (mean = 6.03), that they had enough time to take decisions (mean = 6.81), and relatively high disagreement with the statement that the task was difficult (mean = 2.91). Because profits of buyers were higher than those of the sellers, buyers showed higher agreement with the statement "I am satisfied with the profit I made in this study" (mean = 5.97) than sellers (mean = 3.23). Average values of these items are significantly different from the midpoint 4. Participants also answered some understanding and manipulation checks in the post-experimental questionnaire. Of the participants, 99.48 percent responded correctly to the item of what role they had in the experiment, and 91.67 percent correctly assessed a

[15] One seller in the *Assurance – No Incentives* and one seller in the *No Assurance – Incentives* condition made a loss.

statement testing whether it was clear that sellers could lie in the CSR disclosures.[16] Of the sellers, 88.54 percent correctly assessed how their profit was calculated, and 95.83 percent understood that the amounts donated in the experiment would be transferred to the Red Cross. Participants were also asked to describe their strategy during the game. Our analyses include all participants because excluding players who failed manipulation checks or who showed low motivation did not significantly change the results regarding our main predictions.

Table 1 shows the descriptive statistics for variables related to sellers (Panel A) and buyers (Panel B). Panel A shows that sellers, as preparers, more often make inaccurate disclosures about their donations in the *No Assurance* condition (Average = 70.05 percent when incentives are absent and 61.46 percent when incentives are present; pooled mean = 65.76 percent) than in the *Assurance* condition (Average = 13.54 percent when incentives are present and 9.64 percent when incentives are absent; pooled mean = 11.59 percent). Untabulated results of a repeated measures ANOVA show a significant main effect of *Assurance* on inaccurate disclosures ($F_{(1,\ 92)} = 90.10$, $p < 0.001$). Consistent with our theoretical discussion, assurance of preparers' CSR disclosures renders greater credibility, leading to more accurate disclosures.[17] With regard to H1, panel A reveals that CSR investments (i.e., gross donations) increase more strongly as a result of assurance when incentives are present (from 3.15 to 6.35) compared to when incentives are absent (1.74–3.04). Consistent with H2, panel B shows that buyers pay higher prices as a result of assurance when incentives are present (from 8.25 to 10.48). Such an effect of assurance is not observed when incentives are absent (8.22–7.35). We will perform formal analyses on these variables in the next two sections.

4.2. Impact on preparers' CSR investments (H1)

To test H1 that assurance, relative to no assurance, increases actual donations made by prepares more when incentives are present (and that assurance has limited impact when incentives are absent), we use gross donations (rather than on the cost of these donations borne by the sellers). We do so for two reasons. First, from a policy perspective, it is important to learn about factors impacting donations that charities are actually receiving. Second, prior work suggests that people who receive financial incentives for making donations such as tax benefits and rebate subsidies focus primarily on the gross amount they donate, not so much on the cost they have to bear (Davis et al., 2005; Eckel & Grossman, 2003). While we thus expect our manipulations to impact gross donations, we do recognize that incentives entail a cost to society as they ultimately may lead to lower tax revenues or result in higher tax burdens for certain groups. Consequently, we also explore how our conditions affect net donations (out-of-pocket contributions) by sellers.

Panel A of Fig. 1 depicts gross donations. We performed a repeated measures ANOVA with contrast coding to test for the ordinal pattern in H1. For reasons of abbreviation, we do not tabulate within-subjects effects (e.g., period effects). These results, showing the evolution across periods, are discussed in footnotes. Table 2, panel A, shows that the main effects of *Assurance* ($F_{(1,\ 92)} = 14.49$, $p = 0.001$) and *Incentives* ($F_{(1,\ 92)} = 15.86$, $p = 0.001$) are significant.[18] The interaction of *Assurance* and *Incentives* on gross donations is, however, not significant at conventional levels ($F_{(1,\ 92)} = 2.56$, $p = 0.113$). Given our ordinal interaction for H1, we use the more powerful contrast analysis (Buckless & Ravencroft, 1990) to test H1. We test if assurance has larger impact when incentives are present, with a weight of 3 for the *Assurance–Incentives* condition and −1 as a contrast weight for the *No Assurance – Incentives* condition, and −1 and −1 for the *No Incentives* conditions where assurance relative to no assurance has limited value. Panel B of Table 2 shows that this contrast is significant ($F_{(1,\ 92)} = 29.38$, $p < 0.001$).[19] Consistent with Guggenmos, Piercey, and Agoglia (2018), we confirm non-significance of the residual between-cells variance for this and other contrast tests presented in this paper, unless noted otherwise. Further, the contrast variance residual (q^2) metric for this analysis is 10.7%.

We also present simple effects of assurance and incentives on gross donations. Consistent with the ordinal pattern we predict in H1, Panel C of Table 2 shows that the effect size of assurance when incentives are present (+3.20 (= 6.35–3.15); $F_{(1,\ 46)} = 9.27$, $p = 0.004$) is larger than the effect size of assurance when incentives are absent (+1.30 (= 3.04–1.74); $F_{(1,\ 46)} = 5.74$, $p = 0.021$)[20]. The effect of incentives across the assurance condition (+3.31 (= 6.35–3.04); $F_{(1,\ 46)} = 12.16$, $p = 0.001$) is also stronger in effect size than the effect of incentives in the *No Assurance* condition (+1.41 (= 3.15–1.74); $F_{(1,\ 46)} = 3.96$, $p = 0.053$). This latter finding is important from a government perspective indicating that incentive provision motivates sellers to invest in CSR in particular when assurance is present. In sum, we find support for H1. Assurance of CSR disclosures, relative to no assurance, more strongly

[16] 96.88 percent of the participants in the *No Assurance* condition and by 86.46 percent of the participants in the *Assurance* condition assessed this statement correctly. Because lying can be detected in the *Assurance* condition, certain participants may have interpreted this manipulation check differently than intended in the *Assurance* condition.

[17] Based on our theory, one can argue that in the absence of assurance, CSR investments will be more likely to be overstated when there are incentives than when there are no incentives. Specifically, with incentives, expectations are created in the market that it is important to invest in CSR and sellers may want to make it appear as if they are investing while not actually doing so. We explore this option in an additional analysis. While descriptive statistics show, however, that more sellers are lying in the *No Assurance – No Incentives* condition than in the *No Assurance – Incentives* condition (i.e., 70.05% versus 61.46%), the average overstated amount is descriptively, but not significantly, higher in the *No Assurance – Incentives* condition (mean = 4.59), compared to the *No Assurance – No Incentives* condition (mean = 3.76; $t_{(46)} = -0.815$, $p = 0.419$, untabulated results). At the same time, it seems that sellers to a higher extent want to make it appear as if they are investing in CSR in the *No Assurance – Incentives* condition than in the *No Assurance – No Incentives* condition because reported CSR investments are significantly higher in that condition (mean = 8.50 versus mean = 6.86; $t_{(46)} = -1.903$, $p = 0.063$) while there is no significant difference with regard to actual willingness to donate (mean = 3.91 versus mean = 3.11; $t_{(46)} = -0.827$, $p = 0.412$).

