THE IMPACT OF TAX COMPLIANCE COSTS ON TAX COMPLIANCE BEHAVIOUR

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Abstract

This paper is based on a study that determined whether or not an increase in income tax compliance costs leads to a decrease in income tax compliance.

The tax context experiment involved 75 small and medium entrepreneurs based in Dar es Salaam, Tanzania's business hub. The participants were first randomly assigned to one of the three experiment treatments. In the first treatment, the tax compliance cost was TAZ 50,000; in the second, it was TAZ 100,000; and in the third, it was TAZ 166,667. Each participant in each treatment received income of TAZ 1,000,000. TAZ is a laboratory currency which, at the end of the experiment, was exchanged at the rate of TAZ 120 for 1 actual Tanzania shilling (Tsh). Generally, the results indicated that tax non-compliance significantly increased as tax compliance costs increased.

Although the study used small samples of SME taxpayers, therefore the results may not be generalisable, the results imply that tax compliance costs may be responsible for the unsatisfactory tax compliance levels of SME taxpayers. Therefore, there is a need for tax system simplification.

INTRODUCTION

Considerable literature on the complexity of tax laws and tax compliance costs has primarily centred on: the simplification of tax laws; causes of complexity in these tax laws; the measurement of the complexity of tax laws; the impact of such complexity on tax compliance costs; and the estimation of tax compliance costs (Heyndels & Smolders, 1995; Cuccia & Carnes, 2001; Forest & Sheffrin, 2002; Evans, 2003). So far, however, little attention has been paid to the impact of tax compliance costs on tax compliance behaviour, particularly in the context of developing countries, such as Tanzania. In fact, a review of literature on value-added tax compliance costs by Luca, Richard and Jaime (2012) concluded that literature examining this relationship was missing. This conclusion prompted them to call for further studies in this area, arguing that "it might be productive to pursue this line of research, most probably through a variety of survey instruments, and with appropriate country specificity" (Luca, Richard, & Jaime, 2012, p.58).

Tax compliance definitions include the voluntary payment of taxes in accordance with the spirit of the tax laws (i.e. committed tax compliance); the payment of tax for fear of penalties and audits in line with the spirit of tax laws (i.e. capitulative tax compliance); and the paying of taxes after arranging taxpayers' activities to minimise tax liabilities by complying with tax laws (James & Alley, 2002; McBarnet, 2001). Tax compliance has also been defined as occurring when a taxpayer "register[s] with the revenue authority as required; files the required returns on time; accurately reports tax liability (in the required returns) in accordance with the

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prevailing legislation, rulings, return instructions and court decisions; pays any outstanding taxes as they fall due; and maintains all records as required" (McKerchar & Evans, 2009, pp. 172-173). In this study, however, tax compliance refers to the reporting and paying of tax liabilities in order to comply with tax laws. Therefore, the study excludes some aspects of tax compliance identified in other studies.

Tax compliance occurs when taxpayers obey tax laws (Kirchler, Muehlbacher, Kastlunger, & Wahl, 2007). Yet, tax compliance costs are incurred exclusively for a tax compliance purpose; in essence, such costs are only avoidable when taxation is abolished (Sandford & Hardwick, 1989; Ariff, Ismail & Loh, 1997). This paper investigates the impact of tax compliance costs on the tax compliance behaviour of Small and Medium Enterprises (SMEs) in Tanzania experimentally. In this study, SMEs constitute enterprises with between five and 99 employees, or whose capital investment (in assets) ranges from 5 million Tanzanian shillings (Tshs) (about £2,000) and 800 million Tshs (about £320,000) (*Small and Medium Enterprise Development Policy*, 2003).

Generally, tax compliance costs tend to be regressive in nature (Sandford & Hasseldine, 1992; Pope, 1995; Schoonjans, van Cauwenberge, Reekmans, & Simoens, 2011). In fact, SME taxpayers may face economic hardship as a result of proportionately higher compliance costs (Schoonjans et al., 2011) and their tax compliance levels may be lower (Arachi & Santoro, 2007). High tax compliance costs may explain why SMEs' tax compliance levels are lower than expected, as many of these business entities may perceive the tax systems to be unfair. Subsequently, knowing whether tax compliance costs impact on the SMEs' tax compliance is useful when considering how to combat their tax non-compliance. In this regard, this paper explores whether or not an increase in income tax compliance costs leads to a decrease in levels of income tax compliance.

The paper makes four contributions to tax compliance literature. Firstly, it contributes to the literature on the relationship between tax compliance costs and tax compliance behaviour. Secondly, it adds to the growing body of tax compliance costs literature from developing countries' perspectives. Many such studies have been conducted in developed countries. At the local level of Tanzania, only one such study has been conducted, measuring the tax compliance costs of excise duty (Shekidele, 1999). Additionally, differences in willingness to comply with tax obligations, the efficiency of tax authorities and resource utilisation might hamper the effective application of tax compliance factors which have been developed and tested in developed countries in developing countries. Thirdly, the study has used SME taxpayers in the laboratory experiment. Only a few researchers, such as Torgler (2003a) and Cadsby, Maynes, & Trivedi (2006), have used taxpayers in laboratory experiments. Finally, tax authorities can enhance their tax simplification programmes by focussing on reducing tax compliance costs. The results suggest that a decrease in tax compliance costs can increase SMEs' tax compliance levels.

Section 2 reviews the prior tax compliance literature and develops the hypotheses for this study. Section 3 presents the research method. Section 4 presents data analysis and, finally, Section 5 discusses the results, before presenting a conclusion.

2. PRIOR LITERATURE AND DEVELOPMENT OF HYPOTHESES

SMEs' Income Tax Administration in Tanzania

The Tanzania Revenue Authority (TRA) is responsible for administering income tax collection in Tanzania. Specifically, in Tanzania, the payment of income tax is based on self-assessment; however, all corporate taxpayers are required to have their tax returns signed by tax consultants (The Income Tax Act, 2004). A corporation is any company with incorporated or unincorporated association of persons, excluding partnerships (The Income Tax Act, 2004). Thus, corporate taxpayers include corporations of all sizes (small, medium and large). Tanzania's corporate SMEs have to keep complete records regardless of their turnover, which may increase their tax compliance costs. Sole traders with turnovers of below TZS 20,000,000 (£8,000), however, may opt to use a presumptive tax system for their liabilities to be charged on turnover. Presumptive tax systems base their imposed taxes on sales, rather than on profits (Arachi & Santoro, 2007). Currently, the authority is attempting to reduce tax compliance costs by increasing the application of information technology for filing tax returns online, keeping records through Electronic Fiscal Devices (EFDs) and paying taxes using mobile banking, hence saving time and money for taxpayers.

