DISCUSSION PAPER

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Collaborative Tax Evasion
in the Provision of Services
to Consumers – a Field
Experiment

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Collaborative tax evasion in the provision of services to consumers - A field experiment[*]

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Abstract

We conduct a field experiment with sellers of home-improvement services on two German online markets. We take the role of consumers and vary whether we request an invoice for the delivery of the service. In a market which allows anyone to sell anonymously, a willingness to evade is prevalent. In a market that keeps track of credentials, sellers are only willing to evade when a willingness to collude is signaled. The evasion discount is in most estimates not larger than the tax subsidy for legal demand. Evasion is unlikely to be beneficial for many consumers in our setting.

Keywords: Collaborative tax evasion, evasion discount, undeclared work, third-party reporting, field experiment
JEL Codes: H26; C93; E26; J22; O17

1 Introduction

When consumers demand products or services, the incentives to report the transaction to tax authorities are often weak. Consumers usually do not benefit financially from asking for an invoice (Pomeranz, 2015; Naritomi, 2019). They may even receive a price discount if they agree to proceed without a paper trail (e.g., Chang and Lai, 2004; European Commission, 2014). The incentives to evade are particularly high when a product or service requires a direct interaction between seller and consumer. Collaborative tax evasion implies that governments lose substantial amounts of tax revenue (Slemrod, 2007; Kleven et al., 2011) and induces market inefficiencies (Strand, 2005; Balafoutas et al., 2015). However, while several studies model the interaction between buyers and sellers theoretically (e.g., Yaniv, 1992; Kleven et al., 2011) or provide indirect evidence of collaborative tax evasion (e.g., Pomeranz, 2015; Bjørneby et al., 2018; Naritomi, 2019), to our knowledge, there is no direct evidence from the field on collaborative tax evasion.

We advance the literature in a new direction by studying how sellers behave when they offer services to consumers in naturally occurring markets. The natural field experiment consists of a two-step procedure, which has been used in other contexts (e.g., Flory et al., 2015; Mas and Pallais, 2017).[1] In the first step, we post job advertisements to German online markets in which we search for providers of home-improvement services, namely painting a room and laying a floor. Interested contractors respond by sending a price proposal via email. In the second step, we randomly vary the contract conditions among interested sellers, including whether we request an invoice. This design allows us to study how tax evasion occurs when those who demand and supply services interact.

Online markets are increasingly used for trading home-improvement services (Initiative D21, 2015, 2016). One challenge is to ensure the tax compliance of platform users (e.g., Alm and Melnik, 2010; Bibler et al., 2020).[2] We study sellers' behavior in two regulatory environments often seen in online platforms. Market R (for <u>R</u>estrictive terms of use) restricts access to registered businesses and keeps track of contractors' credentials. In contrast, Market NR (for <u>N</u>on-<u>R</u>estrictive terms of use) mainly aims to facilitate transactions between consumers and anyone including businesses can participate anonymously.

To combat collaborative tax evasion, several countries have introduced monetary rewards for consumers who demand legal work (e.g., 61% of European countries, Williams

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[1] In a natural field experiment the subjects naturally undertake the tasks without knowing that they are part of an experiment; see the taxonomy of experiments proposed by Harrison and List (2004). Several studies observe taxpayers' reactions to randomly manipulated letters from tax authorities or to random audits (overviews are provided by, e.g., Hallsworth, 2014; Asatryan and Antinyan, 2019).

[2] The number of individuals who generate income on online platforms has risen (Farrell et al., 2018). According to a recent survey, one in four Americans who use the gig economy for side jobs do so without declaring the income on their tax returns (Finder, 2019).

and Nadin, 2014). We study contractors' behaviors in such a setting. In Germany, the government has sent a strong signal of tax compliance by introducing a tax subsidy that allows consumers to recover 20% of the labor costs of home-improvement services.

The aim of our paper is twofold. First, we investigate how the intention to evade varies across markets and contract conditions. Our experiment allows us to determine if sellers propose a price which does not include an invoice. Assuming that sellers decline to issue an invoice with the intention to evade taxes and/or regulations, we obtain the fraction of offers from sellers who intend to evade (fraction of evasion offers). We quantify the fraction of offers from sellers who respond to the advertisement with the intention to evade and investigate if sellers change their intention when consumers ask for a 'cash' price, thus signaling their willingness to collude. Theory predicts that the likelihood of evasion increases when the other party credibly commits to collaborate (Boadway et al., 2002; Chang and Lai, 2004). We also examine the effect of asking for a discount of 10 or 20% of the proposed price without signaling a willingness to collude. Second, we quantify the price reduction for consumers who agree to evade. Theory predicts, and survey evidence shows, that the financial benefit is important for sellers' and buyers' decisions to evade taxes (European Commission, 2014). We study whether the price reduction for consumers who agree to evade is larger than the refund consumers can get from the tax subsidy.

We post the advertisements on both online markets in 42 German cities and receive more than 2,800 offers. We send interested sellers one of seven randomly selected emails specifying the contract conditions and ask them to respond. In the baseline treatments, we do not mention that we need an invoice. Sellers should accept the conditions of the treatment independent of whether they intend to declare or evade. In the invoice treatments, we stress that we need an invoice to deduct the costs from taxes.[3] Only sellers who intend to declare should accept this condition. We use the relative difference between sellers' acceptance rate in the two treatments to quantify the fraction of offers from sellers who respond to the advertisement with the intention to evade. In the inquiry treatment, we study sellers' behavior by directly asking for contractors' invoice and "cash" price. Sellers proposing a "cash" price are classified as having the intention to evade.

Our results reveal important challenges of eliminating the willingness to evade on the sellers' side in the market for home-improvement services. In Market R, the fraction of offers from sellers responding to the advertisement with the intention to evade, i.e., unwilling to issue an invoice at the proposed price, is not significantly different from zero. In contrast, in Market NR three out of four offers are from sellers intending to evade. Asking for a discount of 10 or 20% without signaling a willingness to collude has no effect on sellers' intentions, albeit a large fraction is willing to negotiate the price. In contrast,

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[3] Our approach is related to Kerschbamer et al. (2016) who investigate fraudulent seller behavior by manipulating whether the consumer mentions that repair costs are covered by an insurance.

when we ask for a "cash" price, in both markets a substantial fraction of sellers responding to the advertisement with the intention to declare offer this price. Hence, in a setting where the government has sent a signal of compliance and even in a market that keeps track of contractors' credentials, many sellers are willing to evade when asked.

Analyzing possible reasons for the differences between markets, we find that, first, Market R effectively prevents informal sellers (i.e., not registered according to tax and sectoral regulations) from participating. In Market NR, almost every second offer is from an informal seller. Despite the existence of the tax subsidy, the demand for undeclared services seems to be high enough such that informal sellers continue to operate. Second, Market R seems to create an expectation of tax compliance from contractors, or attracts formal sellers who are less inclined to evade. The share of formal sellers unwilling to evade is more than three times higher than in Market NR. Almost all sellers who are flexible (willing to propose a cash and an invoice price) respond with the intention to declare in Market R. In Market NR, they mainly respond with the intention to evade.

The price reduction that sellers offer to consumers who agree to evade is in most estimates not significantly higher than the 20% refund that consumers receive if they use the tax subsidy. However, sellers who respond with the intention to evade in Market NR propose an evasion discount that is higher than the tax subsidy, presumably to deter consumers from insisting on an invoice. In both cases, sellers are likely to benefit as not only the value-added tax (VAT) is evaded but also possibly sellers' income taxes or business taxes. Assuming that consumers face no limitations or costs in claiming the tax subsidy and the quality of legally and illegally provided services is the same, consumers would only benefit from evasion if they choose a seller who initially intends to evade.

The insights from our study are unchanged when we consider attrition in a bounding analysis. However, it is possible that we underestimate sellers' willingness to evade. We assume that sellers have a clear intention when responding to the advertisement. If sellers modify their intention in reaction to the treatment, e.g., by absorbing the tax costs, our estimates of the fractions of offers from sellers who intend to evade present lower bounds. Sellers' willingness to evade might also be larger if the negotiations take place in person.

Our study relates to several fields in the literature. First, we contribute to the literature that estimates the prevalence of tax evasion by proposing an innovative method to provide direct evidence on sellers' intention to evade. Existing studies quantify the amount of income not reported to tax authorities (e.g., Kleven et al., 2011; Bott et al., 2019; Dwenger et al., 2016) or the fraction of individuals who admit that they demanded or supplied undeclared services (e.g., Feld and Larsen, 2012; European Commission, 2014).[4] Second, we contribute to the mostly theoretical literature on collaborative tax evasion

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[4] A variety of indirect approaches exist to quantify non-compliance using traces of income, non-compliance or macro-based inference. For an overview see, e.g., Slemrod and Weber (2012).

(e.g., Boadway et al., 2002; Chang and Lai, 2004; Abraham et al., 2017) by showing that sellers indeed condition their behavior on consumer signals and reward consumers with a reduction in the sales price. Third, we add to the literature on third-party reporting and tax compliance (e.g., Kleven et al., 2011; Pomeranz, 2015; Naritomi, 2019) by showing that even in a developed country like Germany, in which incentives for third-party reporting exist, a substantial fraction of sellers intend to evade. Fourth, we contribute to the recent literature examining how access to evasion opportunities (or the elimination thereof) affects prices (Doerrenberg and Duncan, 2019; Asatryan and Gomtsyan, 2020; Bibler et al., 2020) by providing an estimate of the price difference in a given transaction. Fifth, we contribute to the literature on tax compliance in online markets (e.g., Bibler et al., 2020) by showing that sellers' types and behaviors are different in the two markets.

The paper is structured as follows. Section 2 describes the institutional context of sellers' decisions. Section 3 presents the experimental design. The results on the intention to evade are presented in Section 4. The price reduction for consumers who agree to evade is described in Section 5. Section 6 contains the discussion and conclusion.

2 Institutional context of sellers' decisions

2.1 Institutional context

In Germany, every person who provides services to make profits is required to register a business. Non-EU citizens are only allowed to register a business if they have a valid residence and work permit. Contractors who carry out the activity as a side job need the approval of the main employer. Compared to other countries, the number of procedures, time and cost requirements to start and formally operate a company in Germany are high (ranking 114 out of 190 in the Doing Business 2019 Report, World Bank, 2019).[5] To be permitted to offer home-improvement services such as painting and flooring, sellers also have to become members of the Chamber of Trade and enter the registry of qualified craftsmen (details on the skilled crafts sector are in Appendix A).

Registering a business implies not only fixed registration costs but also higher variable costs. If a transaction is declared to public authorities, the seller and the buyer must pay taxes. Sales are subject to a VAT of 19%. The buyer owes the VAT, but the seller is responsible for collecting and remitting it. Sellers with annual sales of less than 17,500 Euro can be exempted from collecting the VAT (in German *Kleinunternehmerstatus*). All contractors must pay income and business taxes on their profits. The magnitude of

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[5] Registering the business for tax purposes costs between 10-50 Euros. The fees for registration in the Chamber of Trade vary with the profits and across jurisdictions. For example, in Freiburg they amount to one-time fees of 175 Euros plus annual fees which start from 141 Euros. Apart from the bureaucratic costs associated with the registration, regular tax declarations are mandatory.

sellers' taxes is difficult to quantify as it varies with business type, profit, and region. According to micro-simulations, the total average tax burden of a household headed by a self-employed contractor is 27% of gross income (Bach et al., 2016).

If a transaction is not declared, the parties involved face the possibility of detection and sanction. Each infringement can be fined with up to 50,000 Euro. In practice, average fines are rare and much lower. For example, in Baden-Württemberg, the third largest German state, 364 penalties were issued in 2016, averaging 1,500 Euro (BWHT, 2017). It is well-known that the governmental unit established to fight undeclared work (Finanzkontrolle Schwarzarbeit) is understaffed.

To combat the non-declaration of services, the German government introduced a tax subsidy for legally provided services demanded by households in 2006. Consumers can recover 20% of the labor costs of home-improvement services (up to 1200 Euro per year) if they document the transaction with an invoice and pay via bank transfer. The refund is obtained as a reduction in income tax liability (until the liability is zero). To obtain the tax subsidy, households need to report the amount in their annual tax declaration and keep invoices in case their declaration is audited. The refund is received after the tax assessment, usually in the year after the service provision.

2.2 Sellers' decisions and quantities of interest

The institutional context implies that sellers face up to three important decisions. First, they have to decide whether to register their business or act as an informal seller. As discussed by La Porta and Shleifer (2014) and Ulyssea (2018), there are three views on why sellers may operate in the informal sector. Sellers who are potentially productive may be kept out of formality by the regulatory costs, in particular, entry regulations. Next, sellers who are productive enough to survive in the formal sector may choose to remain informal to benefit from the cost advantages of not complying with taxes and regulations. Finally, sellers may only be able to survive because they avoid taxes and regulations.

Second, contractors must decide which price they offer to consumers. Sellers who intend to declare, D, will propose a price p_D including an invoice and taxes. Sellers who intend to evade, E, will propose a price p_E without an invoice and taxes. We assume that formal sellers consider the expected benefits and costs of evasion when making the decision. Since informal sellers cannot declare, they can only propose p_E. We quantify the fraction of offers from sellers who are not willing or able to issue an invoice, denoted as γ. Assuming that these sellers intend to evade taxes and/or regulations, we interpret γ as the fraction of offers from sellers who intend to evade (also referred to as fraction of evasion offers). It includes offers from formal sellers who intend to evade as well as offers from informal sellers. We disentangle the shares of offers of the two types of sellers.

Third, contractors who offer an evasion price have to choose how much lower it is compared to the declaration price. They have to consider that consumers who are aware of the tax subsidy and can benefit from it (i.e., they owe taxes and do not yet exceed the 1,200 Euro threshold) should only accept evasion if the evasion price is lower than or equal to the legal price minus the tax subsidy $p_E \leq p_D(1 - 0.2)$. However, consumers may discount the legal price reduction since the tax refund is obtained with a delay. Furthermore, they may consider hassle costs from itemizing the deduction (Benzarti, 2020) or the low probability of detection. These consumers may accept evasion even if $p_D(1 - 0.2) < p_E < p_D$. There also might be consumers who are unaware of the tax subsidy (19% according to a survey by Feld et al., 2012) or cannot benefit from it. They may accept evasion if $p_E \leq p_D$. We quantify the price reduction for consumers who agree to evade as the difference between the evasion price p_E and the declaration price p_D. The price reduction (also evasion discount) is denoted as ε. We compare it to the refund that can be obtained from the tax subsidy.

3 Experimental design

The field experiment consists of a two-step procedure illustrated in Figure 1. In the first step, we advertise home-improvement jobs on the two online markets without specifying the contract conditions. Sellers respond to the advertisements via email. In this way, we obtain information on the number of interested contractors and their price proposals. In the second step, everyone who sent a price receives an email in which we specify the contract conditions.[6] We document sellers' reactions to these conditions. After at most 48 hours, almost all sellers who accept the conditions are notified that they were not selected for the job. During the experiment, we hired one contractor per treatment.[7]

3.1 Selection of online markets

Providers of home-improvement services increasingly realize that online markets offer a great opportunity (Zentralverband des Deutschen Handwerks, 2014, 2016b). In several countries, two types of markets are central. In the first market type, businesses can offer personal and household services to consumers (business-to-consumer market, e.g.,

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[6] In online markets, this two-step procedure is a natural way of communication from the design of the platforms. First, consumers post an advertisement; second, suppliers send an offer; third, consumers negotiate with suppliers and select one of them. In practice, consumers may only respond to a sub-sample. Our approach of responding to every offer does not make a difference from sellers' point of view.

