

Tax Policy and Household Businesses in Vietnam

Dinh Nguyen*
Anh Pham†

December 2020

[Preliminary draft. Please do not distribute]

Abstract

Small and informal businesses constitute a large fraction of developing economies. This paper examines how a large increase in tax rates affects household businesses in Vietnam, which are a type of small businesses. We use balanced panel data of household businesses and exploit a drastic change in the tax code in 2013–2014 that varied tax rates by industry and locality. Surprisingly, on average, we do not find any evidence for changes in business registration, employment, revenue, and tax payments as a result of the large tax change. Plausibly, many household businesses lacked general understanding of the tax law. Testing this theory, we find that more-educated business owners responded more to the tax change than less-educated business owners. Specifically, when tax rates increased, more-educated owners were less likely to register their business and reduced employment more than less-educated owners.

Keywords: Tax Policy; Informality; Small Businesses; Household Businesses

*Email: dnguyen77@gmu.edu. George Mason University.

†Email: apham16@gmu.edu. George Mason University.

1 Introduction

In many developing countries, small businesses are a large part of the economy. Many small businesses are informal.¹ Thus, there is a great potential for more tax revenue either by increasing the tax rate or broadening the tax base through formalization of the informal firms. Theoretically, formalization might also promote growth because formal businesses have access to government loans and have a broader customer base due to issuing receipts, which in turn might increase tax revenue even more.² On the other side of the spectrum, taxation on small businesses can deter growth because, due to liquidity constraints, these businesses have less money to invest. When a large part of the labor force depends on small businesses, growth deterrence in this sector is consequential. The matter is even more complicated when tax enforcement in developing countries is weak and might be influenced by corruption. Thus, how tax rate changes affect business growth and tax revenue among small businesses in developing countries is an empirical question.

This paper investigates how tax rates affect business registration, activities, and tax revenue of household businesses in Vietnam. Household businesses are small (most of them have only one or two employees, including owners) and located in only one location. In total, household businesses make up about 17 to 30% of GDP and at least 30% of employment in Vietnam.³ We exploit a large change in the Vietnamese tax laws in 2013 and 2014 that, on average, almost doubled tax rates of household businesses in different industries and localities. Some businesses experienced only marginal changes in tax rates, while others experienced their tax rates tripling or quadrupling.

We use censuses of Vietnamese household businesses in 2007, 2012, and 2017 to create a unique firm balanced panel data using business names and addresses. The panel data allow us to track business registration status, employment, sales, and tax payments over time. There are about 500,000 firms in the balanced panel data between 2012 and 2017, and about 300,000 firms between 2007 and 2012. We estimate the effects of the tax changes using 2012–2017 firm balanced panel data. The 2007–2012 data are used for placebo tests.

On average, we do not find any evidence for changes in business registration, employ-

¹Alm and Embaye (2013) estimate that the shadow economy is 37% for lower-middle-income countries, and 38% for low-income countries. Hsieh and Olken (2014) show that in India, Indonesia, and Mexico, 98%, 97%, and 92%, respectively, of firms have fewer than ten employees, and these small firms employ 65%, 54%, and 22%, respectively, of the labor force.

²The prominent theoretical paper is (Levy, 2001). The empirical evidence suggests that formalization has only limited effects on firm growth. Some empirical papers are Bruhn (2010); Kaplan et al. (2011); de Mel et al. (2013).

³See Nguyen (2019), Management (2017), or Truong et al. (2010).

ment, and revenue as a result of the tax change. Coefficients on tax payments are negative but statistically insignificant. Our results are robust to different econometric specifications and measures of tax rates.

One plausible explanation for the average insignificant effects despite the doubling of tax rates is that many businesses might lack general understanding of the tax law and thus might not be aware how the tax change would affect their businesses. To test this theory, we examine businesses with owners with different levels of education and find that more-educated business owners responded more to the tax change than less-educated business owners. Specifically, when tax rates increased, businesses with more-educated owners were less likely to register and reduced employment more than businesses with less-educated owners.

This paper relates to a growing literature on taxation in developing countries, which mainly focuses on tax compliance, rather than firm performance and growth.⁴ The literature of taxation on firm performances in developing countries is much smaller and focuses on large firms, which might have very different behaviors than small firms.⁵ For example, household businesses in Vietnam do not have to adhere to strict accounting rules followed by larger enterprises. In addition, workers in the household businesses possess much lower skills than those employed by larger enterprises.

Evidence of taxes on small businesses in developing countries is even more scant. [Fajnzylber et al. \(2011\)](#); [Monteiro and Assuno \(2012\)](#); [Rocha et al. \(2018\)](#) examine how the SIMPLEST program in Brazil that reduced taxes and entry costs affected business registration. [Rocha et al. \(2018\)](#) find that reducing tax rates (in the presence of low entry costs) increased formalization among entrepreneurs. This effect comes from the formalization of existing informal firms and not from the creation of new formal businesses or greater formal firm survival. Our paper extends the literature by examining a broader set of small businesses, not just entrepreneurs. As a result, besides business registration, we are able to study other dimensions of firm growth such as employment and sales. In addition, data on tax payment allows us to estimate the effect of the tax changes on tax revenue.

Last but not least, our paper advances scholarship by improving data quality in an important way. To our knowledge, this is the first large-scale panel data that track firm registration status over time with several hundred thousand firms. The existing work on informal businesses mostly employs much-smaller-scale survey data.

⁴Some papers are [Brockmeyer et al. \(2019\)](#); [Pomeranz \(2015\)](#); [Slemrod et al. \(2020\)](#); [Waseem \(2020\)](#).

⁵[Bustos et al. \(2004\)](#); [Cai and Harrison \(2017\)](#); [Cerdeira and Larrain \(2010\)](#); [Pham \(2020\)](#).