[18] All reported p-levels are two-tailed unless stated otherwise.

[19] As the donations made by different sellers in one market are not independent, we test whether results are robust when we control for non-independence at the market level. We run mixed models for repeated measures with market as a random effect, using the Kenward-Rogers denominator degrees of freedom. We find similar results as in our main hypothesis test for the contrast [-1, −1, −1, 3] ($F_{(1,\ 20)} = 22.47$, $p < 0.001$). Consistent with H1, within the *No Incentives* condition, we do not find support for a statistically significant effect of assurance ($F_{(1,\ 20)} = 1.86$, $p = 0.187$), while there is a significant effect of assurance within the *Incentives* condition ($F_{(1,\ 20)} = 11.17$, $p = 0.003$). Further, simple effects tests show no significant effect of incentives within the *No Assurance* condition ($F_{(1,\ 20)} = 2.17$, $p = 0.156$), while the effect of incentives is significant within the *Assurance* condition ($F_{(1,\ 20)} = 11.91$, $p = 0.003$).

[20] We still find that for sellers, assurance matters even in the absence of incentives. This effect disappears, however, if we control for market effects (see previous footnote). We also formally test the contrast with codes [-2, -1 -1, 4] which indicates a small incremental value of assurance in the absence of incentives ($F_{(1,\ 92)} = 32.08$, $p < 0.001$, results untabulated). We observe that the [-2, −1, −1, 4] has a lower residual variance (2.5%) compared to the [-1, −1, −1, 3] contrast. For buyers, however, we see that the [-1, −1, −1, 3] pattern explains the data better as the residual variance is 9.8%, which increases to 17.3% when we use the [-2, −1, −1, 4] contrast pattern ($F_{(1,\ 92)} = 8.71$, $p = 0.004$, results untabulated). Given that it is hard to predict why buyers differ compared to sellers with regard to assurance when incentives are absent, we decided to use the conservative approach of using [-1, −1, −1, 3] for tests of H1 and H2.

Table 2
ANOVA and simple effects on gross donations made by sellers (H1) and on net donations

Independent variables	Df	MS	F-statistic	p-value [a]	Df	MS	F-statistic	p-value
Panel A: ANOVA on gross donations made by sellers					**Panel D: ANOVA on net donations**			
Assurance [b]	1	1950.756	14.49	0.001	1	811.568	14.74	0.001
Incentives [c]	1	2135.235	15.86	0.001	1	0.096	0.01	0.966
Assurance * Incentives	1	344.094	2.56	0.113	1	8.240	0.15	0.700
Error	92	134.603			92	55.072		
Panel B: Contrast analysis (H1) on gross donations					**Panel E: Contrast analysis on net donations**			
Contrast [d]	1	3954.944	29.38	0.001	1	321.152	5.83	0.018
Residual between-cells variance	2	237.568	1.76	0.177	2	249.376	4.53	0.013
Total between-cells variance	3	1476.688	10.97	0.001	3	273.296	4.96	0.003
Error	92	134.603			92	55.072		
Panel C: Simple effects on gross donations made by sellers					**Panel F: Simple effects on net donations**			
Effect of assurance in No Incentives condition					Effect of assurance in No Incentives condition			
Assurance	1	328.130	5.74	0.021	1	328.130	5.74	0.021
Error	46	57.137			46	57.137		
Effect of assurance in Incentives condition					Effect of assurance in Incentives condition			
Assurance	1	1966.720	9.27	0.004	1	491.680	9.27	0.004
Error	46	212.070			46	53.018		
Effect of incentives in No Assurance condition					Effect of incentives in No Assurance condition			
Incentives	1	382.505	3.96	0.053	1	5.086	0.13	0.717
Error	46	96.701			46	38.217		
Effect of incentives in Assurance condition					Effect of incentives in Assurance condition			
Incentives	1	2096.824	12.16	0.001	1	3.255	0.05	0.833
Error	46	172.507			46	71.937		

[a] All reported p-values are two-tailed.
[b] Assurance is coded as −1 for the *No Assurance* condition and as 1 for the *Assurance* condition.
[c] Incentives is coded as −1 for the *No Incentives* condition and as 1 for the *Incentives* condition.
[d] The contrast analyses examine whether sellers' gross and net donations are higher in the *Assurance-Incentives* condition than in the three other conditions. We used contrast weights of 3 for the *Assurance-Incentives* condition and −1 for each of the other conditions.

increases CSR investments by preparers when incentives are present. Fig. 2 shows that the evolution of our dependent variable *Gross Donations* over 16 periods is relatively stable across conditions.[21]

As an additional test, we explore sellers' willingness to donate, i.e., how much sellers are planning to donate per product before transactions take place. If incentives create expectations in the market among sellers that CSR is important and that other sellers will invest in CSR, then we expect assurance to have a larger impact on their planned donations, compared to when incentives are absent. We again use a repeated measures ANOVA and use a similar ordinal contrast test with a weight of 3 for the *Assurance–Incentives* condition and −1 for the other cells (Guggenmos et al., 2018). Similar to prior results, this contrast is significant ($F_{(1, 92)} = 16.30$, $p < 0.001$). The means in Table 1 confirm the ordinal pattern (H1) showing that assurance has a larger effect when incentives are present (compared to absent). The contrast variance residual (q^2) is 9.7% and not significant.

Next, panels D, E, and F of Table 2 show analyses with net donations as the dependent variable. Panel B of Fig. 1 also displays the average net donations. Results of a contrast analysis for the ordinal interaction that assurance has more value when incentives are present and limited value when incentives are absent, is significant ($F_{(1, 92)} = 5.83$, $p = 0.018$). Indeed, net donations are still the highest when incentives and assurance are present. However, the residual variance is significant and has a (q^2) metric of 60.83%, suggesting that the pattern has a less good fit. Looking at the ANOVA, we find a main effect of assurance but we do not find a main effect of incentives, nor the interaction to be significant. Also visually, the pattern of average net donations displayed in Fig. 1, Panel B, is more consistent with a main effect of assurance.

However, this does not mean that assurance does not have a stronger effect when incentives are present. In fact, as discussed earlier and in contrast to the main effect of *Assurance* only for net donations (Fig. 1, Panel B), we can observe an ordinal interaction pattern between *Assurance* and *Incentives* for gross donations (Panel A). Specifically, gross donations are much higher when assurance is present compared to absent, if preparers receive incentives, but the difference between gross and net donations does not directly come out of the pocket of sellers. If sellers in this condition did not want to increase their investments or the charitable cause to receive more, they could have simply taken advantage of the incentives by not donating more, while only paying half of the amount out of pocket. Further, as we will discuss in what follows, we can also observe the ordinal pattern between *Assurance* and *Incentives* in the prices paid by buyers. This means that gross donations are also relevant to buyers as they do react on disclosures and gross investments.

