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Business norm versus norm-nudge as a contract-enforcing mechanism: Evidence from a real marketplace

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ABSTRACT

We design a natural field experiment to examine the impacts of norm-based interventions in enhancing honesty in a large decentralized marketplace fraught with contractual breaches owing to individual dishonesty. Sellers in fish markets of Kolkata, India, frequently cheat on the weight of the fish purchased via bilateral bargaining over price. We approach this marketplace and make two interventions: triggering a business norm driven by sellers' adherence to a superstitious belief and enacting a norm-nudge in the form of moral suasion. Our design exploits a within-seller design whereby experimenter-buyers make scripted one-time purchases. We discover that the sellers behave strikingly honestly when the superstitious business norm is made salient. In contrast, moral suasion significantly decreases dishonesty, but its effect is markedly weaker than the superstition-based business norm. Our results suggest that direct normative appeals have the potential to make substantial headway to mitigate fraud in credence good markets where fraud is hard to detect due to information asymmetry.

1. Introduction

An impressive body of literature in economics argues that individuals' ability to enforce contracts is an essential ingredient for economic growth (MacLeod, 2007; Greif, 2005, 2004, 1998; Kahkonen and Meagher, 2001; North, 1981). Formal contract-enforcing mechanisms, that is, institutions that evolve in the shadow of the law, foster trust among trading parties by ensuring that business dealings respect contractual arrangements. However, without recourse to well-functioning legal enforcement structures, which is especially true in developing economies, transactions are often fraught with contractual breaches owing to individual dishonesty, as documented by several researchers (e.g., Bhattacharya and Dugar, 2020; Dugar and Bhattacharya, 2017; Das et al., 2016; Faraz et al., 2013; Schneider, 2012; Souza et al., 2011; List, 2006; Gabre-Madhin, 2001; Ayres and Siegelman, 1995; Pableo and Ignacio, 1987; Ellis, 1982).[2]

In this paper, we design a natural field experiment to compare and contrast the effectiveness of two *norm-based interventions* in mitigating the incidence of dishonest behavior in a large and established decentralized marketplace fraught with contractual

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[1] The authors would like to express their deep gratitude to the guest editor for the Symposium on "Nudges and Incentives", Professor Ferdinand M. Vieider, and two anonymous reviewers for their thoughtful comments, which greatly improved the arguments and expositional clarity of the paper.

[2] In many developing economies, the informal sector constitutes a significant part of economic activity. Firms in the informal sector are typically unrecorded in the official accounts and, therefore, have opportunities to evade market regulations where they exist (La Porta and Shleifer, 2014). Furthermore, the government in many countries has inadequate willingness or resources to enforce rules (Hallward-Driemeier and Pritchett, 2015). As a result, in markets with weak or non-existent enforcement, sellers have a strong incentive to cheat, which may take several forms, including but not limited to replacing good quality with poor quality products, manipulating the quantity of the product already sold under a contract, etc.

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breaches. As our testbed, we use large fish markets in Kolkata, India, where face-to-face negotiations determine final sales prices, and informal evidence suggests that sellers often cheat on the weight of the fish purchased at a mutually agreed-upon price and thereby violate contractual provisions reached via bilateral bargaining. Moreover, the subtle nature of the fraud and a lack of formal contract enforcement mechanisms render detection and punishment of the fraud nearly impossible. Thus, an instance of fraud unambiguously increases the seller's material payoff at the buyer's expense without any consequences for the seller.[3]

Against this backdrop, our first intervention, called *Business Norm*, works by setting in motion a business-specific cultural norm, called *bouni* in the local language. *Bouni* is driven by sellers' adherence to a widely-held superstitious belief in our markets, according to which the first transaction of the day is considered to be auspicious and determining a seller's luck for business for the day.[4] Our second intervention, called *Norm Nudge*, is a moral suasion message directed to the sellers. Everyday life abounds in examples where individuals are reminded to 'do the right thing' through normative appeals.[5] Taking cues from such real-world examples, our scripted message verbally nudges sellers to 'do get everything alright' without any reference to the weighing of the fish or cheating. Therefore, our ethics-laden message makes a direct normative demand on the seller that is rendered salient just before a business deal is put into action. Although an emerging strand of empirical and experimental research in economics has been devoted to exploring how superstitious beliefs or moral suasion in the form of norm-nudges alter individual behavior, we are not aware of any natural field experiment in a standard marketplace that takes advantage of an existing superstitious belief or that puts moral suasion to work to measure their efficacy as a fraud-mitigating device.

Our three treatments, *Baseline*, *Business Norm*, and *Norm Nudge*, utilize a within-seller experimental design whereby undercover experimenter-buyers purchased 1 kg of a popular fish from 61 individual sellers spread across 16 different markets of the city. Each seller offers the fish at a quoted price and allows buyers to engage in alternating, sequential offer bargaining. Our scripted bargaining protocol involves negotiating over the price and allows exactly two back-and-forth offers between a given bargaining pair. Transactions under all three treatments include asking for the quoted price and then requesting for a pre-set focal price discount and making a purchase irrespective of the seller's decision to accept our request to reduce the price. Upon an agreement (bargain success), the discounted price becomes the final price, whereas a purchase is made at the quoted price in case of a disagreement (bargain failure). In the *Business Norm* treatment, the buyer ensures that he is indeed the first customer of the day, thus triggering the *bouni* norm. After agreeing to purchase in the *Norm Nudge* treatment but before the seller weighs the fish, the buyer communicates to the seller to 'do get everything all right.' Afterward, we re-weigh the purchased fish using a calibrated digital scale to detect any possible weight discrepancy.

Our pre-scripted demand-side interventions allow us to induce a particular extensive form game and information structure in the negotiation process, thereby helping us exercise complete control over the bargaining method (see Fig. 1 for the transactions layout). Given that we employ bargaining practices that are regularly used in our marketplace and control for the bargaining protocol, the number of interactions between a given bargaining pair, seller fixed effects, and other potential sources of frictions such as trading parties' time cost of haggling, buyers' bargaining skill or their age, etc., our experiment is equipped to identify how a superstitious belief and a moral nudge may affect dishonest behavior.

Several insights emerge from our investigation. First, only a handful (7%) of the sellers in *Business Norm* treatment accept our request for a price discount, whereas more than half of the sellers do so in *Baseline* and *Norm Nudge* (59% in each). The former number suggests that most sellers are unwilling to initiate a business day with a sale at a discounted price. Second, we find that none of the 61 sellers cheat in the *Business Norm* treatment, whereas almost all the sellers cheat in *Baseline* and *Norm Nudge* treatments (100% and 95%, respectively). This finding suggests that, unlike the norm-nudge, the superstitious business norm in our marketplace completely removes cheating. Third, we find that in the *Business Norm* treatment, sellers bestow upon the buyer, on average, an additional six grams of fish on top of the 1000 g that the buyer paid for. Therefore, the superstitious belief, in addition to eliminating the fraud, rewards the buyer modestly for being the first customer of the day. By contrast, we find that sellers cheat on average 77 g and 54 g in *Baseline* and *Norm Nudge*, respectively. We also find that the sellers, on average, more than recoup the offered price discount by cheating in the *Baseline* and *Norm Nudge* transactions. Consequently, *Business Norm* generates the highest level of buyer surplus among the three treatments, followed by *Norm Nudge*. Hence, while an external normative appeal for a fair transaction reduces cheating significantly than when no such appeal precedes a transaction, its success pales compared to that of an internally held superstitious belief.

Our finding that a normative appeal can be a successful contract-enforcing device and promote an ethical culture is relevant for credence goods markets (Darby and Karni, 1973), such as automobile, bike, and boat repairs, home heating, and plumbing

[3] The buyers in our markets may be aware of the potential of cheating, but it may not be immediately apparent to them if there was a breach due to the fraud's subtle nature. Even if a buyer could detect a violation, the buyer may decide not to pursue legal recourse since the costs of using over small transactions may outweigh the benefits of a legal case. The costs of writing a complete contract can also be prohibitive. While reputation concerns are thought to discipline the cheating-seller, such a mechanism is almost absent in our markets due to the non-observability of the fraud. We discuss this issue further in Section 6.

[4] The commercial custom of *bouni* (or pronounced as *bohni* in other regions) induced by a superstitious belief is so deeply entrenched in India that it has even commanded an entry in Wikipedia. Similar superstitious beliefs about the first transaction of the day are also observed in many South Asian and other countries such as Thailand, Vietnam, the Philippines, and Israel. The term 'superstition' does not appear to have a commonly agreed-upon definition; see Risen (2016), Vyse (2013), and Lindeman and Svedholm (2012) for different accounts and relevant discussions. However, it is generally agreed in the literature that most common superstitions involve behavior related to the control of good or bad luck (Kramer and Block, 2008).

[5] Moral suasion often takes the form of norm-nudges like providing social information, priming social norms, delivering ethical reminders, or making normative appeals. Instances of moral suasion are ubiquitous. In religious ceremonies, people are advised to avoid sin; in the political arena, policies and programs are motivated based on their moral appeal; in educational institutions, students are discouraged from cheating; and firms employ marketing strategies that urge the general public to support fair trade.