2 Institutional Background in Vietnam

2.1 Household Businesses

In Vietnam, a household business is a firm run by a household or family that employs fewer than ten workers and operates in a fixed location. If a business does not meet the above criteria, it must be registered as an enterprise. An enterprise can have fewer or more than ten employees but must register and pay taxes regardless of its revenue. Importantly, enterprises must hire an accountant and prepare official accounting documents, whereas household firms do not face such stringent financial oversight and only need to follow a simplified accounting system. According to the law, household businesses must register only if their annual income exceeds a certain threshold.⁶

2.2 The Tax System and Construction of Statutory Tax Rates

The most common taxes for household businesses are the annual license tax, value-added tax (VAT), and personal income tax (PIT). The license tax is a fixed amount per year based on revenue brackets and is relatively small compared to VAT and PIT.⁷ Throughout the years, VAT and PIT for household businesses have been based on revenue.

Before 2014, VAT for household businesses varied across 5-digit industries and geographical regions, and so did PIT for household businesses before 2015. If following the same accounting rule as enterprises, VAT liability is equal to value-added times VAT rate of enterprise. Due to lack of receipts and proper accounting, it is hard to determine value-added of household businesses. Thus, the central government assigned a range of minimum and maximum VAT fractions to calculate value-added income from revenue.⁸ The provincial tax authorities then determined a specific VAT fraction between these minimum and maximum fractions. Thus, in practice, the VAT liability of household business = revenue \times VAT fraction \times VAT rate of enterprise. In this paper, we calculate VAT rates of household businesses before 2014 = VAT fractions \times VAT rates of enterprises, which vary by 5-digit industries and regions.

⁶Before 2008, the threshold was set every year by the central government. From 2008 to 2015, the thresholds varied by year and geographical regions, which were also set by the central government. From 2015 on, the provincial government was responsible to set the registration threshold in its locality (Item 2, Article 66 Decree 78/2015/N-CP). It was unclear what the thresholds were.

⁷See Article 4, Decree 139/2016/ND-CP.

⁸Documentary 763/BTC-TCT issued in January 16, 2009.

Before 2015, the general PIT rate varied by the taxable income bracket.⁹ The central government also assigned a range of minimum and maximum PIT fractions to calculate PIT taxable income from revenue.¹⁰ In a province, the provincial tax authorities then determined a specific PIT fraction between these minimum and maximum fractions. In other words, PIT taxable income = PIT fraction \times revenue.¹¹

To calculate the PIT rate for household businesses based on revenue before 2015 in this paper, we use the revenue variable in the Vietnamese Household Business Survey (VHBS) that we will describe in section 4. We calculate the taxable income by multiplying PIT fraction by revenue. The PIT liability is then determined by the calculated taxable income and the income bracket. The PIT rate for household businesses in our paper is defined as the average PIT rate, which equals PIT tax liability divided by the reported revenue. Thus, the PIT rate for household businesses before 2015 varied by industries, regions, and a firm's revenue.

In this paper, our main VAT and PIT rate variables for household businesses are constructed using the average of the minimum and the maximum fractions assigned by the central government. It is because, unfortunately, we can only retrieve specific provincial VAT and PIT fractions from three provinces (Hanoi, Ho Chi Minh city, and Dong Nai). We report results of using the provincial VAT and PIT rates of these three provinces in the Appendix.

The new VAT and PIT laws were passed in June 2013 (effective as of January 2014) and November 2014 (effective as of January 2015), respectively.¹² The new laws eliminated VAT and PIT fractions. Instead, VAT and PIT rates were adjusted so that tax liabilities of household businesses equaled the tax rates times revenue. In addition, both the VAT and PIT rates are set by the central government and only vary by industries, not region. In practice, businesses do not distinguish between paying a VAT or a PIT, as both taxes have identical rules. Tax deduction is rare and only possible when the owners are terminally ill or when the business is temporarily closed.

Figures 1 and 2 show that, from 2012 to 2017, the average VAT and PIT rates increased quite drastically across the aggregate sectors. For example, in the retail and wholesale sectors, the average VAT rates were about 0.5 percentage points and 1 percentage point in 2012 and 2017, respectively. Also in the retail and wholesale sectors, the average PIT rates were about 0.2 percentage points and 0.5 percentage points in 2012 and 2017, respectively. Overall, the

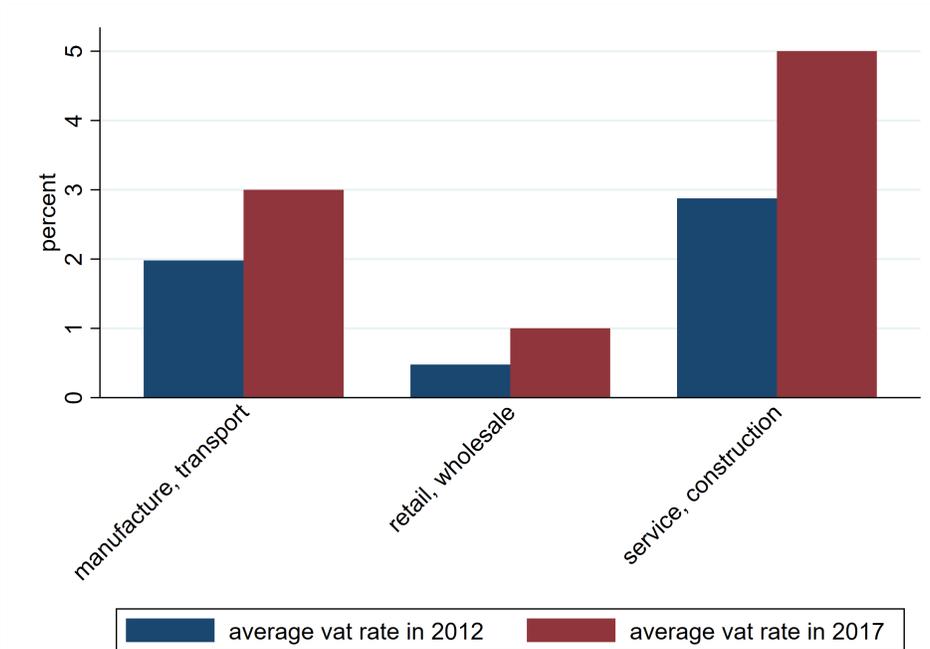
⁹Clause 6, Item 10, Section 1, Chapter 2, Law 04/2007/QH12

¹⁰Documentary 15908/BTC-TCT issued December 26, 2008

¹¹The tax authorities used self-reported information from the businesses and local tax committees to determine the appropriate revenue for each business.