4.3. The impact of assurance and incentives on prices paid (H2)

H2 predicts a similar ordinal pattern for prices paid by buyers. That is, if incentives are present, they may also create expectations among buyers and buyers might be willing to pay more for CSR when assurance is present relative to absent. Absent incentives, assurance has limited value. Fig. 3 graphically confirms the ordinal pattern. Panel A of Table 3 presents the repeated measures ANOVA. It shows a significant main effect of *Incentives* ($F_{(1, 92)} = 4.907$, $p = 0.029$) and a significant interaction of *Assurance* and *Incentives* on the prices paid by buyers ($F_{(1, 92)} =$

[21] The repeated measures ANOVA shows that average donations, however, depend on *Period* ($F_{(15, 1380)}$) = 2.53, p = 0.011), indicating a slight decrease in the later periods (results untabulated). However, there is no statistical support for a change of the effect of the manipulations over time (the p-values for *Period* × *Assurance*, *Period* × *Incentives*, and *Period* × *Assurance* × *Incentives* are not significant at the 10 percent significance level).

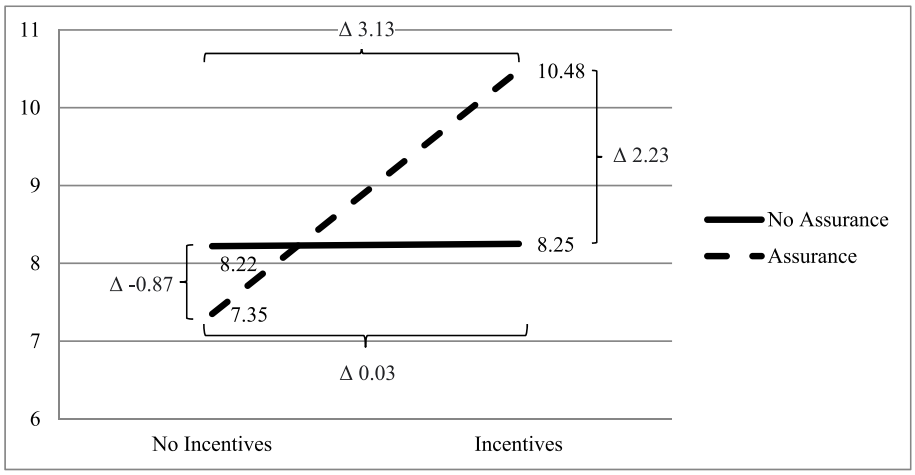


Fig. 3. Effect of *Assurance* [a] and *Incentives* [b] on prices paid by buyers [c] (H2)

[a] Assurance is manipulated as a between-subjects factor at two levels: *No Assurance* and *Assurance*. In the *No Assurance* condition, CSR disclosures were not subject to an audit. In the *Assurance* condition, we operationalize assurance as a 75 percent chance per period that an audit of the CSR disclosure would take place.

[b] Incentives is manipulated as a between-subjects factor at two levels: *No Incentives* and *Incentives*. In the *No Incentives* condition, sellers did not receive incentives for donations to charity. In the *Incentives* condition, sellers received incentives for donations to charity. At the end of each period, they were reimbursed 50 percent of their donations during that period in the form of a tax rebate.

[c] Price paid by buyers is measured as the average price that buyers pay for the purchase of product A from the chosen seller.

4.731, p = 0.032). To formally test H2, we again perform a contrast test with a weight of 3 for the *Assurance – Incentives* condition a weight of −1 for the *No assurance – Incentives* condition to test whether assurance has a strong effect on prices paid when incentives are present; and −1 and −1 for the *No Incentives* conditions to indicate that assurance has less impact on prices paid when incentives are absent. The results of this contrast test in panel B of Table 3 offers support for H2 ($F_{(1, 92)} = 9.505$, p = 0.003).[22] The approach by Guggenmos et al. (2018) suggests a strong fit, as the residual between-cells variance is not significant and the contrast variance residual (q^2) is 9.8%.

Consistent with H2, Panel C of Table 3 shows that the simple effect of *Assurance* on prices paid is significant when incentives are present (+2.23 (= 10.48–8.25); $F_{(1, 46)} = 5.213$, p = 0.027); but not when incentives are absent (−0.87 (= 7.35–8.22); $F_{(1, 46)} = 0.706$, p = 0.405). For buyers, the effect of assurance thus also matters when incentives are present, confirming H2 that social expectations need to be created for assurance to have impact. We also find that buyers pay higher prices as a result of incentives in markets that offer assurance (+3.13 (= 10.48–7.35); $F_{(1, 46)} = 13.160$, p = 0.001). Without assurance, we do not find an incentives effect (+0.03 (= 8.25–8.22); $F_{(1, 46)} = 0.001$, p = 0.980). This latter finding again shows that the effectiveness of incentive provision by governments on users' valuation increases when markets offer assurance.

Fig. 4 shows that buyers in the *Assurance–Incentives* condition pay the highest prices in all periods, except for the last periods (from period 14 onwards). Yet, prices buyers pay decrease over time because of strong price competition.[23] Overall, we observe a convergence of prices paid across conditions towards the end of the game, which is consistent with

Table 3
ANOVA and simple effects on price paid by buyers (H2)

Independent variables	df	MS	F-statistic	p-value [a]
Panel A: ANOVA on price paid by buyers				
Assurance [b]	1	176.719	0.902	0.345
Incentives [c]	1	961.084	4.907	0.029
Assurance * Incentives	1	926.594	4.731	0.032
Error	92	195.873		
Panel B: Contrast analysis (H2)				
Contrast [d]	1	1861.771	9.505	0.003
Residual between-cells variance	2	101.313	0.517	0.598
Total between-cells variance	3	688.132	3.513	0.018
Error	92	195.873		
Panel C: Simple effects on price paid by buyers				
Effect of assurance in No Incentives condition				
Assurance	1	147.000	0.706	0.405
Error	46	208.304		
Effect of assurance in Incentives condition				
Assurance	1	956.314	5.213	0.027
Error	46	183.442		
Effect of incentives in No Assurance condition				
Incentives	1	0.158	0.001	0.980
Error	46	248.312		
Effect of incentives in Assurance condition				
Incentives	1	1887.521	13.160	0.001
Error	46	143.433		

[a] All reported p-values are two-tailed.

[b] Assurance is coded as −1 for the *No Assurance* condition and as 1 for the *Assurance* condition.

[c] Incentives is coded as −1 for the *No Incentives* condition and as 1 for the *Incentives* condition.