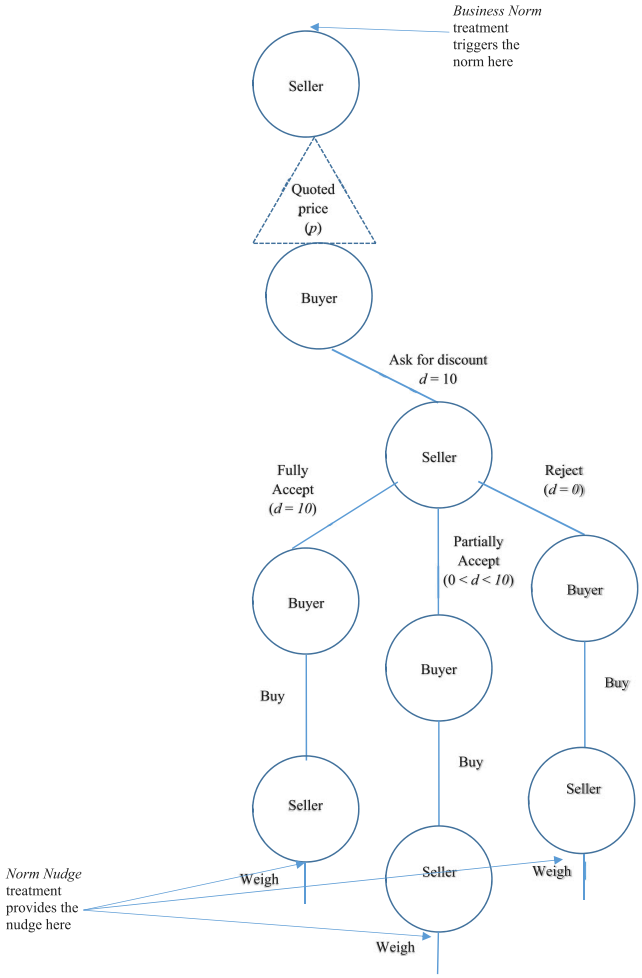

Fig. 1. The layout of the transactions in the experiment.

work. In these markets, bargaining is relatively commonplace (Dulleck and Kerschbamer, 2006), and fraud such as undertreatment (delivering a quality that is insufficient to satisfy a consumer's needs) emerges because consumers in these markets often do not know what level of service they need and cannot ascertain the quality of the received service due to information asymmetry. Our finding from the *Norm Nudge* treatment indicates that a direct normative appeal to sellers may counteract fraud in credence goods markets.

The rest of the paper is organized as follows. In Section 2, we discuss the relevance of our work in the context of the existing literature. In Section 3, we describe the features of our marketplace. In Section 4, we present the experimental treatments and the procedure. The empirical results are reported in Section 5. Section 6 discusses some issues that seem relevant for our study, and Section 7 concludes.

2. Literature

Our paper is part of a large literature exploring the effectiveness of different types of nudges à la Sunstein and Thaler (2003) in various economic domains.[6] We focus on moral suasion, a particular form of norm-nudge that attempts to generate pro-social behavior via direct normative appeals.[7] An extensive strand of literature has designed natural experiments to examine the efficacy of

[6] Sunstein and Thaler (2003) advocates "libertarian paternalism" whose aim is to alter individual behavior without removing any existing options, or significantly modifying financial incentives, or curtailing people's freedom of choice. The effectiveness of nudges has been explored to promote healthy lifestyle choices such as eating well (Lycett et al., 2017; Wilson et al., 2016), doing exercise regularly (Forberger et al., 2019), taking vaccines (Busso et al., 2015); to enable people to make better financial decisions like saving enough for retirement (Thaler and Benartzi, 2004); to improve school enrollments (Reinikka and Svensson, 2005); and to encourage pro-environmental behavior such as conserving energy (Schubert, 2017).

[7] See Bicchieri and Dimant (2019) for a definition and survey of norm-nudges.

moral suasion in discouraging dishonest behavior in settings like credit card debt payments (Bursztyn et al., 2019), tax compliance (Dwenger et al., 2016; Torgler, 2013, 2004, 2003; Blumenthal et al., 2001), compliance with license fees (Fellner et al., 2013), selling newspaper via honor system (Pruckner and Sausgruber, 2013), and honesty among children (Bucciol and Piovesan, 2011). A few papers have designed laboratory experiments to analyze the effects of moral suasion on dishonesty (Dimant et al., 2020; Jacquemet et al., 2019; Shu et al., 2012). However, prior papers have not investigated how moral suasion can reduce dishonesty in a regular face-to-face marketplace.

Our paper contributes to an emerging body of experimental literature documenting that superstitious beliefs may significantly impact the behavior of individuals who hold these beliefs.[8] Invernizzi et al. (2021) designs a field experiment to study a specific superstition followed by the students at Bocconi University, Italy: walking through two lateral passageways and thus shunning the middle passageway of a building entrance. Their study distinguishes between two alternative explanations to understand why students adhere to the superstition: do students fear that not sticking to it would bring bad luck to them or they simply conform to their peers' behavior? They find that while a substantial minority of students are willing to forego a relatively high financial benefit (or incur a high individual monetary cost) to adhere to the superstition, many students simply conform to the behavior of others, in this case a group of student confederates who were paid to walk through the middle passageway. Bayer et al. (2018) designs an experiment for evaluating the widespread belief held by expectant Israeli mothers that a baby's room should remain unfurnished until after the baby is born. They find that many pregnant women, primarily those late into their pregnancy, prefer to adhere to the superstition even at a financial cost.

There are two main differences between the above two studies and ours. First, the superstitions in these studies neither relate to any form of dishonesty nor these studies utilize a real marketplace. Second, we do not measure the strength of sellers' preferences for sticking to the superstitious belief by eliciting their willingness to accept a sum of money in exchange of acting against the belief (i.e., cheat on the weight). Also, we do not investigate alternative explanations such as conformism for why sellers follow the superstition. Instead, we examine whether and to what extent a superstition can reduce fraud. Finally, Invernizzi et al. (2021) and our paper are the only studies that explore the dynamics of interactions between superstitious beliefs and social preferences (conformism and dishonesty, respectively).

We also broadly contribute to a sprawling body of experimental studies, both lab and the field, that has found that deception is sensitive to a variety of economic forces.[9] Our article is most closely related to Dugar and Bhattacharya (2020), who use the same marketplace and adopt the same experimental method as ours; however, they examine if the fish sellers cheat more when customers bargain over price than when they do not and find that bargaining increases the incidence and intensity of cheating. Another closely related study is Kirchler and Palan (2018) that examines whether and how a verbal compliment and a tip (13.1% of the sale price) affect ice cream and durum doner (a Turkish wrap made of meat) sellers' decision to offer a higher or lower than the average *weight* of these food items.[10] They collect one-shot and repeat purchases data from ice cream and durum doner sellers, respectively, and find that the non-monetary gift leads to a higher-than-normal weight of the food items. Even though tipping leads to an even higher-than-normal weight, after accounting for the tipping amount, the compliment is found to be more effective than tipping in eliciting generous behavior. Finally, repeat purchases increase the weight further by about 6%, on average. There are, however, a few critical differences between their study and ours. First, while positive reciprocity plays a key role in influencing sellers' behavior in their case, dishonesty is the main driver behind the fish sellers' behavior. Second, although they study the role of a nudge – the verbal compliment – they do not study a superstitious belief as we do.

Finally, our paper also connects to the literature on contract enforcements using a variety of informal mechanisms. In the absence of formal enforcement structures, contracting parties often resort to informal means to enforce agreements (MacLeod, 2007; Greif, 2006; North, 1981; Macauley, 1963). Indeed, a sizable body of evidence using an array of economic games has emerged from the laboratory or field experiments showing that a wide range of informal mechanisms can enforce contractual obligations like communication (e.g., Brandts et al., 2015; Ben-Ner and Putterman, 2009; Irlenbusch, 2004), social networks (e.g., Chandrasekhar et al., 2018), promise-keeping (e.g., Dufwenberg et al., 2017), social norm (e.g., Kessler and Leider, 2012), guilt aversion (e.g., Charness and Dufwenberg, 2011, 2006), third-party enforcements (e.g., Wu and Roe, 2007), long-term relationships (e.g., Brown et al., 2004), and reciprocity (e.g., Fehr et al., 1997). We add to this literature by exploring the effects of two hitherto unexplored informal instruments on contract enforcement.

3. The marketplace

We conducted our field experiment in large retail fish markets in Kolkata, the capital city of West Bengal, India, that has approximately 4.5 million population as per the 2011 Census. Fish is considered a marker of Bengali identity as it is an integral part of West Bengal's cuisine and culture (Reeves, 2003; Walker, 1998). Hence, fish is an essential food item for an average Bengali

[8] There exists a relatively large literature that uses naturally-occurring data to understand the impacts of superstitious beliefs on individual decision-making in a diverse set of economic contexts. He et al. (2020), Fortin et al. (2014), and Shum et al. (2014) study housing markets; Hirshleifer et al. (2018) focuses on financial markets; Johnson and Nye (2011), Wong and Yung (2005), Yip et al. (2002), and Goodkind (1991) study child-birth decisions; and Ng et al. (2010) studies auction of vehicle license plates. Vyse (2013) discusses various psychological accounts for why individuals engage in superstitious behavior.

[9] See, for example, Bhattacharya and Dugar (2020), Abeler et al. (2019), Dugar et al. (2019), Gneezy et al. (2018), Kirchler and Palan (2018), Dugar and Bhattacharya (2017), Azar et al. (2013), Fischbacher and Follmi-Heusi (2013), Gibson et al. (2013), Innes and Mitra (2013), Houser et al. (2012), Ellingsen et al. (2009), Lundquist et al. (2009), Sutter (2009), Dreber and Johannesson (2008); and Gneezy (2005).