[7] We hired randomly drawn sellers accepting the treatment conditions to complete renovation services in a refugee camp. In the hiring process, we insisted on receiving an invoice. If a seller was not willing to issue an invoice, we randomly drew another seller until we found one who agreed to issue an invoice.

Figure 1: Experimental flow and sample sizes
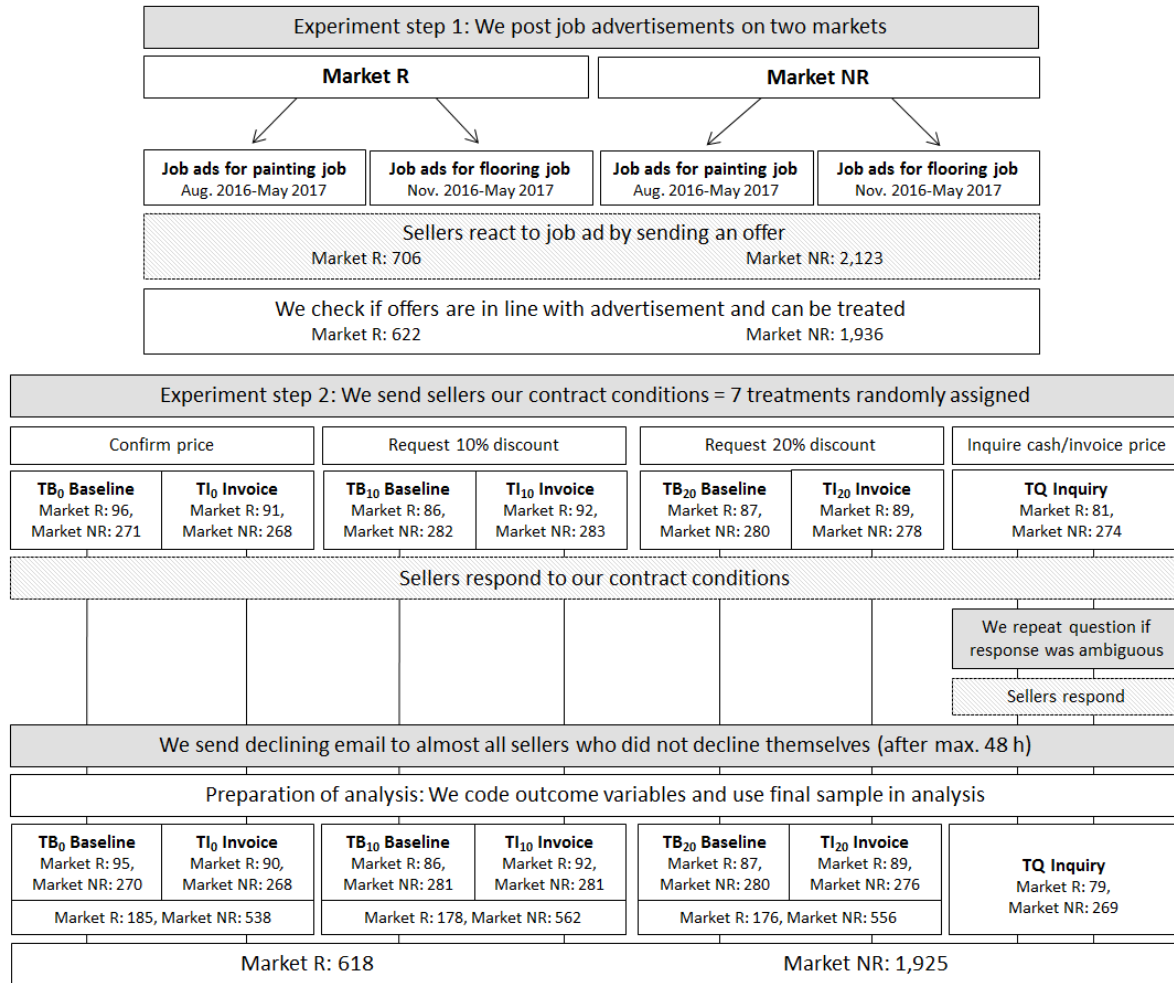
Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. The reported numbers refer to the observations in Market R/NR in the respective step of the experiment. Step 1 is explained in Section **??**, step 2 in Section 3.3, and the preparation of the analysis is described in Section 3.4. Information that we provide to sellers is colored in gray. Information that we receive from sellers is shaded in gray. TB stands for baseline treatment, TI for invoice treatment, and TQ for inquiry treatment.

TaskRabbit). Markets of the second type mainly aim to facilitate transactions between consumers (consumer-to-consumer market, e.g., Craigslist); any person and business can trade almost anything. In our experiment, we consider one market of each type that is important for trading home-improvement services in Germany. Similar markets exist in other European countries, the United States, or Canada (see Table B.1 in the Appendix).

Market R (for Restrictive terms of use) is a market for trading personal and household services with a focus on home-improvement services. Contractors can enter this market only if they have a registered business. Business credentials are verified by the platform and this information is available to consumers. Consumers can rate sellers after they have provided a service and view ratings by previous customers. Although the platform is free of charge for consumers, contractors must pay to register and are charged a monthly fee.

Market NR (for Non-Restrictive terms of use) is a market with few restrictions. Al-

most any product or service can be demanded and supplied on this market. Although contractors who use the platform for commercial purposes are required to publicly reveal business details, they can easily circumvent this restriction by registering as a private user. Participants can use a pseudonym, and identities are not verified. There is no possibility to rate transaction partners. Neither buyers nor sellers are charged any fees.

We study whether the fraction of offers from sellers who are not willing or able to issue an invoice, i.e., who intend to evade, γ differs across markets. For two reasons, we expect that γ is higher in Market NR. First, informal sellers are not allowed to operate in Market R but should be able to participate in Market NR. Formal sellers are permitted to operate on both platforms. Second, the differing terms of use may create divergent expectations of tax compliance from formal contractors, or attract formal sellers with different preferences for evasion. We expect that formal sellers are more likely to intend to evade in Market NR. While both platforms are an informed third party, this might be perceived as less threatening in Market NR which does not track sellers' credentials. Hence, contractors may expect the likelihood of detection to be lower in Market NR (e.g., Kleven et al., 2016). They may also expect that consumers aim to evade (e.g., Chang and Lai, 2004). Finally, formal sellers may assume that competition with informal sellers is more fierce in Market NR (e.g., La Porta and Shleifer, 2014; Gokalp et al., 2017).

3.2 Content and posting of advertisements

In the first advertisement, we search for contractors to paint two rooms (40 sqm). In the second advertisement, we search for contractors to lay a floor in two rooms (40 sqm). Painting and floor installation services are very convenient for a large-scale field experiment. Many jobs require a visit to the site to estimate the price. Our jobs are simple, so a comprehensive description allows sellers to propose a price without a viewing.[8]

The advertisements mirror those for similar jobs in online markets (the wording is shown in Appendix B.4). We use pretests to ensure that the texts include all details important for contractors to propose a price (e.g., the size and shape of the wall and floor). Sellers are asked to send us a price proposal. Requesting a price prior to personal interaction is common in online markets. We stress that the price should exclude the costs of materials, which would be provided by us.[9] We focus on labor costs for two reasons. First, price proposals should be independent of the quality of the material. Second, the tax subsidy applies to labor costs only. Comparing the evasion discount ε to the tax

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[8] Our advertisements emphasize that it is impossible to visit the site beforehand. To test if this restriction has an effect on our results, we post the original advertisement as well as a slight modification that does not include the sentence that a visit is impossible on Market R on the same day and for the same city. We find no significant differences in the number of offers and prices.

[9] Since contractors prefer to bring their own tools, e.g., brushes, we did not provide these items.

subsidy is only possible when the cost of materials is excluded.

We post the advertisements for painting two rooms in 42 cities between August 2016 and May 2017 (see maps in Figure B.1). All state capitals and at least one other city per state are included. The cities are chosen considering population size and distance from each other. Since contractors may operate in broader regions, large distances help to minimize the number of offers per seller. The advertisements for laying a floor are posted in 22 of these cities between November 2016 and May 2017. Each advertisement was posted on Monday at 10 a.m. and remained online until Friday at 5 p.m.

We receive 706 offers in Market R and 2,123 offers in Market NR (see top of Figure 1). In 12% of the offers in Market R and 9% in Market NR, sellers do not comply with the requirements posted in the advertisement, e.g., they ask for a call or do not send a (total) price.[10] As it is impossible to treat those contractors in a standardized way or to compare their behavior to that of complying sellers, we exclude them from the sample. The remaining sample consist of 622 offers in Market R and 1,936 offers in Market NR.

3.3 Contract conditions (treatments)

In the second step of the experiment, we randomly assign one of seven emails specifying the contract condition to interested sellers (the wording is shown in Appendix B). The randomization takes place at the advertisement level, i.e., by job type, market, and city.

In the first treatment arm ("confirm price" in Figure 1), we confirm the proposed price to study the intention of sellers when responding to the advertisement. In the baseline treatment TB_0, we specify the time frame in which the job should be done. Contractors are told that we received several offers and will decide within the next few days. We ask them to send us an email (and propose a day) if they agree with our conditions. We do not mention that we need an invoice. Since the time frame is the only new information, we expect that sellers accept this condition independent of their intention. The treatment is meant to quantify the fraction of contractors who do not reply because they have no capacities within the specified period, got other jobs in the meantime, or forget to answer.

In the invoice treatment TI_0, we add one sentence to the baseline treatment: "I need an invoice, I would like to deduct the costs from taxes." Thus, we use the existence of the tax subsidy to signal that public authorities may be informed about the transaction. Only sellers who intend to declare should accept the conditions of this treatment.

We use the relative difference between sellers' acceptance rate in TB_0 and in TI_0 to

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[10] In 3% (11%) of the offers in Market R (Market NR), sellers send the (total) price after we ask them to do so. The frequency of the different reasons for not fulfilling our requirements by market are listed in Table B.2 in the Appendix. It is difficult to assess how these sellers would have behaved if they had received a treatment. For instance, asking for a call can imply that the seller needs further details to make a reliable legal offer. However, negotiating on the phone also paves the way for evasion.

quantify the fraction of offers from sellers who respond to the advertisement with the intention to evade, denoted as γ_0, in each market. We also use these treatments to estimate the difference between the evasion and the declaration price, denoted as ε_0.

In the second and third treatment arm ("request 10%/20% discount" in Figure 1), we modify the conditions in TB_0 and TI_0 by asking for a discount of 10% (TB_{10}, TI_{10}) or 20% (TB_{20} and TI_{20}). Negotiating prices for services such as painting and flooring is common. However, discounts lower sellers' margin and might thus influence their intentions. In all discount treatments, sellers can react in two ways to the modification of the price. First, they might stick to their intent and accept our discount request, e.g., if their reservation price is below the price proposed by us. Second, sellers might decline our conditions, e.g., if their reservation price is higher than our proposed price. A third strategy is available to sellers who respond to the advertisement with the intention to declare and receive one of the baseline treatments with discount (TB_{10} or TB_{20}). These sellers might deviate from their intention and switch to evasion, e.g., to maintain a certain profit level.

We quantify the fraction of offers from sellers who intend to evade when we ask for a discount, γ_{10} and γ_{20}, from the relative difference in acceptance rates of TB and TI. For two reasons, γ_{10} and γ_{20} might differ from the fraction of evasion offers γ_0 when we confirm the price. First, it is possible that sellers who propose the initial price with the intention to declare switch to the intention to evade after they learn about our counter proposal (γ_{10}, γ_{20} larger than γ_0). Second, the willingness to accept a discount might differ across contractors with different intentions (γ_{10}, γ_{20} could be smaller or larger than γ_0).

In the fourth treatment arm ("inquire cash/invoice price" in Figure 1), we ask whether the price includes an invoice and how much the price would be if we pay cash. The word "cash" is commonly used to signal the intention to evade. Cash payment ensures that a transaction cannot be tracked (Fooken et al., 2015; Immordino and Russo, 2018). Acknowledging the link between cash payment and tax evasion, the German legislature decided to exclude any transaction that has been paid cash from the tax subsidy. The two questions are repeated until the seller quotes a cash and an invoice price or until it is possible to conclude that the contractor is not willing or able to quote one of those prices (see Appendices B.2 for the questions and B.3 for conversation examples).[11]

We use sellers' responses to the questions to quantify the fraction of offers in which sellers explain that their initial price is for cash payment, denoted as γ_Q, in each market. In addition, we calculate the fractions of offers in which sellers are willing to deviate from the original intention. Finally, we use the quoted cash and invoice prices to estimate the

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[11] Most contractors reply in an unambiguous way: "With invoice the price is X" or "Cash/without invoice the price is Y". If we could not categorize the answers, we asked a clarifying question: "So would it be X with invoice and Y in cash?". In 50.4% of cases, no additional interaction took place, in 43.2% one clarifying question was asked, and in 6.4% two or three additional questions were asked.

price reduction for collaborating consumers holding the seller constant, denoted as ε_Q.

3.4 Variables of interest and coding

First, we record the prices proposed by interested sellers. German price regulations require sellers to quote gross prices when trading with consumers. In only 7% of the offers, sellers comply with the law by sending a gross price. In 90% of the offers, sellers do not specify whether the price is gross or net. In 3% of the offers, contractors stress that the proposed price is net, a third of which mention that taxes had to be added.[12] Contractors may assume that they are interacting with a business where it is common to negotiate net prices. However, offering net prices can also be a strategy for proposing tax evasion.

Second, we record sellers' reactions to the assigned treatments. The coding of all responses was verified by three research assistants. In all baseline and invoice treatments, we check whether sellers accept the contract conditions specified in the email. We create a binary variable which is equal to one when the seller confirms our conditions. If the seller does not respond, modifies, or rejects the conditions, the variable is set to zero. We record the reasons for non-acceptance in an additional variable. As indicated in Figure 1, we cannot unambiguously interpret the answers of a small number of contractors (1-2 observations per treatment). These cases are discarded in the analysis.

In treatment TQ, we record the initial intention, the willingness to deviate from that intention, and the quoted cash and invoice prices. Contractors who indicate that the initial price includes an invoice are classified as having responded with the intention to declare. Sellers are coded as having responded with the intention to evade if they explain that the initial price is for cash payment. If sellers propose a second price for the option that they did not initially propose, they are coded as being willing to provide that respective option. It is possible that a seller quotes a cash price and stresses that it includes an invoice (see conversation examples in Appendix B.3). In this case, the cash price deviates from the invoice price because sellers reward immediate payment (see Section 3.5.1). We distinguish the two types of prices. We consider all subjects in the analysis who provide unambiguous answers. Despite repeating our questions in case of ambiguity, 2% of answers cannot be unambiguously interpreted and are discarded in the analysis.[13]

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[12] If sellers propose gross or unspecified prices, we use these values in the treatments and analysis. For the 3% who propose net prices, we randomly use either calculated gross prices or the given net price in the interactions. Both approaches are not ideal. Using calculated gross prices is plausible in the invoice treatment but not in the baseline treatment, in which we intentionally do not want to send a signal. Using the net price is plausible in the baseline treatment but confusing in the invoice treatment. The results do not change when we exclude observations from either of the two approaches.