[d] The contrast analysis examines whether the prices paid by buyers are, as predicted, higher in the *Assurance-Incentives* condition than in the three other conditions. We used contrast weights of 3 for the *Assurance-Incentives* condition and −1 for each of the other conditions.

[22] Controlling for the average of sellers' offer prices on a round-by-round basis ($F_{(1,92)} = 13.98$, p = 0.001) or for the standard deviation of sellers' offer prices on a round-by-round basis ($F_{(1,92)} = 8.03$, p = 0.006) does not change the results of our contrast. As a robustness test, we repeat our hypothesis test controlling for the non-independence of prices paid at market level using mixed models for repeated measures with market as a random effect. Since prices paid are largely determined by prices asked by sellers in the market, we also control for the average price asked by sellers in the given period. Results for the contrast [-1, −1, −1, 3] are similar as in our main hypothesis test ($F_{(1, 18.6)} = 8.51$, p = 0.009). Consistent with H2, assurance is not significant in the *No Incentives condition* ($F_{(1, 18.7)} = 0.06$, p = 0.814), but assurance is significant when *Incentives* are present ($F_{(1, 18.6)} = 3.59$, p = 0.074). Further, when running simple effects tests, we find no significant effect of incentives within the *No Assurance* condition ($F_{(1, 18.6)} = 0.72$, p = 0.406). Within the *Assurance* condition, the effect of incentives is significant ($F_{(1, 18.7)} = 6.27$, p = 0.022).

[23] Untabulated results for the repeated measures ANOVA suggest that this decline across periods is significant ($F_{(15, 1380)} = 75.74$, p < 0.001). There are also interactions of *Period* with *Assurance* ($F_{(15, 1380)} = 3.36$, p < 0.001) and *Period* with *Incentives* ($F_{(15, 1380)} = 3.77$, p < 0.001). However, there is no statistical evidence that our effect of interest, the differential impact of *Assurance* × *Incentives*, depends on *Period*. Specifically, the three-way interaction of *Period* × *Assurance* × *Incentives* is not significant ($F_{(15, 1380)} = 1.40$, p < 0.137).

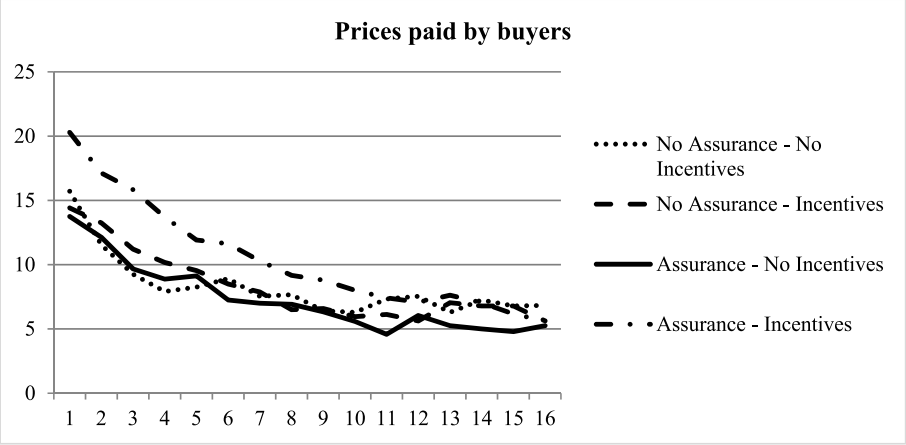


Fig. 4. Evolution over periods of the effect of Assurance [a] and Incentives [b] on price paid by buyers [c] (H2)
[a] Assurance is manipulated as a between-subjects factor at two levels: *No Assurance* and *Assurance*. In the *No Assurance* condition, CSR disclosures were not subject to an audit. In the *Assurance* condition, we operationalize assurance as a 75 percent chance per period that an audit of the CSR disclosure would take place.
[c] Price paid by buyers is measured as the average price that buyers pay for the purchase of product A from the chosen seller.

end-game effects.[24]

4.4. Effect of incentives on social expectations in the market

Consistent with the behavioral economics theory on crowding-in effects of incentives, we argued that incentives will raise social expectations among participants that it is important for market participants to invest in CSR (Andreoni et al., 2014; Borgonovi, 2006; Frey, 2012; Schokkaert, 2006; Vesterlund, 2003). The results of our follow-up experiment, with 57 Amazon's Mechanical Turk (MTurk) participants, provide corroborating evidence for this argument.[25]

In this follow-up experiment, participants assumed the role of a market participant in a market that consists of sellers and buyers. Participants were told that sellers can make CSR investments which they communicate externally through sustainability reports. Between subjects we manipulated whether incentives are present or absent. In the *Incentives* condition, participants were told that sellers received 50% of their investments back as a tax return. Participants in the *No Incentives* condition were told that sellers had to bear the cost of their CSR investments themselves. To measure social expectations with regard to CSR investments, participants indicated their agreement on seven-point Likert scales with the statements that the government found it important that sellers made CSR investments, that market participants expected sellers to make relatively high CSR investments, that market participants had the impression that CSR expenditures were desirable, and that market participants expected sellers to make at least some CSR expenditures. The Cronbach's alpha is equal to 0.72 and an exploratory factor

Table 4
OLS regression on Social Expectations based on additional M-Turk experiment

	Social Expectations [a]
Incentives [b]	0.398*
	(0.214)
CSR Attitudes [c]	0.275***
	(0.067)
Political Orientation [d]	0.085
	(0.054)
Gender [e]	−0.299
	(0.218)
Age	0.005
	(0.009)
Constant	4.083***
	(0.503)
Observations	54

N = 54; OLS regression with Social Expectations as dependent variable; Robust standard errors in parentheses; reported p-levels are two-tailed: *p < 0.10, **p < 0.05, ***p < 0.01.
[a] Social Expectations is a factor based on participants' agreement on seven-point Likert scales with the statements that the government found it important that sellers made CSR investments, that market participants expected sellers to make relatively high CSR investments, that market participants had the impression that CSR expenditures were desirable, and that market participants expected sellers to make at least some CSR expenditures. The Cronbach's alpha of these items equals 0.72.
[b] Incentives is manipulated as a between-subjects factor at two levels: No Incentives and Incentives. In the *No Incentives* condition, participants learn that sellers in the market bear the total costs of their CSR investments themselves. In the *Incentives* condition, participants are told that sellers received part of their investments back as a tax return.
[c] CSR Attitudes is based on participants' agreement on seven-point Likert scales with the statements that they donate to social causes, that they find the battle for the climate important, that they take actions to protect the environment, that corporate social responsibility is important to them, and that they are in favor of governments intervening in markets to stimulate CSR. The Cronbach's alpha of these items equals 0.92.
[d] Political Orientation is participants' assessment on a seven-point Likert scale of where their political views fall, with the lowest levels on the scale representing "the left" and the highest levels representing "the right".
[e] Gender equals zero for male participants and one for female participants.

