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Shaping tax norms through lotteries

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ABSTRACT

This work develops a theoretical framework for a behavioral policy against indirect tax evasion that is complementary to the classical deterrence approach. The policy provides incentives to customers in the form of lottery prizes in order to act as third-party tax enforcers. I argue that the policy introduction might successfully overcome the free-riding problem characterizing third-party tax enforcement. A theoretical model based on Tversky and Kahneman's (1992) Cumulative Prospect Theory is presented. The model states the necessary conditions for an effective policy implementation.

1. Introduction

Developing effective policies that promote tax compliance represents a challenging task for authorities and policymakers. Scholars' contributions have traditionally focused on monitoring and sanctioning as instruments to achieve compliance (Allingham and Sandmo, 1972; Andreoni et al., 1998; Becker, 1968; Yitzhaki, 1974). However, as Slemrod (1992, p.7) points out,"from the tax collection standpoint it is extraordinarily expensive to arrange an enforcement regime so that, from a strict cost-benefit calculus, non-compliance does not appear attractive to many citizens." Indeed, empirical evidence shows that tax evasion is still a widespread problem (Cowell, 1990; Slemrod, 2007). This argument is even more relevant for indirect taxes, like value added (VAT) and retail sales tax (RST)[1]. In fact, VAT and RST payments are based on the collection of private and corporate financial records of transactions. Consequently, and owing to the monitoring costs and the difficulties for the central government to verify the accuracy of this information, revenue-maximizer taxpayers would be tempted to underreport the tax amounts due. (Webley et al., 2006).

Recognizing the ineffectiveness of a centralized enforcement system based exclusively on sanctioning non-compliant business owners, a number of countries enacted policies to engage customers in contrasting VAT and RST evasion. Despite some variants between countries in the actual implementation, the policy mechanism works as follows. The government institutes a lottery and announces a prize. A serial number is printed on all sales receipts and the individual owning the receipt with the number corresponding to the lottery extraction is entitled to claim the prize. In other words, every invoice becomes a lottery ticket. The importance of the sales receipt for tax compliance comes from the fact that, in many countries, it represents the proof of the existence of a monetary transaction, containing information relative to the amount of tax payment due. Once the invoice has been remitted, it becomes difficult for business owners to hide information regarding the business volume and taxable income. Consequently, a key strategy adopted by business owners in evading VAT and RST is to avoid printing the invoice. Indeed, as discussed in further detail below, absent of any policy intervention, customers have virtually no benefit in asking for the invoice, while they could face material and moral costs.

Throughout this paper, I name these interventions that make use of lotteries to contrast indirect tax evasion Lottery Ticket Reward Policy (LTRP). Taiwan has been the first country to engage customers in fighting indirect tax evasion. The Taiwanese *Uniform Invoice Lottery* was originally established in 1951 and it is still in place.[2] Chinese provinces also implemented a lottery system to

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[1] For a recent overview of the so-called "VAT gap" (the difference between estimated VAT payment and actual VAT receipts) in European countries, see the Reckon LLP of 21 September 2009 for the European Commission, http://ec.europa.eu/taxation_customs/resources/documents/taxation/tax_cooperation/combating_tax_fraud/reckon_report_sep2009.pdf

[2] See wikipedia.org/wiki/Uniform_Invoice_lottery

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fight tax evasion starting in 1998[3] Similar policies are adopted by the municipality of Sao Paulo, Brazil[4] and since 2011 in Puerto Rico.[5] The first European country adopting LTRP to fight tax evasion was Slovakia in 2013.[6] Recently, Portugal introduced a somewhat similar policy.

In recent years, scholars have devoted increasing attention to the investigation of LTRP. Empirical evidence shows that the policy is effective in reducing tax evasion and increasing net tax revenue.[7] Wan (2010) exploits the quasi-experimental introduction of LTRP in China in order to estimate its causal effects. According to the author, during the period 1998–2002 the sales tax collection rose by 17% in the Chinese provinces that introduced LTRP, and the ratio between lottery prizes paid by the government and increased tax revenue ranges between 1:30 and 1:40.

Estimating the effects of an anti-tax evasion program that combines the LTRP with tax rebates in the state of Sao Paulo, Brazil (the *Nota Fiscal Paulista*), Naritomi (2013) finds that the policy introduction resulted in an increase of at least 23% taxable revenue reported resulting in at least US$2 billion increase in net tax revenue in four years. Data show that LTRP effects, while present for any type of commodity sold, are stronger for firms selling goods with a relative low purchase value. The author argues that fixed costs of negotiation that suppliers bear in order to offer to consumers an illegal transaction might explain this finding. Moreover, data on consumers' participation to LTRP seem to be consistent with behavioral economics models.