Tax Compliance and Complexity of Tax Laws

Tax law complexities relate to the specialised nature of the tax laws, which complicate the calculation of tax payable (Mulder, Verboon, & De Cremer, 2009). Essentially, tax law complexities are of two types: content complexity and compliance complexity. While content complexity involves difficulties inherent in comprehending tax laws, compliance complexity refers to hurdles that need to be overcome in order to comply with tax laws (Mulder et al., 2009; Saad, 2010).

Generally, tax laws serve several purposes: revenue generation; equity; efficiency and social purposes; however, this might be at the expense of tax law simplicity. It can be argued that the main goal of tax laws is to raise tax revenue (Quandt, 1983; Forest & Sheffrin, 2002). This goal is achievable through the enactment of tax laws aimed at preventing tax evasion and avoidance. Taxpayers evade taxes when they intentionally and unlawfully reduce their tax liabilities. Tax avoidance, on the other hand, refers to the use of legal means for reducing tax liabilities (Alm, 1999b; Slemrod, 2007).

Consequently, government actions towards tax revenue collection and dealing with non-compliant taxpayers shape the content of tax laws. In this regard, the reaction of the government to taxpayers' actions resembles a 'cat-and-mouse' game (Picciotto, 2007). On the one hand, taxpayers strive to find ways of minimising their tax liabilities; on the other hand, governments attempt to find means for minimising tax liabilities. Over time, the re-enactment of tax laws and regulations to prevent the reduction of tax liability results in complex tax laws (Quandt, 1983; Oliver & Bartley, 2005). Although these tax laws define taxable income, consumption or wealth, both the classification and measures of taxable items might prove difficult (Oliver & Bartley, 2005).

Tax laws are also designed with the aim of attaining fairness among taxpayers (Paul, 1997; Forest & Sheffrin, 2002; Oliver & Bartley, 2005). For the sake of fairness, some taxpayers with or without a certain level of income might be exempted from paying taxes, or may be charged low tax rates, particularly in progressive tax systems. When tax exemptions and tax rates are

too numerous, they may cause confusion, making it difficult for taxpayers to comply with tax laws (Oliver & Bartley, 2005).

Moreover, tax laws spell out the responsibilities of the taxpayers in order to achieve efficiency by collecting tax liabilities at minimal costs (Forest & Sheffrin, 2002). In particular, self-assessment tax regimes impose tax compliance responsibilities on taxpayers (probably because these taxpayers tend to know more about their income and expenses than the tax authorities). Such systems, however, may only reduce tax compliance costs when the taxpayers understand the tax laws; otherwise, these systems shift tax compliance costs from the tax authorities to the taxpayers (Paul, 1997; Oliver & Bartley, 2005).

Furthermore, tax laws targeting harmful social behaviour, such as alcohol consumption, may further complicate the tax regime, for example, by resulting in more tax laws and taxes, and confusing the taxpayers even more (Quandt, 1983; Forest & Sheffrin, 2002; Oliver & Bartley, 2005). Complexity also arises because tax laws' competing objectives may not work well together and therefore may translate into complex tax laws. For example, increasing the number of exemptions to improve vertical equity may increase tax compliance costs, contrary to the efficiency criterion.

As tax laws through which tax policies are implemented tend to be written in legal jargon, they tend to be doubly difficult for many taxpayers to understand (Picciotto, 2007). In addition, ambiguous and unstable tax laws can sometimes be interpreted in multiple ways, especially in the absence of a uniform training system for taxpayers, tax return preparers and tax officials (Alm et al., 1992; Picciotto, 2007). According to Oliver and Bartley (2005), the complexity of tax laws stems from the government's and taxpayers' actions.

Tax Compliance and Tax Compliance Costs

Complexity in tax laws and tax compliance costs are positively interlinked (Evans, 2003; Marcuss, Contos, Guyton, Langetieg, Lerman, Nelson, Schafer & Vigil, 2013). Marcuss et al. (2013), using survey data and secondary data from the US Internal Revenue Service (IRS), found a positive relationship between the level of complexity of income tax and the level of tax compliance costs. Additionally, in self-assessment tax systems, complex tax laws may compel taxpayers to hire paid tax return preparers. In addition, complex tax laws may require sophisticated accounting records, which may necessitate hiring bookkeepers, therefore increasing tax compliance costs (Schoonjans et al., 2011).

Taxpayers incur two main types of compliance costs: gross monetary compliance costs and psychological costs. Gross monetary compliance costs include both actual money paid and opportunity costs relating to the time and other resources expended when complying with tax laws (Evans & Tran-Nam, 2014). Psychological costs, on the other hand, involve the estimation of stress and anxieties resulting from complying with tax laws, normally measured using a Likert scale (Evans & Tran-Nam, 2014). Some researchers have calculated net compliance costs which deduct cash flow benefits, tax relief and managerial benefits resulting from tax obligation from the gross compliance costs (see, for example, Sandford, Godwin & Hardwick, 1989; Tran-Nam, Evans, Ritchie &Walpole, 2000). Taxpayers benefit financially from using tax collected before their due for payment to a tax authority (ibid.). Similarly, taxpayers reduce their tax liabilities by deducting tax compliance costs when calculating income taxes. Finally, the improvement in accounting information, for example, might enhance

taxpayers' decision-making abilities. In this study, tax compliance costs refers to the actual money paid in the process of complying with tax laws.

Tax compliance costs can arise for many reasons. Shaw, Slemrod and Whiting (2008), who reviewed the causes of tax compliance costs in the UK, and Shekidete (1999), who studied them in Tanzania, established that tax compliance costs decreased with a reduction in the number of tax rates, coupled with the harmonisation of definitions and compliance procedures. Likewise, KMPG (2006) in the UK, and Evans (2003) in the UK and Australia, reported that tax compliance costs decrease with an increase in the stability of tax laws coupled with less frequent introduction of new tax laws, because taxpayers incur fewer costs and lose less time as they become conversant with the existing tax laws. Lignier and Evans (2014) attributed the increase in tax compliance costs of Australia's SMEs to the introduction of sales taxes, which required extensive accounting records. Other facilitative factors include the introduction of a self-assessment tax system and withholding of transfer compliance costs by taxpayers from tax authorities (Slemrod, 2009).