[24] Because participants knew that the experiment would last sixteen periods, end-game effects may be observed in the results as some participants behaved differently towards the end of the experiment (cf. Figs. 2 and 4). In the results section below, we include all observations from periods 1–16. Repeating the analyses while leaving out periods 14–16 does not qualitatively alter the results. Further, since participants may still be learning in the first periods, we also repeated the analyses leaving out periods 1–3, which does not change the results either.

[25] We did not assign a role in this follow-up experiment as we are interested in the social expectations of market participants in general. In total, 60 participants completed the experiment. However, participants were told that they would not be paid if they had less than 80% of the five attention checks correct. Three participants did not meet this benchmark, were not paid and were excluded from the dataset. Participants received a fee of $1 (€0.84) and it took them on average 7 min to complete the experiment; 65 percent of the participants were male, their average was around 40 years. Participants' demographics do not significantly differ across the between-subjects factor *Incentives*.

analysis confirms that all items load in the expected direction on one factor (eigenvalue = 1.78). We use the average of these items in our analyses (cf. Elliott et al., 2014). To assess the effectiveness of our manipulation, participants also indicated whether or not sellers bore the total cost of their CSR investments. The three participants who missed this manipulation check are not included in our subsequent analyses. Including these participants does not alter our conclusions.

Consistent with our theory, we find that social expectations are indeed significantly higher in the *Incentives* condition (mean = 5.869, standard deviation = 0.984) than in the *No Incentives* condition (mean = 5.409, standard deviation = 0.616; $t_{(52)} = -1.914$, p = 0.061). Further, Table 4 presents the results of a regression analysis of *Incentives* on *Social Expectations*, controlling for participants' attitude towards CSR, political orientation, gender, and age.[26] Results show a significantly positive impact of *Incentives* on Social Expectations (b = 0.398, p = 0.069).

4.5. Buyers' selection of sellers

If our theory holds and buyers ascribe value to credibility in CSR reporting (which assurance can deliver), we would expect that assurance leads to a higher selection by buyers of sellers who present also higher CSR disclosures, relative to the price they ask. We expect this in particular when incentives create social expectations.[27] Table 5 reports the results of a regression analysis with the ratio of disclosed CSR investment levels over prices asked by sellers as an indicator for selection of sellers, whereby a higher ratio represents a higher CSR disclosure, relative to price asked. Given strong price competition in our markets, we need to focus on this relative amount to identify conditions where buyers value CSR disclosures more. Our results shows that this ratio is important for the selection of sellers (b = 1.175, p = 0.047). The three-way interaction between the ratio and our manipulations (*CSR to price ratio* x *Assurance* x *Incentives*) is also significant (b = 1.434, p = 0.033), suggesting that assurance (relative to no assurance) helps buyers to select sellers who disclose relatively higher CSR investments, in particular when incentives are present.[28] This result is also consistent with the idea that for CSR to sufficiently matter to buyers, providing incentives alone might not be enough, but that markets should also offer assurance.

Table 5
Logistic regression on buyers' selection of sellers

	Selection of sellers [a]
CSR-price ratio [b]	1.175**
	(0.593)
Incentives [c]	0.943*
	(0.517)
Incentives * CSR to price ratio	−1.163*
	(0.596)
Assurance [d]	0.783
	(0.516)
Assurance * CSR to price ratio	−0.973
	(0.599)
Incentives * Assurance	−0.879
	(0.598)
Incentives * Assurance * CSR to price ratio	1.434**
	(0.672)
Period	0.020
	(0.013)
Constant	−0.925*
	(0.472)
Observations	1536

N = 1536; Logistic regression with the variable selection of sellers as dependent variable; Robust standard errors in parentheses; standard errors are clustered at the subject level; all reported p-levels are two-tailed: *p < 0.10, **p < 0.05, ***p < 0.01.

[a] Selection of sellers is coded as 0 if the seller was not selected by any of the buyers in the given experimental period and as 1 when the seller was selected by at least one buyer.

[b] CSR-to-price ratio is the ratio of the seller's disclosed CSR investment over the price asked by this seller in the given experimental period.

[c] Incentives is manipulated as a between-subjects factor at two levels: No Incentives and Incentives. In the *No Incentives* condition, sellers did not receive incentives for donations to charity. In the *Incentives* condition, sellers received incentives for donations to charity. At the end of every period, they were reimbursed 50 percent of their donations during that period in the form of a tax rebate.

[d] Assurance is manipulated as a between-subjects factor at two levels: No Assurance and Assurance. In the *No Assurance* condition, CSR disclosures were not subject to an audit. In the *Assurance* condition, we operationalize assurance as a 75 percent chance per period that an audit of the CSR disclosure would take place.

To further analyze wider selection on CSR, we use regression analyses to compare the condition where both assurance and incentives are present against the other three conditions, where we anticipate that, instead of selection on CSR, price competition would prevail. Consistent with a wider selection on CSR when assurance and incentives are present, buyers more often select sellers who disclosed an amount of CSR that was higher than or equal to the average CSR reported in the market. This percentage is significantly higher (b = 0.488, p = 0.079) in markets where Assurance and Incentives are present (45.57 percent) than in the other three conditions: 39.06 percent in the *No Assurance – Incentives* condition, 34.38 percent in the *Assurance – No Incentives* condition,

[26] We measure *CSR Attitudes* based on participants' agreement with the statements that they donate to social causes, that they find the battle for the climate important, that they take actions to protect the environment, that corporate social responsibility is important to them, and that they are in favor of governments intervening in markets to stimulate CSR. We use the average of these items in our analyses (cf. Elliott et al., 2014). The Cronbach's alpha equals 0.92. To measure *Political Orientation*, participants answered the question "In political matters, people talk of "the left" and "the right." How would you place your views on this scale, generally speaking?" on a seven-point Likert scale, where the lowest levels represent "the left" and the highest represent "the right" (Brink, Lee, & Pyzoha, 2019).

[27] Table 1 also shows that average prices quoted by sellers are the highest in the *Assurance–Incentives* condition (i.e., 11.77). Together with the evidence on prices effectively paid by buyers (previous section), which are also highest in this condition (i.e., 10.48), and the donations actually made by sellers, one can conclude that sellers who invest in CSR are more likely to be selected and that buyers in this condition are willing to pay the higher prices charged when sellers invest in CSR as a result of credible reporting. The price gap between the price quoted by sellers and price paid in this condition is small and equal to 1.29 [difference of 11.77 − 10.48], which is lower than the price gap in the *No Assurance–Incentives* condition = 2.41 [difference of 10.66 − 8.25], suggesting that assurance can help people to focus on CSR, when incentives are present. Absent incentives, price gaps remain larger (*Assurance–No Incentives* = 2.66 [difference of 10.01 − 7.35]; *No Assurance–No Incentives* condition = 3.51 [difference of 11.73 − 8.22]), suggesting a stronger price competition, as predicted by our theory, making assurance less effective in moving buyers to CSR.