¹²Law 31/2013/QH13 and Law 71/2014/QH13.

Figure 1: VAT Rate by Sector in 2012 and 2017



average VAT rate in 2012 was about 1.3 percentage points in 2012 and 2.2 percentage points in 2017. In addition, the average PIT rates in 2012 and 2017 were about 0.48 percentage points and 1.08 percentage points, respectively.

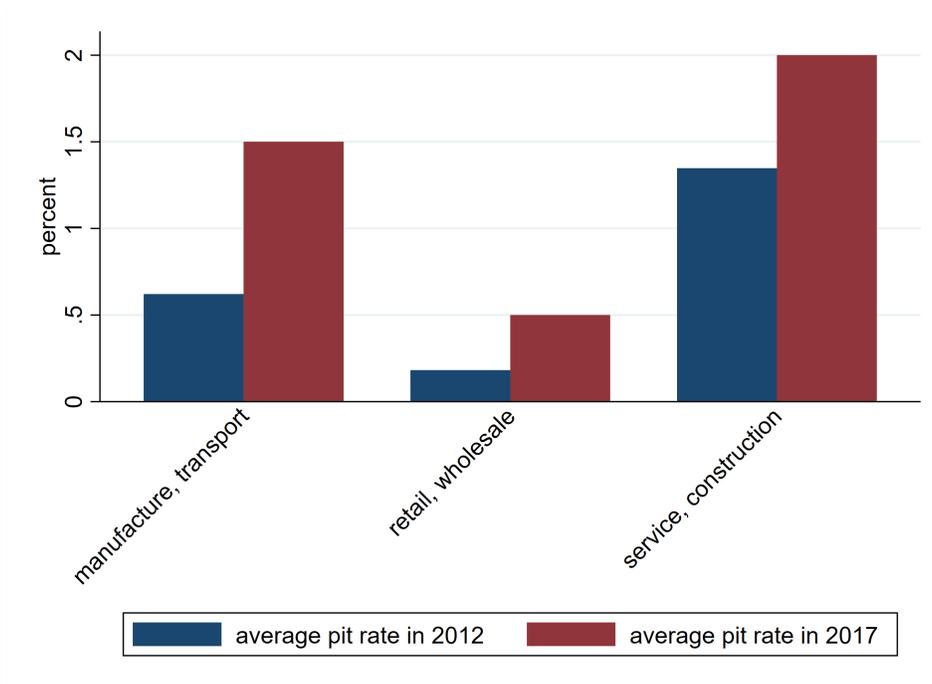
Figure 3 shows the average differences in VAT and PIT rates between 2017 and 2012 by provinces. It is also evident that both tax rates increased by a lot from 2012 to 2017. These increases varied across different provinces, with the average minimum difference of about 0.15 percentage points and the average maximum difference of about 1 percentage point.¹³

Why did Vietnam change the VAT and PIT laws for household businesses in 2013 and 2014? The official reason was that the government wanted to simplify the tax system for household businesses.¹⁴ As explained in the previous paragraphs, it was much more complicated to calculate tax liabilities before the new laws. Unofficially, the Vietnamese government thought household businesses contribute greatly to GDP and thus could be a great source for tax revenue. This could be a motivation to increase the tax rates across the

¹³We create Figures 1, 2, and 3 using the information on statutory tax rates that we collected from reading the tax laws and the VHBS data that will be described in section 4.

¹⁴For example, this official reason was used during the Q&A session between the Ho Chi Minh Tax Office and household businesses in 2015 <https://www.sggp.org.vn/co-quan-thue-tra-loi-ve-quy-dinh-thue-khoan-doi-voi-ho-kinh-doanh-ca-the-165360.html>.