Many researchers have attempted to estimate tax compliance costs. In the US, the IRS commissioned a study carried out by Arthur D. Little, as reported in Slemrod and Venkatesh (2002), which collected businesses' tax compliance cost data on behalf of the Internal Revenue Service (IRS). The data comprised tax compliance costs relating to the keeping of accounting records, equipment, the hire of tax return preparers, and the submission of businesses' tax returns (Slemrod & Venkatesh, 2002). Hall (1996) used the data, and found that tax compliance costs were significant and that small firms paid more than larger ones relative to their sales or assets (i.e. regressive nature). The regressive nature of tax compliance costs indicates that tax compliance costs are fixed, with larger taxpayers enjoying a relative advantage over others.

Nevertheless, the data lacks reliability, because taxpayers might overstate tax compliance cost estimates or might not remember all the tax compliance costs they incurred (Slemrod & Blumenthal, 1996). Moreover, the respondents' bias might affect the data, as affirmed by the response rates of between 30% and 40% (Slemrod & Venkatesh, 2002). Slemrod and Venkatesh (2002) suggested that bias might reduce the tax compliance cost estimation when tax compliance costs of non-respondent taxpayers are excluded. Moreover, the separation of tax compliance costs from others is difficult, especially in the absence of exclusive accounting or tax departments in organisations (Slemrod & Venkatesh, 2002).

On the other hand, a survey of self-employed taxpayers' tax compliance costs established that these taxpayers were more likely to hire tax preparers and spend more time on complying with tax laws than larger taxpayers (Slemrod & Sorum, 1984; Blumenthal & Slemrod, 1992). A similar pattern was evident in larger companies, whose tax compliance costs decreased with an increase in values of assets in the US (Slemrod & Blumenthal, 1996). The implication is that Arthur D. Little's survey data is generally useful.

Several other studies, such as those by Sandford and Hasseldine (1992) carried out in New Zealand, Pope (1995) in Australia, James and Wallschutzky (1997) in Australia and the UK, Schoonjans et al. (2011) in Belgium, and Coolidge (2012) in developing countries using World Bank data, reported similar results. Coolidge (2012) established that, although larger taxpayers can spend 1% of their turnover on tax compliance costs, SMEs can spend from 5% to 15% or more of their revenue on this. Evans, Hansford, Hasseldine, Lignier, Smulders, & Vaillancourt (2014) reported that the tax compliance costs of SMEs in Australia, Canada, South Africa and the United Kingdom were significant and regressive, and were increasing over time. Similar

trends of regressive tax compliance costs were reported in Canada (Vaillancourt, Roy-César, & Silvia Barros, 2013), in Botswana for VAT (Makara & Pope, 2013), in Ethiopia for VAT (Yesegat, 2009) and in Tanzania for excise duty (Shekidete, 1999). Evans and Tran-Nam (2014), who comprehensively reviewed research on tax compliance costs in New Zealand, and compared the findings to research findings drawn from other countries, concluded that tax compliance costs there are large and regressive, with tax reforms failing to reduce them. The results of Lignier, Evans and Tran-Nam's (2014) survey of 10,000 SME taxpayers in Australia, which aimed to estimate the tax compliance costs of all taxes, indicated that SMEs faced high, regressive and increasing tax compliance costs. Similarly, Chittenden and Poutziouris (2005) reported that PAYE-NIC compliance costs incurred by SMEs in the UK were regressive.

A review of tax compliance costs literature by Luca, Richard and Jaime (2012) found that no extensive testing of how tax compliance costs relate to tax compliance levels has been carried out. They found a positive correlation between the Value Added Tax (VAT) gaps and value-added tax compliance costs, using VAT gap data collected by Reckon (1999) and estimates of tax compliance costs in the European Union carried out by the World Bank (2011). The authors acknowledged that the association established does not imply causality, because the data they used was highly skewed by both tax compliance costs and the VAT gap in new European Union member states. Consequently, the authors recommended carrying out further studies to ascertain the causality between tax compliance costs and tax compliance behaviour (Luca, Richard, & Jaime, 2012). A report by the consortium consisting of Ramboll Management Consulting, the Evaluation Partnership and Europe Economic Research (2013) for the European Union on the methods of measuring tax compliance costs methodologies suggested that reducing tax compliance costs might increase voluntary tax compliance costs. Tax systems with high tax compliance costs might appear to be procedurally unfair and, when taxpayers from SMEs know that they are in a disadvantageous position, they may find the tax system vertically unfair.

Tax Compliance and Vertical Fairness

Vertical fairness occurs when taxpayers with different tax payment abilities get different treatment, with the rich bearing the largest portion of the tax burden (Adams, 1965; Kinsey & Grasmick, 1993). Previous research shows that perceptions of vertical fairness may boost tax compliance (Kinsey & Grasmick, 1993; Roberts & Hite, 1994; Braithwaite, 2003). In Australia, as a result of vertical inequity, lower income earners appeared to have higher effective tax rates than higher income earners, apparently due to both tax avoidance on the part of the latter and the tax rate structure. Consequently, the majority of the respondents in one study in Australia recommended high taxes for high-income earners (Braithwaite, 2003).

Vertical fairness is therefore relevant to compliance behaviour. It is also, however, relevant for compliance costs. Some tax authorities mitigate SME taxpayers' heavy tax compliance cost burdens through simplified accounting records (Arachi & Santoro, 2007). In the UK, for example, small unincorporated businesses with annual cash receipts of less than £77,000 can deploy the cash-basis rather than the accrual-basis scheme (HMRC & Gauke, 2012). As such, they pay taxes based on the cash received and paid in a particular period. In Tanzania, sole traders with annual sales of up to 20 million Tanzanian shillings (Tshs) (£8,000) are allowed to have simplified accounts and pay taxes using presumptive systems (The Income Tax Act, 2004). As in the UK, corporate SMEs in Tanzania have to keep complete records, regardless of their annual sales levels.

Tax Compliance and Procedural Fairness

The presence of fair procedures has been shown by some scholars to increase tax compliance (Feld & Frey, 2007; Verboon & van Dijke, 2011). In terms of the complexity of tax laws, procedural fairness can refer to how easy it is for taxpayers to comply with tax laws. As previously stated, complex tax laws may necessitate the use of hired tax return preparers, hence leading to an increase in tax compliance costs and reduced net income. The consequent reduction in profit might motivate taxpayers to compensate themselves for the losses they incur through tax non-compliance. This argument and the vertical fairness consideration leads to the first hypothesis:

$H1_a$: The income tax compliance level decreases with an increase in income tax compliance costs.

