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Working Paper 113

**Gender and Tax Compliance: Firm Level  
Evidence from Ethiopia**

Seid Yimam and Fissaha Asmare

October 2020

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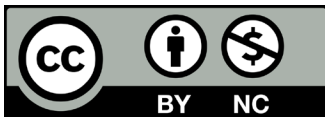
Seid Yimam and Fissha Asmare

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# Gender and Tax Compliance: Firm Level Evidence from Ethiopia

Seid Yimam and Fissaha Asmare

## Summary

Developing countries often lack tax information and enforcement capacity necessary to effectively implement instruments of a modern tax system, such as VAT, income taxes and others. An alternative strategy to increase tax compliance, and thus revenue, in these countries may depend on the capacity of policymakers to harness individual's civic-mindedness, social norms, reciprocity and cultural values of trust (Prichard, Custers, Dom, Davenport and Roscitt 2019). To do so in an effective and targeted way, policymakers need clear evidence on how tax compliance correlates with key taxpayer characteristics, such as gender. However, such evidence remains limited in the Global South, particularly in Africa, and our study aims to fill this gap.

In this study, we investigate the correlation between business owner's gender and tax compliance in Ethiopian enterprises. We measure the tax compliance of businesses from tax audit registry data and combine it with survey data collected from 408 enterprises. Our results suggest that enterprises' tax compliance behaviour is significantly affected by their owners' gender: female owned enterprises are more likely to be tax compliant than those owned by men. The correlation between the owner's gender and tax compliance also becomes stronger as enterprises get larger in size.

The results of our study imply that development-related policies, especially in the area of tax administration and compliance, should consider the behavioural variation among male and female business owners. Moreover, improving the participation of women in business in the country may also enhance equity and tax revenue collection for better resource mobilisation and development.

**Keywords:** Tax compliance, gender, firm size, Ethiopia

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# Introduction

Ethiopia has seen a sensational economic growth in the last decade. Sustaining such an economic growth requires strong domestic resource mobilisation, mainly boosting its tax revenue. However, weak institutional setup, corruption and absence of a transparent political system, on the one hand, and a high informality, coupled with poor awareness of paying tax among the business community, on the other, make tax collection ineffective. The problem is further exacerbated by the absence of policy-relevant studies that can shed light on ways to improve tax collection capacity and to develop a responsible and ethical business community. In light of this, our study shows how utilising taxpayer's behavioural differences, especially business owners' gender, would help to increase tax compliance and enhance government revenue.

Traditional tax compliance models (Allingham and Sandmo 1972; Bruno 2019; Slemrod and Yitzhaki 2002) focus on tax enforcement mechanisms, such as audits and penalties, for better tax revenue collection. The effectiveness of such enforcement mechanisms depends on the availability of verifiable tax information and on the administrative capacity of detecting tax evaders. These traditional models particularly assume that taxpayers are rational and pay their taxes because they fear the penalties that are applicable if they are caught evading (Allingham and Sandmo 1972; Bruno 2019; Slemrod and Yitzhaki 2002). Linking tax enforcement, tax morale and tax compliance, Filippin, Fiorio and Viviano (2013) also show that tax enforcement has a positive cumulative effect on compliance via tax morale in Italy.

In developing countries, however, the probability of catching tax evaders and fraud is much lower due to the high informality of businesses and the tax authority's limited tax enforcement (Besley and Persson 2014; Bird 1989; Carnahan 2015). As a result, developing countries often lack the tax information and enforcement capacity necessary to effectively implement the instruments of a modern tax system, such as VAT, income taxes and others. An alternative strategy to increase tax compliance, and thus revenue, in these countries may depend on the capacity of policymakers to harness individuals' civic-mindedness, social norms, reciprocity, and cultural values of trust (Prichard et al. 2019). To do so in an effective and targeted way, policymakers need clear evidence on how tax compliance correlates with key taxpayer characteristics. However, such evidence remains limited in the Global South, particularly in Africa. Our study aims to fill this gap and contribute to the literature on tax compliance, by exploring the relationship between tax compliance and business owners' gender.

In the growing body of behavioural literature on gender, the bulk of both experimental and survey-based studies show that there is a great deal of behavioural variation between men and women. For instance, women are more likely to exhibit helping behaviour (Andreoni and Vesterlund 2001; Eagly and Crowley 1986), vote based on social issues (Goertzel 1983), score more highly on 'integrity tests' (Ones and Viswesvaran 1998), take stronger stances on ethical behaviour (Glover, Bumpus, Sharp and Munchus 2002; Reiss and Mitra 1998), and behave more generously when faced with economic decisions (Eckel and Grossman 1998). Research findings also suggest that women are particularly effective in promoting honest government and greater representation of women in parliament would result a lower level of corruption (Dollar, Fisman and Gatti 2001).

The existing literature has also revealed behavioural differences between men and women in decision making in risky situations and competitive business environments, which ultimately explain profitability differences. For instance, women are more risk-averse (see Barsky, Juster,

Kimball and Shapiro 1997; Bruce and Johnson 1994; Byrnes, Miller and Schafer 1999), less overconfident and trade less in financial markets than men (Barber and Odean 2001), and are less responsive to competitive incentives than their male counterparts (see Gneezy, Niederle and Rusticchini 2003). Such behavioural differences are also revealed in choices about committing crimes, which is related to tax evasion. As Braithwaite (1989: 44) clearly states 'crime is committed disproportionately by males'. Our question is: do we observe such differences in tax underreporting too?

Indeed, when it comes to taxation specifically, men and women also appear to have different attitudes and behaviour. Studies in the US have shown that women tend to think the tax code is fairer, the likelihood of getting caught for evasion is greater and they overestimate the penalties for evasion (Kinsey 1992; Smith and Stalans 1991). In terms of behaviour, a number of tax compliance experiments have revealed women to be more compliant than men (Cadsby, Maynes and Trivedi 2006; Gërxhani 2007; Kastlunger, Dressler, Kirchler, Mittone and Vorcek 2010).

However, the evidence is not conclusive. as other studies argue that women are not generally more compliant than men. For instance, Friedland, Maital and Rutenberg (1978) found women more likely to evade taxes in a game-simulation context using 15 Israeli undergraduate students. Similarly, Kirchler and Maciejovsky (2001) asserted that women's self-reported tax compliance was lower than men in Austria. A survey-based study by Ameyaw and Dzaka (2016) in Ghana also documented there are no significant gender differences in tax compliance and Chung and Trivedi (2003) only found women to be more compliant than men after providing them with persuasive reasons to pay taxes.

In developed countries, where social, political and cultural gender equality is greater than in developing countries, studies still revealed significant differences in tax compliance behaviour between men and women. For example, D'Attoma, Volintiru and Steinmo (2017) conducted cross-country experimental study in the United States, the United Kingdom, Sweden and Italy. The findings indicate that women are significantly more compliant than men in all countries and under every condition. Whereas, in developing countries where women are highly marginalised and discriminated in every aspect, studies aimed at investigating the role of this behavioural difference in tax mobilisation (compliance) are scant. To the best of our knowledge, no study has attempted to explore how the business owners' gender differential affects tax compliance in Ethiopia. Thus, it is important to address this research gap and investigate if gender plays any role in tax compliance in the Ethiopian context.

Considering tax compliance as a pro-social act and risk-averse behaviour, and tax evasion and avoidance as anti-social and criminal acts, the gender of business enterprises owners could have a serious implication on how they pay their taxes. The central hypothesis we test in this study is that female owned business enterprises or partnership businesses owned by a female majority are more likely to be tax compliant. We test this hypothesis in the context of Ethiopia, where informality and evasion are widespread amongst businesses.