[10] We are grateful to an anonymous referee for informing us of this study.

household. There are 81 small and large retail fish markets in Kolkata.[11] Our experiment entailed purchasing a common Indian major carp, *Rohu*, from 16 randomly-selected large retail fish markets of the city. We collated information about the marketplace using pre-experimental surveys of buyers and sellers to inform our design.[12]

Anecdotal evidence and data from our buyers' survey suggest that sellers frequently cheat on weight in these markets (see Q7 in the buyers' survey).[13] Cheating is facilitated by using traditional hand-held weighing scales (see Fig. A.3 in Appendix A for a photograph of a hand-held weighing scale). Rigged scale, rigged measurement weights, and skillful maneuvering of the scale is perceived as common cheating methods (see Q10 in the buyers' survey). Even for an experienced buyer, it is difficult to detect cheating by visual scrutiny unless the weight discrepancy is enormous (see Q8 in the buyers' survey), as the perceived probability of detection is nearly zero for up to 100 g of cheating conditional on 1 kg of purchase of Rohu (see Q9 in the buyers' survey and Q19 in the sellers' survey). Inspection of weights and scales by government officials is rare (see Q16 in the sellers' survey). Therefore, the lack of implementation of formal regulations to safeguard the provisions of a contract and the difficulty associated with privately monitoring dishonest sellers imply that the sellers face a negligible economic penalty for cheating. These features, coupled with a relatively high proportion of non-repeat buyers in the large markets (see Q10 in the sellers' survey), diminish sellers' concerns for potential sanctions and loss of reputation.

Rohu is a common Indian major carp (see Fig. A.2 in Appendix A for a picture of Rohu). Rohu has high demand, and it is affordable for an average income buyer (see Q12, Q14 in the sellers' survey and Q6, Q3 in the buyers' survey). The average quantity of purchase per transaction for Rohu is about 1 kg(see Q13 in the sellers' survey). It is common to purchase the desired amount of fish cut into pieces from a whole Rohu (see Q11 in the sellers' survey). Lumpiness cannot be attributed to a buyer receiving less than the purchased quantity since sellers deliver the requested quantity by cutting small enough pieces.

Bargaining over price is expected (see Q12 in the buyers' survey and Q9 in the sellers' survey). The retail fish markets in Kolkata are populated with dozens of sellers. The number of customers runs into hundreds during peak business hours (between 8 am to 10 am) (see Q8 in the sellers' survey), and markets are generally busier on weekends than weekdays.

As indicated earlier, a superstitious belief among the sellers exists in our marketplace that the first transaction of the day, called *bouni*, is auspicious. The superstitious belief that good conduct in the first transaction is expected to bring good luck to the seller implies that the first buyer of a day is likely to receive a fair treatment from the seller.

4. The experiment

Undercover experimenter-buyers purchased Rohu from randomly selected sellers from 16 large retail fish markets of Kolkata.[14] All the buyers who made the purchases were male, between 25–30 years of age, had experience purchasing fish, and native speakers of the local language, Bengali. All the buyers were dressed casually during the purchases to blend well with other buyers in these markets. At no time was it made apparent to the sellers or anyone in the market that these buyers knew each other.

Each transaction in the experiment entailed purchasing 1 kg of Rohu cut into pieces without scaling and involved a scripted bargaining protocol following which the buyer requested a price discount of 10 Rupees for 1 kg of purchase. If the seller agreed to reduce the price, either by the buyer's discount amount or another smaller amount proposed by the seller, the transaction was completed with the discounted price as the final price. Even if the seller refused to reduce the price, the buyer still bought the fish with the quoted price as the final price. This sequence of interaction between the buyer and seller is represented in Fig. 1.

Using a within-subjects design, we employed three treatments: *Baseline*, *Norm Nudge*, and *Business Norm*. Specifically, three purchases were made from each seller, and therefore, we have one observation for each treatment from each seller. A buyer purchasing in the *Baseline* treatment made a transaction following the bargaining protocol described above. There was no additional communication in the *Baseline*. In the *Norm Nudge* treatment, each transaction followed the same protocol as in the *Baseline* until the buyer agreed to purchase. After agreeing to make a purchase and before the seller weighed the fish, the buyer communicated an additional sentence in local language to the seller, which essentially translates into 'Do get everything alright'. For a transaction in the *Business Norm* treatment, the buyer first asked the seller whether he had made his *bouni* transaction of the day. Upon getting a negative response, he purchased following the same protocol as in the *Baseline*.[15]

For the *Business Norm* treatment, four of our buyers went to a market around 6 am when the markets usually start opening. Each buyer made a purchase from a different seller and left the market after making his purchase, and noted down the quoted price, the final price, and the specific location of the fish stall in the market on a post-it note and attached it to the fish packet. We used a digital scale to weigh the purchased fish and recorded the actual weight to detect any weight discrepancy. We had calibrated the

[11] Data source: http://www.wbagrimarketingboard.gov.in/bazar/kolkata1.html (last accessed in July 2013). A cached version of the page is retrievable by pasting the above web address in: https://archive.org/.

[12] A summary of the buyers' and sellers' responses to relevant questions from the surveys are provided in Appendices B and C, respectively.

[13] A news article in *The Telegraph*, the fourth most widely read newspaper in India, according to the Indian Readership Survey conducted in 2012, summarized the cheating problem in Kolkata fish markets as follows: "Hundreds of thousands of consumers are cheated every day, thanks to weights and measures that have been rigged on purpose". This news article noted the experience of a buyer who paid for 2 kg of fish and received 1.3 kg and still could not detect the difference in weight at the time of transaction. The article also stated: "Indeed, the problem is so rampant that most people have become quite inured to it. Few complain, and fewer measures are taken by the authorities to bring the guilty to book" and "Ninety-nine times out of 100, customers do not object even if they feel they have been cheated". See Fig. A.1 in Appendix A for a copy of the news article.

[14] Ayres and Siegelman (1995) and Dugar and Bhattacharya (2017) also employed undercover buyers in their field experiments.

[15] If a seller's response to the question of if he had already made the *bouni* transaction was positive, then the buyer moved on to a different seller. The buyer purchased from a seller only after receiving a negative response to the *bouni* question. We had six instances where a buyer had to move on to a different seller.

digital scale before the experiment to ensure its accuracy (see Fig. A.4 in Appendix A for a picture of the digital scale). On the same day, around 8 am, two different buyers went to the same market and made purchases for the *Baseline* and *Norm Nudge* treatments. The information about the specific location of the stalls of the fish sellers from whom the purchases had already been made for the *Business Norm* treatment earlier that morning was shared with these two buyers so that they could make purchases from those specific sellers. These two buyers approached a given seller one after another. One of them purchased for the *Baseline*, and the other purchased for the *Norm Nudge* treatment. After completing his purchase, each buyer moved away from the seller and noted down the transaction information on a post-it note and attached it to the fish packet, and put it in an opaque bag that each one was carrying. Following the same protocol, the two buyers procured observations from the other target sellers of the market. We randomized the order of the *Baseline* and *Norm Nudge* treatments and the buyer who made the purchase in the *Baseline* transaction. Again we used a digital scale to weigh the purchased fish. Thus, we procured three observations from each seller — one for *Baseline*, one for *Norm Nudge*, and one for *Business Norm*.

We procured observations from 16 different markets following the same procedure. All the transactions for a given market were made on a single day to retain the one-shot nature of the transactions. All the purchases were made on weekdays in June 2017. Our experiment generated a total of 61 observations for each treatment.[16] The within-seller design allows us to control for factors such as a seller's intrinsic preferences, fish quality, etc., that may potentially affect a seller's behavior to our interventions and thereby facilitates clear identification of the treatment effects.

5. Results

5.1. Price

We make several observations by first focusing on the price data, both quoted (p) and final ($p - d$) price, measured in Rupees per 1000 g. First, we observe that each seller quoted the same price to all the three buyers who purchased from him. In other words, none of the sellers price discriminated among the three buyers when quoting a price. As a result, the summary statistics of the quoted price are identical across three treatments (see the statistics of p in Table 1) and the mean and standard deviation of matched differences in the quoted prices by the seller id for a given treatment pair are zero (see the statistics of p in Table 2). Second, within each treatment, the mean final price is lower than the mean quoted price, implying that, on average, the bargaining reduced the price in each treatment (see the statistics of p and $p - d$ in Table 1). Third, the final prices were identical in *Baseline* and *Norm Nudge* treatments. As a result, the summary statistics of $p - d$ in Table 1 are identical for these two treatments, and the mean and standard deviation of the matched differences in $p - d$ in Table 2 are zero for this treatment pair. The identical final prices in *Baseline* and *Norm Nudge* imply that the sellers did not charge different final prices for two consecutive purchases. Fourth, the final prices are significantly lower in *Baseline* and *Norm Nudge* treatments than *Business Norm* treatment (see the $p - d$ statistics in Table 2). The higher final price in *Business Norm* is attributable to fewer sellers accepting the request for a price discount in *Business Norm* than in the other two treatments.

We refer to a transaction that resulted in a price reduction (i.e., $d > 0$) as bargain success. We find that 59 percent of the transactions resulted in bargain success in *Baseline* as well as *Norm Nudge*. In contrast, only 7 percent of the transactions resulted in bargain success in *Business Norm* (see Fig. 2). Since the first transaction of the day is believed to determine a seller's luck for subsequent sales of the day, it is natural that the sellers are unwilling to start a business day by offering a price discount, resulting in a lower incidence of bargain success transactions in *Business Norm*. Logit regression estimates also corroborate that the probability of bargain success is significantly lower in the *Business Norm* treatment than the other two treatments (see model (1) in Table 3). These results suggest that buyers are more likely to be better off in *Baseline* and *Norm Nudge* treatments as they received a price discount more often in these treatments than in *Business Norm* treatment.