Demographic Factors

Tax Compliance and Gender

Many studies have reported that male and female taxpayers display different levels of tax compliance (Friedland, Maital, & Rutenberg, 1978; Spicer & Hero, 1985; Cadsby et al., 2006; Alm, Cherry, Jones, & McKee, 2010b). Spicer and Hero (1985), for example, found that female participants were more compliant than male ones in a laboratory experiment. However, "women are more likely to evade [paying tax] than men, but underreport a much smaller fraction of their income than men" (Friedland, Maital & Rutenberg, 1978, p.113). Bordignon (1993) suggested that male taxpayers are greater risk-takers than their female counterparts, which may explain why male taxpayers comply less than female taxpayers. These findings lead to the second hypothesis:

$H2_a$: Female participants will be more compliant than male participants.

Tax Compliance and Age

Having many older taxpayers might be advantageous in terms of their contribution to overall compliance levels in a country. Previous research has found that the age of taxpayers correlates positively with the tax compliance level (Clotfelter, 1983; Kirchler, 1999; Fjeldstad & Semboja, 2001; Alm et al., 2010b). Clotfelter (1983) found that taxpayers aged 65 and above are more compliant than younger taxpayers. Older taxpayers' risk-averse attitudes may prompt them to comply more than younger taxpayers (Chang, Nichols, & Schultz, 1987), hence the third hypothesis:

$H3_a$: Participants aged above 30 will comply more than participants aged 30 and under.

Tax Compliance and Education

The impact of education on tax compliance also produces mixed results in tax compliance studies. Education and tax compliance levels might positively correlate (Jackson & Milliron, 1986; Dubin & Wilde, 1988; Richardson, 2006; Saad, 2010). Richardson (2006) found a positive relationship between education and tax compliance levels. Similarly, Dubin and Wilde (1988) demonstrated that taxpayers with high levels of general education are less likely to be non-compliant taxpayers than those with low levels of education. The positive correlation

between tax compliance and education level is attributed to improved tax fairness perceptions when taxpayers are better educated and with a capacity to deal with complex tax laws (Dubin, Graetz, & Wilde, 1990; Saad, 2010).

On the other hand, highly educated taxpayers also have the capacity to exploit loopholes in tax laws to reduce their tax liabilities (Jackson & Milliron, 1986; Dubin et al., 1990). Moreover, a high level of education may change the perceptions of the payment of income taxes from a reduction of income to a loss, consequently reducing tax compliance (Chang et al., 1987). Thus we present the fourth hypothesis:

$H4_a$: Participants with at least secondary education would be less compliant than participants with primary education.

Due to the individual effects of gender, age and education level, these factors might moderate how tax compliance costs and tax compliance relate. Also, they might moderate their own relationships with tax compliance costs, hence the fifth hypothesis:

$H5_a$: Age, gender and education levels may each moderate the relationship between tax compliance costs levels and tax compliance; when tax compliance costs are high, being a female aged above 30 and having primary education will be associated with higher tax compliance than being a male aged 30 or below and having above primary education.

3. METHODOLOGY

Method

Laboratory experimental methods are appropriate methods for studying causal-effect relationships (Alm, Bloomquist, & McKee, 2010a) because controlling the tax rate, audit rate and income level enables the examination of the impact of tax compliance costs on tax compliance behaviour (Torgler, 2002; Alm & Torgler 2011). Laboratory experiments follow certain accepted criteria to examine cause and effect relationships. Firstly, a laboratory experiment should control the participants' preferences through the rewards structure (Smith, 1982). Control is possible when participants need greater rewards, which is consistent with the assumption that taxpayers want to maximise their income after paying taxes. Moreover, the rewards on offer should depend on an individual's actions; for example, a non-compliant participant might get more than a compliant one if both are not audited as occurs in the real world (Smith, 1982).

Secondly, participants need privacy to ensure that they provide genuine responses, so that the data reflects individual rather than group reactions to the independent variables under investigation (Smith, 1982). Thirdly, the context of a given study is usually hidden to prevent the addition of extra information to experiments (Davis & Swenson, 1988; Wartick, Madeo, & Vines, 1999; Alm, 2010). Indeed, the context of a study prompts participants to use information from their life experiences, which may not necessarily be part of the experiment (Wartick et al., 1999). Consequently, without the context of the study, laboratory experiments measure the economic effects of independent variables on dependent variables only (Alm, 1991; Moser et al., 1995). In other words, the results from context-free studies may have limited external validity.

External validity refers to the transferability of results from a laboratory to a non-laboratory environment (Smith, 1982). As such, many laboratory experiments attempt to imitate real tax systems to increase the transferability of results to non-experiment environments (Spicer & Thomas, 1982; Alm et al., 2010b). In a self-assessment scenario, participants receive income, decide whether or not to file tax returns, and pay taxes on declared income, with some participants being audited and penalised when tax non-compliance is detected (Alm et al., 2010a; Alm et al., 2010b). Using tax and audit rates from real tax structures can further improve the external validity of laboratory experiment results (Alm, 2010). Furthermore, using tax-specific terminology, instead of context-free instructions, can improve the external validity of laboratory experiment results (Wartick et al., 1999; Alm et al., 2010b).

Conversely, laboratory experiments have limitations. Firstly, these experiments normally use students who are not necessarily representatives of taxpayers (Torgler, 2003a; Cadsby et al., 2006; Choo, Fonseca, & Myles, 2015). On the one hand, Choo, Fonseca and Myles (2015), who conducted a study in the UK to determine whether the tax compliance behaviour of students, employees and self-employed participants differed in a randomised control trial, found that self-employed participants reported the highest income, followed by employees, with students reporting the lowest income. On the other hand, Alm et al. (2010a) reported that student and non-student participants might have similar tax compliance responses. Secondly, results from laboratory experiments largely depend on the appropriateness of experimental design (Alm et al., 2010a). This current study has used an instrument previously used by Cadsby et al. (2006)[2], with the consent of the authors, after piloting and amending it to include tax compliance costs. With the exception of using tax terminology, the present study has complied with acceptable standards of laboratory experiments.