Moreover, the relationship between firm size and tax compliance also remains mixed in literature. For instance, using sales as a measure of firm size, Joulfaian (2000) examines corporate tax evasion behaviour and finds that larger firms experience less noncompliance in the US. On the contrary, Amanda and Frida (2018) documented evidence that large firms are more likely to tax avoid compared to smaller firms in Sweden. In addition to this, the political power theory of firms claims that larger firms have more possibilities to influence the political process in their favour to avoid more tax (Siegfried 1972). Given this literature, this study also



aims to examine whether the impact of gender on tax compliance is different across firm size. This study aims to address the following specific research questions:

- Is there any difference in tax compliance among male and female owned enterprises?
- Does the gender composition of enterprise owners influence tax compliance?
- Does the impact of the owners' gender on tax compliance vary across firm size?

To answer these questions, we estimate the log odds ratios from a logit model to describe the probability of being tax compliant using survey and administrative tax data from business enterprises in Addis Ababa, Ethiopia. In this study, tax compliance refers to declaring the right amount of taxable business income in a given fiscal year and non-compliance refers to underreporting taxable business income. Thus, our compliance variable is a dummy variable with value 1 for compliant firms and 0 for noncompliant ones.

The novelty of this research lies on using a combination of taxpayers' administrative data and survey data for two reasons. On the one hand, measuring tax compliance from survey data is not possible as individuals are less likely to be honest about their inherently dishonest behaviours. On the other hand, firm specific characteristics, business environment information and owners' characteristics are generally missing in administrative data. This study leverages on the advantages of combining the two data sources and becomes the first study to explore the role of business owners' gender on tax compliance in a developing country context.

The results show that businesses owned by a female-majority are more likely to be tax compliant than those male-majority owned businesses. The results also document robust evidence that the probability of being tax compliant increases as the ownership share of women in businesses increases. Moreover, the relative gender effect on tax compliance increases with firm size.

The rest of the paper is structured as follows: Section 1 provides a brief context on business income tax in Ethiopia. Section 2 presents data and method of analysis employed followed by Section 3 with a descriptive analysis and variable descriptions. Section 4 discusses the main findings, while Section 5 concludes.

## 1 Business income tax context in Ethiopia

Ethiopia's economy has experienced rapid and broad-based growth since 2007. However, sustaining such economic growth requires strong domestic resource mobilisation, mainly boosting its tax revenue. To that end, improving tax compliance has been a key focus for the government. Tax revenue collected increased from 43 billion Birr in 2010 to 165 billion Birr by the end of 2015. It further increased to 268 billion Birr in 2019. But the tax revenue to GDP share remained low in the country; 13.3 per cent in 2015 and 11.2 per cent in 2019. These achievements are lower than the target of an average 15 per cent for the first growth and transformation plan period (2010 – 2015) and 17.2 per cent for the second growth transformation plan (2015/16 – 2019/20).

The government of Ethiopia collects direct and indirect taxes. Our study focuses on business income tax, which is one of the common direct taxes that businesses face (Category A, B and C). Business income tax accounts for a fairly large share of total tax revenue in Ethiopia. As the 2010/11 national bank annual report indicates, 17.06 per cent of the total tax revenue was collected from business incomes (National Bank of Ethiopia 2011). This share of business income tax in the total tax revenue further increased to 22.13 per cent in the Ethiopian fiscal year 2018/19.

According to the federal income tax proclamation 979/2016, the taxable business income of a taxpayer for a tax year shall be the total business income less the total deductions for the year (Federal Democratic Republic of Ethiopia 2016). That is, taxable business income is determined based on profit and loss or income statement.

The rate applicable to taxable business incomes from business entities (e.g. sole proprietorship, PLC, Share Company) is flat at 30 per cent. But, the rates of business income tax applicable to individuals and Micro Enterprises vary from 0 per cent up to 35 per cent, depending on the amount of taxable business income per the tax year. These taxpayers are required to file a tax declaration and pay their tax in the period prescribed by law.

However, the Ethiopian Ministry of Revenue (MoR) may need to audit some or all of its taxpayers to verify if taxpayers are paying the right amount of tax at the right time. The tax department of the authority undertakes auditing using risk criteria based on previous noncompliant taxpayer records, unexpected inconsistency between past income statements and current declared taxable income, and information from other private and public institutions, as well as individuals. This clearly shows that the decision to audit taxpayers is not random. The audit results tell us the tax compliance status of the taxpayer. For this study, a taxpayer is compliant if the audit results confirm that the taxpayer has never been found guilty of underreporting taxable business income. Otherwise, the taxpayer is noncompliant.

## 2 Data and method of analysis

### 2.1 Data type and sources

This study combines primary and secondary datasets. More specifically, we combine administrative tax data from the Ministry of Revenues (MoR) and survey data we collected from 408 taxpayers randomly selected business establishments<sup>1</sup> in Addis Ababa. Among 408 representative sample firms, only 315 (77.2 per cent) were found to have been audited by the tax administration at least once in the period between 2008 and 2018. Even though audit decision by the tax department is not random in its nature, the 315 taxpayers account for most of the randomly selected sample and could be considered as representative of the population of enterprises.

The administrative data consists of tax declaration of business income, audit history and penalty information. Based on this information, we determine the tax compliance status of businesses. Accordingly, noncompliant businesses are those businesses fined for understating taxable income at least once between 2008 and 2018. Compliant businesses, on the other hand, are those firms that have never been fined for understating taxable income in this period.

Our survey data consists of detailed information on the sample businesses. It provides information on business characteristics, such as year of establishment, number of permanent and temporary employees, and legal status of firms. In addition, it provides ownership and managerial attributes of our sample firms, including age, education, vocational training and

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<sup>1</sup> The administrative data from MOR consists of 11,457 unique establishments based in Addis Ababa. The sample of 408 was randomly selected from this list and by virtue of its randomness, we believe it can be representative of the businesses, particularly sole proprietorship and private limited companies. As a matter of fact, unless a taxpayer is not audited, it is hardly possible to discuss tax compliance behavior. That is the reason why our compliance analysis in the rest of the paper was conditional on the audit status of businesses.

years of prior business experience of the owner with majority ownership share, share of women in ownership and top-level management positions. Our survey data also provides information on tax perceptions and attitudes towards tax policy, tax administration, fairness and complexity of Ethiopian tax system and the general business environment.

## 2.2 Methods of analysis

Apart from presenting descriptive analysis of the survey data, we empirically estimate the association between owners' gender and the probability of being tax compliant. Specifically, we test if women (majority) owned firms are more likely to be tax compliant, using a traditional probability model, controlling for other covariates, such as business owner characteristics (age, training, education and prior business experience), firm specific characteristics (firm size and firm age) and business environment factors (business environment index and informal competition). The equation that we estimate here takes the following general form:

$$Y_i = \alpha + \delta Female_i + X_i\beta' + \epsilon_i \quad (1)$$

Where  $Y_i$  is a dummy variable for tax compliance status of firm  $i$ , taking value 1 for compliant and 0 for noncompliant,  $Female_i$  is our main variable of interest capturing gender of businesses owners,  $X_i$  consists of the vector of covariates that are believed to determine business tax compliance,  $\delta$  is the coefficient of our gender variable and  $\beta$  is a vector of coefficients of variables in vector  $X_i$ ,  $\alpha$  is constant and  $\epsilon_i$  represents error term.

As estimating equation (1) using OLS (the linear probability model) has its own shortcomings, the main analysis in this paper is based on results from a non-linear model. Specifically, we estimate the log-odds ratios from a logit specification describing the probability of being tax compliant. Below is the mathematical model following Greene (2003):

$$Pr(Y_i=1|Female_i, X_i) = \Lambda(\delta Female_i, \beta'X_i) \quad i=1, \dots, N \quad (2)$$

We also estimate equation (2) by splitting the sample by firm size so that we can test if the gender effect on tax compliance behaviour varies across firm size, as measured by the number of full-time permanent workers.