[13] Although 13 responses leave room for interpretation, we can infer what sellers had in mind. The results are the same with and without these observations. We include them to increase power.

3.5 Identification and interpretation

3.5.1 Identification of the intention to evade

The identification of the fraction of offers from sellers who respond to the advertisement with the intention to evade γ_0 from TB_0 and TI_0 relies on two assumptions (described in more detail in Appendix C). First, we assume that only sellers who would declare the transaction accept the conditions of the invoice treatment (A1). This is plausible as we explicitly state that we will use the invoice to deduct the costs from taxes. It would be irrational to issue an invoice and then evade because tax authorities may learn about the transaction from the invoice and compare the information with the contractors' records.[14]

Second, we assume consistency of sellers' behavior across treatments (A2). We expect that sellers have a clear intention when responding to the advertisement.[15] As we do not modify the initial prices, the intention should be unaffected by the treatment. This assumption implies that sellers accepting to issue an invoice when we explicitly ask for it in TI_0 would also accept and issue an invoice if we do not ask for it (A2a). Furthermore, those who accept with the intention to evade in TB_0 would also intend to evade in TI_0 and consequently not accept this treatment (A2b). If these assumptions hold the fraction of sellers accepting our conditions with the intention to declare are equal in TI_0 and TB_0.

However, it could be the case that some sellers who accept with the intention to evade in TB_0 decide to absorb the tax costs and accept with the intention to declare in TI_0. It is also possible that some sellers who accept with the intention to declare in TI_0 decide to keep the collected taxes and accept with the intention to evade in TB_0. If sellers adjust their behavior in one of the two ways, we identify a lower-bound estimate of γ_0.

Although the identification of γ_{10} and γ_{20} requires the same assumptions, the likelihood of violations thereof may differ. In that we lower sellers' margin, it is more likely that some sellers who accept with the intention to declare in TI_{10} or TI_{20} switch to the intention to evade in TB_{10} or TB_{20} (violation of A2a more likely). In contrast, it is less likely that sellers who intend to evade in TB_{10} or TB_{20} accept to issue an invoice in TI_{10} or TI_{20} when we ask for a price discount (violation of A2b less likely).

For the identification of γ_Q, we assume that sellers have no incentive to conceal their initial intention as we show interest in both prices. Similar to assumption A1 described above, we assume that sellers proposing an invoice price (in response to the advertisement

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[14] Unfortunately, tax authorities are not willing to provide information on their enforcement strategies. According to experts, invoices provided by households are a great auditing possibility.

[15] We use the cash and invoice prices proposed in treatment TQ to study the validity of this assumption. If sellers do not have a clear intention and offer a price between their evasion and declaration price, the cash and invoice prices should be same among those those saying that their initial offer included an invoice and those saying that it is for cash payment. However, as shown in Table D.8, whereas the invoice prices are the same, the cash price of those who respond to the advertisement with the intention to evade is significantly lower than the one of those that intend to declare.

or treatment) would declare the transaction. Although we do not stress that we will use the invoice to deduct the costs from taxes, survey evidence indicates that it is unlikely that self-employed contractors collect VAT and do not remit it (Olsen et al., 2019).

To identify the fraction of offers in which sellers are willing to deviate from their initial intention, we must reliably separate offers in which a cash price is proposed with the intention of rewarding immediate payment (including an invoice). In Germany, sellers can determine the payment due date. The statutory payment period is 30 days. Payment within 14 days is often rewarded with an early payment discount (in German *Skonto*). The discount to expedite payment from 30 to 14 days is usually 2-5%. Sellers should give a similar discount to expedite payment from 14 to 0 days. The interactions with sellers allow us to distinguish cash prices involving evasion and cash prices for immediate payment (see Appendix B.3 for conversation examples). A substantial fraction of sellers explicitly stress that their cash price includes an invoice (see Table 4). We show that the discounts involving evasion differ from discounts for immediate payment (see Section 5).

If all assumptions hold, γ_0 and γ_Q measure the same, namely the fraction of offers in which sellers respond to the advertisement with the intention to evade. Note that in TI_0 and TB_0, we identify γ_0 conditional on acceptance in TB_0. In TQ, we identify γ_Q conditional on contractors having responded to the two questions. We do not know what non-responders would have done or whether the reasons for not responding are the same across treatments. We consider non-responders in a bounding analysis.

3.5.2 Intention to evade taxes vs. regulations

We argue that sellers who do not accept to issue an invoice do so to evade taxes. We justify this interpretation with the large and certain financial benefit that sellers have if they use the absence of an invoice to evade taxes (see Section 2.1). Our interpretation is reasonable if other motivations to decline issuing an invoice are of minor importance.

First, sellers may decline to issue an invoice to avoid giving a warranty. In Germany, providers of home-improvement services are obliged to repair deficiencies during a two-year period. Consumers are required to approve the service before payment. When they detect deficiencies later, they must prove that the service was insufficient at the time of approval. If a warranty is granted, the seller must repair the damages if the consumer has any proof that the transaction took place. We conclude that not issuing an invoice would allow only very few sellers to avoid the financial cost of a warranty claim.

Second, sellers may decline to issue an invoice so that they can be paid on the spot. As described in Section 3.5.1, consumers usually must pay within 30 days. The statement that we intend to deduct the services from taxes implies that we would pay via bank transfer (we do not know if sellers are aware of this restriction). While bank transfers

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are usually free, immediate payment might be important for small, liquidity constrained sellers. However, during the period of our experiment, small businesses reported that obtaining credit was exceptionally easy (Zentralverband des Deutschen Handwerks, 2016b). To expedite payment, these sellers can choose an earlier payment due date or incentivize early payment with a discount. Without an invoice, sellers run the risk of receiving no money at all since the contract is invalid and cannot be enforced. We conclude that being paid on the spot provides only a small financial benefit and is also risky.

Third, informal sellers may decide to refrain from registering their business to avoid regulations rather than taxes. As described in Section 2.1, registration may be too burdensome or even impossible. While we cannot assess the importance of avoiding regulations, the avoidance of taxes is at least an important side benefit of not registering the business.

If one of these motivations is more important than we expect, we identify the 'intention to evade taxes and/or regulations' rather than the 'intention to evade taxes.' The first interpretation is similar to the definition of undeclared work: "any paid activities that are lawful as regards their nature but not declared to public authorities" (European Commission, 2014, p. 2).

3.6 Summary statistics

The final sample consists of 618 offers from Market R and 1,925 offers from Market NR (see final step in Figure 1). The lower number of offers in Market R may partly be caused by the market's entry restrictions. Table 1 reports the number of offers and pre-treatment prices of sellers by market and job type. We collected fewer offers for the flooring than for the painting job. On average the fraction of flooring offers is 38% in Market NR and 26% in Market R; the fraction of flooring offers is not significantly different across treatments. One explanation is that we posted the advertisement for the painting job in twice as many cities as the flooring job. However, in particular in Market NR, the average number of offers per city is also higher for painting than for flooring (Market R: 12 vs. 13, Market NR: 43 vs. 30), which may be explained by the lower complexity of the job.

Table 1 shows that we observe a broad range of price proposals in both markets and jobs.[16] The average price for painting is 343 Euro in Market R and 229 Euro in Market NR, i.e., the price of painting is 33% lower in Market NR. The average price for laying a floor is 663 Euro in Market R and 462 Euro in Market NR, i.e., the price of floor installation is 30% lower in Market NR. In both markets, the price for laying a floor is

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[16] Prices may vary due to differences in the expected workload, regional characteristics, or market competition. As shown in Section 5, the price also includes information about sellers' intentions. An example of offers from the lower end of the price distribution is a student who wants to earn money without having a registered business and the required qualifications. An example of offers from the upper end of the distribution is a seller with full order books who would do the job for an excessively high price (deterrence pricing). In Section 5, we discuss to what extent quality might influence prices.

Table 1: Summary statistics by market and treatment for each job

| | Market R | | | | | Market NR | | | | |
| | N | Proposed price (in Euro) | | | | N | Proposed price (in Euro) | | | |
		Mean	SD	Min	Max		Mean	SD	Min	Max
Panel A. Painting										
Total	386	343	141	98	1,370	1,422	229	142	30	1,800
TB_0	61	339	126	98	750	203	233	142	40	850
TI_0	57	323	129	100	702	197	235	130	30	1,000
TB_{10}	52	337	128	120	680	208	222	130	40	800
TI_{10}	57	366	158	130	1,200	208	230	154	40	1,500
TB_{20}	55	321	109	175	690	205	219	131	50	915
TI_{20}	54	367	191	175	1,370	204	222	127	50	750
TQ	50	348	134	150	655	197	244	176	30	1,800
p-value		0.454					0.564			
Panel B. Floor installation										
Total	232	663	265	250	1,800	503	462	219	80	1,500
TB_0	34	650	296	285	1,428	67	473	195	150	1,120
TI_0	33	638	212	320	1,190	71	458	214	160	1,400
TB_{10}	34	623	270	360	1,660	73	486	254	160	1,500
TI_{10}	35	742	316	341	1,666	73	455	203	80	1,071
TB_{20}	32	611	197	250	1,000	75	476	200	100	1,200
TI_{20}	35	659	211	358	1,200	72	465	244	120	1,500
TQ	29	720	321	350	1,800	72	422	221	100	1,500
p-value		0.332					0.703			

Note: Summary statistics are based on offers in the final sample. Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. SD is standard deviation. Min and Max indicate the lowest and highest price per treatment. To test for balance of the proposed prices, we regress this variable on the set of treatment dummies and test whether the estimated coefficients of these dummies are all jointly zero. P-values from a F-Test of joint significance are reported in the last row.

about twice as high as the price for painting, e.g., due to a higher workload.

We study the balancing of pre-treatment prices in the final sample. Table 1 shows that the average proposed prices are similar in all treatments. We regress the prices on a set of treatment dummies and test whether the estimated coefficients are jointly zero. In both markets and for both job types, the average prices are not significantly different across treatments (see p-values in Table 1). Kolmogorov-Smirnov tests of equality of the price distributions across treatments also reveal no significant differences (see Table D.1).

We examine the representativeness of our sample. Unfortunately, information on the sellers is only available in Market R, where contractors of 433 offers describe their business, which is optional information. In that sample, sellers of 30% of offers do not have employees, in 55% they have up to three employees, in 13% 4-9 employees, and in 2% 10-20 employees. If we add sellers without employees and sellers with up to three employees, in at least 85% of the offers in our study, sellers employ up to five workers. We compare these numbers to official statistics reported in Appendix A. In 2016, 57,046 businesses

were registered as providers of painting and flooring services, 70% were very small businesses with no or less than five employees. A possible explanation for the discrepancy between official statistics and the statistics from our sample is that very small businesses are more likely to offer services to households.

4 Does the intention to evade vary across contract conditions and markets?

4.1 Intention to evade when we confirm the price

We use the baseline and invoice treatment (TB_0, TI_0) to quantify the fraction of offers from sellers responding to the advertisement with the intention to evade γ_0. Figure 2 shows that in both markets almost all sellers are willing to accept the conditions of the baseline treatment TB_0. Although we do not amend the offer, 9% in Market R and 4% in Market NR do not reply. In contrast, in the invoice treatment TI_0, the acceptance rate differs substantially by market. While in 89% of the offers that we receive through Market R the sellers accept to issue an invoice, this fraction is only 25% in Market NR.

Figure 2: Acceptance rates when we confirm the price
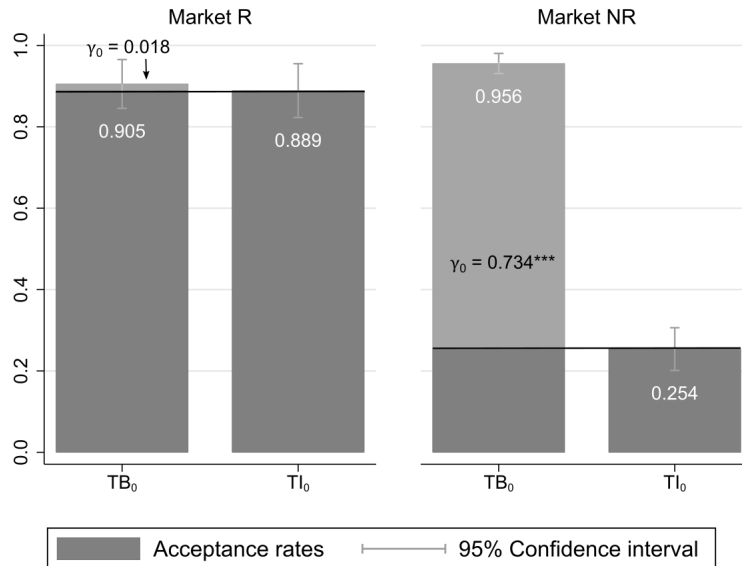
Note: The bars show the fraction of offers in which sellers accept the conditions (acceptance rate). Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. In Market R, the sample size is N = 95 in the baseline treatment TB_0 and N = 90 in the invoice treatment TI_0. In Market NR, N = 270 in TB_0 and N = 268 in TI_0. The fraction of offers from sellers who intend to evade γ_0 is calculated as the difference between the acceptance rates in TB_0 and TI_0 divided by the acceptance rate in TB_0 (e.g., (0.956 - 0.254)/0.956 = 0.734 = 73% in Market NR). Standard errors are obtained by bootstrapping with 10,000 replications.

The difference in the acceptance rates in the two treatments yield the causal effect of

demanding an invoice on contractors' willingness to accept the job at the proposed price. In Market R, the acceptance rate decreases by only 2 percentage points (ppts) (t-test: p=0.712; N=185). In contrast, the acceptance rate decreases by 70 ppts in Market NR (t-test: p=0.000; N=538). We divide the absolute difference by the acceptance rate in the baseline treatment to obtain the fraction of evasion offers γ_0. The fraction is 2% in Market R and 74% in Market NR. We obtain the empirical bootstrap distribution (10,000 replications, sampling with replacement) to assess if the fractions are significantly different from zero. High statistical significance is indicated in Market NR (t-test: p=0.000; N=538) but not in Market R (t-test: p=0.714; N=185).

The results from linear regressions are presented in Table 2.[17] We pool the observations from TB_0 and TI_0 and regress acceptance on a dummy variable indicating the invoice treatment and different sets of control variables. When we control for region and quarter in columns (1) and (2), the invoice treatment effect (see coefficients in Panel A) and the fraction of evasion offers (see predicted values in Panel B) are the same as the unconditional results. The difference between markets is 72 ppts (significant at 1% level).

