

A large, abstract geometric graphic on the left side of the cover. It consists of several overlapping, angular shapes in shades of yellow, orange, and teal, creating a dynamic, layered effect. The shapes are outlined in a light teal color.

**Working Paper 165**

**Does Competition from  
the Informal Sector  
Reduce Tax Compliance  
in the Formal Sector?  
Evidence from Ethiopia**

Seid Yimam, Fissaha Asmare  
& Mick Moore

July 2023

ICTD Working Paper 165

# **Does Competition from the Informal Sector Reduce Tax Compliance in the Formal Sector? Evidence from Ethiopia**

Seid Yimam, Fissaha Asmare and Mick Moore

July 2023

**Does Competition from the Informal Sector Reduce Tax Compliance in the Formal Sector? Evidence from Ethiopia**

Seid Yimam, Fissaha Asmare and Mick Moore

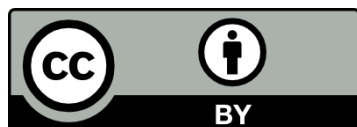
ICTD Working Paper 165

First published by the Institute of Development Studies in July 2023

© Institute of Development Studies 2023

ISBN: 978-1-80470-113-3

DOI: [10.19088/ICTD.2023.023](https://doi.org/10.19088/ICTD.2023.023)



This is an Open Access paper distributed under the terms of the Creative Commons Attribution 4.0 International license (CC BY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original authors and source are credited and any modifications or adaptations are indicated. <http://creativecommons.org/licenses/by/4.0/legalcode>

Available from:

The International Centre for Tax and Development at the Institute of Development Studies, Brighton BN1 9RE, UK

Tel: +44 (0) 1273 606261

Email: [info@ictd.ac](mailto:info@ictd.ac)

Web: [www.ictd.ac/publication](http://www.ictd.ac/publication)

Twitter: @ICTDTax

Facebook: [www.facebook.com/ICTDtax](http://www.facebook.com/ICTDtax)

IDS is a charitable company limited by guarantee and registered in England

Charity Registration Number 306371

Charitable Company Number 877338

# Does Competition from the Informal Sector Reduce Tax Compliance in the Formal Sector? Evidence from Ethiopia

Seid Yimam, Fissaha Asmare and Mick Moore

## Summary

It is widely believed that the existence of 'informal sector' enterprises that visibly do not pay direct taxes reduces the willingness of owners of formal, tax-registered enterprises to pay their own taxes. We call this the *adverse evasion spillover hypothesis*. It is for several reasons hard to test this hypothesis, especially in this most general form. We test a more focused version, with two components. One is that the levels of tax compliance of formal firms are reduced when those firms perceive that they are adversely affected by direct economic competition from informal enterprises. The other is that these effects are especially marked for smaller formal sector firms. Two particular procedures enabled us to collect the data needed to test these hypotheses in a satisfactory way. First, the Ethiopian Ministry of Revenue kindly gave us access to ten years of their administrative data relating to a representative sample of 408 tax-registered firms located in Addis Ababa. Because these records included information on whether firms had been penalised for attempts to understate their tax obligations, we were able to divide our sample into two groups of more and less compliant firms. We then surveyed the owners of those firms, adding in questions about their perceptions of the extent to which they felt adversely affected by competition from informal enterprises, but giving no hint that we were especially interested in tax compliance, or that we had access to their tax compliance record. Our two hypotheses were validated. The more that formal, tax-registered firms perceived that they faced market competition from informal enterprises, the lower were their levels of tax compliance. This adverse impact of perceived competition on tax compliance was greater for smaller formal, tax-registered enterprises.

**Keywords:** informal sector, competition, formal businesses, tax compliance, Ethiopia.

**Seid Yimam** is a Research Associate at the International Centre for Tax and Development.

**Fissaha Asmare** is a junior researcher and PhD fellow at Vilnius University, Faculty of Economics and Business Administration.

**Mick Moore** is a Senior Fellow at the International Centre for Tax and Development and a Professorial Fellow at the Institute of Development Studies.

# Contents

	Summary	3
	Acknowledgements	5
	Acronyms	5
	<b>Introduction</b>	<b>6</b>
<b>1</b>	<b>Data and research methods</b>	<b>7</b>
<b>2</b>	<b>Methods of analysis</b>	<b>9</b>
<b>3</b>	<b>Results and discussion</b>	<b>9</b>
	3.1 Informal competition and tax compliance	9
	3.2 Who feels the competitive pressure and how does that correlate with tax compliance?	11
	3.3 Firm size, perception of informal sector competition and tax compliance	12
<b>4</b>	<b>Conclusion</b>	<b>14</b>
	<b>Appendix</b>	<b>15</b>
	<b>References</b>	<b>17</b>
<b>Tables</b>		
Table 1	Logistic regression result: marginal effects	11
Table 2	Marginal effects of perceived competition on tax compliance across firm size	13
Table 3	Logit model estimation results by firm size group: marginal effects	13
Table A1	Definition, variable description, and descriptive statistics	15
Table A2	Correlation coefficient of business environment factors and perception about the fairness of the MoR	16
Table A3	Determinants of perception on competition from the informal sector ordered logit estimation result	16
<b>Figure</b>		
Figure 1	How do formal firms' perceptions of competitive practices in the informal sector vary across firm size?	12

# Acknowledgements

This study was funded by the International Centre for Tax and Development (ICTD) in close collaboration with the Ethiopian Tax Research Network (ETRN). We extend our gratitude to the institutions and individuals who supported us with resources, logistics and invaluable guidance throughout the whole process of undertaking the study. We would like to acknowledge and thank our research mentor, Dr Giovanni Occhiali, for his invaluable inputs, comments and suggestions from the very beginning to the end of the study, and Dr Giulia Mascagni for her continued encouragement and constructive comments. Comments and suggestions from two anonymous reviewers were also helpful in improving the quality of our study and they deserve our heartfelt thanks. Last, but not least, we are also very grateful for advice, follow-up and logistic facilitation that we received whenever necessary from the whole ICTD team.