5.2. Incidence of weight discrepancy

Next, we focus on the incidence of weight discrepancies across three treatments. A small difference between the quantity for which the buyer paid the seller (q) and the actual quantity received by the buyer (q^a) may arise due to hand-held weighing scales that are typically less precise than a digital scale. Suppose a weight discrepancy, defined as $x = q - q^a$ and measured in grams, is unintentional due to the above imprecision. In that case, we expect x to be approximately randomly and symmetrically distributed around zero in every treatment. We observe $x > 0$ in all the *Baseline* and *Norm Nudge* transactions and $x > 0$ in only 23 percent of the *Business Norm* transactions (see Fig. 2). Given our within-seller design, this evidence refutes the conjecture that the observed x is a result of unintentional random measurement error. The histograms of x in Fig. 3 further substantiate the claim that the measurement errors are not unintentional. The entire distribution of x is below 10 g and predominantly below zero in the *Business Norm* treatment. In contrast, the whole distribution of x in the *Norm Nudge* treatment shifts to the right with all observations above zero, and the distribution of x in the *Baseline* shifts even further to the right.

To further enrich our analysis, we examine three categories of weight discrepancies: $x > 0$, $x \geq 25$, and $x \geq 50$. Since the sellers usually carry 25 g and 50 g weight denominations in our markets, it implies that these weights command economic significance for

[16] For three of the 16 markets, only three of the four buyers for the *Business Norm* treatment could visit the market; therefore, we have observations from only three sellers from those markets.

Table 1
Summary by treatment.

	N	Mean	S.D.	Median	Min	Max
Quoted price in Rupees per 1000 g (p)						
Baseline	61	287.87	7.61	290	270	300
Norm Nudge	61	287.87	7.61	290	270	300
Business Norm	61	287.87	7.61	290	270	300
Final price in Rupees per 1000 g ($p-d$)						
Baseline	61	282.29	7.56	280	270	300
Norm Nudge	61	282.29	7.56	280	270	300
Business Norm	61	287.46	7.34	290	270	300
Price discount in Rupees per 1000 g (d)						
Baseline	61	5.57**	4.84	10	0	10
Norm Nudge	61	5.57**	4.84	10	0	10
Business Norm	61	0.41	1.66	0	0	10
Cheated quantity in grams (x)						
Baseline	61	76.71**	14.04	34	79	96
Norm Nudge	61	54.38**	16.94	4	57	83
Business Norm	61	−5.92**	7.71	−21	−7	9
Cheated value in Rupees (v)						
Baseline	61	21.67**	4.09	22.4	9.52	27.73
Norm Nudge	61	15.34**	4.82	15.95	1.2	23.24
Business Norm	61	−1.69**	2.21	−2.1	−5.88	2.52
Price discount - Cheated value ($d-v$)						
Baseline	61	−16.1**	6.59	−15.76	−27.73	−2.47
Norm Nudge	61	−9.77**	6.28	−9.6	−23.24	3.52
Business Norm	61	2.1**	2.86	2.16	−2.52	12.9

Notes: ** and * respectively denote statistical significance at 1% and 5% levels of significance based on two sided t-test and Wilcoxon signed-rank test. The test results were qualitatively identical for t-test and Wilcoxon signed-rank test.

Table 2
Summary of paired differences between treatments.

	Baseline - Norm Nudge	*Baseline - Business Norm*	*Norm Nudge - Business Norm*
Price quote (p)	0	0	0
	(0)	(0)	(0)
Final price ($p-d$)	0	−5.16**	−5.16**
	(0)	(4.74)	(4.74)
Cheated quantity (x)	22.33**	82.62**	60.29**
	(18.16)	(14.13)	(16.03)
Cheated value (v)	6.33**	23.36**	17.04**
	(5.21)	(4.12)	(4.54)
Buyer surplus (S)	−6.33**	−18.2**	−11.87**
	(5.21)	(6.83)	(6.22)

Notes:
i. Mean of differences (left hand side treatment - right hand side treatment) based on matched pairs of observations by seller id are reported; the corresponding standard deviation of differences are reported in parentheses.
ii. p and d are in Rupees per 1000 g; x is in g; v&S are in Rupees.
iii. ** and * respectively represent statistical significance at 1% and 5% levels of significance based on two sided t-test and Wilcoxon signed-rank test. The test results were qualitatively identical for t-test and Wilcoxon signed-rank test. The tests were not relevant where the outcomes were identical between treatments i.e. the treatment pairs where the mean and standard deviation of paired differences are zero.

the market participants. Therefore, the incidence of $x \geq 25$ and $x \geq 50$ are more robust markers of intentional weight discrepancy. Fig. 2 depicts that none of the *Business Norm* transactions belong to $x \geq 25$ and $x \geq 50$ categories. In contrast, 100 percent and 95 percent of *Baseline* and *Norm Nudge* transactions belong to the $x \geq 25$ category, respectively; these shares decline to 95 percent and 66 percent respectively for the $x \geq 50$ category. No statistical test is needed to infer that the incidences of $x \geq 25$ and $x \geq 50$ are significantly higher in *Baseline* and *Norm Nudge* treatments than in *Business Norm* treatment.

In sum, the above evidence leads to the following conclusions. In *Business Norm* treatment, the majority of the sellers bestow on the buyer a reward for being the first customer of the day as $x < 0$. The remaining transactions where the sellers erred on the other side ($x > 0$) can be treated as instances of unintentional weighing error as x was below 10 g in those transactions. By contrast, in *Baseline* and *Norm Nudge* treatments, a remarkably high proportion of transactions belongs to $x \geq 25$ and $x \geq 50$ categories, implying that the same sellers intentionally cheated the buyers in *Baseline* and *Norm Nudge* treatments given our within-seller design. As a result, subsequently, we refer to x as the cheated quantity.

5.3. Cheated quantity

The mean x in *Business Norm*, *Norm Nudge*, and *Baseline* treatments are approximately −6 g, 54 g, and 77 g, respectively. Each of these means is significantly different from zero (see the statistics of x in Table 1). The paired differences in x reiterate that x

Table 3
Regressions results.

	(1) P(*Bargain success*)	(2) x	(3) v
Norm Nudge		−22.33**	−6.327**
		(0.000)	(0.000)
Business Norm	−0.528**	−82.84**	−23.68**
	(0.001)	(0.000)	(0.000)
Price quote	0.0140*	0.193	0.0936
	(0.024)	(0.372)	(0.134)
Bargain success		−0.421	−0.603
		(0.902)	(0.537)
Tuesday	−0.129	0.527	0.160
	(0.345)	(0.895)	(0.885)
Wednesday	−0.0196	−3.061	−0.852
	(0.885)	(0.482)	(0.489)
Thursday	−0.185	−0.671	−0.154
	(0.145)	(0.876)	(0.900)
Friday	0.00300	0.132	0.0547
	(0.982)	(0.971)	(0.958)
Constant		21.95	−4.783
		(0.721)	(0.785)
Observations	183	183	183
Test for the coefficient of *Norm Nudge* = the coefficient of *Business Norm*:			
F-test statistic		405.76**	402.02**
		(0.000)	(0.000)

Notes:
i. ** p-value < 0.01 and * p-value < 0.05; p-values reported in parentheses correspond to standard errors that account for seller level clustering.
ii. x: cheated quantity in grams; v: cheated value in Rupees.
iii. Logit marginal effects reported in (1) and OLS estimates reported in (2) & (3).
iv. *Baseline* treatment is the benchmark treatment in regressions (2) & (3). In regression (1) the *Baseline* and *Norm Nudge* form the comparison group for the *Business Norm* treatment as the there was no difference in the outcome variable between the *Baseline* and *Norm Nudge*. Monday is the comparison group for the days of the week.

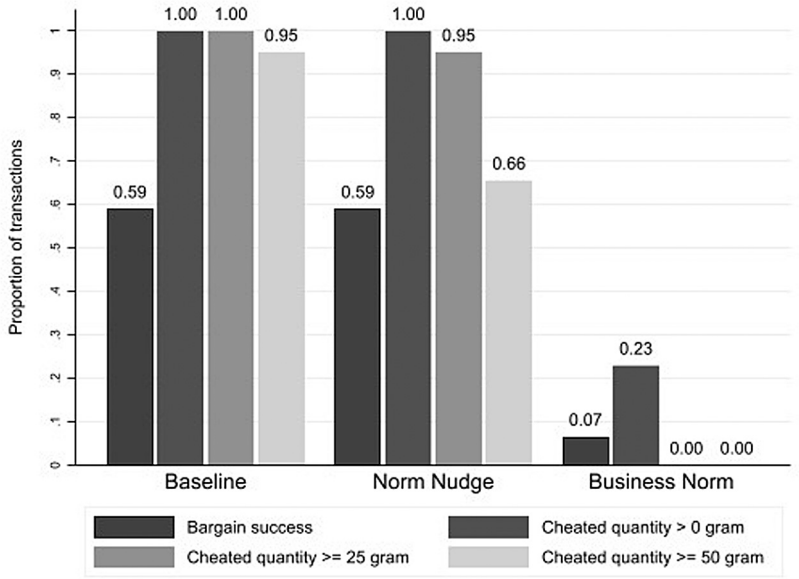

Fig. 2. Proportion of bargain success and different categories of cheating by treatment.

is the lowest in *Business Norm*, the second-highest in *Norm Nudge*, and the highest in *Baseline* (see the statistics of x in Table 2). Controlling for the price quote, bargain success, and the day of the week, the regression results establish that the observed differences in x between the treatments are significant (see model (2) in Table 3).