[28] An interesting question remains how they react when sellers are caught misreporting. As an additional analysis, we examine participants' reactions in the *Assurance* condition when the audit has disclosed misreporting in the previous period. Untabulated results show that the number of sellers' transactions is significantly lower when they were caught misreporting in the previous period versus when there was no misreporting (β = −0.298, t = −2.01, p = 0.050). These findings suggest that buyers penalize misreporting. In addition, sellers set marginally significantly lower prices when an audit showed misreporting in the previous period (β = −1.348, t = −1.65, p = 0.106).

28.39 percent in the *No Assurance – No Incentives* condition.[29]

Further in line with the idea of wider selection on CSR, buyers in the *Assurance−Incentives* condition are significantly more likely to select sellers disclosing the highest CSR investment in the market than buyers in the other conditions (b = 0.519, p = 0.073), and significantly less likely to select sellers disclosing the lowest CSR investment in the market (b = −0.590, p = 0.016). We further find that buyers in the *Assurance-Incentives* condition less often select a seller who offers the lowest price in the market (b = −0.581, p = 0.051).[30] Untabulated results further show that significantly more buyers in the *Assurance – Incentives* condition select a seller who is not asking the lowest price in the market but who reports a CSR investment that is higher than the lowest CSR investment in the market (b = 0.536, p = 0.071) or a seller who is not asking the lowest price but who reports the highest CSR investment in the market (b = 0.766, p = 0.022). These analyses suggest that buyers are willing to forgo profit (i.e., paying lower prices) in return for CSR.[31]

Interestingly, however, a higher selection of sellers who invest in CSR in the *Assurance – Incentives* condition, does not help sellers to realize more profits. Even though buyers pay higher prices, sellers also have to cover relatively higher actual donations. In fact, untabulated results of an ordinal contrast with weights [3, −1, −1, −1] show that sellers in the *No Assurance – No Incentives* condition realize more profits compared to all other sellers ($t_{(1, 92)} = 1.84$, p = 0.070).

4.6. Additional analyses on the link between investments, disclosures, and prices paid

In this section, we further explore the link between CSR investments, disclosures and prices paid. Panel A of Fig. 5 confirms that assurance relative to no assurance triggers reputation concerns for sellers, as disclosures become more informative about what sellers plan to invest. Both the left side of the figure where incentives are absent (β = 0.267, z = 2.88, p = 0.004) as well as the right side where incentives are present (β = 0.387, z = 3.63, p < 0.001) show that assurance leads to a stronger relation between planned investments and disclosures. Consistent with H1, the same path analyses also reveal that sellers are planning to donate higher amounts as a result of assurance when incentives are present (β = 0.282, z = 3.10, p = 0.002). We do not find statistical support for such an effect when incentives are absent (β = 0.136, z = 1.33, p = 0.184), but we recognize that this may be due to our small sample size. Taken together, assurance can motivate preparers to more accurately depict and invest in CSR, especially when markets offer them incentives.

Panel B of Fig. 5 examines how buyers ascribe value to the disclosures. Consistent with H2, we suspect that assurance relative to no assurance reinforces the link between CSR disclosures and prices paid in the condition where incentives are present. This would suggest that assurance helps for better valuation of these disclosures in particular when sellers receive incentives. The results of panel B in Fig. 5 for the *Incentives* condition (right-hand side) indeed confirm that the relation between CSR disclosures and actual prices paid (β = 0.344, $t_{(1, 47)}$ = 2.33, p = 0.024) is stronger as a result of assurance (β = 0.362, $t_{(1, 47)}$ = 1.70, p = 0.095). In the *No Incentives* condition (panel B, left-hand side), the moderating effect of assurance with respect to the relation between CSR disclosures and actual prices paid is not significant (β = −0.285, $t_{(1, 47)} = -1.41$, p = 0.166).[32]

5. Discussion

We create a market experiment in which sellers, next to setting a price for their product, prepare disclosures of CSR investments. Buyers, in turn, select sellers based on these disclosures of prices and CSR investments. Unique to our setting is a reporting feature, where CSR disclosures of sellers may deviate from actual investments. In doing so, we can examine how assurance and incentives (as policy interventions) affect the extent to which CSR disclosures influence market behavior.

This paper contributes to the literature on CSR disclosures in several important ways. First, we explore the conditions under which CSR persists in competitive markets (Bartling et al., 2015; Falk & Szech, 2013; Kitzmueller & Shimshack, 2012), where preparers can make inaccurate CSR disclosures. We offer new theoretical insights by showing that in a market context, incentives may "crowd in" prosocial behavior (Andreoni et al., 2014; Borgonovi, 2006; Eckel et al., 2005; Frey, 2012; Heutel, 2014; Schokkaert, 2006; Vesterlund, 2003) which enhances the value of mandatory assurance. Our results indeed show that investments in CSR as well the value that buyers ascribe to CSR increase as a result of assurance when governments offer incentives to preparers; an effect we observe less when incentives are absent. Interestingly, given that the extant literature shows a positive relation between CSR engagement and firm value (Albuquerque et al., 2019; Buchanan et al., 2018; Busch & Friede, 2018; Lins et al., 2017),

[29] Untabulated results from a repeated measures ANOVA show a significant interaction effect of Assurance and Incentives on buyers' satisfaction ($F_{(1, 92)}$ = 9.579, p = 0.003). A contrast test with a weight of 3 for the *Assurance–Incentives* condition and −1 for the other cells shows that the buyers' satisfaction is indeed higher in the *Assurance-Incentives* condition than in the other cells ($F_{(1, 92)}$ = 4.83, p = 0.031). The higher satisfaction is consistent with a warm-glow effect resulting from users more often selecting preparers who invest more in CSR (Andreoni, 1989). Buyers also agreed more often that the altruism of sellers seems to be sincere. Both the interaction effect of the ANOVA of *Assurance* and *Incentives,* as well as an ordinal contrast with weights -1 -1, −1, 3 show the altruism of sellers seems the most sincere when both incentives and assurance are present ($F_{(1, 92)}$ = 10.75, p = 0.002).