# Acronyms

AESH	Adverse evasion spillover hypothesis
BIT	Business income tax
MoR	Ministry of Revenue

# Introduction

The existence of ‘informal sector’ enterprises that visibly do not pay formal or direct taxes is widely believed to reduce the willingness of owners of formal, tax-registered enterprises to pay their own taxes. This phenomenon is thought to be most widespread in lower-income countries, where informal sector enterprise tends to be most visible. It would be surprising if there were no truth in these claims. We know that one of the standard factors that affects tax compliance in virtually any context is the extent to which actual or potential taxpayers perceive that other people like them are paying their fair share of taxes (Bobek, Hageman and Kelliher 2013; Luttmer and Singhal 2014; Alm, Bloomquist and McKee 2017; Prichard 2022). If some (‘informal’) enterprises are understood not to be paying taxes, then similar enterprises that are registered with the tax administration surely will be more likely to try to evade some of their potential tax burdens. Let us label this general idea the *adverse evasion spillover hypothesis* (henceforth AESH). If it is valid, it makes sense for tax administrations to make more efforts to register and tax informal firms, even if the scope to collect more revenue directly from those informal firms is limited. Visibly bringing them into the tax net should have positive tax compliance effects on tax-registered firms.

However, it is not easy to test the validity of the AESH. When owners of tax-registered firms attempt to justify their own attempts at tax evasion on the grounds that informal enterprises are even worse evaders, they could be simply grasping at a very convenient rationalisation for something they would have done anyway. In most public situations, some degree of guilt or shame is attached to intentional tax evasion. These are emotive issues. We cannot put much faith in the explanations that survey respondents give to justify their own tax evasion.<sup>1</sup> So how then can we research AESH? In the research reported here, we find objective measures of the tax compliance of individual firms from the administrative records of the Ethiopian tax administration. That procedure is explained in detail in Section 1. We also test a more focused version of the basic AESH hypothesis that the existence of tax-avoiding informal firms reduces tax compliance among formal firms. Our operational hypothesis is that formal sector compliance is undermined by the perceived degree of direct economic competition from informal firms.

Previous researchers have explored this idea. A number of research papers indicate some kind of causal connection between the extent to which firms face market competition and their propensity to evade taxes or remain in the informal, underground or shadow economy. Karlinger (2009, 2014) finds macro-level evidence that increasing levels of market competition result in increases in the size of the informal economy. Amin and Okou (2020) and Beltrán (2020) find that the productivity levels of formal firms are adversely affected by competition from the informal sector. Distinguin, Rugemintwari and Tacneng (2016) and Williams and Bezeredi (2018) find similar adverse effects on the rate of growth of the sales of formal sector firms.

However, attempts to directly test the hypothesis that market competition from informal firms reduces levels of tax compliance among tax-registered firms have foundered because of the scarcity of reliable data on tax compliance. Damayanti and Matasik (2021) measure tax compliance using data from World Bank enterprise surveys relating to the number of days over the previous year when firms were visited by tax inspectors. This is problematic for two

---

<sup>1</sup> In principle, an alternative approach to testing the AESH would be to shift focus from individual taxpayers and look instead at how changes over time in the incidence of informal economic activity affect the tax compliance of tax-registered firms. If we could track changes over time in the proportion of economic activity that is informal within either one tax jurisdiction or, better, a set of jurisdictions (provinces, countries), we could search for visible effects on overall tax compliance. In practice, we do not have sufficient reliable data on the incidence of informal economic activity for this to be a viable research procedure at present. Further, we do not have sufficiently reliable time series data on the quality of tax administrations to determine whether changes in compliance reflect changes in the effects of perceptions of informal tax evasion or changes in the performance of tax administrations.

reasons. First, on what basis can we assume that more inspections indicate lower tax compliance? Second, the original survey procedures and classifications resulted in 99 per cent of firms being categorised as *partially compliant* (i.e. receiving some tax inspector visits, but for fewer than 30 days over the year), and fewer than 1 per cent as either fully compliant or non-compliant. There is insufficient variation in the tax compliance measure for statistical purposes. Gokalp, Lee and Peng (2017) use an even less reliable measure of tax compliance. In the World Bank enterprise surveys, firm representatives were asked to estimate ‘the percentage of total sales they would estimate the typical establishment in their area of activity reports for tax purposes’. The answer is taken to indicate the extent of tax evasion by the respondent firm. That is clearly unsatisfactory.

The research reported here uses more direct and reliable measures of tax compliance (Section 1). It also tests a more differentiated version of the idea that it is perceived competition from informal firms that reduces tax compliance among formal firms. Firms labelled ‘informal’ are generally perceived to be small (Gonzalez and Lamanna 2007). It seems likely that the perception that they do not pay tax will have the greatest adverse effects on the level of tax compliance of tax-registered enterprises that are themselves small. Using enterprise data for 6,466 formal manufacturing firms across 14 countries in Latin America, Gonzalez and Lamanna found that the formal firms most affected by head-to-head competition with informal firms largely resemble those informal firms: ‘They are small, credit constrained, underutilize their productive capacity, serve smaller customers, and are in markets with low entry costs’ (Gonzalez and Lamanna 2007, Abstract). Similarly, Ali and Najman (2015) report for 31 sub-Saharan African countries that smaller formal firms perceive higher levels of competition from informal sector operators.