These results imply that *Norm Nudge* reduces the magnitude of cheating by a significant amount relative to *Baseline*; however, it does not eliminate cheating. By contrast, when a buyer happens to be the first buyer of the day in *Business Norm*, the sellers do not cheat. Therefore, *bouni*, driven by a seller's adherence to a superstitious belief, has a much stronger dampening effect on cheating

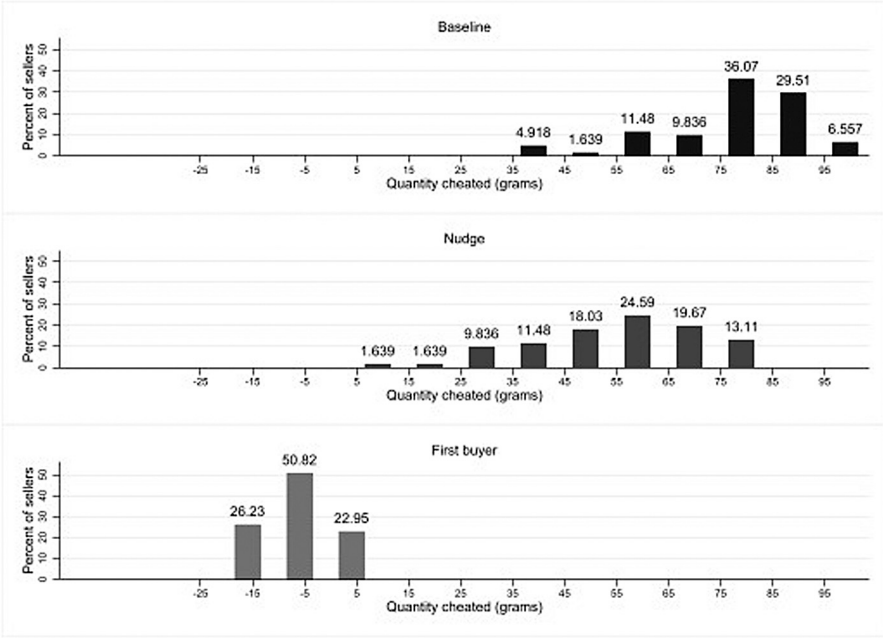

Fig. 3. Histogram of cheated quantity by treatment.

than a norm-nudge that directly conveys a buyer's expectation of a fair transaction. The higher intensities of cheating in *Norm Nudge* and *Baseline* treatments also suggests that the lower average final prices in these two treatments may not necessarily translate into higher buyer surplus as the monetary value of the cheated quantity may more than offset the gain accrued from a price discount.

5.4. Cheated value

The cheated value, $\upsilon = x(p-d)/1000$, used in our analysis, represents the cheated quantity's monetary value, and is measured in Rupees. The mean υ in *Business Norm*, *Norm Nudge*, and *Baseline* treatments are approximately −2 Rupees, 15 Rupees, and 22 Rupees, respectively. Each of these means is significantly different from zero (see the statistics of υ in Table 1). The paired differences in υ in Table 2 also demonstrate that υ is the lowest in *Business Norm*, the second-highest in *Norm Nudge*, and the highest in *Baseline* treatment. The regression results establish that the observed differences in υ between the treatments are significant (see model (3) in Table 3).

The mean cheated value expressed as a percentage of the quoted price stands at approximately −0.6%, 5%, and 8% in *Business Norm*, *Norm Nudge*, and *Baseline* treatments, respectively (see Fig. 4). Therefore, the cheated values are economically significant for the market participants in *Norm Nudge* and *Baseline* treatments, and more importantly these figures reflect considerable monetary loss for buyers for whom fish is an essential food item. In contrast, the sellers are modestly generous towards the first customer of the day as they confer on that buyer a small but statistically significant extra reward.

5.5. Buyer surplus

To evaluate the net monetary impact of the price discount and cheating on the buyers, we adapt the standard definition of the buyer surplus and define it as $S = V - (p - d) - \upsilon$, where V is the buyer's valuation of 1000 g of Rohu. Assuming V as the common valuation of fish by buyers, we compute the difference in S between each pair of treatments using matched pairs of observations for each seller based on the observed $(p - d)$ and υ. For example, based on paired transactions for a given seller, $S_{Baseline} - S_{BusinessNorm} = (p-d)_{BusinessNorm} + \upsilon_{BusinessNorm} - (p-d)_{Baseline} - \upsilon_{Baseline}$. Since in our data, p is identical for all three treatments for a given seller, the difference in S between two treatments is effectively the difference in $d - \upsilon$, i.e., $S_{Baseline} - S_{BusinessNorm} = (d - \upsilon)_{Baseline} - (d - \upsilon)_{BusinessNorm}$. In other words, the difference in buyer surplus between any two treatments is determined by the extent to which the cheated value in each treatment offsets the received price discount. Hence the statistics for $(d - \upsilon)$ by treatments in Table 1 provide the same insight as the statistics for the paired difference in S, as reported in Table 2. One may also assess the net impacts graphically from Fig. 4 as it presents the mean price discount and mean cheated value expressed as percentage of the quoted price for each treatment.

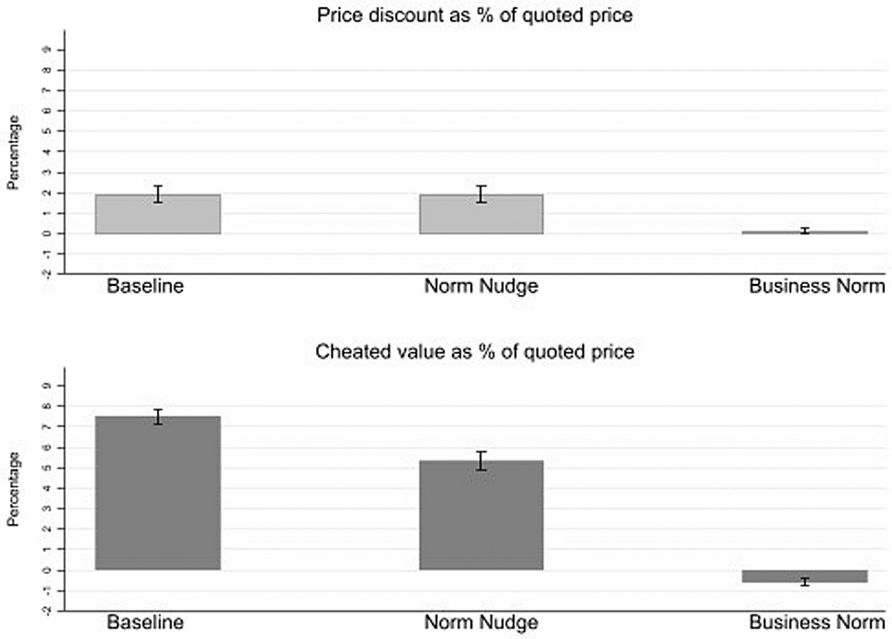

Fig. 4. Mean and 95% confidence interval of price discount and cheated value by treatment.

We find that the sellers, on average, more than offset the price discount by cheating in the *Baseline* and *Norm Nudge* transactions as the mean $(d - v)$ are significantly negative for these treatments (see Table 1). The mean difference in S between *Baseline* and *Norm Nudge* is −6.33 Rupees, and this difference is significant (see statistics of S in Table 2). It implies that the buyers' simple one-sentence normative appeal induces the sellers to cheat less translating into a higher buyer surplus in *Norm Nudge* than *Baseline* treatment.

By contrast, the sellers bestowed a net reward on the buyers in the *Business Norm* transactions as the mean $(d - v)$ is significantly positive for this treatment (see Table 1). The mean difference in S between *Norm Nudge* and *Business Norm* is −11.87 Rupees, and this difference is significant (see statistics of S in Table 2). It implies that a higher cheated value more than offsets the gain from a lower final price in the *Norm Nudge* treatment, which translates into a significantly lower buyer surplus in *Norm Nudge* than *Business Norm* treatment where cheating is effectively eliminated.

The mean difference in S between *Baseline* and *Business Norm* is −18.2 Rupees, and this difference is significant (see statistics of S in Table 2). Similar to *Norm Nudge* treatment, it implies that the higher cheated value in *Baseline* more than offsets the gain from a lower final price than in *Business Norm* treatment translating into a significantly lower buyer surplus in *Baseline* treatment than *Business Norm* treatment.

The above three results jointly imply that buyer surplus is the lowest in *Baseline*, the second-highest in *Norm Nudge*, and the highest in *Business Norm*. Put differently, although *Norm Nudge* succeeds in generating a higher buyer surplus than *Baseline* by reducing the intensity of contract violations, the intrinsic superstitious belief is much more potent in preventing contract violations. Consequently, it generates the highest level of buyer surplus despite a higher average final price than *Norm Nudge* and *Baseline*.

6. Discussion

This section discusses a few issues that are pertinent to our results. Specifically, the first four subsections present plausible alternative explanations for our findings and argue why they are hard to reconcile with the data patterns observed across our treatments. Section 6.5 highlights the potential role of reputation concerns of sellers in our marketplace.[17]

[17] We are immensely grateful to the editor and two anonymous referees for highlighting these issues that deserve special attention.

6.1. Pre-purchase verification of the bouni transaction

Before initiating the *Business Norm* transactions, we verified that the seller had not yet made the first transaction on that day, aka *bouni*. Given this design feature, one might attribute the elimination of cheating in that treatment to the individual or the combined effects of the following two factors: first, the superstitious belief held by the sellers about *bouni*, and second, the pre-purchase verification of the *bouni* transaction making the buyer's expectation of fair dealing salient. The channel via which the second factor may operate is as follows. Making *bouni* salient caused a seller to (second-order) expect that the buyer expects a fair transaction, i.e., the purchased fish weighing 1000 g. The seller conformed to the buyer's (first-order) expectation and refrained from cheating. Hence, pre-purchase verification subtly conveying the expectation of honesty associated with a *bouni* transaction might have reduced cheating fully or partially. Our design does not allow us to entirely refute the second factor's role or precisely pin down the contribution of each factor. However, *Norm Nudge* and *Business Norm* treatments' data permit us to argue that the superstitious belief is primarily responsible for removing cheating in *Business Norm* treatment.