[30] The chance that a seller is selected by at least one buyer is significantly higher in the *Assurance – Incentives* condition than in the other three conditions (β = 0.19, z = 1.96, p = 0.050), suggesting that in this condition price competition is again less likely to be played. In additional analyses, we find that sellers react to being selected or not with price setting and CSR investment behavior in the next periods. Sellers who were selected in the previous period ask significantly higher prices (mean change = 0.41; $t_{(1, 95)}$ = 3.30, p = 0.001), report significantly higher donations (mean change = 0.35; $t_{(1, 95)}$ = 2.56, p = 0.012), and plan to make significantly higher gross donations (mean change = 0.17; $t_{(1, 95)}$ = 1.76, p = 0.081) than in the previous period. Sellers who were not selected in the previous period, in fact, ask significantly lower prices (mean change = −2.62; $t_{(1, 95)} = -13.32$, p < 0.001), report significantly lower donations (mean change = −0.45; $t_{(1, 95)} = -3.26$, p = 0.002) and plan to make significantly lower gross donations (mean change = −0.55; $t_{(1, 95)} = -4.62$, p < 0.001) than in the previous period. In sum, if not selected, sellers reduce the price and also the donation but they decrease their donation to a lower extent than their prices, suggesting that they still value CSR.

[31] Results on some of the PEQ items using ordinal contrasts with +3 for the *Assurance – Incentives* condition and −1 for the other conditions corroborate this conclusion. Buyers in the *Assurance – Incentives* condition agreed more with the statements 'I mainly chose my seller based on the donations' ($F_{(1,92)}$ = 1.77, p = 0.093, one-tailed) and 'How much a seller donated influenced whether I would select him in a later period' ($F_{(1,92)}$ = 2.33, p = 0.065, one-tailed) than buyers in the other conditions. Sellers in that condition agreed more with the statement 'Buyers mainly chose their seller based on the donations' than sellers in the other conditions ($F_{(1,92)}$ = 2.12, p = 0.074, one-tailed). Buyers in the *Assurance – Incentives* condition were less likely to agree with the statement 'I mainly chose sellers based on the lowest price (regardless of what other buyers decided)' ($F_{(1,92)}$ = 2.40, p = 0.063, one-tailed) than buyers in the other conditions; sellers in the *Assurance – Incentives* condition were less likely to agree with the statement 'Buyers mainly choose their seller based on the selling prices' ($F_{(1,92)}$ = 1.88, p = 0.087, one-tailed) compared to the other conditions.

[32] We also ran an OLS model (clustering on the buyer-subject level) in which we regress *CSR reports*, *Incentives*, and *Assurance* on price paid by buyers. In the model, the three-way interaction of *CSR reports* × *Incentives* × *Assurance* is significant (β = 0.647, t = 2.21, p = 0.029), while the two-way interaction of *Assurance* × *Incentives* is not significant (β = −1.901, t = −1.09, p = 0.280). It confirms that we can attribute the effects in Table 3 to buyers' perceptions of CSR disclosures. Buyers pay higher prices for CSR reports as a result of assurance when incentives are present.

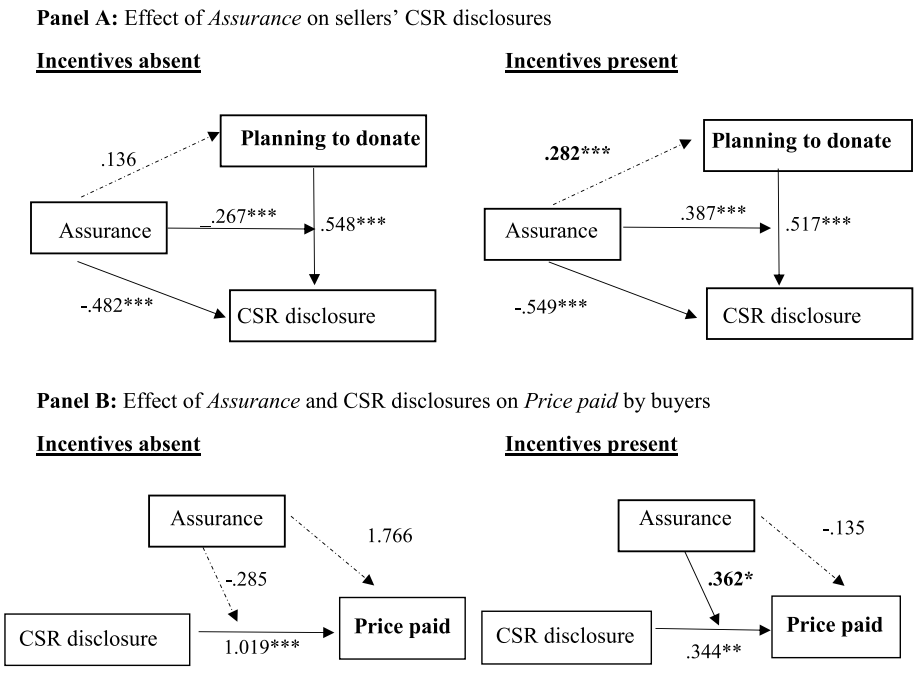


Fig. 5. Attribution of the economic effects to CSR disclosures

Panel A depicts the results of a path analysis (N = 768, for each depiction). All paths displayed in this figure are estimated, and they are estimated jointly using quasi-maximum likelihood. Standard errors are clustered at the subject level. The standardized path coefficient and the corresponding significance level of the coefficients are shown next to each path. All reported p-levels are two-tailed: *p < 0.10, **p < 0.05, ***p < 0.01. Paths with coefficients significant at the 0.10 level or less are presented in solid lines. Other paths are in dotted lines. Goodness-of-fit of our model is calculated using standardized root mean squared residual (SRMR) and coefficient of determinant (CD). For the *No Incentives* model, SRMR is 0.172, and CD is 0.218. For the *Incentives* model, SRMR equals 0.141, and CD equals 0.238. Variable definitions can be found in Table 1. Note: CSR disclosure is measured at the seller level as the donation they show in their CSR disclosures to buyers before buyers buy products (might deviate from what sellers are actually planning to donate). This amount had to range between zero and 15 points.

Panel B depicts the results of an ordinary least squares regression with *Price paid* as dependent variable. N = 768 (for each depiction). Robust standard errors are in parentheses; standard errors are clustered at the subject level; all reported p-levels are two-tailed: *p < 0.10, **p < 0.05, ***p < 0.01. R^2 for the *Incentives absent* model is 0.403; for the *Incentives* model, it is 0.210. Variable definitions can be found in Table 1. Note: CSR disclosure is measured at the buyer level as the amount shown in the CSR disclosure by the seller of their choice.

significant policy interventions that stimulate CSR can be beneficial for the economy, whereas governments may forgo these opportunities when such interventions are not implemented. Yet, in order for such interventions to be effective, our findings also suggest that governments should think of implementing third party assurance.

Second, our results also add to the recent debate on when assurance can offer credibility to CSR disclosures (Beyer & Guttman, 2012; Dando & Swift, 2003; Pflugrath et al., 2011). We show that assurance indeed ensures that CSR investments are higher and more accurately depicted in disclosures when markets also offer incentives to preparers of CSR. Without assurance, preparers misrepresent their CSR investments. Our results may help regulators and auditors to decide for which sectors assurance is more important. Specifically, assurance can be more crucial in sectors where CSR investments are strongly expected by market participants. Also, while we focus on the impact of mandatory assurance of standardized forms of CSR disclosures (Trotman & Trotman, 2015), in reality other verification mechanisms are possible. Companies could ask for voluntary assurance and also other institutions, including tax authorities, and activists may ask for assurance. The anticipation of such verification might produce similar results as what we document.