The version of the AESH that is tested in this paper has two components:

- The more that formal, tax-registered firms perceive that they face market competition from informal enterprises, the lower will be their levels of tax compliance (Hypothesis 1).
- This adverse impact of perceived competition on tax compliance will be greater for smaller formal, tax-registered enterprises (Hypothesis 2).

## 1 Data and research methods

To collect the data to test these hypotheses, we began with the records relating to the payment of business income tax (BIT) maintained by the Ministry of Revenue. BIT is a very significant tax in Ethiopia. In 2018/19 it accounted for 22 per cent of the total tax revenue collected in the country (NBE 2019).<sup>2</sup> The ministry’s BIT records covered 11,457 unique business establishments in the capital city, Addis Ababa. From them, we randomly selected for our research a 3.7 per cent sample of 408 enterprises. We believe that our sample is representative of registered businesses in the capital, especially sole proprietorships and private limited companies. We used a standard definition from the Federal Micro and Small Enterprises Development Agency (FeMSEDA 2011) to divide our 408 firm sample into two groups: 243 micro and small businesses and 72 medium and large businesses.<sup>3</sup> For the ten-year period 2008 to 2018, we extracted annual administrative data on the tax declarations that each firm had filed; the amount of BIT returns and if these tax returns were assessed by

---

<sup>2</sup> According to the Federal Income Tax Proclamation number 979/2016, article 20 (1) ‘the taxable business income of a taxpayer for a tax year shall be the total business income less the total deductions for the year’. Taxable business income is determined based on profit and loss, as reported in the income statement. The BIT rate for business entities (e.g. sole proprietorship, PLC, share company) is a flat 30 per cent. The rates applicable to individuals and micro enterprises vary from 0 per cent up to 35 per cent depending on the level of taxable business income.

<sup>3</sup> Micro and small enterprises have up to 30 permanent employees while medium and large enterprises have more than 30.



the tax department of the MoR; and records of any penalties levied, with reasons. These records of tax returns assessment or audit and penalties were vital, because they enabled us to produce a relatively objective measure of actual tax compliance, firm by firm. The procedure for doing that requires some explanation.

The Ethiopian Ministry of Revenue checks and audits tax returns fairly thoroughly. It also levies penalties quite frequently. Over the ten years for which we collected administrative data, every one of our 408 sample enterprises was penalised at least once. But these penalties are often levied for technical or logistical failings on the part of taxpayers that are hard to avoid and may have no connection with attempts to under-report tax liabilities. For example, filing and payment systems are not digitised, so taxpayers sometimes opt to pay fines for late filing and late payments to avoid long queues at peak times. We exclude these kinds of technical penalties from our measure of tax compliance. Our measure is based on the levying of fines for under-reporting taxable income, following audit. Conceptually, tax compliance is a continuous variable. But we do not have the sample size and the data needed to reliably measure it as a continuous variable. We use a simple binary classification. Firms that had been fined for under-reporting taxable income at any point in the period 2008 to 2018 were defined as 'non-compliant'. Those that had never been fined for this reason were defined as 'compliant'. In the analysis, compliance was allocated a value of 1, and non-compliance 0. Like all measures of tax compliance, ours is imperfect. It is, however, almost certainly more accurate than information obtained by interviewing taxpayers.<sup>4</sup>

After collecting both basic identifying data and tax penalty records for our sample of 408 formal enterprises, we then organised a survey, which was conducted between 16 August and 7 September 2019. The interviews were conducted by trained enumerators, who were provided with a cooperation letter from the Ethiopian Development Research Institute (now Policy Studies Institute), a semi-autonomous research think tank. The only firm-specific information given to the enumerators was registered business names and locations. They did not know the basis on which we chose the firm sample. We did everything possible to prevent either enumerators or interviewees suspecting that the survey was linked to taxation issues. Our survey instrument looked like a standard enterprise survey.<sup>5</sup> In addition to a number of questions about the characteristics of the sample firms and their owners, respondents were asked: 'the extent to which they think practices of competitors in the informal sector were an "obstacle" for their business'. Following other researchers (Gonzalez and Lamanna 2007; Mathias, Lux, Crook, Autry and Zaretzki 2015; Gokalp *et al.* 2017), we used a four-point Likert scale, with answers ranging from 1, indicating 'no obstacle' to 4, indicating a 'major obstacle'.

The answers to this last question are central to this research. It is vital therefore that they are accurate. In addition to the quality of the interviews, this depends on the interviewees having a clear and common understanding of the term 'informal sector'. In many countries, this would not be the case. 'Informal sector' and 'informality' are often used abstractly, and lack formal definition.<sup>6</sup> Ethiopia is different. All business enterprises are legally required to register for a business licence that is renewable on an annual basis with either the local or the national government authority. Further, registering with any of these tax authorities is at least

---

<sup>4</sup> Laboratory experiments to assess tax compliance use pseudo setups and most field experiments also involve tax administrations, like sending letters and text messages. These too could distort taxpayers' true response (Kangave, Mascagni and Moore 2018; Kangave, Waiswa and Sebagala 2021).