Our argument begins by assuming that the pre-purchase verification of *bouni* is equivalent to furnishing an overly subtle nudge to a seller not to cheat. By contrast, *Norm Nudge* treatment's nudge was arguably far less subtle since the buyer directly asked the seller to get everything alright. Consequently, the nudge in the *Norm Nudge* treatment is likely to create a stronger second-order belief in a seller about the buyer's expectation of a fair transaction than that of the *Business Norm* treatment. However, the data show that the *Norm Nudge* treatment's possibly more powerful nudge was far less effective in reducing cheating, let alone eliminating cheating, than the *Business Norm* treatment's conceivably weaker nudge. Based on this evidence, we contend that the superstitious belief played the dominant role in eliminating cheating rather than the buyer's expectation of a fair transaction, created via our pre-purchase verification in the *Business Norm* treatment. Had conveying the buyer's expectation of honesty played the dominant role, we would have observed no cheating or very little of it in the *Norm Nudge* treatment, which is refuted by our data.

6.2. Buyers' expectations about cheating

A potential explanation for the observed treatment differences relies on differences in a buyer's expectation about cheating across our treatments. It seems plausible that sellers cheat a great deal without any intervention and cheat modestly with a norm-nudge because buyers expect sellers to cheat as usual in the former and a smaller amount in the latter due to the direct moral appeal.[18] Furthermore, buyers expect sellers to be honest in the *bouni* transactions, and sellers simply comply with this expectation. Thus, one may wonder if sellers' cheating behavior merely conforms to a buyer's expectation of getting a raw or a fair deal in our markets. Our argument, quite similar to that in Section 6.1, is that this alternative explanation is hard to reconcile with the observed differences in fraudulent activities across treatments. The expectation of a fair transaction was communicated directly to the seller in the *Norm Nudge* treatment. In contrast, a similar expectation was conveyed, albeit subtly, in the *Business Norm* treatment. Since cheating is effectively eliminated in the *Business Norm* treatment but not in the *Norm Nudge* treatment, it suggests that sellers' behavior was far less responsive to the buyer's expectation of honest behavior than our treatment variable in the *Business Norm* treatment, the superstitious belief.[19]

6.3. Timing of the purchases and the first-best design

Since the *Baseline* and *Norm Nudge* transactions were completed around 8 AM and the *Business Norm* transactions were completed around 6 AM, it is reasonable to be concerned about the potential effects of the difference in purchase times across treatments on seller behavior. One might think of a situation where a seller, realizing during the peak hours that the business for the day was not turning out as well as he had expected, cheats more than earlier in the day to offset the effects of a bad day for business. As a result, we would observe relatively more cheating in the other two treatments than the *Business Norm* treatment. However, given the features of our marketplace and our design, we do not think this hypothesis explains our data well.

Recalling that the peak business hours are from 8–10 AM in our markets, *Baseline* and *Norm Nudge* transactions were completed when the business in these markets just started peaking. Thus, it is hard to conceive that by 8 AM, it would be already apparent to a seller that the business for the day might not turn out well enough, which causes him to cheat more than earlier in the day. Even if we assume that a seller figured out by 8 AM that the business for the day would be dull, then based on the above conjecture, the seller is expected to cheat more in all subsequent transactions. Put differently, this conjecture would imply that the incidence

[18] Q7 in the buyers' survey demonstrates that 93.5% of the buyers think that sellers may cheat.

[19] As noted in the introduction, the superstitious belief held by sellers in our marketplace is governed by a seller's deep-rooted adherence to a seemingly irrational norm and, no anecdotal evidence from our marketplace indicates that it is influenced by a buyer's expectation of a fair transaction.

and magnitude of cheating in the *Norm Nudge* and *Baseline* transactions should be statistically equivalent as these purchases were made consecutively within minutes of each other. However, sellers cheated significantly less in the *Norm Nudge* than the *Baseline* transactions.[20]

Furthermore, since our purchases were spread over weeks across 16 different markets of the city, it is doubtful that all the 61 sellers, spread over time and space, faced the same business situation (i.e., the business for the day was dull compared to their expectation), which prompted each of them to cheat more in the *Baseline* and *Norm Nudge* treatments than in the *Business Norm* treatment. (see seller level x in Fig. D.1 in Appendix D).

Let us now briefly address why we did not opt for the 'first-best' design of sending all three buyers simultaneously during the market-opening times. Upon consulting the market features, we decided against that design. Around 6 AM, when sellers are just getting ready for the day, very few buyers are present in the market. Suppose three buyers of the same age group approached a given seller one after another to purchase the same fish (Rohu), asked for the same price discount, and bought the fish irrespective of the discount decision of the seller. In that case, the buyers' behavior could have run the risk of standing out. It could have raised a suspicion that they were not 'typical' buyers, which might have affected sellers' behavior. Since we wanted to procure data from a natural setting without raising any alarm that could alter sellers' normal responses, we decided against the 'first-best' design. By contrast, around 8 AM, these markets are teeming with buyers, and therefore, two subsequent transactions with the same price discount request for the same fish are far less likely to stand out.

6.4. Strategic behavior in price quotes

A strategic seller could decide to quote a comparatively high price as he would like to accept a buyer's request for a price discount, which might, in turn, influence the intensity of cheating. However, we believe that the observed treatment differences in cheating are not sensitive to such strategic behavior. In our design, the buyer first inquired about the price of 1 kg of the fish, and upon hearing the price, he asked whether the seller would be willing to offer a discount of 10 Rupees for 1 kg of purchase. So, when the seller quoted the price, he did not know whether the buyer would bargain over the price and what quantity of fish the buyer would purchase. Nevertheless, an experienced seller may strategically quote a price based on his expectation about a price bargain. Our within-seller design allows us to control for such seller-specific expectations or strategic behavior. Furthermore, each seller in our experiment quoted the same price to all three buyers representing three different treatments, yet we observe significantly dissimilar cheating behavior across treatments. Hence, it is evident that

6.5. Seller reputation and repeat purchases

The final issue that we address pertains to seller reputation. Why do sellers in our markets seem to be not concerned about their reputation, especially when studies in the literature document that reputational and image concerns play significant roles in influencing dishonest behavior (e.g., Huber and Huber, 2020; Abeler et al., 2019; Khalmetski and Sliwka, 2019)? Relatedly, why do sellers cheat and risk not converting a one-time buyer into a repeat customer? Recall that from our pre-experiment surveys we know that even though most buyers in our markets think that sellers may cheat yet, most of them never reweigh the purchased fish. Moreover, both buyers and sellers believe that buyers would not detect cheating below 100 g, conditional on 1 kg purchase of Rohu. Given the agreement between seller and buyer beliefs about detecting cheating, sellers have little incentive to invest in reputation-building measures. Consequently, cheating below 100 g, as observed in the data, goes undetected and unpunished. In general, we believe that sellers expect buyers never to reweigh the purchase or detect cheating unless cheating is so prominent that it is detectable by visual inspection. As a result, the fraudulent business practice does not damage a seller's reputation or the prospects of getting repeat buyers.

While we posed as one-time buyers in our experiment, we conjecture that repeat customers may face a different cheating algorithm in our marketplace. However, it is not warranted that repeat purchases will necessarily mitigate cheating in our marketplace. Schneider (2012) documents that repeat transactions fail to reduce or eliminate fraud such as "undertreatment" in auto repair services markets in North America, a credence good market. Schneider (2012) notes that the failure of repeat transactions

[20] We can also draw on the data from Bhattacharya and Dugar (2020), who use the same marketplace to buy 1 kg of the same fish during peak business hours for their three conditions: Baseline, Bargain Failure, and Bargain Success. They find that the mean cheated quantity is 28 g in the Baseline, 37 g in Bargain Failure, and 85 g in Bargain Success. Thus, there exist substantial differences in cheating behavior across the three conditions even when the timings of all the purchases are approximately the same.

to reduce undertreatment could result from buyers' inability to assess service quality after the transaction. Brown and Minor (2021) observe that reputation can solve asymmetric information problems if misconduct is frequently observed, usually not the case in credence goods markets. Based on this evidence, it can be conjectured that sellers have little incentive to build a reputation for good behavior in credence good markets. In principle, ours is also an example of a credence goods market where cheating on the weight constitutes an instance of undertreatment, and buyers cannot detect cheating below 100 g. Therefore, it remains an open question whether and exactly how our sellers' cheating strategies would vary depending upon if someone is a one-time buyer instead of a repeat buyer in our marketplace.

7. Conclusion

People's confidence in the success of contract enforcement mechanisms is a crucial asset for an economy's long-term prosperity. Understanding the determinants of contract enforcement is, therefore, essential for the development of possible remedies. In this study, we design a natural field experiment to examine whether norm-based interventions can reduce contract violations in a large and established marketplace where sellers regularly cheat on the provisions of a contract reached via bilateral bargaining. We explore two interventions. Our first intervention entails activating an already existing superstitious business norm called *bouni* in our markets that induces sellers to believe that the first transaction of the day determines the luck for the business for the rest of the day and, therefore, the first customer of the day receives fair treatment. Superstitious beliefs are known to influence individual decisions. However, our knowledge is limited on whether superstitious beliefs can be used to curb cheating in a marketplace fraught with fraudulent activities. The second intervention studies whether exposure to a direct moral appeal for a fair transaction mitigates sellers' dishonest behavior. Moral suasion is ubiquitous in many real-life domains, yet there is a shortage of evidence regarding how direct normative appeals can affect unethical behavior in a standard market setting. Our paper offers such evidence.