Figure 2: PIT Rate By Sector in 2012 and 2017



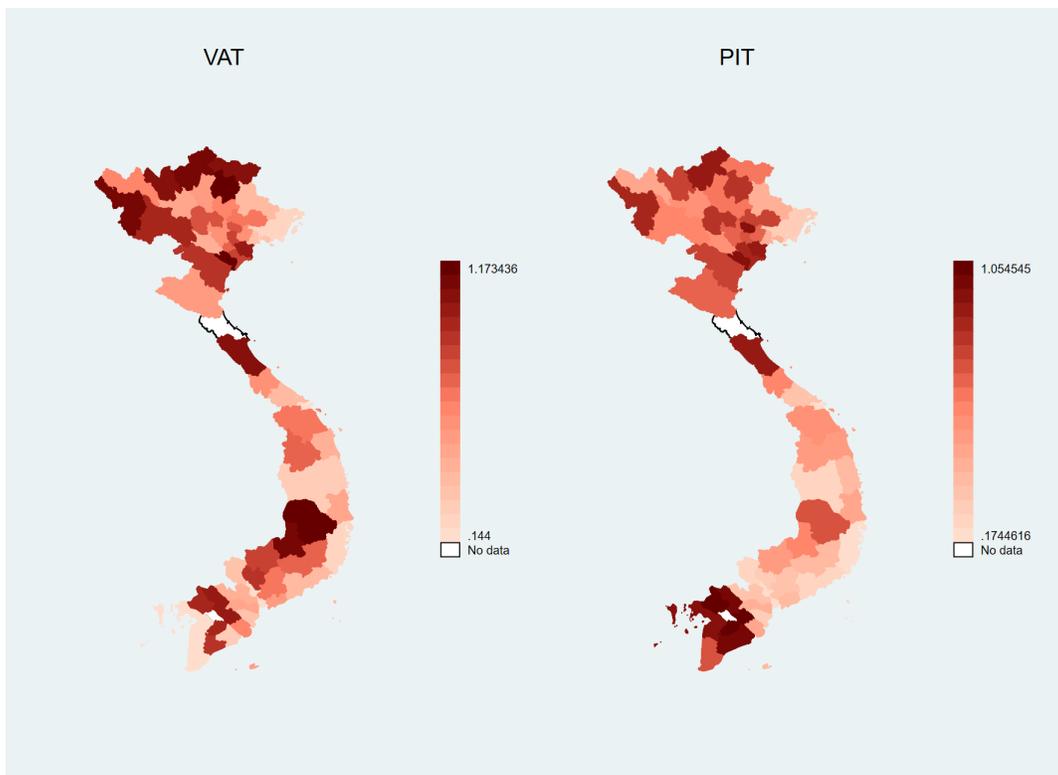
board.

What was the process to pass the new laws? In June 2012, the Ministry of Finance formed a committee to review the tax laws and to draft a proposal of the new VAT law, which was then posted online to collect opinions of experts, government agencies, household businesses, etc.¹⁵ After consulting the opinions, the committees made the necessary changes to the law and submitted it to Congress. Congress passed the VAT law in June 2013 (to be effective in January 2014) and the PIT law in November 2014 (to be effective in January 2015). In practice, it is unclear how much household businesses shaped the laws. As late as 2015, there was a lot of confusion about the new laws that the local tax offices had to clarify and hold Q&A sessions for businesses.¹⁶ Nevertheless, since the committee was not formed until June 2012, we think that household businesses were unaware of the specific changes in the new law as of June 2012. Thus, we do not expect the anticipation effect in 2012. This assumption is key to interpreting our regression results.

¹⁵Decision 1430/Q-BTC on June 7, 2012.

¹⁶The conversations between Ho Chi Minh City tax office and household businesses in a Q&A session in 2015: <https://www.sggp.org.vn/co-quan-thue-tra-loi-ve-quy-dinh-thue-khoan-doi-voi-ho-kinh-doanh-ca-the-165360.html>

Figure 3: The Difference Between VAT and PIT Rate in 2017 and 2012 by Province



3 Theoretical Prediction

When the tax rate increases, businesses would either pay more taxes to the government and/or increase bribes to the tax collectors to avoid paying higher taxes. Either way, businesses would have less money at hand to invest or hire workers if they are financially constrained. Since most small businesses are financially constrained, we expect that revenue and number of workers would decrease as the tax rate increases.

The expectation on business registration is unclear. On the one hand, [Rocha et al. \(2018\)](#) find that a decrease in tax rates increases business registration status, which implies that an increase in tax rates decreases business registration status. On the other hand, [Le et al. \(2020\)](#) find that an increase in corruption increases tax registration status. If an increase in tax rates increases bribes, it would increase business registration.

It is unclear how an increase in tax rates would affect business tax payments to the government. It is because while tax rate is higher, tax base might decrease due to lower business revenue.

4 Vietnamese Household Business Survey (VHBS)

4.1 The Census

The Vietnamese Household Business Survey (VHBS) is the census of all household businesses in Vietnam. It is collected by the General Statistical Office (GSO) of Vietnam to assess local and regional economic development and calculate the official statistical indicators such as Gross Domestic Product (GDP) at the national and local levels. The data is collected in June of 2002, 2007, 2012, and 2017.

We create firm panel datasets of all household businesses by matching the exact street addresses and owner's names. This matching method does not allow us to capture businesses that change locations. Nevertheless, a firm balanced panel between 2012 and 2017 consists of about 500,000 household businesses per year. A firm balanced panel between 2007 and 2012 consists of about 300,000 household businesses each year. Unfortunately, there is some problem with the industry code in 2002, so we cannot use data from 2002.

The Census asks firms questions about firm registration status, number of employees including the owners, and revenue in the first six months of the year. We use all these variables as our dependent variables.

Table 1: Summary Statistics Of VHBS in 2012

	count	mean	sd	min	max
register	504059	0.305	0.460	0.000	1.000
# workers	504059	1.593	0.928	1.000	6.000
revenue	502978	121866.528	209054.281	3900.000	1584000.000
tax liabilities in the first 6 months	10758	1270.713	2679.883	0.000	21700.000
tax liabilities in the first 6 months imputed with 0	12677	1054.619	2327.910	0.000	17838.000
retail, wholesale	504059	0.447	0.497	0.000	1.000
manufacture, transport	504059	0.458	0.498	0.000	1.000
service, construction	504059	0.079	0.270	0.000	1.000
other	504059	0.000	0.000	0.000	0.000

Revenue and tax liabilities are in thousands of VND.

Table 1 shows summary statistics in 2012. About 30% of businesses were registered in 2012. The average number of workers (including owners) was about 1.6. The average tax liabilities for the first six months of 2012 was about 1.3 million VND (or about \$65). The average revenue for the first six months was about 120 million VND (or about \$6000). On the aggregate, about 45% of the firms were in retail or wholesale, 45% were in manufacturing or transportation, and 8% were in services or construction.

4.2 The Sample of Businesses Surveyed for Tax Information

In addition to the 2012 and 2017 household business census, GSO also carried out an extensive survey that selected a random sample of businesses from VHBS. The survey consists of more detailed questions, including information about the amount of taxes that businesses paid. The sample is representative at the national and provincial level.