<sup>5</sup> At the end of the interview, the enumerators did ask some standard, indirect questions that could in principle be used to rank the respondent firms according to their attitudes to tax compliance. The answers are not used in this analysis.

<sup>6</sup> The core of the original notion of 'informal economy' was economic operators who were in some sense not registered with or legible to government agencies. But that is in practice ambiguous, and increasingly so. Any single enterprise might be known and recorded with official agencies for some purposes (e.g., cell phone ownership, for water and electricity supplies, having some kind of land title, paying a local property tax or waste disposal charge) but not for others (e.g., no formal address, not having a business registration certificate, not being registered with the national tax authority, etc.) (Medvedev and Oviedo Silva 2015; Williams and Shahid 2016; Moore 2021; Berkel and Tarp 2022).

formally a condition for receipt of a business licence. The term ‘informal firms’ therefore has a clear meaning for Ethiopians: it refers to firms registered neither for a business licence nor with tax authorities for a tax identification number (TIN). There is a standard Amharic term, which we used in our interviews. Our interviewees can have been in little doubt about the intended meaning.

## 2 Methods of analysis

Our research objective was to empirically estimate whether and how far perceived competition from informal firms correlated with the probability that our respondents – the formal firms – had a history of tax non-compliance. To address these objectives, we estimate the log-odds-ratios and marginal effects from binary and ordered logit models. Other control covariates in our probability model include business owner characteristics (age, sex, training, education, and prior business experience), firm-specific characteristics (firm size, firm age, and sector dummies), and business environment factors (business environment index and perception of informal competition).

We employ two approaches to further examine if the correlation between perceived competition from informal firms and formal firm tax compliance varies across firm sizes. The first one is estimating the marginal effect of formal firms’ perception of informal competition on their tax compliance across different firm sizes. We capture firm size by the logarithm of the number of full-time permanent employees in the firm. The results should indicate whether the estimated tax compliance effect of the perception of competition from informal firms varies among firms of different sizes.

In our second approach, we undertake a separate estimation of the correlation between formal firms’ perceptions of informal competition and their tax compliance for each of our two categories of respondent firms (243 micro and small businesses and 72 medium and large businesses).

## 3 Results and discussion

This section presents and discusses the main results of our study. First, we present estimation results from the binary logit models to examine whether perceived informal sector competition reduces the tax compliance of tax-registered firms. Second, we present evidence that the correlation between (a) formal firms’ perceived competition from informal firms and (b) tax compliance history significantly varies across firms’ sizes. In estimating our models, we account for firm characteristics, business environment factors, and business owner characteristics that are expected to determine tax compliance. The description of these variables together with descriptive statistics is provided in Table A1 in the appendix.

### 3.1 Informal competition and tax compliance

To model the correlation between informal competition and tax compliance, we estimate a binary logit model contingent on different covariates that determine compliance. We define informal competition in three different ways in our analysis. First, we consider it as an ordinal variable and include it in the model with a value that ranges from zero up to four. Column one of Table 1 presents estimation results using this definition. Second, we consider informal competition as a dummy variable where one represents informal competition as ‘a major obstacle’ and zero otherwise. Finally, we use a dummy variable for informal competition but

in this case, one represents 'an obstacle' of any intensity and zero 'no obstacle'. In Table 1, column two, and column three, we present the estimation results using the last two definitions of perceived competition from informal firms, respectively.

In all the estimated models we find that perceptions of the degree of informal sector competition influence tax compliance negatively and significantly, though with varying degrees of significance and magnitude. In the first model, where we define the perceived competition from informal sector enterprises as an ordinal categorical variable, 'no obstacle' is used as a base category. The result is that, compared to firms that perceive informal competition as not an 'obstacle' for their business, the likelihood of being tax compliant is significantly lower by 19 percentage points for firms that perceive informal competition as 'a major obstacle'. In the second model, the probability of being tax compliant is lower by 16 percentage points for firms that perceive informal competition as 'a major obstacle' than firms that presume informal competition as 'moderate, minor, or no obstacle'.

Finally, measuring informal competition such that all firms that perceive any level of obstacle are lumped together only reduces the significance of the estimated coefficient. Tax compliance is still found negatively correlated with the incidence of informal competition.

All in all, our results are very consistent with the hypothesis that perceptions of competition from informal firms significantly reduce tax compliance on the part of firms registered for taxes. There are at least two different explanations for this finding. Because we are simply using correlations, we cannot assess causation, i.e. the extent to which either is valid:

- Formal firms that face more competition from informal firms might be making lower profits, and thus feel more motivated to evade tax.<sup>7</sup>
- Competitive pressure from informal firms not paying tax might erode the trust of legitimate taxpaying firms in the tax authorities and lead them to resent the unfairness. The correlation analysis presented in Table A2 of the appendix provides suggestive evidence for this. The formal firms' perception of the Ministry of Revenue's fairness is negatively related to the firm's perception of informal competition and various business environment factors, like tax administration, easiness of application for tax refunds, and tax returns.

---

<sup>7</sup> For example, Amin and Okou (2020) show that the labour productivity of formal firms that face competition from informal firms is about 25 per cent lower than the productivity of formal firms that do not experience that competition.