Participants, Experimental Design and Procedure

The participants were recruited via invitation letters, which were hand-delivered to the SME owners and managers' offices. This physical recruitment method also facilitated the clarification of details about the experiment when potential participants raised concerns. The experiment was carried out in 2013 and involved 75 entrepreneurs with SMEs, who were based in Dar es Salaam, Tanzania. Of these participants, 57% were female. In terms of their educational background, 52% had primary education and 48% had at least secondary education. The mean age was 37, with an age standard deviation of 8.72. Although the experiment offered maximum earnings of 25,000 Tanzanian shillings (Tshs)[3] (£10) per person, the actual payment made to each participant depended on his or her tax return. The mean payment was 16,000 Tshs (£6.40).

The participants were first randomly assigned to one of the three experiment treatments. In the first treatment, the tax compliance cost was TAZ 50,000; in the second, it was TAZ 100,000; and in the third treatment, it was TAZ 166,667 (see Appendices 1 and 2). The income the participants received in each treatment was TAZ 1,000,000. The selection of tax compliance cost values was based on evidence that tax compliance costs of SMEs in developing countries range from 5% to 15% or more of their respective turnover (Coolidge, 2012). TAZ was defined as a laboratory currency exchangeable with the actual money at TAZ 120 for 1 actual

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[2] These authors examined the impact of audit rate, penalty rate and obedience to authority on tax compliance manually.

[3] The hourly wage rate is Tshs 20,000.

Tanzanian shilling at the end of the experiment. As such, only tax compliance costs were manipulated. The experimental design was 1 x 3, as indicated in Table 1.

The participants were then asked to pick an envelope containing experimental instruments. The envelopes contained consent forms, tax return forms in duplicate[4] and instruction sheets. Thereafter, each participant was asked to read and sign a participant information sheet and a consent form. The researcher then read out the information applicable to all of the participants[5]. The participants were instructed to work independently and verify their documents, and were told not to talk to each other during the experiment. The researcher also read out information about the income the participants had received, the tax rate and the audit rate. All participants received identical information.

Table 1: Experimental Design

Treatments	1	2	3
Tax compliance costs	TAZ 50,000	TAZ 100,000	TAZ 166,667
Participants	[n=25]	[n=25]	[n=25]

Based on the assumptions of economic tax compliance theory, the participants were made aware of the tax rate, the income, the income tax penalty rate and the audit rate (Allingham & Sandmo, 1972; Yitzhaki, 1974); however, these factors were fixed so as to remove their impact on tax compliance behaviour (Hanlon & Heitzman, 2010). The tax rate was set at 30%; the tax penalty rate was double the tax owed[6]; each participant had a 10% chance of being audited; and the gross income was TAZ 1,000,000. Moreover, full tax compliance was required. This requirement was contrary to many experiments, which allow participants to report any income from 0 to the actual income received (Moser, Evans III, & Kim, 1995; Alm et al., 2010b). Consequently, results from these studies have limited applicability outside the laboratory situations (Webley & Halstead, 1986; Cadsby et al., 2006). Finally, the participants went through information on tax compliance costs individually.

The experimental procedure can be summarised as follows. Participants familiarise themselves with details of the income, the tax rate, the audit rate, the penalty rate and the tax compliance costs. They then complete and file the tax return, and the audit takes place. Tax penalties are imposed on non-compliant taxpayers, and these are indicated on the duplicate tax returns. Finally, one period concludes before a fresh one begins. In all, three periods were conducted, following a question and answer session, and a practice round. The experiment took 80 minutes to complete and ended with a debriefing before the experimental tokens were exchanged for payment.

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[4] Participants retained the duplicate tax returns and the duplicates were used for payment of the experimental token.

[5] Some items differed as experimental treatments.

[6] These two variables reflected Tanzania's income tax structure.

4. EXPERIMENTAL RESULTS AND DISCUSSION

Data Screening

Fifteen (15) observations (six in the first round, four in the second and five in the third) were excluded from the analysis because the observations exceeded TAZ 1,000,000 of the gross income given in each session. It cannot be ascertained why these participants reported more than the amount given in the instruments; it is probable that they either wanted to cheat or that their actions resulted from misunderstandings of the rules of the game. Since no taxpayer wants to pay more than required, these observations were omitted. This omission left 210 [64 (30.48%) for treatment 1; 75 (35.71%) for treatment 2; and 71 (33.81%) for treatment 3] observations for analysis. One participant did not indicate their gender and four others did not indicate their education levels; these observations were not imputed and, hence, were excluded from the subsequent analysis of the impact of gender. The imputation of the missing categorical data is discouraged, as precise, rather than continuous estimation of the data (for example, an estimation of the gender of a participant), is required (Hair, Black, Babin, & Anderson, 2010).

The hypotheses were examined using the analysis of variance[7] (ANOVA) approach because of the presence of a single dependent variable, that is, tax compliance, and many independent variables (Mitchell & Janina, 2013). However, data was not normally distributed, because the Shapiro Wilk test indicated $p < .001$. Also, an assumption of a homogeneity of variance was not met as Levene's test was $p < .001$. The data was rank transformed before the ANOVA test was performed. The rank transformed data changes data to distribution free (Timothy, Donald, & Larry, 1985), consequently overcoming both normality and heteroscedasticity problems (Conover & Iman, 1981; Timothy et al., 1985).

In addition, the partial eta squared (η_p^2) measure was used to test the significance of the results. The η_p^2 measures the overall effect of an independent variable on a dependent variable; where η_p^2 is ≥ 0.01, the effect is "small"; when η_p^2 is equal to $\geq.06$, the effect is "medium"; and when η_p^2 is $\geq.14$, the effect is "large" (Cohen, 1988; Richardson, 2011). As demonstrated later, all of the significant independent variables had medium-sized effects.

The tax compliance rate [(income reported less tax compliance costs reported) / (gross income given less gross tax compliance costs given)] measured tax compliance. The participants were divided into two age groups: ≤ 30 years old, and over 30. These classifications are similar to those used in Fjeldstad and Semboja's (2001) survey study, which was conducted in Tanzania and established that taxpayers aged over 29 complied more than their younger counterparts. Finally, as the sample was rather small, the participants were divided into two groups by education level: primary education and post-primary education.

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[7] Both the results from individual rounds and those from the entire experiment indicated a similar nature.

Results and Discussion

Generally, means of tax compliance rates were 99% (SD =.12), 91% (SD = .27) and 80% (SD = .34) for treatments 1, 2 and 3, respectively, whereas the median tax compliance rate for all three treatments was 100%. This trend of compliance rates was similar to the results that Cadsby et al. (2006) came up with, implying that tax compliance might be high when it is enforced. Specifically, when the participants were allowed to report any amount from zero to the correct amount, their average compliance was 57%, while the mean compliance rate from participants who were required to comply fully was 99.5% (Cadsby et al., 2006).