Despite the empirical evidence suggesting that LTRP might be a useful tool in contrasting indirect tax evasion, to my knowledge only a few contributions attempt to develop a theoretical framework that allows predicting the effects of the policy implementation. Marchese (2009) proposes a theoretical contribution showing that the provision of incentives to consumers through in-kind transfers might be effective in reducing the level of tax evasion. However, according to the author's model, the possibility that a business owner set a compensation for accepting an illegal transaction would hamper the effectiveness of the policy. Differently from Marchese, in my contribution I propose a model based upon findings in behavioral economics. My model predictions are consistent with the empirical evidence that LTRP might also be effective in situations where it is common for suppliers to trade avoiding invoices emission with price discounts.

Fabbri and Hemels (2013) also investigate LTRP and its possible application. The authors focus on the welfare implications of LTRP, discussing the possible side effects and stressing the long-run benefits deriving from the policy implementation. On the other hand, in this work I am interested in the decision-making process underlying LTRP.

Giebe and Schweinzer (2014) investigate the possibility of using lotteries in order to correct the distortion due to taxation of consumption through which a public good is financed. However, while the starting point of the authors' research is the existence of LTRP in different countries, the paper does not focus on the mechanism that makes lotteries effective in inducing customers to ask ask for receipts, and it takes for granted that all LTRP applications are "highly successful in their intended purpose of reducing tax evasion" (Giebe and Schweinzer, 2014, p.8). Conversely, in this work I investigate the micro-foundation of LTRP. I focus on the specific decision situation faced by a consumer that has to request an invoice, and I derive the conditions under which the introduction of a lottery is successful in effecting consumers' behavior.

The objective of this paper is to develop a theoretical framework for LTRP. I argue that, absent any policy intervention, consumers fail to enforce business receipts emission after a business transaction. Indeed, for a customer enforcing invoices emission is a costly action that generates a positive externality whose benefits are not internalized by the customer himself. I then analyze the introduction of LTRP for incentivizing invoices emission enforcement. I propose a model of non-expected utility based on Tversky and Kahneman's Cumulative Prospect Theory (1992). The model states a set of conditions for the successful implementation of LTRP.

The remainder of this paper is structured as follow: in the next section, I explain why consumers have no incentives to enforce invoices emission. In Section 3, a model analyzing the introduction of LTRP is presented. Finally, Section 4 discusses the results obtained and possible limitations.

2. Incentivize consumers to act as third-party tax enforcers

Consider the situation of a buyer that has to claim an invoice emission from a deceitful seller after a business transaction. The rational buyer evaluates private costs and benefits of asking the seller for the invoice. Assume that the total amount of VAT and RST involved in the transaction are used to finance a public good. The private benefit deriving to the buyer from asking for the invoice would be equal to the share of public good financed by the amount of taxes involved in the transaction divided by the total population of the institutional entity to which sales taxes are paid (e.g., state level, federal level, etc.). Therefore, given that this population is typically large, private incentives asking for an invoice are close to zero.

On the other hand, even ruling out the opportunity cost of the time in asking and waiting for the invoice printout, a customer not enforcing an invoice emission may derive private benefits. First, it is possible to enjoy a price discount on the purchased goods. In fact, a business owner who does not remit an invoice increases his profit by the amount of taxes involved in the transaction minus the expected cost of the sanction. Any positive fraction of this increased profit could be transferred to the customer through a price discount. Hence, customers and business owners could collude to evade taxes due to the collectivity and privately sharing of benefits.

Moreover, even in situations where bargain solutions are not available,[8] requesting an invoice emission might nevertheless be costly for a buyer. McGee (2012) has collected two decades of scholars' contributions investigating moral and ethical aspects of evading taxes. The author extensively discusses cultural, philosophical and religious perspectives that defend tax-evasion and that could lead to the formation of pro-tax evasion norms of behavior in certain cultures or segments of the population. As a consequence of these social norms, in those contexts a buyer wanting to act as a third-party tax enforcer bears social costs. Chang and Lai (2004) in a theoretical contribution incorporate social norms into a collaborative tax evasion agreement between a seller and their customer. Indeed, the authors show that this collusive practice tends to intensify the extension of the tax evasion problem. Moreover,

[3] For details on the Chinese lottery see Wan (2010).

[4] For detailed information see the *Nota Fiscal Paulista* http://www.nfe.fazenda.gov.br/

[5] See http://www.loteriaelectronicapr.com/

[6] See http://www.finance.gov.sk/En/Default.aspx?CatID=19&id=4

[7] One limitation of the studies discussed below is that the effect of LTRP is estimated using data that cover a period of time of only a few years. Further empirical investigations will be required to determine whether the result would be different if the data were covering a longer time span, because, for example, individuals' taste for gambling modifies over time.

[8] Often bargaining over a price discount in exchange for an unlawful action is not feasible. For example, for transactions of a small entity, the opportunity cost of avoiding bargaining would be higher than the eventual gain from a discount. Additionally, there are cultures like the Japanese, for which bargaining over a price is unusual or even considered impolite (Berton, 1998).