Thirty-five percent of observations on tax payments are missing. We address the missing-observation concern in the analysis by using both the original data (i.e., allowing for missing values in the reported tax payments) and a version where we impute missing tax observations with zero (in case firms that do not owe any taxes decide not to answer the tax payment questions).

In 2007, all firms were asked about whether they paid VAT. Unfortunately, the 2007 survey does not ask for the tax amount.

4.3 The Reliability of the VHBS

An important discussion is how honestly firms report their tax payments and revenue in the survey. Similar to the majority of “conventional” micro and small enterprise surveys in developing countries, all information collected in the VHBS survey is self-reported and does not come from audit data. Nevertheless, at the beginning of the survey and on tax-related questions, the surveyors remind businesses that the questions are for statistical analysis and not for any tax purposes, which should reduce concerns about misreporting.

In addition, we believe that firms have no incentive to purposely misreport the tax amount that they officially pay to the government, especially when we know that anecdotally, tax collectors give businesses receipts after they pay their taxes. The receipts only include the tax amount and do not have information on a business’s tax rate or revenue.

In terms of the reported revenue, as explained in section 2.2, underreporting revenue for tax purposes is relatively easier in Vietnam than in developed countries because cash transactions are the norm. In fact, it is the only way that household businesses and tax collectors collude to lower a business’s tax payment because there is almost no tax deduction. Nevertheless, we have several reasons to believe that firms are more likely to honestly report their revenue in our survey data, rather than just reporting what legally matches with their tax payment to the tax authorities.

First, our data is survey data and is not the tax administrative data. At the beginning of the survey and before the section asked about taxes, the instructions specifically state that interviewers need to remind business owners that the survey is for statistical and not for tax purposes. Unlike district tax collectors who might not live in the commune, interviewers are residents in the commune who would have a better sense of what is going on. Therefore, businesses would be more willing to reveal their actual revenue in our survey data than when reporting to the tax authority.

Second, based on the information from the survey, we calculate the effective tax rate in 2017 to be the tax payment reported in the first six months divided by revenue in the first six months. Among registered firms, more than 75% of the effective tax rate calculated from the survey are below a business’s statutory total tax rate (combined VAT and PIT statutory tax rates). For example, among registered businesses in an industry with a total statutory tax rate of 1.5 percentage points, the median calculated effective tax rate is 0.63 percentage points. Therefore, in the 2017 survey, it looks like firms did not report revenue and tax payments to match with the statutory tax rates.

5 Empirical Method

We run the following firm fixed effect regressions:

$$Y_{fict} = \beta_f + year_t + \beta_1 TaxRate_{ict} + X_{jt} + X_{pt} + \epsilon_{it} \quad (1)$$

Y_{fict} are household business outcome variables of firm f in industry i at the 5-digit level, commune c , and time t . The variables are business registration indicator (1 if registered and 0 if not), number of workers, $\ln(\text{revenue})$, $\ln(\text{revenue}/\text{worker})$, tax liabilities in the first 6 months, and indicator for whether a firm paid VAT. Number of workers, $\ln(\text{revenue})$, $\ln(\text{revenue}/\text{worker})$, and tax liabilities are winsorized at a 99 percentile. The indicator for whether a firm paid VAT is equal to 1 if the firm already paid VAT and 0 if not paid, did not have to pay, or missing.

β_i is the firm fixed effect. $year_t$ is the year indicator variable.

Since the VAT law was passed in mid-2013 and the PIT law was passed in late 2014, we use the firm balanced panel data between 2012 and 2017 to estimate the main effect of the change in tax rates on business outcomes. Regressions using the firm balanced panel data between 2007 and 2012 are placebo tests.

As explained in the previous section, before 2014, VAT rates varied by industries i and regions c . PIT rates varied by 5-digit industries, regions, and firm's revenue. The PIT rate can be endogenous, especially when the dependent variable is revenue. In the main paper, we only show the regressions using the VAT rates. In the Appendix, we show the IV regression results when we use the VAT rate as an instrument for the total tax rate (VAT rate + PIT rate). The IV regression results in the Appendix are very similar to the reduced form results in the main text.¹⁷

When using the firm balanced panel data between 2012 and 2017, in 2012, $TaxRate_{ict}$ is the VAT rate of a firm in industry i , commune c , and year 2012. In 2017, $TaxRate_{ict}$ is the tax rate in 2017, assuming that the firm in 2017 was in the same industry as in 2012. This alleviates concerns that firms changed industries due to tax rate changes.¹⁸

When using the firm balanced panel data between 2007 and 2012 for placebo tests, we impose $TaxRate_{ict}$ in 2007 to equal the hypothetical tax rates in 2012, and $TaxRate_{it}$ in 2012 to equal the hypothetical tax rates in 2017.

¹⁷PIT rates and VAT rates are highly positively correlated.

¹⁸In the data, only about 5% of the firms changed industries from 2012 to 2017.

X_{jt} is the 2-digit industry-year fixed effect, which captures time trend at the 2-digit industry level. X_{pt} is the province-year fixed effect, which captures time trend at the province level. Standard errors are clustered two-ways at 5-digit industry and commune levels.¹⁹

As explained in the section 2.2, since the tax committee was only formed in June 2012 and the 2012 VHBS was collected in June 2012, we do not expect household businesses in the 2012 VHBS to know about the details of the new law. This assumption is key to interpreting our regression results.

6 Results

6.1 General Results

As mentioned in section 2.1, only household businesses exceeding certain revenue thresholds need to register and pay taxes. Nevertheless, in this section, we first examine all household businesses because businesses might have an incentive to not grow above certain sizes to avoid paying taxes in industries with high tax rates.