**Table 1 Logistic regression result: marginal effects**

	Model 1	Model 2	Model 3
<b>Informal competition (Base: not an obstacle)</b>			
A minor obstacle	-0.097 (0.4139)		
A moderate obstacle	-0.028 (0.3971)		
A major obstacle	-0.190*** (0.3435)		
Informal competition (1=major obstacle, 0=otherwise)		-0.156*** (0.2710)	
Informal competition (1=obstacle, 0=not obstacle)			-0.121* (0.3061)
<b>How easy/difficult to pay tax (Base: very easy)</b>			
Easy	-0.298*** (0.6139)	-0.302*** (0.6157)	-0.292*** (0.6246)
Difficult	-0.306*** (0.6517)	-0.306*** (0.6563)	-0.291*** (0.6638)
Very difficult	-0.228** (0.6932)	-0.221** (0.6954)	-0.229** (0.7014)
<b>Owner and firm-related characteristics</b>			
AGE	0.026 (0.0810)	0.024 (0.0804)	0.026 (0.0816)
AGE SQUARED	-0.000* (0.0008)	-0.000* (0.0008)	-0.000* (0.0008)
GENDER	0.003*** (0.0039)	0.003*** (0.0039)	0.003*** (0.0039)
EDUC	0.012 (0.2807)	0.008 (0.2825)	0.010 (0.2781)
TRAIN	-0.193*** (0.2909)	-0.188*** (0.2884)	-0.203*** (0.2900)
EXP	0.005 (0.0175)	0.006* (0.0174)	0.005 (0.0175)
FIRM AGE	-0.005 (0.0586)	-0.005 (0.0579)	-0.005 (0.0587)
FIRM AGE SQUARED	0.000 (0.0013)	0.000 (0.0013)	0.000 (0.0013)
ln(PERWORK) <sup>8</sup>	-0.043** (0.1083)	-0.039* (0.1063)	-0.037* (0.1079)
BENVNIN <sup>9</sup>	0.091* (0.2715)	0.083 (0.2620)	0.073 (0.2757)
<b>N</b>	<b>315</b>	<b>315</b>	<b>315</b>

Note: Robust standard errors in parentheses, \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .  
Dependent variable: compliance (1=compliant, 0=non-compliant).

### 3.2 Who feels the competitive pressure and how does that correlate with tax compliance?

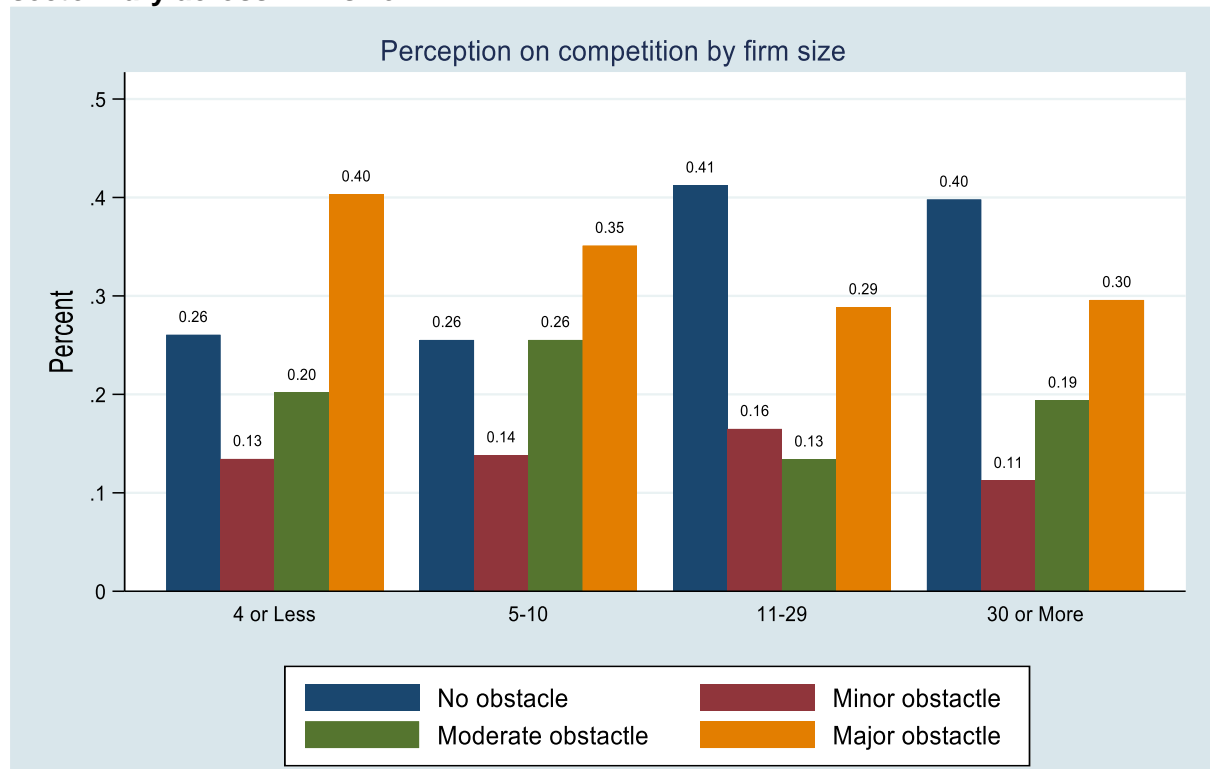
Figure 1 presents the distribution of our sample firms by size (number of permanent employees) according to their reported perceptions of the degree to which they suffer from competitive pressure from the informal sector.<sup>10</sup> A clear pattern emerges. The smallest firms are most likely to perceive competition from the informal sector as 'a major obstacle' to their economic viability, and least likely to perceive it as 'no obstacle'.