# 3 Descriptive analysis

## 3.1 Audit intensity and tax compliance

Irrespective of the audit status of businesses, the administrative data shows that all our sample businesses faced at least one of a number of penalties between 2008 and 2018 for reasons such as late filing, late payments and others. These fines are not actually based on audit results, rather mainly because taxpayers fail to respect deadlines and maintain proper documentations. For instance, as filing and payment systems are not digital and sophisticated in Ethiopia, taxpayers usually face a long queue within the tax filing and payment periods. Thus, many of them might opt to pay fines for late filing and late payments to avoid long waiting time.

Out of the total 408 sample firms, declared taxable income from 77.2 per cent (315) of the enterprises were audited by the tax authority for understatement of taxable income at least once between 2008 and 2018. The audit result determines compliant status of firms. The rest of taxpayers in this sample, 22.8 per cent (93), have never been audited for possible tax understatement or avoidance. It is important to note that the fact that businesses were not audited does not mean they were compliant throughout the stated period. Rather, it only implies that these firms were not selected for audit by the authority. Table 3.1 presents the intensity of auditing (number of audits) for tax understatement and follow-up penalty status that the sample businesses faced between 2008 and 2018.

**Table 3.1 Tax revision and penalty intensity in the period 2008-2018**

Tax audit intensity (N=315)			Penalty intensity for tax understatement (N=315)		
Intensity (#)	Frequency	Per cent	Intensity (#)	Frequency	Per cent
1	48	15.24	0	200	63.49
2	56	17.78	1	101	32.06
3	68	21.59	2	13	4.13
4	60	19.05	3	1	0.32
5	36	11.43			
6	26	8.25			
7	14	4.44			
8	5	1.59			
9	2	0.63			

Source: Ethiopian MoR Administrative data from 2008-2018 (Authors' computation)

The tax revision process through auditing happens when the tax department suspects the trustworthiness of the already declared taxable income by taxpayers. Those taxpayers found guilty would be fined by the department. Accordingly, the audit data shows that 63.5 per cent (200) of the audited sample (315) were never fined due to understatement of taxable income. These businesses are the 'compliant' taxpayer enterprises. The noncompliant enterprises in this study are, on the other hand, enterprises that were found guilty of understating their taxable income at least once in the period 2008-2018. In our audited sample of enterprises, 36.5 per cent (115) were fined at least once or more in the 11 year period. As Table 3.1 presents, almost 67 per cent of the audited sample have been investigated three or more times in the period. However, only one firm was found guilty of understating taxable income three times in the period. This may suggest that as enterprises experience audit more frequently, they tend to become more compliant.

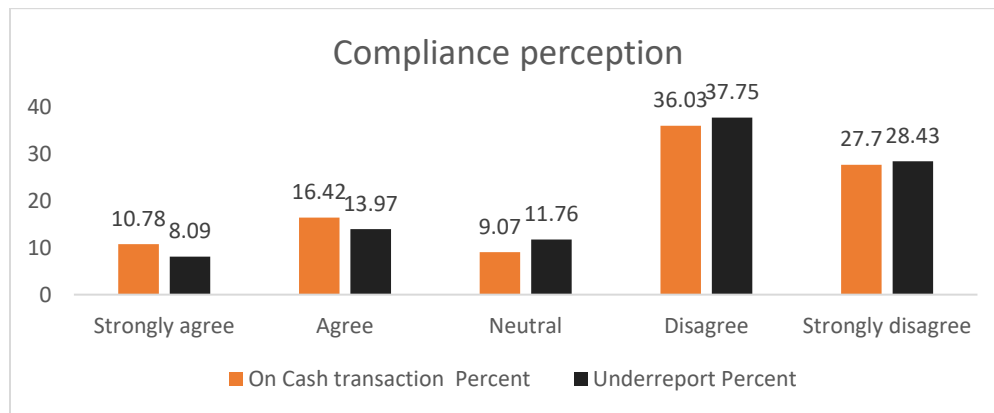
### 3.2 Tax compliance: attitudes and perceptions from the survey

Respondents were asked the reason for paying their taxes as required by the tax regulation. Responses for this question indicate that 94 per cent of the respondents pay taxes as per the regulation because 'it is their duty as citizen'. Those who pay tax for fear of 'severe punishment for tax evasion' account 5 per cent of the sample. Only five respondents pay their taxes as required by the law because they 'do not know how to minimise taxes'. According to these responses, the behaviour of most of our sample can be characterised as 'voluntarily compliant', as they regard paying tax as their citizenship duty. Those who pays taxes because of either lack of knowledge on how to minimise their tax or fear of severe punishment are 'involuntarily compliant'. However, linking survey responses with the respective penalty history of firms, the

trustworthiness of these responses is highly questionable. For instance, 36.5 per cent of those who stated 'I pay taxes because I believe doing so is my duty as a citizen' were found guilty of understating tax. In addition, 44 per cent of those who claimed 'fear of severe punishment' was the main reason for paying their tax as per the rule were also penalised at least once between 2008 and 2018.

We have also asked the responders' level of agreement with other people's thoughts, especially regarding statements such as 'people think that it is sometimes reasonable to underreport tax if they get the chance' and 'people think it is okay not to pay tax on cash transactions'. The responses are presented in Figure 3.1 below.

**Figure 3.1 Compliance perception**



Source: Authors' Survey Data, 2019

The majority of the respondents in our survey, more than 63 per cent, disagree or strongly disagree with what people think on paying tax on cash transactions and underreporting tax. These responses can be used to imply the compliance behaviour of respondents. For example, 66 per cent of respondents disagree/strongly disagree with the statement 'people think it is sometimes reasonable to underreport tax if they get the chance'. On average, those who disagree with the statement are expected to be compliant and those in agreement with the idea to be noncompliant. The compliance perception has no significant correlation with respondents' gender, rather we found a strong correlation with business owners' gender. For instance, respondents from businesses with male majority owners tend to agree or be neutral with 'people think that it is sometimes reasonable to underreport tax if they get the chance' and firms are more likely to be penalised for 'understating tax' in comparison to businesses dominantly owned by women.

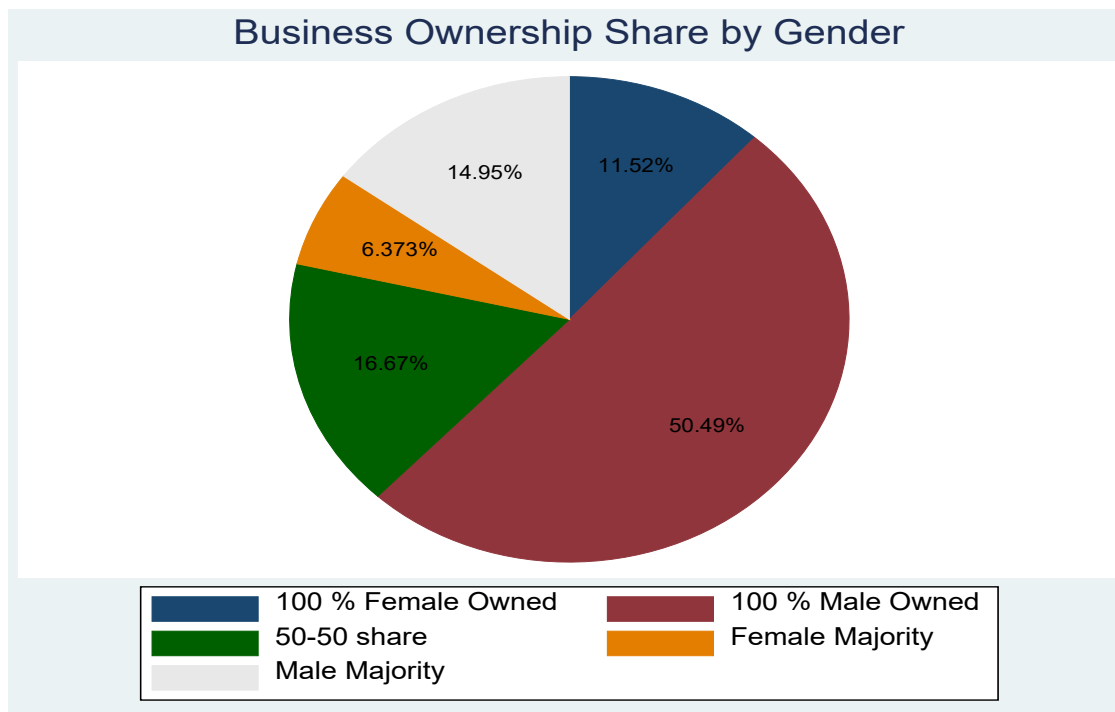
### 3.3 Female ownership and participation in top level management of firms