We find that the business norm driven by superstitious belief eliminates the fraud. We also find evidence that exposing sellers to a direct normative nudge right before they engage in the act of fraud goes a significant way to reduce contract violations. However, the norm-nudge does not succeed in eliminating contract violations like the intrinsic superstitious belief. The last result aligns well with the existing research suggesting that ethics reminders may promote compliance with the honesty norm. In essence, these findings highlight that norm-based interventions may be important for fostering the enforcement of contracts.

Our result, especially on the norm-nudge, has implications for credence good markets (Darby and Karni, 1973). In credence goods markets, buyers are often subjected to *undertreatment* (i.e., the delivered quality is insufficient to satisfy the buyer's need) because buyers, by and large, do not know what level of service they need and cannot ascertain the quality of the received service due to information asymmetry. As a result, they receive the short end of a business deal. Our results indicate that buyers' direct normative appeal for fair treatment may counteract fraud to some extent in credence goods markets.

In closing, we make two observations on *bouni*, the superstitious commercial norm we study in this paper, and its connection to the relevant literature in economics. Our first observation pertains to the generalizability of our result regarding the superstitious norm. We believe that the finding concerning the impact of superstitious belief about the first transaction of the day on dishonesty can be replicated in other markets where such a belief exists. We utilize a marketplace that meets the requirements of a traditional trading place, and we explore a superstitious belief that is not unique to Kolkata fish markets. Similar superstitious beliefs regarding how a day's first sale may influence a seller's luck for an entire business day exist in other parts of India, neighboring South Asian countries, and many other Asian countries (see footnote 3).[21] However, there is an acute shortage of evidence regarding how superstitious beliefs comparable to *bouni* shape dishonesty and other forms of social preferences. This leads us to our next observation, the lack of studies like ours. A relatively large literature uses naturally occurring data to understand the impacts of superstitious beliefs on individual decision-making in a diverse set of economic contexts. However, apart from Invernizzi et al. (2021), ours is the only study that examines the interaction between superstitious beliefs and social preferences. More data are needed to fully grasp the role of superstition in generating pro- or anti-social behavior.

[21] The custom of *bouni* takes several forms in different regions of India and its neighboring countries. For example, in one popular version, sellers strictly prefer to conduct the first transaction of the day on a cash-only basis. According to another version, sellers prefer a family member to make the first transaction of the day. While these variations have varied implications for both seller and buyer, which deserve thorough empirical scrutiny, almost all variations are focused on the belief that the first sale of a day, if completed following the local custom, brings good luck for the seller for the rest of the day.

Appendix A

See Figs. A.1–A.4.

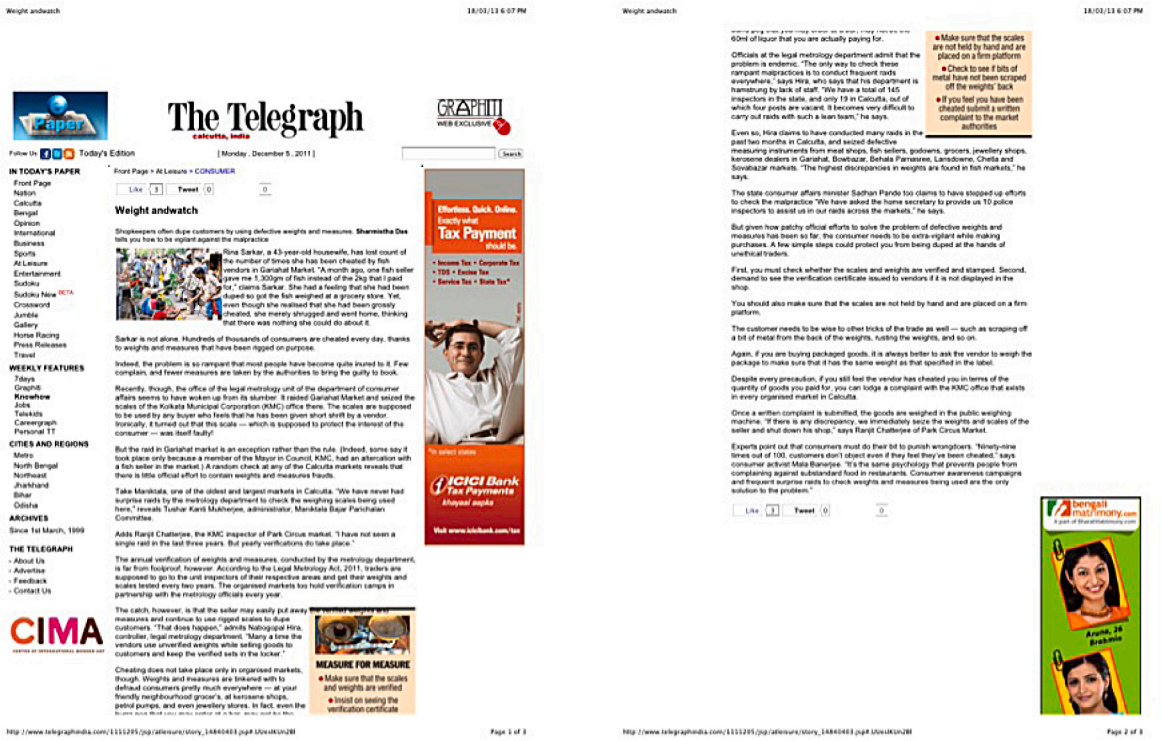

Fig. A.1. Newspaper article on cheating in a Kolkata fish market.

Fig. A.2. Rohu.
Source: Image obtained from the Internet.

Fig. A.3. Traditional scale used by fish sellers (left) and fish being cut for sale (right).
Source: Images obtained from the Internet.

Fig. A.4. Digital scale used in the experiment to detect cheating.
Source: One of the authors clicked the picture.

Appendix B

Buyers' survey

200 randomly selected buyers of fish from ten large retail fish markets of Kolkata answered the following questions. The survey was conducted in July 2013. We hired ten research assistants to conduct the survey, who approached a buyer outside one of the main entrances of a market. It took each buyer on average 15 min to answer all the questions. The research assistants were naive to our research hypothesis. The survey was conducted in the Bengali language. The following is a direct translation from the Bengali script.

Q1. Gender: (a) Male 76% (b) Female 24%

Q2. Which income group do you belong to?
(a) Low income 14.5%
(b) Middle income 59%
(c) High income 26.5%

Q3. Identify the group of customers by their income group, who mostly buy each of the following fish types:

	Very low income	Low income	Middle income	High income	Very high income
Small Rohu	2%	15%	72%	11%	0%
Large Rohu	0%	16%	75%	9%	0%

Note: Small implies whole fish 1–2 kg; Large implies whole fish 2–3 kg.
Percentages are rounded off to the nearest whole number.

Q4. Do you always buy fish from a particular seller in this market?
(a) Yes 39% (b) No 61%

Q5. How long (in years) have you been buying fish? Mean 19.5 years

Q6. In your opinion what is the demand category for each of the following type of fish in this market?

	Very low demand	Low demand	Medium demand	High demand	Very high demand
Small Rohu	0%	0%	0%	11%	89%
Large Rohu	0%	0%	0%	9%	91%

Note: Small implies whole fish 1–2 kg; Large implies whole fish 2–3 kg.
Percentages are rounded off to the nearest whole number.

Q7. Do you think fish sellers cheat on quantity when someone buys fish like Rohu cut into pieces?
(a) Yes 93.5% (b) No 6.5%

Q8. Have you ever caught a seller cheating during a transaction?
(a) Yes 0% (b) No 100%

Q9. Suppose you purchased 1 kg of fish like Rohu cut into pieces. The list below shows possible amounts of cheating. Which interval represents the lowest cheating amount that you would be able to detect by mere visual inspection?

		Probability of detection						
		Zero chance	Very low chance	Low chance	Medium chance	High chance	Very high chance	100%
Cheated quantity	<50 g	98	2	0	0	0	0	0
	50–100 g	91	8	1	0	0	0	0
	101–150 g	57	19	15	9	0	0	0
	151–200 g	24	28	29	15	4	0	0
	>200 g	10	11	16	37	14	12	0

Note: Percentages are rounded off to the nearest whole number.

Q10. What are the possible methods of cheating? Please mention all that apply.
(a) Rig the weights 74%
(b) Rig the scale 63%
(c) Manipulate the way sellers hold the scale 58%
(d) Other methods 21%

Q11. After you made a purchase have you ever re-weighed the purchased fish?

(a) Yes 2%
(b) No 98%

Q12. Do you bargain about fish price?
(a) Yes 83%
(b) No 17%

Appendix C

Sellers' survey (Q1–Q20) and the seller perception experiment (Q21)

200 randomly selected fish sellers from ten fish markets of Kolkata answered the following questions. The survey was conducted in July 2013. The survey was conducted in late morning (off-peak hours). It took each seller on average 20 min to answer all the questions. We paid each seller 50 Rupees (approximately $1) for participation and any additional money from the game. We hired research assistants to conduct the survey. The research assistants were naive to our research hypothesis. The survey was conducted in the Bengali language. The following is a direct translation from the Bengali script.