<sup>8</sup> Logarithm of the number of full-time permanent employees in the firm (ln(PERWORK)) is used as firm size indicator variable in this study.

<sup>9</sup> Business environment index (BENVNIN) is calculated from 15 business environment factors. We ask respondents to rate to what extent access to foreign currency, access to finance, access to land, corruption, courts, crime theft and disorder, customs and trade regulations, tax administration, tax rates, business licensing and permits, macro-economic instability, the functioning of the judiciary, lack of skilled labour force, transport, and electricity are an obstacle for their business. 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 a 'major obstacle' for one's business operation.

<sup>10</sup> For this purpose, we treat the 72 medium and large businesses in our sample as one group, and allocate the 243 micro and small businesses among three groups. The four groups are thus approximately equal in size.

**Figure 1 How do formal firms' perceptions of competitive practices in the informal sector vary across firm size?**



We then estimate an ordered logistic regression model that measures the relationship between firm size and the perception of competitive pressure from the informal sector. In this model, the dependent variable is formal firms' perception of the extent to which competition from informal sector firms is 'an obstacle' to their business. It is an ordinal variable rated as one 'no obstacle', two 'a minor obstacle', three 'a moderate obstacle', and four 'a major obstacle'. The estimation results are in Table A3 in the appendix. They reveal that formal firms' perception of informal sector competition negatively and significantly correlates with firm size. The larger the size of the firm, the lower the likelihood that its owners perceive informal sector competition as a major challenge. This finding accords with what we know about the business activities of formal and informal sector firms respectively. The latter tend to be concentrated in smaller scale activities with lower fixed costs. They are therefore more vulnerable to competition. This was the finding of the 2003 survey by the Central Statistical Authority on urban informal employment in Ethiopia.<sup>11</sup>

### 3.3 Firm size, perception of informal sector competition, and tax compliance

To understand how the correlation between competition perception and tax compliance varies across firm size, we follow two approaches.

The first approach involves estimating the marginal effects of competition perception levels on tax compliance for different firm sizes. In this case, we compute marginal effects from the three models in Table 1 at the 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentile of the firm size variable,  $\ln(\text{PERWORK})$ . Table 2 presents the results.

<sup>11</sup> The survey revealed that the top three areas of activity for informal sector firms were: crafts and related trades workers (49 per cent); elementary occupations including selling goods in the street, in public places or from door to door and providing various street services (25 per cent); and service workers and shop and market sales workers (21 per cent) (CSA 2003).

**Table 2 Marginal effects of perceived competition on tax compliance across firm size**

Firm size (number of permanent workers)	Marginal effects		
	Model 1	Model 2	Model 3
25 <sup>th</sup> quantile (4)	-0.185***	-0.151***	-0.117**
50 <sup>th</sup> quantile (10)	-0.193***	-0.157***	-0.122**
75 <sup>th</sup> quantile (29)	-0.200***	-0.163***	-0.126**

Note: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

The marginal effect of perceived competition on tax compliance increases in absolute terms as firm size increases. For instance, formal businesses that perceive competition from the informal sector as 'a major obstacle' for their businesses are 18.5 percentage points less likely to be tax compliant than those formal firms with a perception that the practice of competition in the informal sector is 'not an obstacle at all'. The likelihood of being tax non-compliant is relatively higher in the larger firms, averaging 19.27 and 20.03 percentage points in the 50<sup>th</sup> and 75<sup>th</sup> quantiles, respectively (Model 1). Even if the magnitude varies, similar trends are also shown in the last two columns of Table 2 (from Model 2 and Model 3). These results suggest that even though owners of relatively larger firms are less likely to perceive informal sector competition as a challenge for their business (Figure 1), as the number of permanent workers increases (firms get relatively larger), they react marginally stronger with non-compliance than the smaller firms.

The second approach is estimating separate models for two groups of firms of different sizes: the 243 micro and small enterprises that each employ up to 29 permanent workers; and the 72 medium and large enterprises that each employ 30 or more workers. Table 3 provides the estimation results for these two categories of firms.

**Table 3 Logit model estimation results by firm size group: marginal effects**

Variables	Micro and small firms	Medium and large firms
Informal competition (1=major obstacle, 0=otherwise)	-1.039***(0.3162)	0.222 (0.7202)
<b>How easy/difficult to pay tax (Base: very easy)</b>		
Easy	-2.154***(0.7040)	-1.263 (1.3921)
Difficult	-2.116***(0.7497)	-1.129 (1.4764)
Very difficult	-1.928***(0.7881)	0.332 (1.5976)
AGE	0.101 (0.0963)	0.237 (0.2596)
AGE SQUARED	-0.00128 (0.0010)	-0.00202 (0.0024)
GENDER	0.0120***(0.0047)	0.0268***(0.0114)
EDUC	-0.197 (0.3199)	0.600(0.7928)
TRAIN	-0.962****(0.3602)	-1.151*(0.6576)
EXP	0.0600***(0.0266)	-0.028 (0.0318)
FIRM AGE	-0.0618 (0.0686)	0.0435 (0.1334)
FIRM AGE SQUARED	0.00074 (0.0015)	-0.00054 (0.0027)
BENVIN	0.514*(0.2980)	-0.328 (0.6560)
Constant	0.495 (2.2662)	-5.524 (6.9334)
<b>N</b>	<b>243</b>	<b>72</b>

Note: Robust standard errors in parentheses, \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$   
 Dependent Variable: compliance (1=compliant, 0=non-compliant)

The significant and negative correlation between competition from the informal sector and the tax compliance levels of formal firms persists for micro and small-sized formal firms (see column 1 in Table 3). This implies that smaller formal firms face a relatively stronger competition pressure from similar businesses operating in the informal sector and would likely tend to evade tax, particularly by understating their taxable incomes.