Table 2: Analysis of Variance

Dependent Variable: Rank of compliance rates							
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	
Corrected Model	67765.116	14	4840.365	2.577	.002	.160	
Intercept	1153936.361	1	1153936.361	614.276	.000	.764	
Gender	18010.443	1	18010.443	9.588	.002	.048	
Age	1538.577	1	1538.577	.819	.367	.004	
TCC	11960.112	2	5980.056	3.183	.044	.032	
Education	3111.172	1	3111.172	1.656	.200	.009	
Gender * Age	11841.715	1	11841.715	6.304	.013	.032	
Gender * TCC	11617.373	2	5808.687	3.092	.048	.032	
Gender * education	3582.465	1	3582.465	1.907	.169	.010	
Age * TCC	454.463	2	227.231	.121	.886	.001	
Age * education	744.375	1	744.375	.396	.530	.002	
TCC * education	1043.882	2	521.941	.278	.758	.003	
Error	356920.806	190	1878.531				
Total	2659890.000	205					
Corrected Total	424685.922	204					

Adjusted R Squared = .098)

Note: TCC is tax compliance costs

Table 2 shows the results of analysis of variance. A 2 x 3 x 3 x 3 analysis of variance of age (≤30 years old and > 30 years old), education (primary level and above primary education level), tax compliance costs (TAZ 50,000, TAZ 100,000 and TAZ 166,667) and gender (female and male) between subjects was run to test the hypotheses.

In contrast with what was expected in hypothesis 2_a, the main effect of gender on tax compliance was insignificant: F (2, 187) = 3.38, ns, η_p^2 = .03. This result is consistent with the findings by Cadsby et al. (2006), which indicated that male participants and female participants comply similarly.

Fig.1: Mean Ranks of Tax Compliance Rates vs. Gender
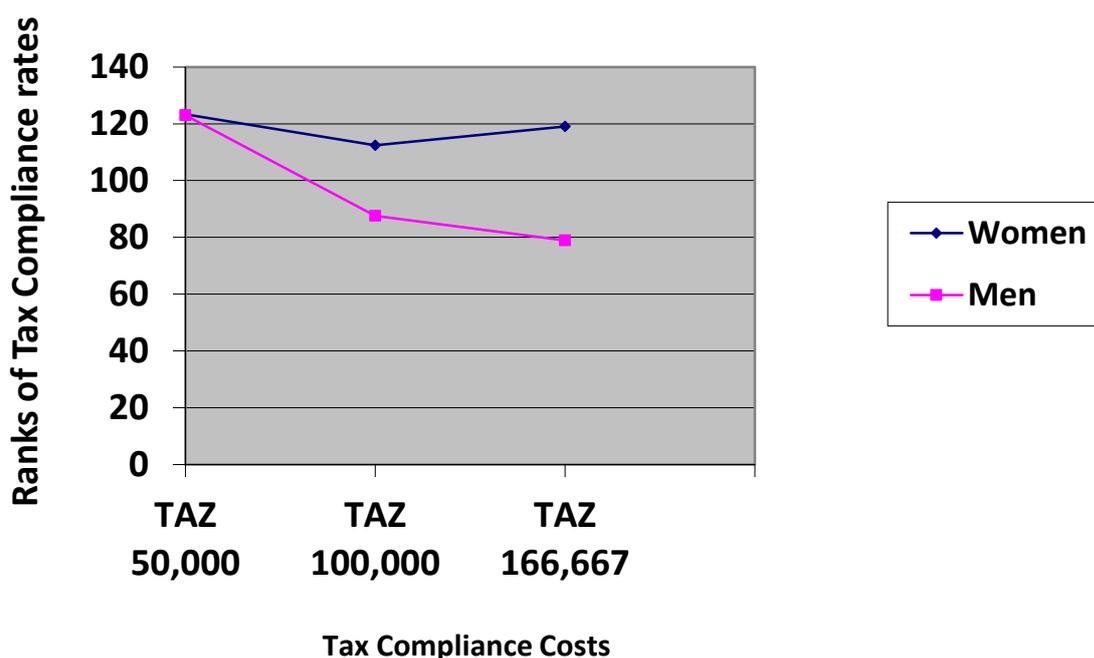
However, consistent with hypothesis 5_a, a significant interaction between gender and tax compliance costs qualified this relationship: $F (2, 187) = .3.69$, $p = .03$, $\eta_p^2 = .04$. Figure 1 shows this interaction. Thus, using the traditional Bonferroni test, when tax compliance costs were TAZ 50,000, the women's rates and men's mean rank of tax compliance rates were similar: $M_{diff} = .42$, 95% CI [-35.01-35.84], $p = .98$. Similarly, when the tax compliance costs were TAZ 100,000, the mean differences were insignificant: $M_{diff} = 27.92$, 95% CI [-4.07-59.92], $p = .11$. However, at the tax compliance cost level of TAZ 166,667, the women's mean rank of tax compliance rates differed significantly from that of men: $M_{diff} = 64.07$, 95% CI [36.67-91.47], $p < .001$. Consequently, at the low tax compliance costs levels, both men and women may comply more when tax compliance costs are low than when their tax obligations are at higher levels; in fact, their compliance levels decrease with an increase in tax compliance costs, albeit at unequal rates.

With regard to the age variable, the main effect of age on the tax compliance was insignificant: $F (1, 187) = .02$, $p = .90$, $\eta_p^2 = .00$. This result suggests that the age of a person may not necessarily influence tax compliance. This result contradicts initial expectations reflected in hypothesis 3_a. Also the interaction between age and education was found to be insignificant ($F (1, 187) = .06$, $p = .81$, $\eta_p^2 = .00$), as was the case with the interaction with gender ($F (1, 187) = 1.59$, $p = .21$, $\eta_p^2 = .01$) as well as its interaction with tax compliance costs ($F (2, 187) = .03$, $p = .97$, $\eta_p^2 = .00$). These findings imply that tax compliance rates may be similar, regardless of the gender, education and age of the taxpayer.