As shown in Section 3.6, the average price and the fraction of flooring offers are higher in Market R. We account for the differences in the regressions. In columns (3) and (4), we hold the proposed prices constant. In the baseline treatment, in both markets the price is not significantly related to sellers' reactions. In contrast, the positive coefficients on the interaction "proposed price $\times$ TI_0" imply that the negative effect of the invoice treatment decreases with the price. Although the effects are similar in magnitude, the effect is only significant in Market NR. In this market, a price increase by one standard deviation is related to an 8.4 ppts higher likelihood that the seller accepts to issue an invoice.

In columns (5) and (6), we also control for the job type. Contractors offering floor installation services are equally likely to accept the conditions of TB_0 as sellers of painting services. We find that sellers of floor installation services are more likely to accept to issue an invoice in Market NR (significant at the 10% level). However, Panel B shows that the fractions γ_0 and the difference between markets are the same in all specifications.

We study whether the results hold in a subgroup analysis. In Figure D.2 (a) and (b) in the Appendix, we show that the acceptance rates, the fractions γ_0, and the market difference are similar across job types. When we split the sample by the first and second half-year (see Figure D.2 (c) and (d)), γ_0 is not significantly different across time.[18] Finally, in Market R, we compare offers from sellers without employees to offers from sellers with

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[17] We obtain the same result when we run probit estimation (see Table D.2 in the Appendix). We prefer to report linear regressions, which allow us to interpret interaction terms in a straightforward way.

[18] During the time of our experiment, the sector experienced excellent economic conditions, thus increasing sellers' market power (Zentralverband des Deutschen Handwerks, 2016a). On the one hand, sellers' earnings might be high enough such that tax evasion is not attractive. On the other hand, a boom also implies market power for employees which might use the sellers' resources for moonlighting.

Table 2: Regression results when we confirm the price

	(1)	(2)	(3)	(4)	(5)	(6)
	Market		Market		Market	
	R	NR	R	NR	R	NR
Panel A. Coefficients from linear regression						
Invoice treatment TI_0	-0.017	-0.704	-0.011	-0.706	-0.033	-0.742
	(0.033)	(0.029)	(0.033)	(0.028)	(0.042)	(0.029)
Proposed price			-0.004	0.013	-0.005	0.013
			(0.032)	(0.016)	(0.031)	(0.016)
Proposed price $\times$ TI_0			0.062	0.084	0.061	0.086
			(0.049)	(0.034)	(0.049)	(0.034)
Floor installing					0.003	-0.026
					(0.076)	(0.043)
Floor installing $\times$ TI_0					0.061	0.137
					(0.063)	(0.075)
Region fixed effects	yes	yes	yes	yes	yes	yes
Quarter fixed effects	yes	yes	yes	yes	yes	yes
Panel B. Fractions calculated from predicted values						
Fraction of evasion offers γ_0	0.019	0.736	0.013	0.737	0.037	0.761
	(0.049)	(0.029)	(0.049)	(0.028)	(0.060)	(0.029)
Difference between Market NR - Market R	0.717		0.725		0.724	
	(0.057)		(0.057)		(0.067)	
N	185	538	185	538	185	538

Note: Market R (for R̲estrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. Panel A reports results from linear regressions in which the dependent variable is a dummy variable indicating if the seller accepts our conditions. The proposed price is standardized to zero mean and unit variance by market and job type. Standard errors clustered at the advertisement level are reported in parentheses. Panel B reports the fraction of offers from sellers who intend to evade predicted from regression results and the differences of these fractions between markets. Standard errors of the fractions and the differences are obtained from bootstrapping with 10,000 replications.

employees. In both treatments, the acceptance rate is slightly lower among sellers without employees. Although the results are in line with the literature which typically finds less evasion among larger firms, both fractions are not significantly different from zero.

We report the results from additional robustness checks in Table D.3 in the Appendix. We show that the findings are robust to dropping offers with the lowest and highest 5% of prices or keeping only the first offer from contractors who sent multiple offers. To study if the results also apply to other volumes of the service, we post two additional advertisements with a different number of rooms.[19] The results in Market NR remain

[19] We advertise the painting of four rooms (80 sqm) and laying a floor in one room (20 sqm). We focus on the baseline and invoice treatment in which we confirm the price (TB_0, TI_0). The advertisements were each posted in four cities between August and October 2017. We receive 70 offers in Market R and 300 offers in Market NR. Summary statistics, presented in Table D.4, show that the pattern of prices across markets and treatments is unchanged. Whereas flooring costs about twice as much in the main experiment, this is the exact opposite in this extension: painting costs twice as much as flooring.

stable when we use this sample. In Market R, the fraction γ_0 is 20% and thus larger than in the main sample. However, the advertisement was only posted in four cities.

The estimate γ_0 captures the fraction of offers from sellers who intend to evade among those accepting in TB_0. To estimate the fraction of evasion offers among all offers used in Step 2 of the experiment, we must consider non-responders in TB_0. For this purpose, we derive lower and upper bounds of the quantities of interest. To calculate the lower bound of γ_0, we assume that non-responding sellers have the intention to declare and would have accepted in TB_0 and TI_0. For the upper bound, we assume that non-responders have the intention to evade. They would have accepted only in TB_0. In Market R, the lower and upper bounds are 2% and 11%, respectively, with a 95% confidence interval spanning from zero to 16% (see Imbens and Manski, 2004). In Market NR, γ_0 is bounded by 70% and 75% with a confidence interval spanning from 66% to 79%.

Finally, we examine the responses of contractors not accepting the conditions of the invoice treatment in Table 3. In Market R, in five of the 10 offers in which sellers do not accept, the sellers provide an explanation. No seller states that issuing an invoice is impossible. Sellers answer four times that an invoice is possible if the VAT is added. One seller asks for a call. In Market NR, in two-thirds of the 200 offers in which sellers do not accept the invoice condition, they provide an explanation. In 45% of the offers, sellers state that they are not able to issue an invoice. In 12% of the offers, contractors claim that an invoice would be possible if the VAT would be added, and in 9% of the offers sellers state that an invoice would be possible if the price increases by more than the VAT. Only 2% request a call or visit. The results are in line with our expectation that, first, informal sellers are unable to participate in Market R, and second, that among formal sellers avoiding to pay taxes is central in the decision to (not) issue an invoice (as suggested by the large fraction stating that an invoice is possible if the VAT is added among those that do not say they are unable to issue an invoice, see also Section 4.4).

4.2 Intentions when we ask for a cash and an invoice price

We use treatment TQ to study how sellers react when consumers signal their willingness to evade by asking for a "cash" price. We also investigate whether sellers who initially propose a cash price would provide an invoice if the consumer asks for it. In 11% of the 79 offers in Market R and in 8% of the 269 offers in Market NR, sellers do not respond to our questions. In Market R, additional 15% ask for a call, this fraction is 4% in Market NR. Due to the lack of anonymity in Market R, sellers may only be willing to negotiate "cash" prices on the phone. The average proposed prices and fractions of the two job types are not significantly different across offers in which sellers reply to the questions, ask for a call, or do not reply. In the analysis, we use the 58 (Market R) and 237 (Market

Table 3: Reasons for non-acceptance in invoice treatment TI_0

Reason	Market R	Market NR	Representative wording examples
No response	0.500	0.330	-
Invoice not possible	0.000	0.450	Sorry, no invoice possible, I am doing this private; I have no registered business
Invoice possible if VAT is added	0.400	0.115	With invoice you have to add 19%; Invoice is no problem, then add VAT
Invoice possible if price increases by more than VAT	0.000	0.090	I can issue an invoice but not at this price. With invoice the price will increase plus VAT.
Ask for a call	0.100	0.015	Call me, then we can talk about everything; Please call me to talk about details
N	10	200	

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. Reported are the fractions of offers in which sellers provide the respective reason on all offers in which sellers do not accept in TI_0.

NR) offers in which sellers respond. To address possible biases due to sellers who do not reply at all, we report results from a bounding analysis in which we consider these sellers.

In Panel A of Table 4, we report sellers' responses to our two questions. In Market R, 5% of sellers say that the initial price is for cash payment, the fraction is 73% in Market NR. The numbers are remarkably close to the fraction of offers from sellers who intend to evade γ_0 calculated from TB_0 and TI_0. Despite the limitations of both approaches, our findings seem to have high internal validity. We argue that in TQ it is unlikely that sellers change their intention after treatment (see Section 3.5.1). The similarity of results suggests that contractors also stick to their initial intention in TB_0 and TI_0.

To calculate the lower bound of γ_0, we assume that all non-responding sellers (N = 9 in Market R, N = 22 in Market NR) would have proposed an invoice price. For the upper bound, we assume that they would have proposed a cash price. In Market R, γ_Q is bounded by 5% and 18% (95%-CI: 0.003; 0.257), in Market NR it is bounded by 66% and 75% (95%-CI: 0.615; 0.795). The market difference is also highly significant when we consider the possible behavior of non-responders (see Table D.5 in the Appendix).

We examine how many of the sellers who say that the initial price includes an invoice (see row II) are willing to propose a cash price when we ask for it. We find a large willingness to reduce the price. We distinguish sellers who propose a cash price involving evasion (row IIa) from sellers proposing a cash price to reward consumers for immediate payment (row IIb), see Section 3.5.1. In 38% (Market R) and 31% (Market NR) of the offers, the sellers reward immediate payment, i.e., they propose a cash price without switching to evasion. In Market R, in 46% of the declaration (invoice) offers the sellers

Table 4: Reactions when we ask for a cash/invoice price

	Market R	Market NR	$|\Delta|$ Markets
Panel A. Sellers' responses to our two questions			
(I) Share saying that initial price is for cash payment γ_Q	0.052	0.726	0.674
	(0.029)	(0.030)	(0.042)
thereof: (Ia) also propose invoice price	1.000	0.390	0.610
	(0.215)	(0.037)	(0.136)
(II) Share saying that initial price includes invoice	0.948	0.274	0.674
	(0.031)	(0.029)	(0.042)
thereof: (IIa) also propose cash price=evasion	0.455	0.646	0.192
	(0.069)	(0.060)	(0.089)
(IIb) also propose immediate payment discount	0.382	0.308	0.074
	(0.067)	(0.058)	(0.067)
Panel B. Total fraction of offers from sellers willing to evade/declare			
Total share willing to propose cash price (I + II*IIa)	0.483	0.903	0.420
	(0.068)	(0.021)	(0.070)
Total share willing to propose invoice price (II + I*Ia)	1.000	0.557	0.443
	(0.215)	(0.033)	(0.100)
N	58	237	

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. In Panel A, rows I and II are reported as a fraction of the total N, rows Ia, IIa, and IIb are reported as a fraction of the offers in I and II. Row IIa contains the fraction of cash offers involving evasion, IIb the fraction of cash offers rewarding immediate payment. In Panel B, we use the fractions from Panel A to calculate the total fraction of offers in which sellers are willing to propose a cash/invoice price. The differences between markets in the last column are presented in absolute values. Standard errors are obtained from bootstrapping with 10,000 replications.

are willing to evade when we ask for it. In Market NR, the fraction is 65%. The difference between markets is significant. While the market difference is insignificant when we consider non-responders, the bounds confirm that even in Market R, which keeps track of sellers' credentials, many sellers are willing to evade when asked (see Table D.5).

In Panel B, we report the total share of offers in which sellers propose a cash price, in response to the advertisement or to the treatment. The share is 48% in Market R and 90% in Market NR. The market difference is highly significant. The fraction is bounded by 37% and 69% in Market R and by 79% and 100% in Market NR, see Table D.5.

We also investigate how many of the contractors who initially propose a cash price are willing to quote an invoice price. As shown in row Ia of Panel A, all sellers in Market R are willing to also quote an invoice price. In Market NR, this only applies to 39% of the offers. The market difference is significant. Due to a low number of observations in Market R, the bounding analysis can only be implemented in Market NR. In this market, the fraction is bounded by 35% and 46% (see Table D.5). As shown in Panel B of Table 4, the total fraction of offers in which sellers propose an invoice price is 100% in Market R (as expected) and 56% in Market NR. The market difference is again significant and

the finding is robust when we consider non-responders.

4.3 Intention to evade when we ask for a price discount

We use the baseline and invoice treatments with discount (TB_{10}, TI_{10}, TB_{20} and TI_{20}) to study whether the fraction of offers from sellers who accept with the intention to evade changes when consumers ask for a price discount without signaling their willingness to collude. Figure 3 shows that in Market R (Panel a) and in Market NR (Panel b) in all discount treatments, a substantial fraction of sellers react by withdrawing their offer.

We calculate the relative difference of acceptance rates in TB and TI for each discount to obtain estimates of the fractions γ_{10} and γ_{20}. In Market R, the fraction of offers in which sellers intend to evade is 10% when we ask for a 10% and a 20% discount (not significantly different from zero). Since in Market R all sellers respond to the advertisement with the intention to declare, significant increases in the fraction of evasion offers would be in line with the idea that some sellers switch from declaration to evasion. Differences cannot be caused by the different acceptance of discounts of sellers who intend to evade. However, the differences between γ_{10} and γ_0 ($\Delta = 0.079$, p-value = 0.487), γ_{20} and γ_0 ($\Delta = 0.084$, p-value = 0.644) and γ_{20} and γ_{10} ($\Delta = 0.004$, p-value = 0.983) are insignificant.
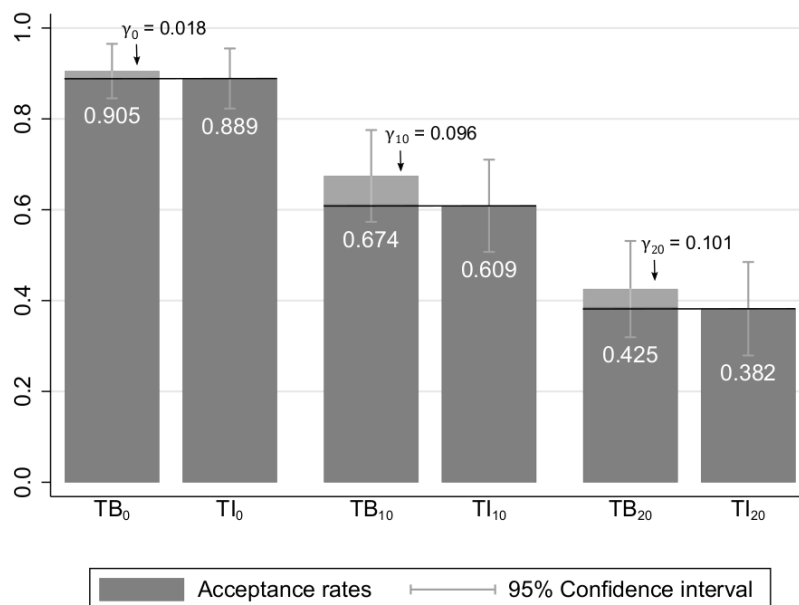
In Market NR, the fraction of offers from sellers intending to evade is 71% when we ask for a discount of 10% and 77% when we ask for a 20% discount. Again, none of the differences between γ_{10} and γ_0 ($\Delta = -0.024$, p-value = 0.594), γ_{20} and γ_0 ($\Delta = 0.034$, p-value=0.471), and γ_{20} and γ_{10} ($\Delta = 0.058$, p-value=0.258) is significant. Note that in Market NR, the change from the condition in which we confirm the price to conditions in which we ask for a discount contains the combined reaction of declarers and evaders. Some contractors who intend to declare without a discount may have switched to evasion in the discount treatments, thus increasing the fraction of evasion offers γ. Contractors who intend to evade may have been more likely to decline the discount request (e.g., because they offered lower prices when responding to the advertisement), thus decreasing γ. It is possible that the null effect is due to both reactions counteracting each other.