Results in Table 3 also show that the perceived competition from informal firms does not significantly correlate with the tax compliance of medium and larger firms. This may be mainly either because medium and large firms do not face strong competition from the informal sector, or they find it more difficult to evade taxes (Dabla-Norris, Gradstein and Inchauste 2008). The fact that the sample size of firms in this group is small also calls for

caution about interpreting the results. However, Figure 1 above has already revealed that larger firms were much less likely than smaller firms to report competition from the informal sector as a problem.

## 4 Conclusion

There are good reasons from the literature on tax compliance to expect that visible tax avoidance on the part of informal firms will reduce the levels of tax compliance on the part of formal, tax-registered firms. It is however very challenging actually to test that hypothesis, partly for lack of reliable, independent data on levels of tax compliance. Thanks to the cooperation of the Ethiopian Ministry of Revenue, we were able to obtain the right kind of data on tax compliance. Even then, we can only test this general *adverse evasion spillover hypothesis* (AESH) by narrowing it to a more precise hypothesis: that it is perception of the degree of direct economic competition from informal firms that changes the tax compliance behaviour of formal firms. The more that they feel the adverse effects of such competition, the more likely they are to respond by evading their own taxes. That approach to the question in turn allows us to test an extension of that argument: that it is smaller formal tax-registered firms that feel the greatest competition from the informal sector, and therefore informal sector competition will have an especially adverse effect on the tax compliance levels of smaller formal firms. We test two hypotheses:

- The more that formal, tax-registered firms perceive that they face market competition from informal enterprises, the lower will be their levels of tax compliance.
- This adverse impact of perceived competition on tax compliance will be greater for smaller formal, tax-registered enterprises.

Our evidence is that, at least for Addis Ababa, both hypotheses are valid. These results constitute presumptive evidence that the existence of informal firms not registered for business income tax to some degree reduces tax compliance and thus the revenue that government collects even from (small) tax-registered enterprises.

# Appendix

**Table A1 Definition, variable description and descriptive statistics**

Variables	Description	Overall Average	Average (Compliant)	Average (Non-compliant)	Mean Difference
<b>Perception of competition from the informal sector</b>					
Not obstacle	1=not obstacle, 0=otherwise	32.70	21.90	10.79	11.11
Minor obstacle	1=minor obstacle, 0=otherwise	13.70	8.25	5.40	2.85
Moderate obstacle	1=moderate obstacle, 0=otherwise	19.40	13.33	6.03	7.30
Major obstacle	1=major obstacle, 0=otherwise	34.30	20.00	14.29	6.29
<b>Owner and firm characteristics, and business environment</b>					
AGE	Age of the owner in years	45.89	45.51	46.57	-1.06
AGE SQUARED	Age squared of the owner in years	2228.81	2183.47	2307.66	-124.20
GENDER	Female ownership shares from 0% to 100%	28.90	32.03	23.46	8.57**
EDUC	1=if the owner has a diploma or above	61.30	37.46	23.81	13.65
TRAIN	1=owner has Technical and Vocational Education Training (TVET) related to the business	47.00	26.03	20.95	5.08***
EXP	Business experience before starting the business (in years)	6.43	6.79	5.79	1.00
FIRM AGE	Age of the firm in years	13.62	13.35	14.08	-0.73
FIRM AGE SQUARED	Age squared of the firm in years	222.49	212.36	240.11	-27.75
<b>How easy or difficult is it to pay tax?</b>					
Very easy	1=very easy, 0=otherwise	8.60	7.30	1.27	6.03**
Easy	1=easy, 0=otherwise	54.29	32.06	22.22	9.84**
Difficult	1=difficult, 0=otherwise	20.00	12.06	5.08	6.98**
Very difficult	1=very difficult, 0=otherwise	17.14	12.06	5.08	6.98**
ln(PERWORK)	Logarithm of total number of permanent workers	2.63	2.50	2.84	-0.34**
BENVIN	Index of business environment factors	2.54	2.55	2.52	0.03
Compliant=200 (63.49%), Non-compliant=115 (36.51%), * p < 0.05, ** p < 0.01, *** p < 0.001					



**Table A2 Correlation coefficient of business environment factors and perception about the fairness of the MoR**

	MOR_fair	Inf_compn	File return_easy	Apply refund_Easy	Pay tax_easy	Licensing procedu.	Tax rate	Tax_admn
MOR_fair	1.000							
Inf_compn	-0.012	1.000						
File retu_easy	-0.238	0.114	1.000					
Apply refund_Easy	-0.258	0.216	0.378	1.000				
Pay tax_easy	-0.312	0.047	0.733	0.373	1.000			
Licensing procedu.	-0.091	0.147	0.154	0.110	0.147	1.000		
Tax rate	-0.155	0.359	0.275	0.295	0.193	0.120	1.000	
Tax_admn	-0.170	0.264	0.274	0.221	0.195	0.191	0.711	1.000