Q1. Gender: (a) Male 100% (b) Female 0%

Q2. What level of formal education have you completed?
(a) No formal education 4.5%
(b) Less than 10th grade 46.5%
(c) Completed Secondary education (10th grade) 42%
(d) Completed Higher Secondary education (12th grade) 7%
(e) Some college 0%
(f) Have a college degree 0%

Q3. What is your approximate monthly income (in Rs.) from selling fish only (if owner)?
(a) Less than 2500 8.5%
(b) 2501–5000 21%
(c) 5001–7500 47%
(d) 7501–10000 20.5%
(e) More than 10 000 3%

Q4. How long have you been selling fish? Mean: 21 years

Q5. Do you operate in more than one market? No: 100%

Q6. How many fish sellers, do you think, are there in this market? Mean: 54

Q7. Are you working for somebody else? No: 100%

Q8. Which time interval represents the peak business hours during weekdays? 8:00 am–10:00 am: 91.5%

Q9. What proportion of customers bargain about price?
None: 0%
Less than half: 9%
About half: 37%
More than half: 54%

Q10. Out of every 10 customers, how many are repeat customers?
Mean: 3.25

Q11. Out of every 10 customers, how many prefer to buy a fish like Rohu cut into pieces?
Mean: 6.25

Q12. In your opinion what is the demand category for each of the following type of fish?

	Very low demand	Low demand	Medium demand	High demand	Very high demand
Small Rohu	0%	0%	2%	31.5%	66.5%
Large Rohu	0%	0%	4%	21%	75%

Note: Small implies whole fish 1–2 kg; Large implies whole fish 2–3 kg.

Q13. What is the usual amount of a fish like Rohu (in kg) that an average customer buys in one transaction? Mean: 1.05 kg

Q14. Identify the group of customers by their income group, who mostly buy the following fish types:

	Very low income	Low income	Middle income	High income	Very high income
Small Rohu	0.0%	5.5%	88.5%	6.0%	0.0%
Large Rohu	0.0%	4.0%	83.0%	13.0%	0.0%

Note: Small implies whole fish 1–2 kg; Large implies whole fish 2–3 kg.

Q15. How often do you encounter a customer who carries his/her own weighing scale?
(a) Always 0%
(b) Almost always 0%
(c) Sometimes (50–50 chance) 0%
(d) Almost never 0%
(e) Never 100%

Q16. How often do government officials visit to check your weighing scale and weights?
(a) Yearly 13.5% (b) Rarely 82% (c) Never 4.5%

Q17. What is the minimum weight denomination that you use?
(a) 10 g 3%
(b) 25 g 86.5%
(c) 50 g 10.5%

Q18. There are rumors that some fish sellers cheat by weight. What do you think?
(a) Likely to be true 3%
(b) Unlikely to be true 10.5%
(c) I don't know 86.5%

Q19. Are you familiar with the term '*bouni*'?
(a) Yes 100%
(b) No 0%

Q20. If yes, why is the term '*bouni*' relevant for you? Open ended responses that contained the following words or similar phrases.
(a) Auspicious/good luck 100%

Q21. Elicited beliefs about probability of detection

		Probability of detection						
		Zero chance	Very low chance	Low chance	Medium chance	High chance	Very high chance	100%
Cheating scenario	Small Rohu							
	<50 g	**93.5**	6.5	0	0	0	0	0
	50–100 g	**94.5**	4	1.5	0	0	0	0
	101–150 g	**66**	22.5	8.5	3	0	0	0
	151–200 g	27	29	**36.5**	6.5	1	0	0
	>200 g	9	15	21	**38.5**	12	4.5	0
	Large Rohu							
	<50 g	**93**	7	0	0	0	0	0
	50–100 g	**93.5**	5.5	1	0	0	0	0
	101–150 g	**64.5**	21.5	10.5	3.5	0	0	0
	151–200 g	26.5	27.5	**38**	7	1	0	0
	>200 g	9.5	14.5	22	**37.5**	13	4.5	0

Notes:
(i) Procedure: Each seller was asked to consider a hypothetical buyer who purchases 1 kg of fish. For each fish type, we listed five different cheating scenarios, each representing a distinct quantity of cheating. For each scenario, sellers were asked to choose one of the seven qualitative detection probability categories. After each seller was led through the situation, but before he responded, he was told that after other sellers from his market have been surveyed, one of the fish types and then one of the five cheating scenarios from that selected fish type would be selected at random for all the sellers. If his response were the same as the modal response of his group, then he would receive an additional payment of 100 Rupees (approximately $2.00). Thus, sellers' beliefs about detection probability were incentive-compatible.
(ii) Each cell reports % of responses for $n = 200$. Modal response for each scenario is represented in bold.

Appendix D

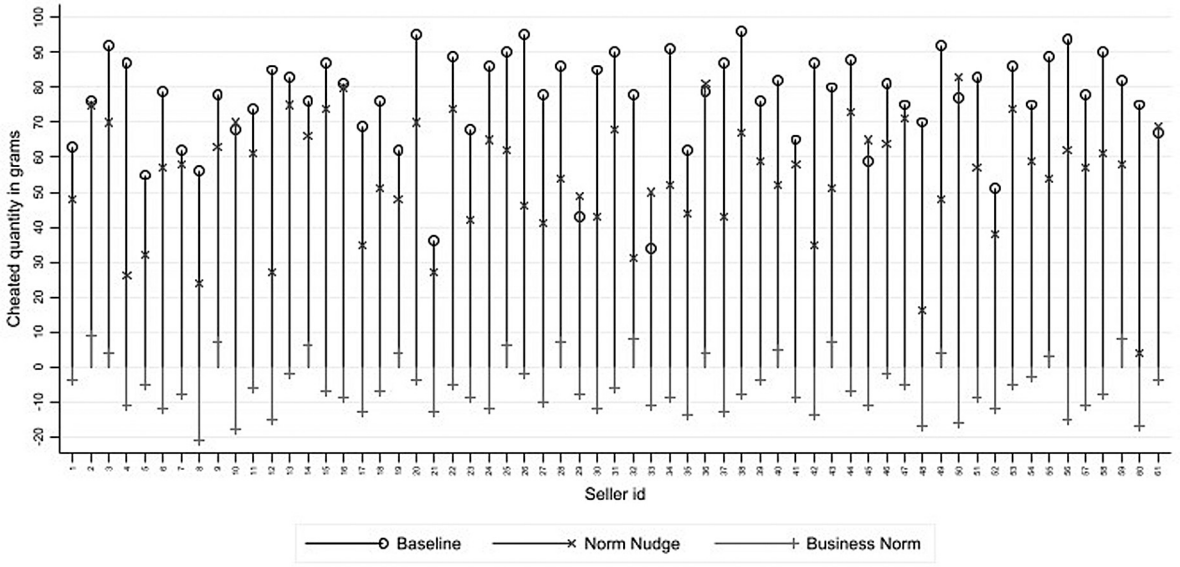

Fig. D.1. Cheated quantity (in grams) by seller id and by treatment.

Table D.1
Significance test results.

	Baseline	*Norm Nudge*	*Business Norm*
Price discount (d)			
t-test	8.996**	8.996**	1.932
	(0.000)	(0.000)	(0.0581)
Wilcoxon signed-rank test	5.950**	5.950**	2.000
	(0.000)	(0.000)	(0.1250)
Cheated quantity (x)			
t-test	42.671**	25.072**	−5.998**
	(0.000)	(0.000)	(0.000)
Wilcoxon signed-rank test	6.793**	6.792**	−4.809**
	(0.000)	(0.000)	(0.000)
Cheated value (v)			
t-test	41.390**	24.878**	−5.997**
	(0.000)	(0.000)	(0.000)
Wilcoxon signed-rank test	6.792**	6.792**	−4.824**
	(0.000)	(0.000)	(0.000)
Price discount - Cheated value ($d - v$)			
t-test	−19.066**	−12.154**	5.746**
	(0.000)	(0.000)	(0.000)
Wilcoxon signed-rank test	−6.791**	−6.662**	4.928**
	(0.000)	(0.000)	(0.000)

Notes:
i. t-test statistics for H_0: mean = 0 are reported with p-values for two-sided test in parentheses.
ii. z statistic for Wilcoxon signed-rank test and two-sided p-values in parentheses correspond to comparison with zero.
iii. ** p-value < 0.01 and * p-value < 0.05.

Table D.2
Comparative tests based on matched pairs of observations.

	Baseline - Norm Nudge	*Baseline - Business Norm*	*Norm Nudge - Business Norm*
Final price ($p-d$)			
Paired Student's t-test	–	−8.508**	−8.508**
		(0.000)	(0.000)
Wilcoxon signed-rank test	–	−5.843**	−5.843**
		(0.000)	(0.000)
Cheated quantity (x)			
Paired Student's t-test	9.604**	45.683**	29.380**
	(0.000)	(0.000)	(0.000)
Wilcoxon signed-rank test	6.336**	6.792**	6.792**
	(0.000)	(0.000)	(0.000)
Cheated value (v)			
Paired Student's t-test	9.483**	44.251**	29.328**
	(0.000)	(0.000)	(0.000)
Wilcoxon signed-rank test	6.339**	6.791**	6.791**
	(0.000)	(0.000)	(0.000)
Buyer surplus (S)			
Paired Student's t-test	−9.483**	−20.822**	−14.903**
	(0.000)	(0.000)	(0.000)
Wilcoxon signed-rank test	−6.339**	−6.791**	−6.791**
	(0.000)	(0.000)	(0.000)

Notes:
i. p-values for two-sided test in parentheses, ** p-value < 0.01 and * p-value < 0.05.
ii. '–' indicates that the test is not relevant as the outcomes were identical for that treatment pair.

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