Table 2 shows the effects of tax rate changes on business outcomes using firm balanced panel data between 2012 and 2017. Table 3 shows the placebo effects of tax rates on business outcomes using firm balanced panel data between 2007 and 2012. The regression coefficients are interpreted as how much the dependent variables change as a result of a one percentage point increase in the tax rate. As mentioned in section 2.2, the average VAT rate in 2012 was 1.3 percentage points. Thus, a one percentage point increase in the tax rate is equivalent to a very large increase of 75%.

We see that the results of Tables 2 and 3 are similar to each other and are statistically insignificant. Table 9 in the Appendix shows that the IV results when we instrument the total tax rate (which is the sum of the VAT rate and the endogenous PIT rate) with the average VAT rate are similar to the reduced-form results in Table 2. Tables 7 and 8 in the Appendix report results when we run regressions of only three provinces with specific VAT and PIT fractions. Tables 7 and 8 have similar results to results in Tables 2 and 3.

Table 4 shows the effects of tax rate changes on tax payments when using firm balanced panel data between 2012 and 2017. The number of observations drops drastically in Table 4 compared to Table 2. It is because only subsamples of firms in 2012 and 2017 were asked questions about taxes. The dependent variables of the first and second columns are tax

¹⁹Commune is the smallest administrative unit in Vietnam. Provinces oversee communes.

Table 2: The Effects of Tax Rates on Business Outcomes from 2012 to 2017

	(1) register	(2) # workers	(3) ln(#workers)	(4) ln(revenue)	(5) ln(revenue/worker)
Average VAT rate	0.00602 (0.0137)	-0.0125 (0.0368)	-0.0112 (0.0169)	0.0406 (0.0393)	0.0510 (0.0412)
Constant	0.290*** (0.0242)	1.623*** (0.0652)	0.372*** (0.0300)	11.10*** (0.0694)	10.72*** (0.0727)
Observations	953,224	953,224	953,224	947,514	947,514
R-squared	0.761	0.793	0.782	0.818	0.800
2-digit industry-year FE	Yes	Yes	Yes	Yes	Yes
province-year FE	Yes	Yes	Yes	Yes	Yes

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Two-way clustered standard error at the 5-digit industry in 2012 & commune in 2012. Firm balanced panel data between 2012 and 2017. #workers, ln(#workers), ln(revenue), and ln(revenue/worker) are winsorized at the 99 percentile.

Table 3: Placebo: The Effects of Tax Rates on Business Outcomes from 2007 to 2012

	(1) register	(2) # workers	(3) ln(#workers)	(4) ln(revenue)	(5) ln(revenue/workers)
average VAT rate	0.00294 (0.0135)	-0.0231 (0.0264)	-0.00894 (0.0117)	0.0301 (0.0363)	0.0406 (0.0347)
Constant	0.303*** (0.0247)	1.721*** (0.0484)	0.402*** (0.0215)	10.37*** (0.0664)	9.957*** (0.0634)
Observations	574,844	574,844	574,844	571,880	571,880
R-squared	0.781	0.784	0.776	0.832	0.825
2-digit industry-year FE	Yes	Yes	Yes	Yes	Yes
province-year FE	Yes	Yes	Yes	Yes	Yes

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Two-way clustered standard error at the 5-digit industry in 2007 & commune in 2012. Firm balanced panel data between 2007 and 2012. #workers, ln(#workers), ln(revenue), and ln(revenue/worker) are winsorized at the 99 percentile. We impose the tax rate in 2012 for year 2007 and the tax rate in 2017 for year 2012.

liabilities for the first six months of 2012 or 2017 at the 99 percentile. We impute missing tax liabilities with 0 in the second column, while we leave them as missing in the first column. In the third column, the dependent variable is equal to 1 if the firm already paid VAT and 0 if not paid, don't have to pay, or missing. The coefficients in Table 4 are negative but statistically insignificant. The confidence intervals are quite large.

The placebo tests in Table 5 show the effects of tax rate changes on whether the firm paid VAT using panel data between 2007 and 2012. Unfortunately, in 2007, the survey only asked whether firms paid VAT, but did not ask the amount. The number of observations in Table 5 is more than that in Table 4 because the 2007 survey asked all firms whether they paid VAT in 2007, while the 2012 and 2017 surveys only asked a subset of firms. Table 5 shows that the result for whether firms paid VAT because of a hypothetical tax change from 2007 to 2012 is similar to the change from 2012 to 2017 shown in Table 4.

Table 4: The Effects of Tax Rates on Tax Payments from 2012 to 2017

	(1) tax liabilities first 6 months	(2) tax liabilities first 6 months imputed 0	(3) indicator paid VAT
average VAT rate	-381.6 (930.8)	-274.8 (611.4)	-0.0500 (0.100)
Constant	2,920* (1,481)	1,864* (1,060)	0.494*** (0.174)
Observations	1,222	2,176	2,176
R-squared	0.792	0.801	0.764
2-digit industry-year FE	Yes	Yes	Yes
province-year FE	Yes	Yes	Yes

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Two-way clustered standard error at the 5-digit industry in 2012 & commune in 2012. Firm balanced panel data between 2012 and 2017. The dependent variables of the first and second columns are at the 99 percentile. In the second column, we impute missing tax liabilities with 0. In the third column, the dependent variable is equal to 1 if the firm already paid VAT and 0 if not paid, did not have to pay, or missing.