Regressions that control, e.g., for initial prices, confirm the results (see Table D.6 in the Appendix). We conclude that asking for a discount has on average no effect on sellers' intention to evade. This may partly be due to violations of our assumptions or the combined reaction of declarers and evaders. Another possible explanation is that our request simply implies lower profits or sends a negative signal about the consumer type. Demanding clients can be a challenge for sellers of home-improvement services.

The discount treatments allow us to examine sellers' reactions to discounts more generally. We find that consumers can still choose from a large number of offers when they request a discount and that sellers tend to be more inclined to negotiate prices in Market

Figure 3: Acceptance rates when we ask for a discount

(a) Market R

(b) Market NR
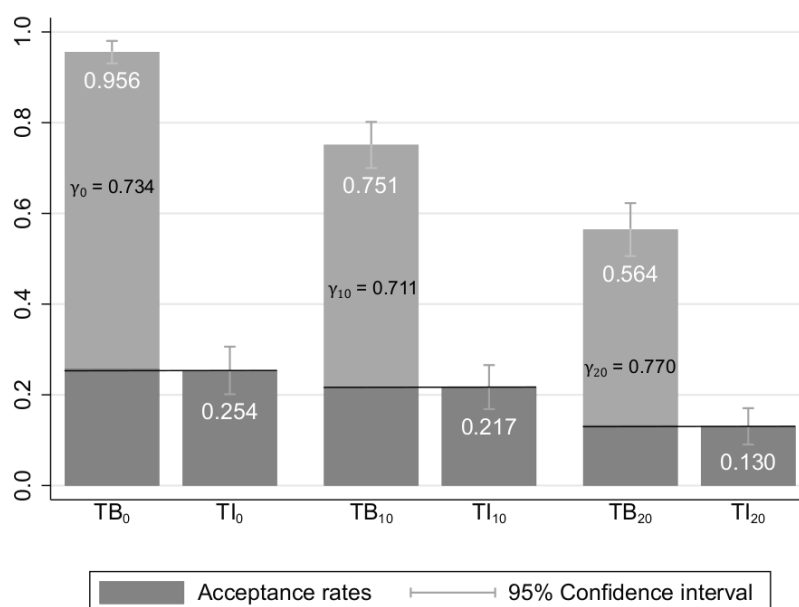
Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. The bars show the fraction of offers in which sellers accept the conditions in the baseline and invoice treatments when we confirm the price TB_0, TI_0 (Market R: N=185, Market NR: 538), with a 10% discount TB_{10}, TI_{10} (Market R: N=178, Market NR: 562), and with a 20% discount TB_{20}, TI_{20} (Market R: N=176, Market NR: 556). The fraction of offers in which sellers intend to evade γ_0, γ_{10}, and γ_{20} are calculated as the difference between acceptance rates in TB, TI divided by the acceptance rate in TB, e.g., in Market NR $\gamma_{20}=$ (0.564 - 0.130)/0.564 = 0.770 = 77%. Standard errors are obtained by bootstrapping with 10,000 replications.

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Table 5: Fractions of offers from different seller types

	Market R	Market NR	|Δ| Markets
Panel A. Fractions of offers from formal/informal sellers			
Offers from formal sellers	1.000	0.557	
	(0.010)	(0.033)	0.443
Offers from informal sellers	0.000	0.443	(0.033)
	(-)	(0.033)	
N	58	237	
Panel B. Formal sellers' willingness to propose a cash price			
Offers from sellers only declare (no cash price)	0.517	0.174	
	(0.068)	(0.033)	0.343
Offers from flexible sellers (cash and invoice price)	0.483	0.826	(0.075)
	(0.068)	(0.034)	
N	58	132	
Panel C. Initial intentions of flexible formal sellers (proposing a cash and an invoice price)			
Offers from flexible sellers initially proposing invoice price	0.893	0.385	
	(0.061)	(0.047)	0.508
Offers from flexible sellers initially proposing cash price	0.107	0.615	(0.076)
	(0.060)	(0.047)	
N	28	109	

Note: Market R (for <u>R</u>estrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. The fractions in Panel A are based on all sellers responding to our two questions in treatment TQ. In Panel B, we restrict the sample to formal sellers, and in Panel C to formal sellers who are flexible (propose a cash and an invoice price). Sellers proposing cash prices with the intention to reward immediate payment are not considered as having proposed a "cash" price. The differences between markets in the last column are presented in absolute values. Standard errors are obtained from bootstrapping with 10,000 replications.

NR. For example, compared to those who accept when we confirm the price, in the invoice treatments 43% are willing to give a discount of 20% in Market R and 51% in Market NR. The average price of sellers accepting to give a discount is not significantly different from the average price of sellers accepting when we confirm the price. Hence, to the extent that price reflects quality, the consumer does not have to be concerned about lower quality.

4.4 Possible reasons for market differences

As outlined in Section 3.1, there are two possible explanations for the market differences described above. First, informal sellers should only be able to participate in Market NR. Second, the different terms of use may create different expectations of tax compliance from formal sellers, or attract formal sellers with different preferences for evasion. We use treatment TQ to study the importance of these two reasons.

We show the fraction of offers from formal and informal sellers in Panel A of Table 5. We classify all offers in which the seller provides an invoice price as being from a formal seller. All offers in which sellers are unwilling to issue an invoice, even if they can

request any price, are classified as being from an informal seller.[20] As expected, all offers are from formal sellers in Market R. In contrast, 44% of offers are from informal sellers in Market NR. The difference between the markets is highly significant. The numbers are remarkably close to the fractions of sellers who decline in treatment TI_0 with the explanation that they do not have a registered business (see Table 3). According to our bounding analysis, the fraction of offers from informal sellers is bounded by zero and 13% in Market R and by 41% and 49% in Market NR (see Table D.7 in the Appendix).

To study if the two markets create different expectations of tax compliance among formal sellers or attract formal sellers with different preferences for evasion, first, we restrict the sample to offers from formal sellers in Panel B of Table 5. We investigate formal sellers' willingness to propose a cash price. In Market R, about half of the sample is reluctant to evade. The other half is flexible, they quote a cash and an invoice price. This division is different in Market NR where more than four out of five offers are from flexible sellers. The difference between the markets is highly significant, and the results are robust when we consider non-responders in a bounding analysis (see Table D.7).

Second, we examine whether the initial intentions of flexible sellers differ across markets (see Panel C of Table 5). In Market R, 89% of flexible sellers propose an invoice price when responding to the advertisement. In Market NR, this fraction is only 39%; the majority responds to the advertisement with a cash price. The market difference is significant, which is confirmed in the bounding analysis (see Table D.7). The results suggest that the markets indeed create different expectations of tax compliance and/or attract different types of sellers (unfortunately, we cannot distinguish the two mechanisms).

5 What is the price reduction for consumers who agree to evade?

We aim to quantify the price reduction for consumers who agree to evade. To determine consumers' private gains from not declaring the transaction, that is, their evasion rent, it is necessary to know the counterfactual situation. As described in Section 2.2, in a setting with a tax subsidy the counterfactual should vary with consumers' possibilities and costs to claim the tax subsidy. Consumers who could use the tax subsidy should only benefit from evasion if the price reduction is at least as high as the legal refund. Consumers who consider the hassle costs from itemizing, discount the legal refund (which is received with a time lag), or who cannot claim the tax subsidy might benefit from evasion even if the price reduction is lower than the legal refund. Consumers might also consider that the

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[20] We argue that all sellers who can issue an invoice indeed propose an invoice price. This assumption may be violated if small businesses (*Kleinunternehmer*) decline to issue an issue to avoid crossing the VAT threshold (see Section 2.1). However, only 1.7% of sellers in our sample reported having that status. In addition, Jarkko et al. (2019) find that Finnish firms' bunching at VAT thresholds seems to be caused by real economic decisions rather than evasion.

quality of illegally provided services might be lower or that evasion implies that they have to pay immediately, whereas they can usually pay within 30 days in a legal transaction.[21] Since we are unable to quantify these aspects, we focus on the null hypothesis that the price reduction for consumers who agree to evade is larger than the tax subsidy of 20%.

We rely on two strategies to estimate the price reduction, calculated as $\varepsilon = \frac{p_D - p_E}{p_D}$. First, we use the baseline and invoice treatment to quantify how much the prices proposed by contractors who intend to evade differ from the prices offered by sellers who intend to declare (between variation). Second, we use the responses to treatment TQ to quantify the difference between the invoice and the cash price from sellers who propose both types of prices (within variation). In both strategies, quality differences might be responsible for a part of the price difference. In the between variation, quality differences might stem from informal sellers providing lower quality or from formal sellers deliberately lowering the quality, as consumers are unable to claim a warranty. In the within variation, only the latter effect matters since only formal sellers are considered in the calculation.

To estimate the price reduction from between variation, we use the average prices from accepting contractors in TI_0 as the declaration price $\bar{p}_D$. The evasion price is calculated from the average price of those accepting in TB_0. This price is the sum of the prices from sellers who intend to declare and from sellers intending to evade, weighted with the shares of the groups. Assuming equal shares and average prices of declaration offers across TB_0 and TI_0, we can solve for the average evasion price $\bar{p}_E$ (see Table D.8 for the prices).

In Panel A of Table 6, we present the price reduction ε_0 calculated from these prices. Since the fraction of offers from sellers that intend to evade is not significantly different from zero in Market R, we cannot use the approach to calculate ε_0 in this market. In Market NR, the evasion price is 21% lower than the declaration price. The confidence interval shows that the evasion discount is not significantly different from the tax subsidy of 20%. We assess whether the results are different when non-responders in TB_0 are considered in the analysis. For the lower bound, we assume that all non-responders (N=12) intend to declare; for the upper bound, we assume that they intend to evade. We use the prices that non-responders propose. The bounds and the confidence interval are almost identical with the main results (see Table D.9 in the Appendix).[22]

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[21] We assess whether the initial prices vary with sellers' ratings (available for 498 of the 618 observations in Market R). Almost two-thirds of those with a rating receive the best average grade of 5 stars, 29% receive on average 4.5 stars while the remaining receive less than 4.5 stars. The average proposed price of the 5-star sellers is 476 Euro, those of sellers with fewer than 5 stars is 419 Euro (difference significant at 5% level). This suggests that price and quality are positively correlated. Although there are good reasons to believe that the quality of illegally provided services is lower, survey evidence suggests that it could also be higher; 23% of Germans respond that they bought undeclared services because they are provided faster, while 7% say that the reason was better quality (European Commission, 2014).

[22] We use the variation between the prices of sellers accepting TB_{10} and TI_{10} and TB_{20} and TI_{20} to calculate the evasion discount when consumers ask for 10% or 20% reduction of the price. We are again only able to calculate ε_{10} and ε_{20} in Market NR. The price reduction is 0.15 (95%-CI: -0.037;

Table 6: Reductions of the sales price

	Market R	Market NR
Panel A. Results from between variation TB$_0$, TI$_0$		
Price reduction ε_0 accepting sellers	–	0.205
	–	[0.061; 0.348]
N	–	326
Panel B. Results from within variation TQ		
Price reduction for immediate payment	0.046	0.067
	[0.011; 0.082]	[0.022; 0.112]
N	21	20
Price reduction ε_Q all flexible sellers	0.174	0.291
	[0.152; 0.196]	[0.244; 0.339]
N	28	109
Price reduction ε_Q if initial price included invoice	0.170	0.197
	[0.146; 0.193]	[0.149; 0.244]
N	25	42
Price reduction ε_Q if initial price is for cash payment	–	0.349
	–	[0.294; 0.405]
N	–	67

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. The price reduction is calculated as $[\bar{p}_D - \bar{p}_E]/\bar{p}_D$ using the mean prices reported in Table D.8. In Panel A, ε_0 is calculated based on price proposals in which sellers accept the conditions in TB$_0$ and TI$_0$. In Panel B, the price reduction ε_Q is calculated from prices quoted by flexible sellers (those proposing a cash and an invoice price) in treatment TQ. In brackets, we report 95% confidence intervals of the price reduction from bootstrapping with 10,000 replications.

To calculate the evasion discount from the price variation within sellers (i.e., holding contractors constant), we use the quoted cash prices as p_E and the quoted invoice prices as p_D. As described in Section 3.5.1, we are able to identify offers in which the seller proposed a cash price with the intention to reward immediate payment (including invoice). The first row of Panel B in Table 6 shows that in these offers sellers give an average discount of 5% in Market R and 7% in Market NR. This is similar to the discount to expedite payment from 30 days to 14 days, which is usually 2-5%. The confidence intervals show that the price reduction for immediate payment is significantly lower than the reduction offered to consumers who agree to evade (see second row in Panel B). This result indicates that we successfully separate discounts for immediate payment from evasion discounts.

We find that the price reduction ε_Q is, on average, 17% in Market R. It is significantly lower than the tax subsidy of 20% but not significantly different from the VAT (1 - 1/1.19 = 16% if calculated as a reduction of the gross price), which suggests that the

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0.344, N = 272) when we ask for 10% discount and 0.24 (95%-CI: 0.046; 0.443, N = 194) when we ask for a 20% discount. The price reductions are not significantly different from the tax subsidy of 20% or the price reduction ε_0, suggesting that asking for a lower price does not change the evasion discount.

contractors in Market R simply reduce the price by the VAT. In contrast, in Market NR the evasion price is, on average, 29% lower than the declaration price. In this market, the evasion discount is significantly higher than the tax subsidy. We study if the results hold when offers from non-responding sellers are considered. To obtain the bounds, we assume that all non-responders (N=9 in Market R, N=22 in Market NR) are flexible. For the lower bound, we assign them a zero discount, for the upper bound, we assign them the maximum discount of flexible sellers in the market. The evasion discount is bounded from 13% to 22% in Market R and from 25% to 42% in Market NR, the bounds are significantly different from 20% in Market NR but not in Market R (see Table D.9).

In Figure 4, we show the cumulative distribution of the price reduction ε_Q by market, which varies from 7% to 33% in Market R. In 79% of the offers, the price reduction is 20% or less. In Market NR, the distribution of the price reduction is much wider, ranging from 0 to 68%. The sample is almost equally split in offers in which the sellers give a price reduction of more than 20% and offers in which the price reduction is less than 20%.