#### 3.3.1 Ownership of firms

The World Bank (WB) enterprise survey data (2015) shows that women participate in the ownership of 29.6 per cent of firms in Sub Saharan Africa (SSA), while only 12.3 per cent of firms are owned by a women majority. The same survey indicates that the Ethiopian business environment outperforms the SSA average on both indicators: women participate in the ownership of 36.2 per cent of firms, while women majority ownership of firms is at 16.3 per cent. However, in our 2019 survey, as presented in Figure 3.2, there exist women among the owners in 49.5 per cent of the establishments and women own 50 per cent or the majority in 34.56 per cent of the sample establishments. This balanced participation of women in business

ownership is unexpected and it might be because the sample is only from Addis Ababa, which is relatively more developed as a large capital city, while the WB survey is drawn from firms across different parts of the country, including more remote and smaller cities.

**Figure 3.2 Business ownership participation by gender**

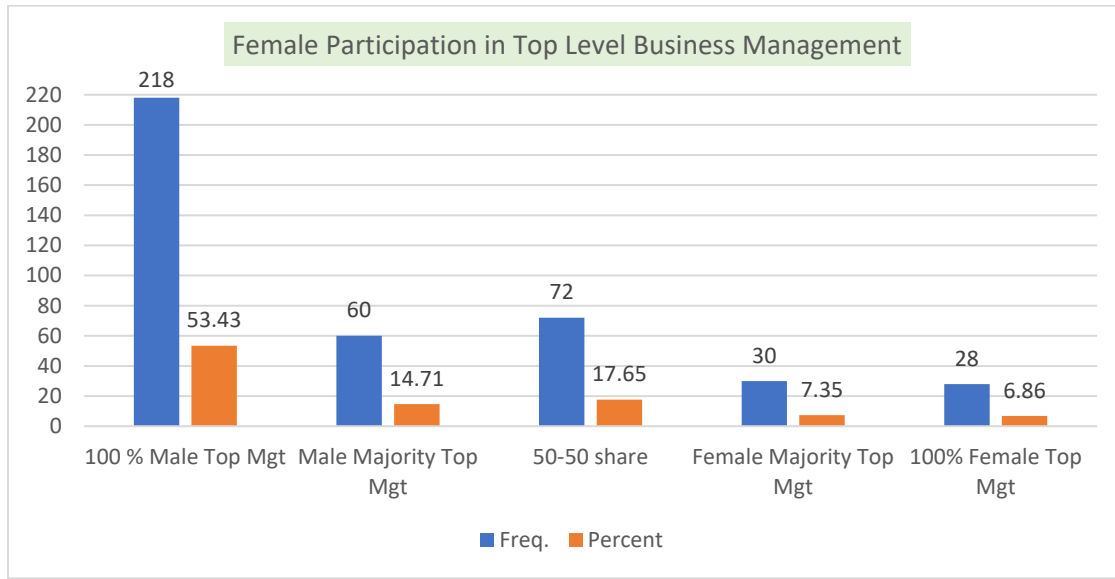


Source: Authors' Survey Data, 2019

### 3.3.2 Participation in top level management of firms

Women participation in top level business management in Ethiopia is very low. The World Bank enterprise survey data (2015) indicates that only 8.8 per cent of the 847 firms in question had a female top manager, which was far below the SSA average: 15.5 per cent in the same survey year. Figure 3.3 presents the participation of women in top level business management from our survey. It shows that women engage in top management positions in 46.6 per cent of the businesses. Women dominate top level management positions in around 14 per cent of firms and they completely control all those positions in 6.9 per cent (28) of the businesses in the sample.

**Figure 3.3 Women’s participation in top level business management**



Source: Authors' Survey Data 2019

### 3.4 Variable description and mean difference between compliant and noncompliant firms

In Table 3.2 below, we describe the variables used in our model estimation. It also depicts the mean value of the variables based on firms’ tax compliance status of 315 audited firms. The values in the third, fourth and fifth column represents the mean values of continuous variables and the percentage of categorical variables for compliant, noncompliant and the total sample, respectively. The last column depicts a two-sample t-test of mean difference of the continuous and dummy variables, while we use chi-square test of independence for categorical variables. We account for factors that potentially determine tax compliance behaviour of businesses by grouping them into three different categories: owner characteristics, firm characteristics and business-environment-related factors. To shed light on some of the covariates, emphasis is given for variables that have a significant difference between compliant and noncompliant owners. Related to owner characteristics, on average noncompliant business owners are found to be younger, less educated and with minimal years of business experience before starting their businesses.

On the other hand, a statistically significant difference is also observed among compliant and noncompliant firms based on whether the owner bears any vocational or technical training related to the business. From the audited sample, owners have business related vocational or technical training in 47 per cent of the businesses, with a relatively larger proportion of them (26 per cent) being among the compliant firms.

Concerning firm related characteristics and business environment factors, the average age of firms is found to be 13 years, while the average number of permanent workers in the sample business is almost 45 persons. While the average business environment index is 2.54 for the total sample, there is no significant difference in business environment assessment between respondents of compliant and noncompliant firms. This index ranges from 1 to 4. The more the index approaches to 4 the more severely the business environment becomes obstacle for business operations.

**Table 3.2 Definition, variable description, and summary statistics by tax compliance status**

Variable Name	Variable Description	Average (Overall sample)	Average (Compliant)	Average (Noncompliant)	Mean Difference
<b>Owners Characteristics</b>					
<b>AGE</b>	Age of the owner in years	45.89	45.50	46.56	1.06
<b>AGE SQUARED</b>	Age squared of the owner in years	2228.80	2183.46	2307.66	-124.2
<b>GENDER</b>	1= if share >=50% of a business is owned by women	34.29	39.50	25.23	14.28**
<b>GENDER 1</b>	1= if share >=60% of a business is owned by women	17.46	21.50	10.43	11.07**
<b>GENDER 2</b>	Female ownership shares from 0% to 100%	28.90	32.03	23.46	8.57*
<b>EDUC</b>	1= if the owner has diploma or above	61.27	59.00	65.22	-6.22
<b>TRAIN</b>	1= if the owner has any Technical and Vocational Education Training (TVET) related to the business	46.98	41.00	57.39	-16.39**
<b>EXP</b>	Business experience before starting the business (in years)	6.43	6.79	5.79	1.00
<b>Firm Characteristics and Business Environment</b>					
<b>FIRM AGE</b>	The age of the firm in years	13.62	13.35	14.08	-0.73
<b>FIRM AGE SQUARED</b>	Square of firm's age in years	222.49	212.36	240.11	-27.75
<b>PERWORK</b>	Total number of permanent workers	45.20	39.70	54.76	-15.06
<b>BEVTIN</b>	Index <sup>2</sup> of business environment factors	2.54	2.55	2.52	0.03
<b>INFCOMP</b>	Informal competition =1 if practices of competitors in the informal sector is not an obstacle	32.70	21.90	10.79	11.11
	2= a minor obstacle	13.65	8.25	5.40	2.85
	3= a moderate obstacle	19.37	13.33	6.03	7.3
	4= a major obstacle	34.29	20.00	14.29	5.71
<b>Legal status</b>	Individual = 1 and Private Company LT=0	46.35	50.05	39.13	11.37**
<b>Compliant=200 (63.49%), Noncompliant = 115 (36.51%), * p &lt; 0.05, ** p &lt; 0.01, *** p &lt; 0.001</b>					

Source: Authors' Survey Data in 2019 and Ethiopian MoR Administrative data from 2008-2018

<sup>2</sup> Business Environment Index (**BEVTIN**) is calculated from 15 business environment factors. The index ranges from 1 up to 4: an index value 1 indicates that business environment factors, on average, are 'no obstacle' while index value 4 indicates that the factors are 'major obstacle' for one's business operation.