6.2 Plausible Mechanisms

Our insignificant findings in the previous section are quite surprising given a drastic increase in the tax rate. In this section, we discuss several possible explanations for the insignificant

Table 5: Placebo: The Effects of Tax Rates on Tax Payments from 2007-2012

	(1) Indicator paid VAT
Average VAT rate	-0.0389 (0.0302)
Constant	0.467*** (0.0541)
Observations	16,764
R-squared	0.759
2digit industry-year FE	Yes
province-year FE	Yes

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Two-way clustered standard error at the 5-digit industry in 2012 & commune in 2012. Firm balanced panel data between 2007 and 2012. The dependent variable is equal to 1 if the firm already paid VAT and 0 if have not paid, did not have to pay, or missing. We impose tax rates in 2012 for year 2007 and tax rates in 2017 for year 2012.

results. First, it could be that tax enforcement is weak and/or businesses lack understanding of the tax law. Thus, a change in the law does not imply a change in practice. For example, [Tourek \(2020\)](#) points out individuals usually pay the old tax liability, even if the tax code has changed. Second, household businesses might not respond to (dis)incentives like what researchers expected. This reason is quite surprising because small businesses are known to face liquidity constraints. We empirically test the “knowledge” of the tax law below.

We use the business owner’s educational levels as a proxy for knowledge of the tax law. To test whether owners with different educational level responds differently to the tax change, we run the following regression equation:

$$Y_{fict} = \beta_f + year_t + \beta_1 TaxRate_{ict} + \beta_2 Education \times TaxRate_{ict} + X_{jt} + X_{pt} + \epsilon_{it} \quad (2)$$

$Education = 1$ if the owner receives at least a two-year-college degree, and 0 otherwise. The coefficient β_2 is the coefficient of interest.

Column 1 of Panel A in [Table 6](#) shows that when the tax rate increases by 1 percentage point (or 75% increase), businesses with more-educated owners are 2.75 percentage points (10%) less likely to register than businesses with less-educated owners. Column 3 of Panel A in [Table 6](#) shows that when the tax rate increases by 1 percentage point (or 75% increase), businesses with more-educated owners hire 1.75% fewer workers than businesses with less-

Table 6: Placebo: The Effects of Tax Rates on Tax Payments from 2007 to 2012

	(1) register	(2) #workers	(3) ln(workers)	(4) ln(revenue)	(5) ln(rev/workers)
<u>Panel A: 2012-2017</u>					
VAT rate	0.00669 (0.0135)	-0.0114 (0.0369)	-0.0108 (0.0170)	0.0412 (0.0393)	0.0510 (0.0412)
Education&VAT rate	-0.0275*** (0.00981)	-0.0448*** (0.0110)	-0.0178*** (0.00478)	-0.0211 (0.0153)	-6.42e-05 (0.0160)
<u>Panel B: Placebo 2007-2012</u>					
VAT rate	0.00295 (0.0135)	-0.0231 (0.0264)	-0.00892 (0.0117)	0.0302 (0.0363)	0.0407 (0.0347)
Education&VAT rate	-0.000372 (0.0141)	0.000570 (0.0232)	-0.00676 (0.00997)	-0.0320 (0.0290)	-0.0231 (0.0300)
2-digit industry-year FE	Yes	Yes	Yes	Yes	Yes
province-year FE	Yes	Yes	Yes	Yes	Yes

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Two-way clustered standard error at the 5-digit industry in 2012 & commune in 2012. Firm balanced panel data between 2007 and 2012 and from 2012 to 2017.

educated owners.

7 Conclusion

This paper examines the effects of tax rate changes on household business registration, employment, revenue, and tax payments. We use balanced panel data of household businesses and exploit a change in the tax law in 2013–2014 that varied tax rates by industry and locality. We do not find any evidence for changes in business activities and tax payments.

One plausible explanation for the insignificant results is the lack of understanding about the tax law. Thus, a change in the law does not imply the change in practice. In fact, we find that businesses with more-educated owners responded more to the tax change than businesses with less-educated owners. The government might want to take into account the knowledge and understanding about the tax law when designing a policy.

References

- Alm, James and Abel Embaye, "Using Dynamic Panel Methods to Estimate Shadow Economies Around the World, 1984-2006:," *Public Finance Review*, April 2013. Publisher: SAGE Publications Sage CA: Los Angeles, CA.
- Brockmeyer, Anne, Spencer Smith, Marco Hernandez, and Stewart Kettle, "Casting a Wider Tax Net: Experimental Evidence from Costa Rica," *American Economic Journal: Economic Policy*, August 2019, *11* (3), 55–87.
- Bruhn, Miriam, "License to Sell: The Effect of Business Registration Reform on Entrepreneurial Activity in Mexico," *The Review of Economics and Statistics*, July 2010, *93* (1), 382–386.
- Bustos, Alvaro, Eduardo M. R. A. Engel, and Alexander Galetovic, "Could higher taxes increase the long-run demand for capital? Theory and evidence for Chile," *Journal of Development Economics*, April 2004, *73* (2), 675–697.
- Cai, Jing and Ann Harrison, "Industrial Policy in China: Some Unintended Consequences?," 2017.
- Cerda, Rodrigo A. and Felipe Larrain, "Corporate taxes and the demand for labor and capital in developing countries," *Small Business Economics*, February 2010, *34* (2), 187–201.
- de Mel, Suresh, David McKenzie, and Christopher Woodruff, "The Demand for, and Consequences of, Formalization among Informal Firms in Sri Lanka," *American Economic Journal: Applied Economics*, April 2013, *5* (2), 122–150.
- Fajnzylber, Pablo, William F. Maloney, and Gabriel V. Montes-Rojas, "Does formality improve micro-firm performance? Evidence from the Brazilian SIMPLES program," *Journal of Development Economics*, March 2011, *94* (2), 262–276.
- Hsieh, Chang-Tai and Benjamin A. Olken, "The Missing Missing Middle," *Journal of Economic Perspectives*, August 2014, *28* (3), 89–108.
- Kaplan, David S., Eduardo Piedra, and Enrique Seira, "Entry regulation and business start-ups: Evidence from Mexico," *Journal of Public Economics*, December 2011, *95* (11), 1501–1515.
- Le, Duong Trung, Edmund Malesky, and Anh Pham, "The impact of local corruption on business tax registration and compliance: Evidence from Vietnam," *Journal of Economic Behavior & Organization*, September 2020, *177*, 762–786.
- Levy, Santiago, "Good Intentions, Bad Outcomes," 2001.
- Management, Center Institute For Economic, "Executive Summary: Formalization of Household Businesses in Vietnam," 2017.
- Monteiro, Joana C. M. and Juliano J. Assuno, "Coming out of the shadows? Estimating the impact of bureaucracy simplification and tax cut on formality in Brazilian microenterprises," *Journal of Development Economics*, September 2012, *99* (1), 105–115.