Our results also inspire research on CSR in the area of buyer-seller selection (Govindan et al., 2015) or capital markets (Barth et al., 2017; Owen, 1990). We conclude that policy interventions, such as providing incentives and assurance of CSR disclosures, can move industries to more sustainable outcomes. As such, we also offer important insights on how CSR disclosures and related policy interventions can influence partner selection and contracting in markets.

This study is subject to some limitations that give rise to opportunities for further research. First, in our experiment, the likelihood of being audited is relatively high and once an audit takes place, misreporting is detected. However, varying types and levels of uncertainty are possible in reality. There may be uncertainty with regard to whether an audit will take place, ranging from mere threat of being audited to complete certainty. Uncertainty may further come from potential future audit regulation that governments tend to develop or from the uncertainty on whether or not an audit is able to detect problematic reporting. For example, current standardization distinguishes different levels of CSR assurance ranging from limited to reasonable assurance, entailing different levels of demands regarding evidence gathering (European Parliament and Council, 2022; SEC, 2022). Prior research shows that these levels can affect users' confidence in their judgments (Vera-Muñoz, Gaynor, & Kinney, 2020). Overall, assurance of CSR disclosures is more complex than the audit of financial statements and future research could study these additional complexities.

In our experiment, we operationalize CSR investment as making charitable donations, which entails a positive outcome. However, with regard to other CSR aspects, performance could also be poor (e.g., environmental performance). It would also be interesting for future research to allow additional reporting decisions in such contexts, including whether or not to report CSR information and whether to do so partially or completely, which may be especially relevant in a setting where CSR performance is poor. It is unclear whether assurance would impact preparers' willingness to misreport differently than their willingness to omit information. For this reason, it would be interesting to study whether preparers' reporting decisions and, in turn, users' reactions to these reports, are affected differently by assurance when CSR performance is good versus poor.

Also, market participants may vary with regard to personal characteristics and preferences that can affect how they react to CSR information. Yet, it is also possible that these elements may play a less important role in competitive market settings. Future research could provide clarity in this matter. Another design choice in our experiment is that the product offered in the market has the same value for all buyers. In reality, however, when reselling products to their own customers, buyers may charge higher prices for more sustainable products. In such markets where buyers can set their own retail prices, assurance and incentives could be even more impactful, as their end consumers may strongly value products provided through a more sustainable supply chain.

Furthermore, our experimental design does not account for the fact that incentives entail a societal cost as they may lead to lower tax revenues or higher tax burdens for certain groups in the market. Future research might study how buyers would react to the presence of incentives for sellers when this would result in a higher tax burden. It

could then, for example, be expected that buyers would not be willing to pay higher prices for more sustainable products as they are already bearing the cost. At the same time, assurance might become even more important as buyers may resist bearing the cost of incentives when reported investments are potentially inaccurate. However, these effects might not be as strong when buyers, in turn, could charge higher prices for more sustainable products, which may potentially reduce or offset the cost of tax incentives.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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APPENDIX A research instrument

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APPENDIX. B, Experimental procedures

Prior to start of actual play:
Buyers and sellers are randomly assigned to the seller and buyer roles
(In each market, 4 people play the role of buyer; 4 people play the role of seller). [a]
Market participants are informed about the market setting, the incentive structure, and the choices each party needs to make.
* They are aware that CSR disclosures are audited with a 75% chance (*Assurance condition) and that sellers receive a 50% tax deduction (Incentives condition).*
Repeated during the 16 rounds of play:
Sellers set prices and how much they are actually planning to donate.
Sellers make a disclosure about their donation, which can deviate from what they are actually planning to donate. [b]
Prices for each seller and their CSR disclosures are revealed to buyers, together with information about proposals and transactions in prior periods.
Buyers choose whether they want to buy the product (labeled as product A) in this period and from which seller (based on prices and CSR disclosures).
Buyers privately answer a question on how satisfied they are with their choice. [c]
Only in the *Assurance* condition:
Sellers are informed whether an audit took place in that period and are provided with the outcome of the audit.
Feedback:
Sellers/buyers are individually informed about their own compensation (earnings).
Buyers, in addition, receive an overview of their past transactions.
Only in the *Assurance* condition:
Buyers are informed whether an audit took place and what the result is.

[a] We consider sellers as the preparers of the CSR disclosure and buyers as users of these disclosures.

[b] When preparing the disclosures, sellers are informed that buyers can only see the CSR disclosures and the proposed prices but not what they are actually planning to donate, prior to making their decisions. *Assurance* condition only: Sellers are informed that there is a 75 percent chance that the CSR disclosures will be audited to check whether the amount is correct. In the case of an audit, sellers know that outcomes will be made available to buyers after the period of play.

[c] *Assurance* condition only: When buyers choose, they also receive the same information about the audit probability and are told that, if an audit takes place, the result will be made available after they make their decision.

APPENDIX. C, Information displayed in the Assurance conditions about audits[a]

Panel A: Example of audit report presented to buyers in the *Assurance* condition.

In this period, an audit took place.	
Your seller in this period is:	3
The information of this seller in the sustainability report is:	Correct
The sustainability report indicates the following amount:	5
The actual amount that the seller is willing to donate per product sold:	5

Panel B: Example of overview of past transactions participants received each period for the *Assurance* condition.

Prior periods seller 1					Prior periods seller 2					Prior periods seller 3					Prior periods seller 4				
PERIOD	PRICE	Sustainability report	AUDIT	Number of buyers	PERIOD	PRICE	Sustainability report	AUDIT	Number of buyers	PERIOD	PRICE	Sustainability report	AUDIT	Number of buyers	PERIOD	PRICE	Sustainability report	AUDIT	Number of buyers
1	23	8	correct	0	1	30	5	correct	0	1	10	5	correct	4	1	30	6	correct	0
2	10	3	correct	0	2	15	5	correct	0	2	10	4	correct	4	2	15	5	correct	0
3	10	4	correct	0	3	6	2	correct	3	3	10	5	correct	0	3	10	6	correct	1
4	6	2	correct	3	4	8	3	correct	0	4	8	4	correct	1	4	12	7	correct	0
5	8	4	no audit	1	5	8	4	no audit	0	5	6	3	no audit	3	5	10	6	no audit	0
6	8	4	correct	0	6	5	1	correct	1	6	5	2	correct	2	6	9	5	correct	1

[a] The information in Panels A and B was displayed in z-Tree and presented in the language of the participants.

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