## 4 Econometric results and discussion

This section presents econometrics estimation results from the logit model to examine the effect of the business owners' gender on tax compliance, along with other covariates. In order to account for different gender indicators and check result robustness, we estimated three models with different gender indicators in each model. The model well fits the data, which is confirmed by the significance of the likelihood ratio, overall test of significance. Following is the interpretations of the empirical results compared with findings from related studies in the area.

**Table 4.1: Logit model regression results**

Variables (Dependent variable: tax compliance (=1 a firm is compliant and =0 noncompliant))	(LPM) <sup>3</sup>	(Logit Models)		
	1	2	3	4
AGE	0.0289 <sup>*</sup> (0.0169)	0.140 <sup>*</sup> (0.0779)	0.137 <sup>*</sup> (0.0785)	0.132 <sup>*</sup> (0.0779)
AGE SQUARED	-0.000313 <sup>*</sup> (0.0002)	-0.00151 <sup>**</sup> (0.0008)	-0.00145 <sup>**</sup> (0.0008)	-0.00141 <sup>*</sup> (0.0008)
GENDER (=1 if share >=50% owned by women)	0.197 <sup>***</sup> (0.0537)	0.955 <sup>***</sup> (0.2742)		
GENDER 1 (=1 if share >=60% owned by women)			1.134 <sup>***</sup> (0.3766)	
GENDER 2 (female ownership share, 0 - 100%)				0.0114 <sup>***</sup> (0.0037)
EDUC (=1 if Diploma and Above)	-0.00155 (0.0587)	0.00385 (0.2769)	-0.00337 (0.2773)	0.00430 (0.2764)
TRAIN (=1 if owner has TVET)	-0.181 <sup>***</sup> (0.0558)	-0.869 <sup>***</sup> (0.2716)	-0.900 <sup>***</sup> (0.2766)	-0.868 <sup>***</sup> (0.2759)
EXP (Years of prior business experience of owner)	0.00608 <sup>*</sup> (0.0036)	0.0286 <sup>*</sup> (0.0174)	0.0248 (0.0174)	0.0276 (0.0175)
FIRM AGE	-0.00125 (0.0123)	-0.00420 (0.0577)	-0.00412 (0.0579)	-0.00728 (0.0573)
FIRM AGE SQUARED	-7.54e-08 (0.0003)	-0.0000133 (0.0013)	0.0000163 (0.0014)	0.0000594 (0.0013)
Ln (PERWORK)	-0.0468 <sup>**</sup> (0.0228)	-0.221 <sup>**</sup> (0.1050)	-0.185 <sup>*</sup> (0.1053)	-0.221 <sup>**</sup> (0.1036)
BEVTIN	0.0705 (0.0544)	0.326 (0.2580)	0.293 (0.2594)	0.306 (0.2593)
<b>INFCOMP (No obstacle is the base category)</b>				
Minor Obstacle	-0.108 (0.0861)	-0.535 (0.4142)	-0.559 (0.4011)	-0.548 (0.4074)
Moderate Obstacle	-0.0581 (0.0766)	-0.278 (0.3861)	-0.284 (0.3935)	-0.290 (0.3928)
Major Obstacle	-0.195 <sup>***</sup> (0.0706)	-0.944 <sup>***</sup> (0.3440)	-0.904 <sup>***</sup> (0.3401)	-0.936 <sup>***</sup> (0.3437)
Constant	0.0404 (0.4055)	-2.277 (1.8514)	-2.153 (1.8632)	-2.042 (1.8464)
N	315	315	315	315

Robust standard errors in parentheses \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 4.1 Gender and tax compliance

This study mainly sought to answer the key research question, which is how owners' gender affect the tax compliance behaviour of enterprises. In other words, it aims at testing the central hypothesis that female owned businesses are more compliant than male owned ones. The logit model estimation results show that compared with male business owners, the likelihood of being tax compliant is larger for female business owners. That confirms our hypothesis and in terms of magnitude of gender ownership effect, (majority) female owned businesses are on average 19.8

<sup>3</sup> The first column presents estimation results from a Linear Probability Model (LPM) for the sake of completeness.

percentage points more likely to be tax compliant than the (majority) male owned businesses (see Table 4.2, Model 2). This marginal effect of (majority) female owners on tax compliance becomes stronger, increasing on average to 23.6 percentage points in Model 3.

**Table 4.2 Marginal effects of firm owners' gender on tax compliance from the logit models**

Models	Variables	dy/dx	Std.Err	z	P>  z	[90% C.Interval]	
Model 2	GENDER	0.1977	0.0535	3.70	0.000	0.1098	0.2857
Model 3	GENDER 1	0.2362	0.0742	3.18	0.001	0.1141	0.3584
Model 4	GENDER 2	0.0024	0.0007	3.20	0.001	0.0012	0.0036

In order to ascertain the robustness of our result, we use the alternative measures/indicators of gender. The first measure is a dummy variable that takes a value of 1 if the share of female business ownership is greater than or equal to 50 per cent. The second one is similar to the first measure, but, in this case, it takes value 1 if the share of female ownership in the business is greater than or equal to 60 per cent. Finally, we proxy gender as a continuous variable given by the business ownership share of women. The sign and the significance of our variable of interest, owners' gender, remains robust in all the alternative measures.

As it can be seen in all the three columns of Table 4.1, the coefficient of owners' gender on tax compliance is positive and significant. The implication is that businesses owned by women or women majority are more likely to be tax compliant than those male or male majority owned businesses. The results also document evidence that probability of being tax compliant increases as the ownership share of women in the business increases. Table 4.2 indicates that as share of women ownership in a business increases by 1 per cent, on average, the likelihood of the business to be tax compliant increases by 0.24 per cent (Model 4). This also implies that 100 per cent of female owned businesses, on average, have a 24 percentage points higher chance of being tax compliant than 100 per cent of male owned businesses.

We would argue that this tax compliance difference based on gender is attributed to the behavioural difference among men and women. Many studies in the behavioural science focusing on tax compliance behaviour have also shown that women are more ethical than men in paying taxes (Beron, Tauchen and Witte 1992; Kinsey 1992; Scholz and Pinney 1995; Smith 1992; Spicer and Hero; 1985). Kasipillai and Abdul-Jabbar (2006) also documented evidence that being female increase tax compliance compared to male in Malaysia. In line with these studies, Torgler and Valev (2010) also found significantly greater aversion to corruption and tax evasion among women than men in different countries and at different times. In addition to the findings of previous studies, we explore reasons behind our regression results from the survey data in Table 4.3.