- Nguyen, Hoa Thai, “How large is Vietnam’s informal economy?,” *Economic Affairs*, 2019, 39 (1), 81–100.
_eprint: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/ecaf.12328>.
- Pham, Anh, “Effects of temporary corporate income tax cuts: Evidence from Vietnam,” *Journal of Development Economics*, September 2020, 146, 102476.
- Pomeranz, Dina, “No Taxation without Information: Deterrence and Self-Enforcement in the Value Added Tax,” *American Economic Review*, August 2015, 105 (8), 2539–2569.
- Rocha, Rudi, Gabriel Ulyssea, and Lasa Rachter, “Do lower taxes reduce informality? Evidence from Brazil,” *Journal of Development Economics*, September 2018, 134, 28–49.
- Slemrod, Joel, Obeid Ur Rehman, and Mazhar Waseem, “How Do Taxpayers Respond to Public Disclosure and Social Recognition Programs? Evidence from Pakistan,” *The Review of Economics and Statistics*, May 2020, pp. 1–44.
- Tourek, Gabriel, “Targeting in Tax Behavior: Evidence from Rwandan Firms,” *Working Paper*, 2020, p. 91.
- Truong, Trong, Thien Tran, Dung Pham, and Binh Le, “The Non-Farm Household Business Sector in Vietnam,” 2010.
- Ulyssea, Gabriel, “Firms, Informality, and Development: Theory and Evidence from Brazil,” *American Economic Review*, August 2018, 108 (8), 2015–2047.
- Waseem, Mazhar, “The Role of Withholding in the Self-Enforcement of a Value-Added Tax: Evidence from Pakistan,” *The Review of Economics and Statistics*, August 2020, pp. 1–44.

8 Appendix

Table 7: Tax Rates on Business Outcomes from 2012 to 2017 in 3 Provinces

	(1)	(2)	(3)	(4)	(5)
	register	# workers	ln(#workers)	ln(revenue)	ln(revenue/workers)
VAT rate	0.0109 (0.00991)	-0.00214 (0.0228)	-0.00405 (0.00971)	0.0464** (0.0204)	0.0491** (0.0198)
Constant	0.328*** (0.0194)	1.922*** (0.0446)	0.515*** (0.0190)	11.38*** (0.0398)	10.87*** (0.0387)
Observations	173,578	173,578	173,578	172,698	172,698
R-squared	0.798	0.801	0.793	0.808	0.790
2-digit industry-year FE	Yes	Yes	Yes	Yes	Yes
province-year FE	Yes	Yes	Yes	Yes	Yes

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Two-way clustered standard error at the 5-digit industry in 2012 & commune in 2012. Firm balanced panel data between 2012 and 2017 of Hanoi, Ho Chi Minh City, Dong Nai, the three provinces with specific information on VAT and PIT fractions. #workers, ln(#workers), ln(revenue), and ln(revenue/worker) are winsorized at the 99 percentile.

Table 8: Placebo: Tax Rates on Business Outcomes from 2007 to 2012 in 3 Provinces

	(1) register	(2) # workers	(3) ln(#workers)	(4) ln(revenue)	(5) ln(revenue/workers)
VAT rate	-0.00376 (0.00989)	-0.0134 (0.0225)	-0.0146 (0.0107)	0.0273 (0.0291)	0.0447* (0.0247)
Constant	0.395*** (0.0201)	2.092*** (0.0456)	0.594*** (0.0218)	10.80*** (0.0591)	10.19*** (0.0502)
Observations	104,156	104,156	104,156	103,878	103,878
R-squared	0.811	0.791	0.789	0.818	0.809
2-digit industry-year FE	Yes	Yes	Yes	Yes	Yes
province-year FE	Yes	Yes	Yes	Yes	Yes

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Two-way clustered standard error at the 5-digit industry in 2012 & commune in 2012. Firm balanced panel data between 2007 and 2012 of Hanoi, Ho Chi Minh City, Dong Nai, the three provinces with specific information on VAT and PIT fractions. #workers, ln(#workers), ln(revenue), and ln(revenue/worker) are winsorized at the 99 percentile. We impose tax rates in 2012 for year 2007 and tax rates in 2017 for year 2012.

Table 9: Tax Rates on Business Outcomes: IV Regressions from Data 2012 to 2017

	(1) register	(2) #workers	(3) ln(#workers)	(4) ln(revenue)	(5) ln(revenue/workers)
Average Total Tax Rate	0.00491 (0.0105)	-0.00944 (0.0288)	-0.00922 (0.0134)	0.0194 (0.0308)	0.0265 (0.0329)
Observations	948,940	948,940	948,940	947,514	947,514
R-squared	0.000	-0.000	-0.000	0.001	0.001
2-digit industry-year FE	Yes	Yes	Yes	Yes	Yes
province-year FE	yes	yes	yes	yes	yes

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Two-way clustered standard error at the 5-digit industry in 2012 & commune in 2012. Firm balanced panel data between 2012 and 2017. #workers, ln(#workers), ln(revenue), and ln(revenue/worker) are winsorized at the 99 percentile. Average total tax rate, which is the sum of VAT rate and PIT rate, is instrumented by average VAT rate. The F-test rejects the weak instrument.