The main effect of education on tax compliance was insignificant: F (2, 187) = .56, p = .57, η_p^2 = .01, contrary to hypothesis four. Furthermore, the interaction between education and tax compliance costs was insignificant: F (2, 187) = .35, p = .71, η_p^2 = .01. As hypothesis 1$_a$ anticipated, the main effect of three conditions of tax compliance costs on tax compliance was significant: F (2, 187) = 3.13, p = .04, η_p^2 = .04. This finding means some of the experimental treatments may differ from each other significantly. However, a further analysis using Tukey's honesty test was required in order to determine which of the treatments differed significantly (Mitchell & Janina 2013). The test results indicated that the mean rank of tax compliance rates for the TAZ 50,000 condition was significantly higher than that of the TAZ 166,667 condition (p = .04). However, the mean rank of tax compliance rates of the condition of TAZ 100, 000 did not significantly differ from that of the condition of TAZ 50,000, (p = .60) or from the condition of TAZ 166,667, (p = .99).

Taken together, these results suggest that high levels of tax compliance costs do have a bearing on tax compliance levels. Specifically, the results suggest that when tax compliance costs are high, taxpayers may be more inclined to evade tax. However, it should be noted that the level of tax compliance costs must be high enough to be able to see an effect, because small variations in tax compliance costs did not appear to reduce tax compliance significantly. Finally, all other interactions between variables were insignificant and irrelevant to the hypotheses tested, all F ≤ 2.79, p ≥ .10 and η_p^2 ≤ .02.

5. CONCLUSION

Tax compliance costs literature shows that tax compliance costs can be large and regressive, but the relationship between tax compliance costs and tax compliance behaviour is not clear. This study investigated this relationship and its results reveal that tax compliance costs have a significant negative impact on tax compliance behaviour, albeit only at high levels of tax compliance costs. These results were consistent across genders, despite female participants being found to be significantly more compliant than their male counterparts. The findings were also consistent across the age groups and education levels tested.

These findings are important for tax authorities aiming to increase tax compliance levels, as lowering tax compliance costs appears to improve them. Consequently, tax authorities should consider the effect of tax compliance costs when introducing new taxes. In fact, some already do. Moreover, tax authorities should continue to reform tax systems in order to reduce tax compliance costs.

The current findings also add to the growing body of literature on tax compliance costs by establishing how tax compliance costs and tax compliance levels are related. The study also used taxpayers in an experiment conducted in a developing country context.

However, as the data was based on a rather small sample, it is important to be cautious, as the study's findings might not necessarily be transferable to the general taxpayer population. Thus, future research could replicate the study, using a larger sample to confirm the current results and to generate generalisable findings. A further limitation of the study is that the model does not explain more than 12% (adjusted R-squared) of variability in the tax compliance level. However, this statistical effect is in line with other studies on the effect of procedural justice considerations on tax compliance (Wenzel, 2002; Wenzel, 2004; Murphy & Tyler, 2008).

Procedural justice considerations probably account for a small part of tax compliance behaviour. In other words, improving procedural justice considerations alone may be an ineffective tax compliance measure. In conclusion, the regressive nature of tax compliance costs might explain why SMEs' tax compliance levels are lower than those of larger taxpayers.

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APPENDICES: EXPERIMENTAL INSTRUCTIONS

Appendix 1: Experimental instruments

Treatment 1: Instruction sheet

1. *Setting*: You are responsible for completing and then filing a tax return form. Please read all the sections of this brief before starting the task.

2. *Documentation*: You will be requested to select a large envelope randomly from a set of envelopes provided by one of the supervisors. Each large envelope contains 4 tax return forms, and this instruction sheet. Please verify these documents, if there are any discrepancies, please raise your hand and inform a supervisor accordingly immediately before beginning work on filing the tax returns.

3. *Confidentiality*: You alone are aware of the number associated with the material you have randomly selected. Neither the supervisors of today's session nor those who will analyse the tax returns subsequently will know your identity. Thus, your privacy is completely guaranteed, thus enabling you to respond truthfully to the questions posed without worrying about your responses ever being linked directly to you.

4. *Independence*: Please do not communicate with other participants either verbally or in any other manner. Complete privacy is important, and we expect your co-operation. We must ask anyone found communicating with others in any manner to leave the room and to return the contents of the large envelope. If you have any problems, please raise your hand up and a supervisor will come to your aid.

5. *Your income*: Your income is set at the beginning of the session at TAZ 1,000,000. TAZ is a laboratory currency and at the end of the exercise TAZ 120 it will be exchanged for 1 actual Tsh. The amount you can retain is described below.

6. *Taxation*: You should fill in the tax return form correct information as required. The tax return form will enable you to file a complete and reliable tax return. However, there is a cost associated with production of tax returns. In your case you have to pay a tax deductible expense amounting to TAZ 50,000. There are also considerable costs involved in running these sessions. To help defray these costs, you are required to submit 30% of the income after deducting the above tax return form expense as taxation.

7. *Penalty*: The income given to you and tax return expenses must be reported on the tax return forms. If detected cheating, see *section 9 Auditing* below, you will pay double the amount of tax underpaid.

8. *Tax return form*: On the tax return form, please indicate the total amount of TAZ shown in number 5 above which represents your income and costs of tax return shown in number 6 above. Keep a copy of the tax return form for your records. In the space provided, multiply the amount indicated after deducting the expenses of a tax return form by 30% to arrive at the tax payable. You may use a calculator to ensure the accuracy of your tax return. Transfer the information of tax returns on the copy of the tax return; this copy belongs to you. You will be paid an amount equivalent to the remaining amount of income [70%]. At this point, you should quietly raise your hand up. Please do not speak or shout. It is important to maintain

silence so that those still working are not disturbed. A supervisor will take you to another room nearby where you may be audited.

9. Auditing: Although we do not have time or resources to check everyone's tax return, 1 in 10 (10%) will be checked for correctness. You will be required to pick a piece of paper from a larger envelope; if you pick a piece of paper written "1" you will be audited. If you are selected for the audit:

> i. Your tax return will be compared to the information provided in this instruction sheet and your own copy of tax return in private.
> ii. If the tax amount is correct, you are free to go to the next round.
> iii. However, if the tax amount is incorrect, we will deduct double of the tax unpaid by recording on your copy of tax return and then you go to the next round.

If you are not selected for audit, we will not check your tax returns. You are free to go to the next round.

10. *Assistance*: If you have any problems, please raise your hand and a supervisor will come to your aid.

Treatment 2: Instruction sheet

1. *Setting*: You are responsible for completing and then filing a tax return form. Please read all the sections of this briefing document before starting the task.

2. *Documentation*: You will be requested to select a large envelope randomly from a set of envelopes provided by one of the supervisors. Each large envelope contains 4 tax return forms, and this instruction sheet. Please verify these documents, if there are any discrepancies, please raise your hand and inform a supervisor immediately before beginning work on filing the tax returns.