Figure 4: Distribution of the price reduction ε_Q holding seller constant
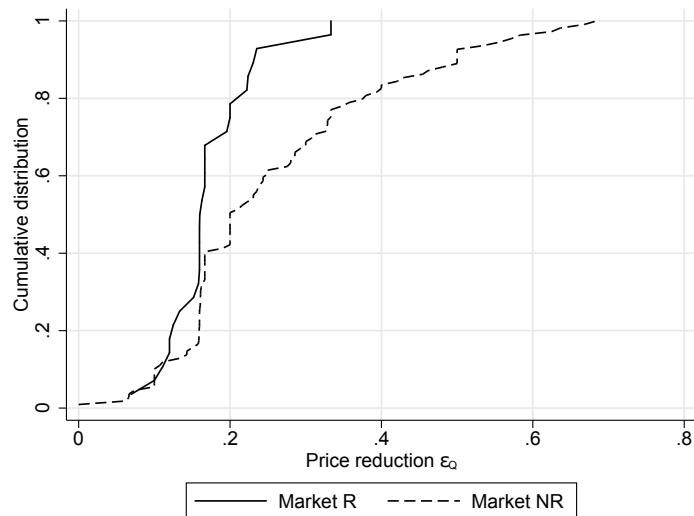
Note: The lines show the cumulative density distribution of the price reduction ε_Q calculated from responses in TQ. The analysis is based on flexible sellers quoting a cash price and an invoice price. We disregard cash prices from contractors who aim to reward immediate payment. Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. N=28 in Market R and N=109 in Market NR.

When we compare the price reduction obtained from between (Panel A) and within variation (Panel B) in Market NR, the estimate based on the within variation is higher. Considering possible quality differences, we would expect the opposite effect. However, whereas the results from between variation are based on differences of initial prices, in treatment TQ contractors are given a chance to quote a second price. In the lower part of Table 6, we examine if sellers' initial intention matters for the evasion discount.

In Market NR, contractors who indicate that their initial price includes an invoice reduce the price by 20% when switching to a cash price. The price reduction is close to the decrease calculated using the between variation. In contrast, when sellers switch from a cash to an invoice price the evasion discount is 35%. The confidence interval ranges from 29% to 41%, indicating that the reduction is significantly higher than the tax subsidy. The results are similar when we consider attrition in a bounding analysis (see Table D.9). The high price reduction can be interpreted as evidence for deterrence pricing. To persuade consumers from insisting on an invoice, contractors who intend to evade seem to be willing to share a higher fraction of the total amount of saved taxes (which includes not only the VAT but also sellers' income taxes, social security contributions etc.).

The result that some sellers in Market NR propose a very large price increase if they are asked to issue an invoice is also reflected in the explanations for non-acceptance of the invoice treatment TI_0, shown in Table 3. In Market NR, about half of the sellers who would issue an invoice at a higher price say that the VAT has to be added while the other half says that the price has to increase by more than the VAT. In Market R, all sellers who would issue an invoice at a higher price say that only the VAT must be added.

Note that the results are based on one round of negotiation. Consumers could try to negotiate a better offer by bringing down the price increase for the invoice price. In that case, the evasion discount of contractors intending to evade would represent an upper bound. Consumers could also try to bring down the cash price quoted by sellers who initially proposed an invoice price. That would imply that the evasion discount of sellers' initially proposing an invoice price represents a lower bound.

In sum, assuming that consumers face no limitations in claiming the tax subsidy and aspects such as quality differences do not matter, our results suggest that consumers only benefit from evasion if they choose a seller who did not want to provide an invoice initially. Considering (1) a potentially lower service quality if no invoice is issued, (2) that consumers might be able to negotiate a better offer, or (3) that they have to pay immediately rather than in 30 days, it is possible that consumers do not even benefit if they choose a seller who initially intends to evade. However, if consumers are unaware of the tax subsidy or unable to use it, if they consider the inconvenience of itemizing, or if they discount the legal refund, they might benefit from evasion even if they choose a seller proposing an evasion discount of less than 20%. To conclusively assess whether consumers benefit from evasion, we would need to quantify the different aspects.

6 Conclusion and discussion

?? Tax evasion is estimated to be particularly high when products or services are sold to consumers (e.g., Kleven et al., 2011; Pomeranz, 2015; Naritomi, 2019). Only a few

studies, mostly theoretical, explore the collaboration between sellers and consumers (e.g., Boadway et al., 2002; Chang and Lai, 2004). Through conducting a field experiment in a naturally occurring market, our study adds a new direction to the literature. We post job advertisements for home-improvement services and vary whether we request an invoice for the delivery of the service. We investigate whether and why the fraction of offers from sellers who intend to evade differs across two regulatory environments often seen in online platforms. We examine sellers' reaction when consumers ask for a price discount or a 'cash' price and quantify the price reduction for consumers who agree to evade.

In Market R, which keeps track of sellers' credentials, the fraction of sellers responding to the advertisement with the intention to evade is not significantly different from zero. In Market NR, in which anyone can participate anonymously, three of four offers involve evasion. When we ask contractors for a 'cash' price many of them agree to evade, even in Market R. In contrast, asking for a discount without signaling a willingness to collude does not change the fraction of evasion offers in the two markets.

Studying possible reasons for the market differences, we find that Market R is able to enforce formality, and to create an expectation of tax compliance from contractors. However, our findings indicate that even though the German government has sent a strong signal of tax compliance by subsidizing home-improvement services, there seems to be enough demand for informal sellers for many of them to continue operating. Almost every second offer in Market NR is from an informal seller. Governments should consider which features of the legislation influence the decision to be informal. Registration may be too complex for sellers offering small-scale services as a side job.

Moreover, we find that consumers receive a similar price reduction when they use the tax subsidy as when they choose an offer involving evasion - unless they opt for a seller who did not want to provide an invoice initially. To conclusively assess whether consumers would benefit from evasion, we would need to quantify aspects such as consumers' possible limitations to claim the subsidy and quality differences.

Our study indicates the challenges of measuring consumers' benefit from evasion. In addition, we are unable to quantify contractors' gain from evasion. The seller is likely to benefit as not only the VAT is evaded but also possibly sellers' income or business taxes. However, declaring a sale does not necessarily imply that the taxable profit increases by the same amount, as contractors can deduct transaction-related costs. Surveys or well-designed survey experiments conducted in parallel to the field experiment might allow researchers to learn about the aspects important to quantify consumers' and sellers' evasion rent. While a field experiment in which a large number of sellers actually provide a service legally or illegally (not the case in our experiment, see footnote 7) would allow researchers to study final prices, quantities, and qualities, our own experience suggests

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that such a design is likely to imply a violation of ethical and legal boundaries.

The advantage of running the experiment on online platforms is that we receive offers from formal and informal sellers. It is usually difficult to collect information on informal contractors. A possible limitation of advertising the jobs on online markets is that two types of sellers are not captured. First, registered businesses that do not use the internet for selling services are disregarded. We expect that they would behave similarly as contractors who participate in Market R. Second, transactions initiated via social connections (e.g., through acquaintances) are not captured. We expect that these sellers are at least as likely to evade as sellers on Market NR. In addition, since the conversations can be tracked by the platforms, we expect that sellers from both markets are more inclined to agree to evasion if the negotiations take place in person.

The experiment relies on advertisements for small-scale home-improvement jobs. The results are similar for the two types of jobs considered (painting and floor installation). The home-improvement sector is a prominent example of a sector in which the occurrence of collaborative tax evasion is estimated to be high (e.g., European Commission, 2014). We expect that the results would be similar for other comparable services in this sector. The results are likely to be valid, in particular, for small-scale services. The median amount Europeans admit to having spent on undeclared goods and services is 200 Euros per year (European Commission, 2014). The results might be different for large-scale services, where it is likely that only a fraction of the total order is not declared to tax authorities. The results are also more likely to apply to jobs provided by small firms or self-employed contractors. A self-employed proprietor has better chances to conceal transactions than a firm with several employees (e.g., Kleven et al., 2011). Finally, the results are more likely to be valid for services that occur inside the house or in a private environment in which the probability that others observe the service is low.

Our experimental set-up is an innovative method to study tax evasion. It could be implemented in other settings to further understand the importance of collaborative evasion and how it varies, e.g., with information, enforcement, or firm and market structure.

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Appendix

A   Sector description

The skilled crafts and trade sector is one of the most diverse economic sectors in Germany. In 2016, it consisted of over 550,000 firms that generated revenues of 551 billion with over 5 million workers (see Table A.1). Painting and flooring services belong to the finishing trade which is the largest industry within the skilled crafts and trade sector (227,219 firms represent a share of 41%). Firms that belong to the finishing trade are responsible to finish the construction and perform the secondary contract work. The finishing trades generated revenues of over 148 billion Euro with more than 1.4 million workers in 2016.

Table A.1: Summary statistics on the sector

	Num. of firms	Num. of workers	Workers per firm	Revenue in 1000 Euro	Revenue per worker
Skilled crafts and trades	554,349	5,142,464	9	551,469,184	107,238
among them: Finishing trade	227,219	1,437,632	6	148,095,013	103,013
Painting (A10)	34,406	205,015	6	15,476,442	75,489
Parquet flooring (B112)	4,490	14,829	3	1,340,297	90,384
General flooring (B103)	3,395	16,475	5	1,796,478	109,043
Decorator (B127)	14,755	48,569	3	3,653,157	75,216
Sum of painting and flooring	**57,046**	**284,888**	**5**	**3,653,157**	**75,216**

Note: Federal Statistical Office, Handwerkszählung 2016. A10 etc. is the official code of the group.

In 2016, 57,046 firms were registered to perform painting and floor installation services. This is a share of 25% of all firms in the finishing trade and a share of 10% of all firms operating the skilled crafts and trade sector. Over 280,000 persons worked in painting and flooring services, the generated revenue amounts to more than 3.6 billion Euro. The share of the total skilled crafts and trade sector on the gross value added amounts to 7.7% (Zentralverband des Deutschen Handwerks, 2018). Using the fraction of the finishing trade and painting and flooring services on the skilled crafts and trade sector (based on revenues), we estimate the finishing trades proportion of the gross value added to be 2-3% and the proportion of painting and flooring services to be 0.5-1% of the value added.

The skilled crafts and trade sector consists of mainly small and medium-sized firms, as shown in Table A.2. The share of firms with less than 5 workers amounts to almost 60%. This is also true in the finishing trades and in the subgroups of painting and flooring services. Here the share of very small and small firms is even larger and amounts to 70%.

Table A.2: Distribution of firms by size

	Skilled crafts and trade		Finishing trade		Painting and flooring	
	Number	in %	Number	in %	Number	in %
< 5 workers	329,842	59.5	150,635	66.3	39,878	69.9
5-9 workers	116,196	21.0	42,800	18.8	10,487	18.4
10-19 workers	63,476	11.5	22,135	9.7	4,720	8.3
20-49 workers	32,081	5.8	9,106	4.0	1,679	2.9
> 50 workers	12,754	2.3	2,543	1.1	282	0.5
	554,349		227,219		57,046	

Note: Federal Statistical Office, Handwerkszählung 2016.

B Details of the experiment

B.1 Wording of advertisements (translated from German)

Advertisement painting
Looking for someone to paint two rooms, in total 40 (80) sqm. There are no slopes and the walls are 2.5m high. Ceilings do not have to be painted. The rooms will be empty. Wallpapering is unnecessary. The walls are currently white with woodchip wallpaper. White paint (brand x) and covering material will be provided. It is not possible to view the site before. Please send me your price proposal (excl. material). Thank you!

Advertisement parquet flooring
Looking for someone to install parquet floor in two rooms, in total 40 (20) sqm. The room is rectangular. The parquet floor should be installed using the floating method. I will provide the flooring parquet (brand x) as well as skirting boards. It is not possible to view the site before. Please send me your proposed price (excl. material). Thank you!

B.2 Wording of treatments (translated from German)

Treatment TB_0: Baseline, no discount
Thanks for your offer of X€. The job should be done within the next four weeks. The price of X€ would be okay for me. If you agree, please get back to me and let me know when you could do the job. I have received several offers and will decide in the next few days. Thank you!

Treatment TI_0: Invoice, no discount
Thanks for your offer of X€. The job should be done within the next four weeks. The price of X€ would be okay for me. I need an invoice, I would like to deduct the costs from taxes. If you agree, please get back to me and let me know when you could do the job. I have received several offers and will decide in the next few days. Thank you!

Treatment TB_{10}: Baseline, 10% discount
Thanks for your offer of X€. The job should be done within the next four weeks. The price of $(1 - 0.1) \cdot X$€ would be okay for me. If you agree, please get back to me and let me know when you could do the job. I have received several offers and will decide in the next few days. Thank you!

Treatment TI_{10}: Invoice, 10% discount
Thanks for your offer of X€. The job should be done within the next four weeks. The

price of $(1 - 0.1) \cdot X$€ would be okay for me. I need an invoice, I would like to deduct the costs from taxes. If you agree, please get back to me and let me know when you could do the job. I have received several offers and will decide in the next few days. Thank you!

Treatment TB$_{20}$: Baseline, 20% discount
Thanks for your offer of X€. The job should be done within the next four weeks. The price of $(1 - 0.2) \cdot X$€ would be okay for me. If you agree, please get back to me and let me know when you could do the job. I have received several offers and will decide in the next few days. Thank you!

Treatment TI$_{20}$: Invoice, 20% discount
Thanks for your offer of X€. The job should be done within the next four weeks. The price of $(1 - 0.2) \cdot X$€ would be okay for me. I need an invoice, I would like to deduct the costs from taxes. If you agree, please get back to me and let me know when you could do the job. I have received several offers and will decide in the next few days. Thank you!

Treatment TQ: Inquiry
Thanks for your offer. Does it include an invoice? How much would it cost if I pay in cash?

Additional interactions in TQ in case questions not clearly answered:

1. In case of ambiguous price(s): "So X includes an invoice? How much would it cost if I pay in cash?" or "So X is the cash price? How much would it cost including an invoice?"

2. When the seller reports that the price includes an invoice but no cash price was given in the first answer: "And how much would it cost if I pay in cash?"

3. When the seller reports that the price is cash and no invoice price was given in the first answer: "And how much would it cost including an invoice?"

Rejection
Thanks again for your offer. Unfortunately, I have to tell you that we haven't chosen you.

B.3 Representative examples of answers in treatment TQ (translated from German)

Every interaction began with our treatment text ("Thanks for your offer. Does it include an invoice? How much would it cost if I pay cash?") and ended with our rejection.

- Proposes only invoice price (initial invoice, no additional interaction):
  Seller: Yes, only with invoice, 380 Euro including VAT. Thanks a lot.

- Proposes only cash price (initial cash, no additional interaction):
  Seller: No, no invoice included, and I cannot issue one. This is private after work or during the weekend.

- Proposes cash and invoice price (initial cash, no additional interaction):
  Seller: Hello, the offer is net, if it should be with invoice than plus VAT, as you like. Kind regards

- Proposes cash and invoice price (initial invoice, no additional interaction):
  Seller: If you pay cash without invoice I can reduce the price to 150 Euro. Do I need to bring anything else besides basic equipment?