**Table 4.3 Potential reasons for women owned businesses being relatively more tax compliant**

Variables	Male (N=207)	Female (N=108)	Diff
Audit intensity	3.579	3.287	0.292
Reasonable to underreport <sup>4</sup>	3.430	3.898	-0.468***

<sup>4</sup> In our survey, respondents from businesses were asked to express their agreement/disagreement towards the statement 'People think that it is sometimes reasonable to underreport tax...'. The possible responses were coded as 'Strongly agree=1', 'Agree=2', 'Neutral=3', 'Disagree=4' and 'Strongly disagree=5'.

Easiness of Tax refund application <sup>5</sup>	3.343	3.139	0.204**
MOR Fairness (1=fair, 0=unfair)	0.333	0.454	-0.121**

\*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Source: Authors' Survey, 2019

Firstly, we understand that on average, there is no significant audit intensity difference among male and female owned firms, implying that the probability of being audited is random and the tax department has no prior tendency to target male owned businesses. This confirms that the gender tax compliance differential presented in Table 4.1 is not attributed to the fact that female owned businesses were less frequently audited by the tax authority.

Secondly, female owned businesses representatives are more likely to disagree with the view that 'people think it is sometimes reasonable to underreport tax' and have a more positive attitude towards the tax system than their male counterparts. For instance, women are more likely to think it is easier to apply for a tax refund and they also believe MOR treats businesses more fairly compared to men (Table 4.3).

## 4.2 Firm size, owners' gender and tax compliance

In this study, firm size is measured by (natural log of) the number of permanent workers in the establishment. As Table 4.1 presents, the probability of being tax compliant declines as firm size increases. A 1 per cent increase in the number of permanent workers is associated with about 0.038 to 0.046 percentage points reduction in the likelihood of being tax compliant (Appendix 1). This result is statistically significant and consistent across all the considered models. One plausible justification could be that larger firms take more risk of underreporting their income, as the expected gain increases with firm size or large firms are more likely to underestimate the institutional capacity to catch them – i.e. they assign a lower probability of being caught and/or relatively lower penalty for evading taxes. On the other hand, in our previous analysis we showed the correlation between firm owners' gender and tax compliance.

Yet, from the preceding discussions, we cannot understand whether owners' gender has heterogeneously correlated with tax compliance behaviour across different firm sizes. To better understand the dynamics, we analyse the correlation between tax compliance and gender across firm size following two different approaches. First, we predicted the marginal effect of owners' gender at different values of firm size (Ln (PERWORK)) from the logit models estimated in Table 4.1. Second, we estimate the logit models for different group of firms based on their size. This enables us to compare the coefficients or marginal effects of the gender variables on compliance for different groups.

Table 4.4 shows that the correlation between gender and tax compliance is firm size dependent and it is significant. As the number of permanent workers (log) increases, the likelihood of being tax compliant becomes higher for women owned enterprises, compared with men owned ones. For instance, if we compare the marginal effect of gender between firm size 1 and 6, it becomes higher by around 3.4 percentage points for women in the latter case, considering our first definition of gender (column 1). The results are consistent across the three models documenting robust heterogenous effect of gender on tax compliance across firm sizes.

<sup>5</sup> We also asked business representatives to rate easiness of 'tax refund application' as 'very easy=1', 'easy=2', 'difficult=3' and 'very difficult=4'.

**Table 4.4 Marginal tax compliance effect of gender across firm size**

Firm Size (Ln (PERWORK))	Marginal effect across different models		
	GENDER	GENDER_1	GENDER_2
0	0.1654	0.2051	0.001990
1	0.1803	0.2196	0.002173
2	0.1933	0.2324	0.002333
2.5	0.1989	0.2380	0.002401
3	0.2038	0.2429	0.002461
3.5	0.2078	0.2472	0.002510
4	0.2110	0.2507	0.002549
4.5	0.2132	0.2535	0.002577
5	0.2145	0.2555	0.002593
6	0.2142	0.2570	0.002589

For the second approach, we categorise firms in to two groups: one group only consists of micro and small business and the other group accounts for medium and large business. Our definition of firm size follows FeMSEDA (2011) that micro and small enterprises are those entities with 30 or lower workers, while medium and large firms are businesses that employ more than 30 workers. The results are presented in Table 4.5.

**Table 4.5 Logit model estimation results by firm size groups**

Variables (Dependent variable: tax compliance (=1 a firm is compliant and =0 noncompliant))	(1)	(2)	(3)	(4)	(5)	(6)
	Micro and Small	Medium and large	Micro and Small	Medium and large	Micro and Small	Medium and large
AGE	0.128 (0.0892)	0.228 (0.2141)	0.128 (0.0910)	0.184 (0.2080)	0.124 (0.0897)	0.142 (0.2173)
AGE SQUARED	-0.00152* (0.0009)	-0.00194 (0.0020)	-0.00146 (0.0009)	-0.00159 (0.0020)	-0.00145 (0.0009)	-0.00111 (0.0021)
GENDER (=1 if share >=50% by women)	0.792** (0.3264)	1.594** (0.6257)				
GENDER 1(=1 if share >=60% by women)			1.101** (0.4478)	1.259 (0.9784)		
GENDER 2 (female ownership, 0 - 100%)					0.00883** (0.0043)	0.0238** (0.0111)
EDUC (=1 if Diploma or Above)	-0.162 (0.3195)	0.514 (0.6661)	-0.150 (0.3153)	0.646 (0.6953)	-0.179 (0.3171)	0.660 (0.6606)
TRAIN (=1 if owner has TVET)	-0.727** (0.3208)	-1.452** (0.6527)	-0.829** (0.3307)	-1.045* (0.6295)	-0.752** (0.3262)	-1.242* (0.6832)
EXP (Years of prior business experience)	0.0522** (0.0253)	-0.00912 (0.0298)	0.0518** (0.0252)	-0.000778 (0.0292)	0.0516** (0.0258)	-0.0109 (0.0292)
FIRM AGE	-0.0596 (0.0673)	0.158 (0.1394)	-0.0508 (0.0673)	0.106 (0.1220)	-0.0566 (0.0669)	0.108 (0.1322)
FIRM AGE SQUARED	0.000891 (0.0016)	-0.00268 (0.0028)	0.000640 (0.0016)	-0.000928 (0.0025)	0.000779 (0.0016)	-0.00149 (0.0027)

BEVTIN	0.391	-0.187	0.327	-0.0882	0.352	-0.0546
	(0.2907)	(0.6796)	(0.2986)	(0.6680)	(0.2927)	(0.7030)
<b>INFCOMP (No obstacle is the base category)</b>						
Minor Obstacle	-0.579	-0.718	-0.541	-1.278	-0.570	-1.045
	(0.4814)	(0.9714)	(0.4708)	(1.0064)	(0.4764)	(0.9368)
Moderate Obstacle	-0.0215	-0.590	0.00868	-0.799	-0.0300	-0.585
	(0.4860)	(0.7858)	(0.4946)	(0.7459)	(0.4900)	(0.8055)
Major Obstacle	-1.184***	0.0848	-1.142***	0.0658	-1.150***	-0.0228
	(0.4016)	(0.8180)	(0.4005)	(0.7650)	(0.4023)	(0.8133)
Constant	-1.748	-7.231	-1.676	-5.808	-1.583	-5.352
	(2.1116)	(5.6680)	(2.1503)	(5.2971)	(2.1210)	(5.5408)
<b>Marginal effect of gender</b>	<b>0.1549</b>	<b>0.3075</b>	<b>0.2142</b>	<b>0.2598</b>	<b>0.0017</b>	<b>0.0047</b>
<i>N</i>	243	72	243	72	243	72

Robust standard errors in parentheses, \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Results in Table 4.5 shows that estimated gender coefficients are significantly positive and different for the two firm groups, except in Model 4. The most plausible reason for the insignificance coefficient of the gender variable in Model 4 is a lower sample size. In this model, we use a strict definition of gender and there is very limited variation in the data. In terms of magnitude, the average marginal effect of gender is higher in the medium and large firms than micro and small ones (bottom row of Table 4.5).