3. *Confidentiality*: You alone are aware of the number associated with the material you have randomly selected. Neither the supervisors of today's session nor those who will analyse the tax returns subsequently will know your identity. Thus, your privacy is completely guaranteed, thus enabling you to respond truthfully to the questions posed without worrying about your responses ever being linked directly to you.

4. *Independence*: Please do not communicate with other participants either verbally or in any other manner. Complete privacy is important, and we expect your co-operation. We must ask anyone found communicating with others in any manner to leave the room and to return the contents of the large envelope. If you have any problems, please raise your hand up and a supervisor will come to your aid.

5. *Your income*: Your income is set at the beginning of the session at TAZ 1,000,000. TAZ is a laboratory currency and at the end of the exercise TAZ 120 it will be exchanged for 1 actual Tsh. The amount you can retain is described below.

6. *Taxation*: You should fill in the tax return form correct information as required. The tax return form will enable you to file a complete and reliable tax return. However, there is a cost associated with the production of tax returns. In your case, you have to pay a tax deductible

expense amounting to TAZ 100,000. There are also considerable costs involved in running these sessions. To help defray these costs, you are required to submit 30% of the income after deducting the above tax return form expense as taxation.

7. *Penalty*: The income given to you and tax return expenses must be reported on the tax return forms. If detected cheating, see *section 9 Auditing* below, you will pay double the amount of tax underpaid.

8. *Tax return form*: On the tax return form, please indicate the total amount of TAZ shown in number 5 above which represents your income and costs of tax return shown in number 6 above. Keep a copy of the tax return form for your records. In the space provided, multiply the amount indicated after deducting the expenses of a tax return form by 30% to arrive at the tax payable. You may use a calculator to ensure the accuracy of your tax return. Transfer the information of tax returns on the copy of the tax return; this copy belongs to you. You will be paid an amount equivalent to the remaining amount of income [70%]. At this point, you should quietly raise your hand up. Please do not speak or shout. It is important to maintain silence so that those still working are not disturbed. A supervisor will take you to another room nearby where you may be audited.

9. *Auditing*: Although we do not have time or resources to check everyone's tax return, 1 in 10 (10%) will be checked for correctness. You will be required to pick a piece of paper from a larger envelope if you pick a piece of paper written "1" you will be audited. If you are selected for the audit:

> i. Your tax return will be compared to the information provided in this instruction sheet and your own copy of tax return in private.
> ii. If the tax amount is correct, you are free to go to the next round.
> iii. However, if the tax amount is not correct, we will deduct double of the tax unpaid by recording on your copy of tax return and then you go to the next round.

If you are not selected for audit, we will not check your tax returns. You are free to go to the next round.

10. *Assistance*: If you have any problems, please raise your hand up and a supervisor will come to your aid.

Treatment 3: Instruction sheet

1. *Setting*: You are responsible for completing and then filing a tax return form. Please read all the sections of this brief before starting the task.

2. *Documentation*: You will be requested to select a large envelope randomly from a set of envelopes provided by one of the supervisors. Each large envelope contains 4 tax return forms, and this instruction sheet. Please verify these documents, if there are any discrepancies, please raise your hand up and inform a supervisor accordingly immediately before beginning work on filing the tax returns.

3. *Confidentiality*: You alone are aware of the number associated with the material you have randomly selected. Neither the supervisors of today's session nor those who will analyse the tax returns subsequently will know your identity. Thus, your privacy is completely

guaranteed, thus enabling you to respond truthfully to the questions posed without worrying about your responses ever being linked directly to you.

4. *Independence*: Please do not communicate with other participants either verbally or in any other manner. Complete privacy is important, and we expect your co-operation. We must ask anyone found communicating with others in any manner to leave the room and to return the contents of the large envelope. If you have any problems, please raise your hand up and a supervisor will come to your aid.

5. *Your income*: Your income is set at the beginning of the session at TAZ 1,000,000. TAZ is a laboratory currency and at the end of the exercise every TAZ 120 will be exchanged for 1 actual Tshs. The amount you can retain is described below.

6. *Taxation*: You should fill in the tax return form correct information as required. The tax return form will enable you to file a complete and reliable tax return. However, there is a cost associated with the production of tax returns. In your case, you have to pay a tax deductible expense amounting to TAZ 166,667. There are also considerable costs involved in running these sessions. To help defray these costs, you are required to submit 30% of the income after deducting the above tax return form expense as taxation.

7. *Penalty*: The income given to you and tax return expenses must be reported on the tax return forms. If detected cheating, see *section 9 Auditing* below, you will pay double the amount of tax underpaid.

8. *Tax return form*: On the tax return form, please indicate the total amount of TAZ shown in number 5 above which represents your income and costs of tax returns shown in number 6 above. Keep a copy of the tax return form for your records. In the space provided, multiply the amount indicated after deducting the expenses of a tax return form by 30% to arrive at the tax payable. You may use a calculator to ensure the accuracy of your tax return. Transfer the information of tax returns on the copy of the tax return; this copy belongs to you. You will be paid an amount equivalent to the remaining income [70%]. At this point, you should quietly raise your hand up. Please do not speak or shout. It is important to maintain silence so that those still working are not disturbed. A supervisor will take you to another room nearby where you may be audited.

9. *Auditing*: Although we do not have time or resources to check everyone's tax return, 1 in 10 (10%) will be checked for correctness. You will be required to pick a piece of paper from a larger envelope if you pick a piece of paper written "1" you will be audited. If you are selected for the audit:

      i. Your tax return will be compared to the information provided in this instruction sheet and your own copy of tax return in private.
      ii. If the tax amount is correct, you are free to go to the next round.
      iii. However, if the tax amount is not correct, we will deduct double of the tax unpaid by recording on your copy of tax return and then you go to the next round.

If you are not selected for audit, we will not check your tax returns. You are free to go to the next round.

10. *Assistance*: If you have any problems, please raise your hand up and a supervisor will come to your aid.

Appendix 2: Tax Return Form

Taxpayer information	Tick one	
Gender	Male	Female
Your age		
What business are you in?		
Your education level		

Income information

Item	Notes	TAZ
Total income received	A	
Less:		
Expenses of tax return form	B	
Net income before tax	C=A-B	
Taxation	D=30%xC	
Net income	E=C-D	

Notes

A.   Total income received

B.   Expenses of tax return form as indicated in the instruction sheet

C.   The difference between A and B

D.   Net income