- Proposes cash and invoice price but stresses that cash price also involves invoice (initial invoice, no additional interaction):
  Seller: Dear Mr. Lorenz, Of course you will receive an invoice. VAT, call-out fees, and material excluding paint are included in the price. Cash payment 260 Euro (with invoice). Kind regards

- Proposes only cash price (initial cash, with additional interaction):
  Seller: It is without. Kind regards
  Consumer: And how much would it cost including an invoice?
  Seller: I can only an issue from October onwards, since I will only be self-employed from there on. Kind regards

- Proposes cash and invoice price (initial cash, with additional interaction):
  Seller: Dear Mr. Walter, my offer was without VAT. Kind regards
  Consumer: And how much would it cost including an invoice?
  Seller: +19%, i.e., ca. 60 Euro

- Proposes cash and invoice price (initial invoice, with additional interaction):
  Seller: This would be 500 Euro
  Consumer: So including an invoice 560 Euro and cash 500 Euro?
  Seller: Yes!

- Proposes cash and invoice price but stresses that cash price also involves invoice (initial invoice, with additional interaction)
  Consumer: That means 230 with invoice and 207 when I pay cash?
  Seller: Good morning, of course you will receive an invoice when you pay cash.

- Proposes cash and invoice price but stresses that cash price also involves invoice (initial invoice, with additional interaction)

  Seller: Hello Mr. Barth, Of course you will receive an invoice. Cash payment is okay for me but please consider that you will probably lose the tax advantage through paying cash. Kind regards

  Consumer: And how much would it cost if I pay cash?

  Seller: Hello Mr. Barth, it doesn't matter if you pay cash or transfer the money, it will remain the same price. I cannot offer an immediate payment discount at such a low price. Kind regards

B.4 Tables and figures explaining details of experiment

Table B.1: Features of markets and examples of countries

	Market type	
Market features	Restrictive (R)	Non-Restrictive (NR)
Type of good/services traded		
- Personal/household services	x	
- Almost any		x
Access restrictions on sellers' side		
- Only registered businesses	x	
- No access restrictions		x
Background check of sellers' identity		
- Yes	x	
- No		x
Consumer rating possible		
- Yes	x	
- No		x
User fees		
- Only for sellers	x	
- None		x
Examples of countries	DEU	DEU
	CHE	CHE
	AUT	AUT
	ITA	ITA
	FRA	FRA
	GBR	GBR
	USA	USA
	CAN	CAN
	NDL	

Note: Countries are indicated by their three digit code in ISO 3166. In several countries, markets exist that are similar to those listed in the table except for a variation in one of the market features.

Figure B.1: Map of cities

(a) Painting

(b) Floor installation
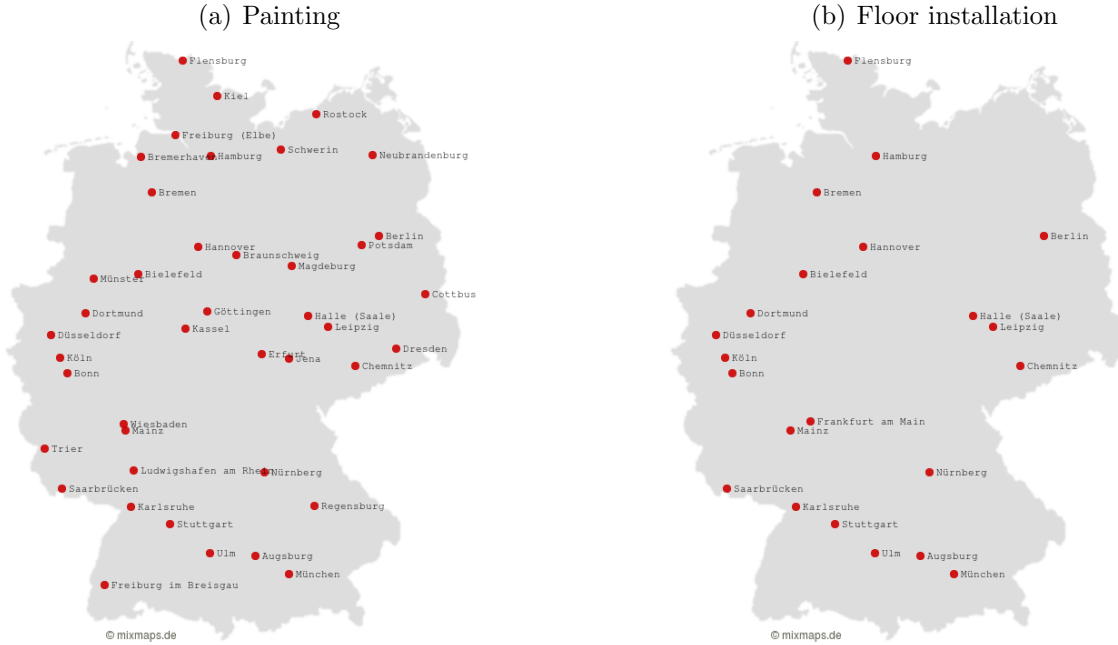
Note: The advertisement for the painting job was posted in 42 cities and for the flooring job in 22 of these cities. Due to technical issues, we were not able to collect offers for the painting job in Chemnitz in Market NR.

Table B.2: Reasons for not being treated

Reason	Market R	Market NR
Seller asks for a call or visit prior to sending a price proposal	0.078	0.020
Seller sends offers including the material	0.021	0.006
Seller does not send a (total) price even if we ask them to so	0.007	0.035
Seller requests detailed information which would have implied differences across sellers	0.007	0.013
Seller sends unspecific offers	0.006	0.014
Total	0.119	0.088

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. Reported fractions are relative to the sample that sent an offer.

C   Details on identification strategy of γ_0

We aim to identify the fraction of offers from sellers who respond to the advertisement with the intention to evade γ_0. We can derive γ_0 as the conditional probability of observing a seller with intention to evade given that the job is accepted, $P(E|acc)$. Using Bayes' rule, the fraction is equal to the conditional probability shown in equation (1),

$$\gamma_0 = P(E|acc) = \frac{P(acc|E)P(E)}{P(acc)} \tag{1}$$

In TB_0, we do not mention that we need an invoice. We assume that sellers accept the treatment independent of their intention. The probability that a seller accepts the job given the contract conditions of the baseline treatment is the sum of the probability of acceptance given the seller intends to declare and the probability of acceptance given the seller intends to evade weighted with the probability of being that type of seller,

$$P(acc|\text{TB}_0) = P(acc) = P(acc|D)P(D) + P(acc|E)P(E). \tag{2}$$

In the invoice treatment TI_0, we stress that an invoice (I) is needed to deduct the service costs from the tax bill. The probability that a seller accepts the job given the contract conditions in the invoice treatment can again be written as the sum of the probabilities of accepting the job when the seller intends to declare or to evade and is willing to issue an invoice weighted with the probability of being that type of seller,

$$P(acc|\text{TI}_0) = P(acc|I) = P(acc|D,I)P(D,I) + P(acc|E,I)P(E,I). \tag{3}$$

The fraction of offers from sellers with intention to evade can be identified from the difference of acceptance rates in the baseline and invoice treatment based on two assumptions. First, TI_0 should only be accepted by those who intend to declare the transaction:

Assumption 1 (A1)

$$P(acc|E,I) = 0 \quad \text{or} \quad P(not\ acc|E,I) = 1 \tag{4}$$

We assume that all sellers who intend to evade will not accept the job in the invoice treatment. This assumption is highly plausible since we explicitly state that we aim to deduct the costs from taxes. We thereby signal that we will only hire them if we actually receive an invoice which we would make available to public authorities. It would be irrational to issue an invoice and to evade because tax authorities may learn about the transaction from the invoice and compare the information with sellers' records. Under

A1, the probability that a seller accepts the job in the invoice treatment reduces to

$$P(acc|\text{TI}_0) \overset{A1}{=} P(acc|D,I)P(D,I). \tag{5}$$

Second, we assume consistent behavior of sellers across TB_0 and TI_0

Assumption 2 (A2)

$$\text{A2a:} \quad P(acc|D)P(D) = P(acc|D,I)P(D,I). \tag{6}$$

$$\text{A2b:} \quad P(acc|E)P(E) = P(not\ acc|E,I)P(E,I). \tag{7}$$

We assume that sellers have a clear intention when responding to the advertisement which, since we do not modify the prices initially proposed by sellers, is unaffected by the treatment. Assumption A2a implies that those who accept the job and agree to issue an invoice if we explicitly ask for it in TI_0 would also accept and issue an invoice if we do not ask for it (equation 6). A violation of A2a could happen when sellers who initially intend to declare decide to keep the collected taxes when we do not explicitly ask for an invoice in TB_0. Assumption A2b implies that those who accept with intention to evade in TB_0 would also intend to evade in TI_0 and consequently not accept this treatment (equation 7). A2b could be violated when sellers who respond to the advertisement with intention to evade decide to absorb the tax costs and accept with the intention to declare in TI_0. However, only formal sellers can change their intention in reaction to the treatment.

If assumptions A1 and A2 hold the fraction of offers from sellers responding to the advertisement with intention to evade γ_0 is identified from the differences of acceptance rates of the two treatments divided by the acceptance rate of the baseline treatment,

$$\gamma_0 = P(E|acc) = \frac{P(acc|\text{TB}_0) - P(acc|\text{TI}_0)}{P(acc|\text{TB}_0)} \overset{A1-A2}{=} \frac{P(acc|E) \cdot P(E)}{P(acc)}. \tag{8}$$

If assumptions A1 and/or A2 are violated, our estimate of γ_0 presents a lower bound.

D   Additional results

Table D.1: P-values of Kolmogorov-Smirnov tests

	Market R							Market NR					
	TB_0	TI_0	TB_{10}	TI_{10}	TB_{20}	TI_{20}		TB_0	TI_0	TB_{10}	TI_{10}	TB_{20}	TI_{20}
TI_0	0.921							0.229					
TB_{10}	0.974	0.950						0.846	0.375				
TI_{10}	0.430	0.404	0.522					0.803	0.611	0.854			
TB_{20}	0.926	0.723	0.738	0.079				0.989	0.452	0.885	0.998		
TI_{20}	0.348	0.597	0.788	1.000	0.276			0.843	0.450	0.833	0.999	1.000	
TQ	0.190	0.575	0.565	0.788	0.222	0.973		0.845	0.785	0.795	0.803	0.639	0.571

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. P-values are from a Kolmogorov-Smirnov test of the equality of the distribution of the proposed prices. We perform the test for all treatments against each other. The statistics are based on offers in the final sample.

Table D.2: Probit regression results when we confirm the price

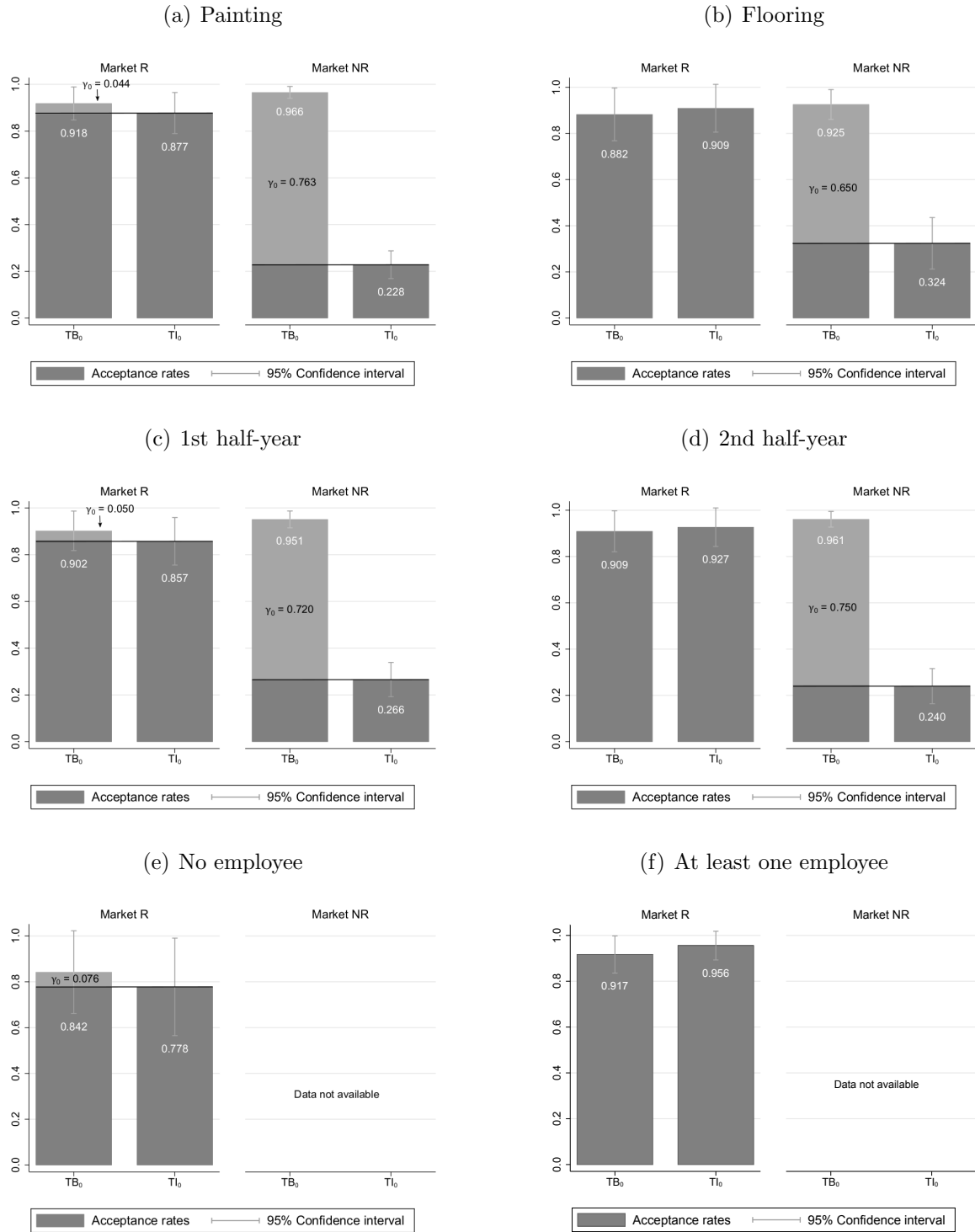|	(1)	(2)	(3)	(4)	(5)	(6)
	Market		Market		Market	
	R	NR	R	NR	R	NR
Panel A. Marginal effects from regression						
Invoice treatment TI_0	-0.016	-0.488	0.002	-0.482	-0.026	-0.518
	(0.041)	(0.005)	(0.043)	(0.007)	(0.061)	(0.021)
Proposed price			-0.000	0.003	-0.003	0.004
			(0.046)	(0.029)	(0.042)	(0.032)
Proposed price $\times$ TI_0			0.066	0.074	0.067	0.069
			(0.072)	(0.030)	(0.073)	(0.029)
Floor installing					0.013	-0.085
					(0.071)	(0.057)
Floor installing $\times$ TI_0					0.065	0.132
					(0.078)	(0.078)
Quarter fixed effects	yes	yes	yes	yes	yes	yes
Panel B. Fractions calculated from predicted values						
Fraction of evasion offers γ_0	0.018	0.734	0.015	0.735	0.015	0.735
	(0.064)	(0.204)	(0.049)	(0.078)	(0.017)	(0.078)
Differences between markets Market NR - Market R	0.716 (0.215)		0.720 (0.092)		0.720 (0.188)	
N	140	538	140	538	140	538

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. Panel A reports marginal effects from a probit estimation of job acceptance on the invoice treatment indicator and different sets of control variables. Due to the low number of observations in Market R, it is not possible to jointly control for region and quarter effects. Due to perfect prediction in some cells, in Market R the sample decreases by 45 observations when we control for quarter. The results are unchanged when we drop the quarter variable. The proposed price is standardized to zero mean and unit variance by market and job type. Clustered standard errors on the advertisement level are reported in parentheses. Panel B reports the fraction of offers from sellers who intend to evade predicted from probit estimation and the differences of these fractions between markets. Standard errors of the fractions and the difference between markets are obtained from bootstrapping with 10,000 replications.