## 5 Conclusion

The Ethiopian economy has been growing and sustaining such economic growth requires strong domestic resource mobilisation, mainly boosting its tax revenue. Domestic resource mobilisation through the form of taxation is a vital tool to finance government budgets and speed up economic growth. However, the amount of collected taxes is still below the expected level in Ethiopia. This is mainly caused by the existence of widespread tax evasion, corruption, and limited administrative and enforcement capacity. In the absence of enforcement capacity, increasing tax revenues and financing development expenditures in developing countries, like Ethiopia, usually depends on the capacity of policymakers to harness individuals' civic mindedness, social norms, reciprocity and cultural values of trust. However, how social values, norms and individual behavioural differences can play a role in reducing tax evasion needs empirical evidence.

In line with this, our study aims to explore the role of business owners' gender on tax compliance in Ethiopian enterprises. This study also aims at scrutinising whether firm size has different implications on the tax compliance behaviour of male and female owned enterprises.

To address these objectives, we combine tax audit registry data with survey data we collected from 408 enterprises. The estimation results from the logit model reveal a statistically significant difference in the tax compliance behaviour of enterprises owned by men and women. Controlling for different covariates including firm characteristics, ownership characteristics and business environment factors, the results confirm the commonly held view that female owned enterprises are, on average, more likely to be compliant than their male counterparts. Moreover, tax compliance behaviour of enterprises is also size dependent. From the result, it is evident that the probability of being tax compliant significantly declines as firm size increases, irrespective of firm owners' gender. There is also robust evidence that female owned businesses become relatively

more compliant than male owned businesses in larger size businesses, than in smaller ones.

The result of the study implies that, policies aimed at improving tax administration system, introducing new tax enforcement and audit practices should consider the behavioural difference between male and female owners. Moreover, it is also necessary to improve women business participation in the country for equity concerns and as minimising tax evasion is one of the multifaceted social benefits of encouraging women entrepreneurs.

# References

- Allingham, M. G. and Sandmo, A. (1972) 'Income Tax Evasion: A Theoretical Analysis', *Journal of Public Economics*, 1.3-4: 323-338
- Amanda A. and Frida I. (2018) 'Is Tax Avoidance Affected by Firm Size? A Study of The Relationship Between Effective Tax Rates and Firm Sizes of Swedish Listed Firms', Masters dissertation, Jönköping University, Jönköping International Business School, Business Administration
- Ameyaw, B. and Dzaka, D. (2016) 'Determinants of Tax Evasion: Empirical Evidence from Ghana', *Modern Economy* 7.14: 1653-1664
- Andreoni, J. and Vesterlund, L. (2001) 'Which Is the Fair Sex? Gender Differences in Altruism', *The Quarterly Journal of Economics* 116.1: 293-312
- Barber, B. M. and Odean, T. (2001) 'Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment', *The Quarterly Journal of Economics* 116.1: 261-292
- Barsky, R. B., Juster, F. T., Kimball, M. S. and Shapiro, M. D. (1997) 'Preference Parameters and Behavioural Heterogeneity: An Experimental Approach in The Health and Retirement Study', *The Quarterly Journal of Economics* 112.2: 537-579
- Beron, K. J., Tauchen, H. V. and Witte, A. D. (1992) 'The Effect of Audits and Socioeconomic Variables on Compliance' in J. Slemrod (ed.), *Why People Pay Taxes*, Ann Arbor: University of Michigan Press
- Besley, T. and Persson, T. (2014) 'Why Do Developing Countries Tax So Little?' *Journal of Economic Perspectives* 28.4: 99-120
- Bird, R. M. (1989) 'The Administrative Dimension of Tax Reform in Developing Countries', in Malcolm Gillis (ed.) *Tax Reform in Developing Countries*, Durham: Duke University Press
- Braithwaite, J. (1989) 'Crime, Shame and Reintegration', Cambridge: Cambridge University Press.
- Bruce, A. C. and Johnson, J. E. (1994) 'Male and Female Betting Behaviour: New Perspectives', *Journal of Gambling Studies* 10.2: 183-198
- Bruno, R. L. (2019) 'Tax Enforcement, Tax Compliance and Tax Morale in Transition Economies: A Theoretical Model', *European Journal of Political Economy* 56: 193-211
- Byrnes, J. P., Miller, D. C., and Schafer, W. D. (1999) 'Gender differences in risk taking: a meta-analysis', *Psychological Bulletin* 125.3: 367-383
- Cadsby, C. B., Maynes, E. and Trivedi, V. U. (2006) 'Tax Compliance and Obedience to Authority at Home and in the Lab: A New Experimental Approach', *Experimental Economics* 9.4: 343-359
- Carnahan, M. (2015) 'Taxation Challenges in Developing Countries', *Asia & the Pacific Policy Studies* 2.1: 169-182
- Chung, J. and Trivedi, V. U. (2003) 'The Effect of Friendly Persuasion and Gender on Tax Compliance Behaviour', *Journal of Business Ethics* 47.2: 133-145

- D'Attoma, J., Volintiru, C. and Steinmo, S. (2017) 'Willing to Share? Tax Compliance and Gender in Europe And America', *Research & Politics* 4.2: 1-10
- Dollar, D., Fisman, R. and Gatti, R. (2001) 'Are women really the "fairer" sex? Corruption and women in government', *Journal of Economic Behavior & Organization* 46.4: 423-429
- Eagly, A. H. and Crowley, M. (1986) 'Gender and Helping Behaviour: A Meta-Analytic Review of the Social Psychological Literature', *Psychological Bulletin* 100.3: 283-308
- Eckel, C. C. and Grossman, P. J. (1998) 'Are women less selfish than men?: Evidence from dictator experiments', *The Economic Journal* 108.448: 726-735
- Federal Democratic Republic of Ethiopia (2016) 'Federal Income Tax Proclamation No.979/2016', *FEDERAL NEGARIT GAZETTE* 22<sup>nd</sup> Year No.104, Addis Ababa 18<sup>th</sup> August, 2016
- FeMSEDA (2011) 'Fderal Micro and Small Enterprises Development Agency Establishment Council of Ministries Regulation No. 201/2011', *FEDERAL NEGARIT GAZETTE* 17<sup>th</sup> Year No.24, Addis Ababa 23<sup>rd</sup> March, 2011
- Filippin, A., Fiorio, C. V. and Viviano, E. (2013) 'The Effect of Tax Enforcement on Tax Morale', *European Journal of Political Economy* 32: 320-331
- Friedland, N., Maital, S. and Rutenberg, A. (1978) 'A Simulation Study of Income Tax Evasion', *Journal of Public Economics* 10.1: 107-116
- Gërzhani, K. (2007) 'Explaining Gender Differences in Tax Evasion: The Case of Tirana, Albania', *Feminist Economics* 13.2: 119-155
- Glover, S. H., Bumpus, M. A., Sharp, G. F. and Munchus, G. A. (2002) 'Gender differences in ethical decision making', *Women in Management Review* 17. 5: 217-227
- Gneezy, U., Niederle, M. and Rustichini, A. (2003) 'Performance in Competitive Environments: Gender Differences', *The Quarterly Journal of Economics* 118.3: 1049-1074
- Goertzel, T. (1983). 'The Gender Gap: Sex, Family Income and Political Opinions in the Early 1980's', *JPMS: Journal of Political and Military Sociology* 11.2: 209-222
- Greene, W. H. (2003) *Econometric Analysis*, India: Pearson Education India.
- Joulfaian, D. (2000) 'Corporate Income Tax Evasion and Managerial Preferences', *Review of Economics and Statistics*, 82.4: 698-701
- Kasipillai, J. and Abdul-Jabbar, H. (2006) 'Gender and Ethnicity Differences in Tax Compliance', *Asian Academy of Management Journal* 11.2: 73-88
- Kastlunger, B., Dressler, S. G., Kirchler, E., Mittone, L. and Voracek, M. (2010) 'Sex Differences in Tax Compliance: Differentiating Between Demographic Sex, Gender-Role Orientation, and Prenatal Masculinization (2D: 4D)', *Journal of Economic Psychology* 31.4: 542-552
- Kinsey, K. A. (1992) 'Deterrence and Alienation Effects of IRS Enforcement: An Analysis of Survey Data', in J. Slemrod (ed.) *Why People Pay Taxes*, Ann Arbour: University of Michigan Press
- Kirchler, E. and Maciejovsky, B. (2001) 'Tax Compliance Within the Context of Gain and Loss Situations, Expected and Current Asset Position, and Profession', *Journal of Economic Psychology* 22.2: 173-194