**Table A3 Determinants of perception on competition from the informal sector, ordered logit estimation result**

Variables	Coefficients	Standard error
The dependent variable (perception on competition) is a categorical		
AGE	0.140**	(0.0636)
AGE SQUARED	-0.00155**	(0.0006)
GENDER	0.00309	(0.0027)
EDUC	-0.491**	(0.2073)
EXP	0.0158	(0.0138)
FIRM AGE	-0.0373	(0.0451)
FIRM AGE SQUARED	0.00153	(0.0012)
ln(PERWORK)	-0.209**	(0.0841)
LEGAL STATUS (1=Individual, 0=PLC)	0.277	(0.2450)
BENVNIN	1.291***	(0.1991)
<b>Sector dummies</b>	<b>Yes</b>	
<b>Number of observations</b>	<b>408</b>	

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

# References

- Ali, N. and Najman, B. (2015) 'Informal Competition and Productivity in Sub-Saharan Africa', in Annual Meeting of the French Economic Association, Rennes, France
- Alm, J., Bloomquist, K.M. and McKee, M. (2017) 'When You Know Your Neighbour Pays Taxes: Information, Peer Effects and Tax Compliance', *Fiscal Studies* 38.4: 587–613
- Amin, M. and Okou, C. (2020) 'Casting a Shadow: Productivity of Formal Firms and Informality', *Review of Development Economics* 24.4L 1610–1630
- Beltrán, A. (2020) 'Informal Sector Competition and Firm Productivity', *Applied Economics Letters* 27.15: 1243–1246
- Berkel, H. and Tarp, F. (2022) 'Informality and Firm Performance in Myanmar', *Journal of Development Studies* 58.2: 1–20
- Bobek, D.D., Hageman, A.M. and Kelliher, C.F. (2013) 'Analyzing the Role of Social Norms in Tax Compliance Behavior', *Journal of Business Ethics* 115.3: 451–468
- Central Statistics Authority (CSA) (2003) Report on Urban Informal Sector Sample Survey, <https://www.statsethiopia.gov.et/wp-content/uploads/2019/06/Urban-Informal-Sector-Sample-Survey-Report-January-2003.pdf>
- Ethiopian Federal Income Tax Proclamation No. 979/2016, Addis Ababa, Ethiopia
- Dabla-Norris, E., Gradstein, M. and Inchauste, G. (2008) 'What Causes Firms to Hide Output? The Determinants of Informality', *Journal of Development Economics* 85.1: 1–27
- Damayanti, T.W. and Matasik, A.L. (2021) 'Market Competition, Fairness and Tax Compliance: The Formal Sector's Perspective', *Journal of International Studies* 14.1
- Distinguin, I., Rugemintwari, C. and Tacneng, R. (2016) 'Can Informal Firms Hurt Registered SMEs' access to credit?', *World Development* 84: 18–40
- FeMSEDA (2011) Federal Micro and Small Enterprises Development Agency Establishment Council of Ministries Regulation No. 201/2011, Federal Negarit Gazette 17<sup>th</sup> Year No. 24, 23 March 2011, Addis Ababa
- Gokalp, O.N., Lee, S.H. and Peng, M.W. (2017) 'Competition and Corporate Tax Evasion: An Institution-based View', *Journal of World Business* 52.2: 258–269
- González, A.S. and Lamanna, F. (2007) *Who Fears Competition from Informal Firms? Evidence from Latin America*, World Bank Policy Research Working Paper No. 4316, Washington, DC: World Bank
- Kangave, J., Mascagni, G. and Moore, M. (2018) *How Do We Research Tax Morale at the Subnational Level?* IDS Working Paper 506, Brighton: Institute of Development Studies
- , Waiswa, R. and Sebaggala, N. (2021) *Are Women More Tax Compliant than Men? How Would We Know?* African Tax Administration Paper 23, Brighton: Institute of Development Studies

- Karlinger, L. (2014) 'The "Dark Side" of Deregulation: How Competition Affects the Size of the Shadow Economy', *Journal of Public Economic Theory* 16.2: 293–321
- (2009) 'The Underground Economy in the Late 1990s: Evading Taxes, or Evading Competition?', *World Development* 37.10: 1600–1611
- Luttmer, E.F. and Singhal, M. (2014) 'Tax Morale', *Journal of Economic Perspectives* 28.4: 149–68
- Mathias, B.D., Lux, S., Crook, T.R., Autry, C. and Zaretzki, R. (2015) 'Competing Against the Unknown: The Impact of Enabling and Constraining Institutions on the Informal Economy', *Journal of Business Ethics* 127.2: 251–264
- Medvedev, D. and Oviedo Silva, A.M. (2015) 'Informality and Profitability: Evidence from a New Firm Survey in Ecuador', *Journal of Development Studies*, 52: 412–427
- Moore, M. (2021) 'Tax Obsessions: Taxpayer Registration and the Informal Sector in Sub-Saharan Africa', *Development Policy Review*, e12649
- National Bank of Ethiopia (NBE) (2019) *Annual Report 2018/19*
- Prichard, W. (2022) *Unpacking 'Tax Morale': Distinguishing Between Conditional and Unconditional Views of Tax Compliance*, ICTD Working Paper 147, Brighton: Institute of Development Studies
- Williams, C.C. and Bezeredi, S. (2018) 'Evaluating the Impact of Informal Sector Competition on Firm Performance: Some Lessons from South-East Europe', *Journal of Developmental Entrepreneurship* 23.04: 1–14
- and Shahid, M.S. (2016) 'Informal Entrepreneurship and Institutional Theory: Explaining the Varying Degrees of (In)formalization of Entrepreneurs in Pakistan', *Entrepreneurship & Regional Development* 28.1–2