Figure D.2: Heterogeneity of results by job type, half-year, and seller type

(a) Painting

(b) Flooring

(c) 1st half-year

(d) 2nd half-year

(e) No employee

(f) At least one employee

Note: The bars show the fraction of offers in which sellers accept the conditions in TB_0, TI_0 (acceptance rate). The fraction of offers from sellers with intention to evade γ_0 is set to zero when the acceptance rate is higher in TI_0 than in TB_0. Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. In Panel (a) and (b), we split the sample by job type (Painting: Market R: N = 118, Market NR: N = 400; Flooring: Market R: N = 67, Market NR: N = 138). In Panel (c) and (d), we split the sample by half-year (1st half-year: Market R: N = 100, Market NR: N = 285; 2nd half-year Market R: N = 85, Market NR: N = 253). In Panel (e) and (f), we split the sample by business size, this information is available for a subset of sellers in Market R, see Section 3.6 (No employee: N = 37, at least one employee: N = 92). Standard errors are obtained by bootstrapping with 10,000 replications.

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Table D.3: Robustness of results when we confirm the price

	(1)	(2)	(3)	(4)	(5)	(6)
	Excl. lower/ upper 5%		Excl. duplicates		Other job volumes	
	Market		Market		Market	
	R	NR	R	NR	R	NR
Panel A. Coefficients from linear regressions						
Invoice treatment TI_0	-0.048	-0.945	-0.098	-0.872	-0.084	-0.684
	(0.127)	(0.094)	(0.110)	(0.093)	(0.118)	(0.098)
Proposed price	0.032	0.018	0.005	0.013	0.034	0.036
	(0.046)	(0.017)	(0.031)	(0.015)	(0.039)	(0.021)
Proposed price $\times$ TI_0	-0.028	0.107	0.057	0.080	0.030	0.031
	(0.053)	(0.041)	(0.042)	(0.033)	(0.072)	(0.028)
Floor installing	0.023	-0.044	-0.030	-0.030	0.177	0.010
	(0.095)	(0.045)	(0.086)	(0.046)	(0.107)	(0.050)
Floor installing $\times$ TI_0	0.047	0.196	0.059	0.141	-0.091	-0.004
	(0.088)	(0.075)	(0.085)	(0.078)	(0.182)	(0.093)
Region fixed effects	yes	yes	yes	yes	yes	yes
Quarter fixed effects	yes	yes	yes	yes	yes	yes
Panel B. Fractions calculated from predicted values						
Fraction of evasion offers γ_0	-0.016	0.741	0.015	0.728	0.209	0.748
	(0.054)	(0.029)	(0.061)	(0.029)	(0.080)	(0.038)
Difference between Market NR - Market R	0.757		0.713		0.539	
	(0.062)		(0.068)		(0.088)	
N	161	483	143	522	70	300

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. Panel A reports results from a linear regression of job acceptance on the invoice treatment indicator and the indicated control variables, as in columns (3) and (4) of Table 2. The proposed price is standardized to zero mean and unit variance by market and job type. Clustered standard errors on the advertisement level are reported in parentheses. Panel B reports the fraction of offers from sellers who intend to evade predicted from regressions and differences of these fractions. In columns (1)-(2), we study the effect of dropping sellers proposing very low or high prices by excluding the upper and lower 5% of price offers per advertisement. In columns (3)-(4), we assess if multiple offers by one seller affect our results by identifying sellers who applied in more than one city. There are 46 sellers who applied at least twice; we only keep their first offer. In columns (5)-(6), we check if the results hold when we post other volumes of the two jobs, namely painting four rooms and laying a floor in one room. The advertisements were posted in four cities only, summary statistics are provided in Table D.4. Standard errors of the fractions and the differences of the fractions are obtained from bootstrapping with 10,000 replications.

Table D.4: Summary statistics of additional job advertisements

	Market R					Market NR				
	N	Proposed price (in Euro)				N	Proposed price (in Euro)			
		Mean	SD	Min	Max		Mean	SD	Min	Max
Panel A. Painting										
Total	46	619	263	260	1,560	220	506	335	80	2,700
TB_0	20	594	286	300	1,560	111	483	286	100	1,600
TI_0	26	638	247	260	1,400	109	529	379	80	2,700
p-value		0.587					0.306			
Panel B. Floor installation										
Total	24	361	116	226	675	80	242	106	85	550
TB_0	11	380	126	250	675	38	258	102	100	500
TI_0	13	345	110	226	600	42	228	108	85	550
p-value		0.474					0.215			

Note: Based on advertisements of painting of four rooms (80 sqm) and laying a floor in one room (20 sqm). In this extension, we focused on TB_0, TI_0. Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. SD is standard deviation. Min and Max indicate the lowest and highest price per treatment. To test for balance of the proposed prices, we regress the variable on the both treatment dummies and test whether the estimated coefficients of these dummies are all jointly zero. P-values from a F-Test of joint significance are reported in the last row.

Table D.5: Bounds on the reactions to asking for cash/invoice price

	Market R			Market NR		
	point est.	LB	UB	point est.	LB	UB
Panel A. Sellers' responses to our two questions						
(I) Share saying that initial price is for cash payment γ_Q	0.052	0.045 [0.003; 0.257]	0.179	0.726	0.664 [0.615; 0.795]	0.749
thereof: (Ia) also propose invoice price	1.000	- -		0.390	0.345 [0.289; 0.518]	0.459
(II) Share saying that initial price includes invoice	0.948	0.821 [0.741; 1.000]	0.955	0.270	0.251 [0.207; 0.384]	0.336
thereof: (IIa) also propose cash price=evasion	0.455	0.391 [0.290; 0.634]	0.531	0.646	0.483 [0.394; 0.815]	0.736
(IIb) also propose immediate payment discount	0.382	0.328 [0.231; 0.572]	0.469	0.308	0.230 [0.155; 0.572]	0.483
Panel B. Total fraction of offers from sellers willing to evade/declare						
Total share willing to propose cash price (I + II*IIa)	0.483	0.365 [0.267; 0.827]	0.687	0.903	0.785 [0.740; 1.000]	0.996
Total share willing to propose invoice price (II + I*Ia)	1.000	0.821 [0.741; 0.955]	0.955	0.557	0.480 [0.428; 0.744]	0.680
N	58	67		237	259	

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. The point estimate (est.) is reported for the sake of comparability (see also Table 4). LB is the lower bound, UB is the upper bound. To calculate the bounds of the parameters in I and II, we assume that either all non-responders belong to the group under investigation or not. For the calculation of the bounds of the parameters in Ia, IIa, and IIb, we assume that all non-responders have the initial intention under investigation (row I/II) and are either all willing to propose the respective price or not. We are not able to report the bounds in Ia in Market R since this would imply an increase of the sample by 300%. The confidence interval of the bounds from Imbens and Manski (2004) are reported in brackets (obtained from bootstrapping with 10,000 replications). Since the fractions naturally range from 0 to 1, we restrict the values of the confidence interval to this range.

Table D.6: Regression results when we ask for a discount

	Market R	Market NR
	(1)	(2)

Panel A. Coefficients from linear regression

	Market R	Market NR
Invoice treatment TI_0	0.005	-0.737
	(0.042)	(0.026)
Baseline Discount 10% TB_{10}	-0.227	-0.204
	(0.063)	(0.027)
Discount 10% $\times$ Invoice treatment TI_{10}	-0.061	0.169
	(0.080)	(0.034)
Baseline Discount 20% TB_{20}	-0.479	-0.388
	(0.065)	(0.034)
Discount 20% $\times$ Invoice treatment TI_{20}	-0.032	0.269
	(0.094)	(0.047)
Proposed price	yes	yes
Proposed price $\times$ TI	yes	yes
Flooring	yes	yes
Flooring $\times$ TI	yes	yes
Region effects	yes	yes
Quarter effects	yes	yes

Panel B. Fractions calculated from predicted values

	Market R	Market NR
No discount γ_0	0.013	0.736
	(0.050)	(0.029)
10% discount γ_{10}	0.109	0.711
	(0.103)	(0.035)
20% discount γ_{20}	0.105	0.766
	(0.174)	(0.038)
$\Delta \gamma_{10} - \gamma_0$	0.095	-0.025
	(0.114)	(0.044)
$\Delta \gamma_{20} - \gamma_0$	0.091	0.030
	(0.180)	(0.047)
$\Delta \gamma_{10} - \gamma_{20}$	0.004	-0.055
	(0.199)	(0.051)
N	539	1656

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. Panel A reports results from linear regression of the acceptance rate on treatment indicators and different sets of control variables. The proposed price is standardized to zero mean and unit variance by market and job type. Clustered standard errors on the advertisement level are reported in parentheses. Panel B reports the fraction of offers from sellers with intention to evade calculated from predicted values of the regression and differences between discount conditions (0%, 10%, 20%). Standard errors of the fractions and absolute changes are obtained from bootstrapping with 10,000 replications.

Table D.7: Bounds on the fractions of offers from different seller types

	Market R			Market NR		
	point est.	LB	UB	point est.	LB	UB
Panel A. Bounds on the fractions of formal and informal sellers						
Offers formal sellers	1.000	0.866 [0.796; 1.000]	1.000	0.557	0.510 [0.458; 0.646]	0.595
Offers informal sellers	0.000	0.000 [0.000; 0.203]	0.134	0.443	0.405 [0.355; 0.542]	0.490
N	58	67		237	259	
Panel B. Bounds on formal sellers' willingness to propose a cash price						
Offers sellers who only declare (no cash price)	0.517	0.448 [0.347; 0.682]	0.582	0.174	0.149 [0.102; 0.353]	0.292
Offers flexible sellers (cash and invoice price)	0.483	0.418 [0.319; 0.653]	0.552	0.826	0.708 [0.646; 0.900]	0.851
N	58	67		132	154	
Panel C. Bounds on initial intentions of formal flexible sellers (proposing a cash and an invoice price)						
Offers flexible sellers initially proposing invoice price	0.893	0.676 [0.546; 0.995]	0.919	0.385	0.321 [0.253; 0.561]	0.489
Offers flexible sellers initially proposing cash price	0.107	0.081 [0.007; 0.454]	0.324	0.615	0.511 [0.439; 0.747]	0.679
N	28	37		109	131	

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. The point estimate (est.) is reported for the sake of comparability (see also Table 5). LB is the lower bound, UB is the upper bound. To calculate the bounds of the parameters, we assume for the lower (upper) bounds that none (all) non-responders belong to the group under investigation. The bounds on the fractions are naturally bounded by zero and one. The confidence interval of the bounds from Imbens and Manski (2004) are reported in brackets (obtained from bootstrapping with 10,000 replications). Since the fractions naturally range from 0 to 1, we restrict the values of the confidence interval to this range.

Table D.8: Average declaration and evasion price

	Market R		Market NR	
	$\bar{p}_D$	$\bar{p}_E$	$\bar{p}_D$	$\bar{p}_E$
Panel A. Prices used in between variation TB_0, TI_0				
Prices used for ε_0 accepting sellers	-	-	346	275
	(-)	(-)	(19)	(16)
N	–		326	
Panel B. Prices used in within variation				
Prices used for immediate payment discount	427	407	372	347
	(66)	(57)	(53)	(48)
N	21		20	
Prices used for ε_Q all flexible sellers	525	434	400	284
	(45)	(38)	(29)	(23)
N	28		109	
Prices used for ε_Q if initial price included invoice	527	438	397	319
	(48)	(42)	(57)	(52)
N	25		42	
Prices used for ε_Q if initial price was cash payment	-	-	403	262
	(-)	(-)	(31)	(16)
N	–		67	

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. Prices reported in Euro. In Panel A, $\bar{p}_D$ is the mean price of those who accept the invoice treatment (obtained from regressions in which we control for region and quarter effects). In Market NR, $\bar{p}_E$ is calculated from $\bar{p}_E = \frac{\bar{p}_{TB} - \bar{p}_D \cdot (1-\gamma_0)}{\gamma_0}$ where the price of those accepting TB_0 is $\bar{p}_{TB} = 294$, $\gamma_0 = 0.736$, and $\bar{p}_D$ as reported in the table. It is not possible to calculate $\bar{p}_E$ in Market R since γ_0 is not significantly different from zero. In Panel B, $\bar{p}_D$ refers to the invoice price, $\bar{p}_E$ to the cash price that flexible sellers (those quoting p_D and p_E) report in treatment TQ (obtained from regressions in which we control for region and quarter effects). In parentheses we report the standard error (obtained from bootstrapping with 10.000 replications).

Table D.9: Bounds on the reductions of the sales price

	Market R			Market NR		
	point est.	LB	UB	point est.	LB	UB
Panel A. Bounds on results from between variation TB_0, TI_0						
Price reduction ε_0 accepting sellers	–			0.205	0.205 [0.072; 0.352]	0.203
N				326	338	
Panel B. Bounds on results from within variation TQ						
Price reduction for immediate payment	0.046	0.030 [0.007; 0.125]	0.106	0.067	0.036 [0.013; 0.184]	0.151
N	21	30		20	42	
Price reduction ε_Q all flexible sellers	0.174	0.130 [0.101; 0.242]	0.217	0.291	0.253 [0.215; 0.463]	0.418
N	28	37		109	131	
Price reduction ε_Q if initial price included invoice	0.170	0.123 [0.093; 0.244]	0.217	0.197	0.142 [0.110; 0.379]	0.331
N	25	34		42	64	
Price reduction ε_Q if initial price was cash payment	–			0.349	0.282 [0.233; 0.536]	0.495
N				67	89	

Note: Market R (for Restrictive terms of use) keeps track of sellers' credentials. Market NR (for Non-Restrictive) allows anyone to sell anonymously. The point estimate (est.) is reported for the sake of comparability (see also Table 6). LB is the lower bound, UB is the upper bound. To obtain the bounds in Panel A, for the lower bound (LB), we assume that all non-responders (N=12) intend to declare; for the upper bound (UB), we assume that they intend to evade. We use the prices that non-responders proposed. To obtain the bounds in Panel B, we assume that all non-responders (N=9 in Market R, N=22 in Market NR) are flexible. For the lower bound, we assign them a zero discount, for the upper bound, we assign them the maximum discount that we observe in the group under investigation. The confidence interval of the bounds from Imbens and Manski (2004) are reported in brackets (obtained from bootstrapping with 10,000 replications).

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