National Bank of Ethiopia (2011) 'Annual Report 2010/11', <https://nbebank.com/annual-report/> (accessed December 2019)

Ones, D. S. and Viswesvaran, C. (1998) 'Gender, Age, and Race Differences on Overt Integrity Tests: Results Across Four Large-Scale Job Applicant Datasets', *Journal of Applied Psychology* 83.1: 35

Prichard, W., Custers, A., Dom, R., Davenport, S. and Roscitt, M. (2019) 'Innovations in Tax Compliance: Conceptual Framework', Washington D.C.: The World Bank

Reiss, M. C. and Mitra, K. (1998) 'The effects of individual difference factors on the acceptability of ethical and unethical workplace behaviors', *Journal of Business Ethics* 17.14: 1581-1593

Scholz, J. T. and Pinney, N. (1995) 'Duty, Fear, and Tax Compliance: The Heuristic Basis of Citizenship Behaviour', *American Journal of Political Science* 39.2: 490-512

Siegfried, J. (1972) 'The Relationship Between Economic Structure and The Effect of Political Influence: Empirical Evidence from The Corporation Income Tax Program' Ph.D. dissertation (University of Wisconsin), reported in Stickney and McGee (1982).

Slemrod, J. and Yitzhaki, S. (2002) 'Tax Avoidance, Evasion, and Administration' in A. J. Auerbach and M. Feldstein (eds.) *Handbook of Public Economics*, Amsterdam: Elsevier

Smith, K. W. (1992) 'Reciprocity and Fairness: Positive Incentives for Tax Compliance. In Why People Pay Taxes: Tax Compliance and Enforcement (The University of Michigan Press, Ann Arbor), 223–250.

Smith, K. W. and Stalans, L. J. (1991) 'Encouraging tax compliance with positive incentives: A conceptual framework and research directions', *Law & Policy* 13.1: 35-53

Spicer, M. W. and Hero, R. E. (1985) 'Tax evasion and heuristics: A research note', *Journal of Public Economics* 26.2: 263-267

Torgler, B. and Valev, N. T. (2010). 'Gender and public attitudes toward corruption and tax evasion', *Contemporary Economic Policy* 28.4: 554-568

World Bank (2015) 'World Bank Enterprise Survey', <https://login.enterprisesurveys.org/content/sites/financeandprivatesector/en/library.html#/content/dam/wbgassetshare/enterprisesurveys> (accessed December 2019)

# Appendix

## Appendix 1

### Marginal effects from the Logit Models

Models	Variables	dy/dx	Std.Err	z	P>  z	[90% C.Interval]	
Model 2	AGE	0.0290	0.0159	1.82	0.068	0.0028	0.0551
	AGE SQUARED	-0.0003	0.0002	-2	0.046	-0.0006	-0.0001
	GENDER	0.1977	0.0535	3.7	0	0.1098	0.2857
	EDUC	0.0008	0.0573	0.01	0.989	-0.0935	0.0951
	TRAIN	-0.1798	0.0530	-3.39	0.001	-0.2670	-0.0926
	EXP	0.0059	0.0035	1.68	0.094	0.0001	0.0117
	FIRM AGE	-0.0009	0.0119	-0.07	0.942	-0.0205	0.0188
	FIRM AGE SQUARED	0.0000	0.0003	-0.01	0.992	-0.0005	0.0004
	Ln (PERWORK)	-0.0458	0.0212	-2.16	0.031	-0.0808	-0.0109
	BEVTIN	0.0675	0.0530	1.27	0.203	-0.0197	0.1547
<b>INFCOMP (No obstacle is the base category)</b>							
	Minor Obstacle	-0.1049	0.0820	-1.28	0.201	-0.2399	0.0300
	Moderate Obstacle	-0.0525	0.0729	-0.72	0.471	-0.1725	0.0674
	Major Obstacle	-0.1933	0.0662	-2.92	0.004	-0.3023	-0.0844
Model 2	AGE	0.0286	0.0161	1.77	0.077	0.0020	0.0551
	AGE SQUARED	-0.0003	0.0002	-1.89	0.059	-0.0006	0.0000
	GENDER 1	0.2362	0.0742	3.18	0.001	0.1141	0.3584
	EDUC	-0.0007	0.0578	-0.01	0.99	-0.0957	0.0943
	TRAIN	-0.1874	0.0535	-3.5	0	-0.2754	-0.0995
	EXP	0.0052	0.0036	1.44	0.149	-0.0007	0.0110
	FIRM AGE	-0.0009	0.0121	-0.07	0.943	-0.0207	0.0190
	FIRM AGE SQUARED	0.0000	0.0003	0.01	0.99	-0.0005	0.0005
	Ln (PERWORK)	-0.0386	0.0216	-1.79	0.074	-0.0741	-0.0030
	BEVTIN	0.0611	0.0538	1.13	0.257	-0.0275	0.1496
<b>INFCOMP (No obstacle is the base category)</b>							
	Minor Obstacle	-0.1111	0.0802	-1.38	0.166	-0.2430	0.0209
	Moderate Obstacle	-0.0544	0.0754	-0.72	0.471	-0.1784	0.0696
	Major Obstacle	-0.1864	0.0662	-2.82	0.005	-0.2953	-0.0776
Model 4	AGE	0.0275	0.0161	1.71	0.087	0.0011	0.0539
	AGE SQUARE	-0.0003	0.0002	-1.87	0.062	-0.0006	0.0000
	GENDER 2	0.0024	0.0007	3.2	0.001	0.0012	0.0036
	EDUC	0.0009	0.0578	0.02	0.988	-0.0941	0.0959
	TRAIN	-0.1813	0.0540	-3.36	0.001	-0.2701	-0.0925
	EXP	0.0058	0.0036	1.61	0.108	-0.0001	0.0117
	FIRM AGE	-0.0015	0.0120	-0.13	0.899	-0.0212	0.0182
	FIRM AGE SQUARE	0.0000	0.0003	0.04	0.964	-0.0004	0.0005
	Ln (PERWORK)	-0.0462	0.0212	-2.18	0.029	-0.0811	-0.0114
	BEVTIN	0.0639	0.0539	1.19	0.236	-0.0248	0.1525
<b>INFCOMP (No obstacle is the base category)</b>							

	Minor Obstacle	-0.1084	0.0813	-1.33	0.182	-0.2422	0.0253
	Moderate Obstacle	-0.0553	0.0749	-0.74	0.461	-0.1785	0.0680
	Major Obstacle	-0.1933	0.0665	-2.91	0.004	-0.3028	-0.0839

**Note:** N=315, Dependent variable is tax compliance (=1 if a firm is compliant and =0 otherwise), Model VCE is Robust.