

Wealth Taxes and Firms' Capital Structures: Credit Supply and Real Effects*

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Abstract

We study the financial and real effects of an unexpected wealth tax reform in Colombia associated to climate affectations that included a large proportion of small medium enterprises (SMEs) as new taxpayers. We employ a unique administrative dataset composed by the universe of corporate credit (bank-firm-loan level data) from credit registry matched with firms' and banks' balance-sheet data and with confidential tax reports at the firm and bank levels. The tax information at the firm level allows us to accurately identify taxpayers and non-taxpayers of the wealth tax. The change in the wealth tax base is associated with lower bank credit and significantly higher loan rates, especially for high-leveraged taxpayers, consistent with a reduction of bank risk-taking in the segment of firms affected by the reform. We find that affected firms increased the reliance on trade credit as a potential substitution of bank credit. We also identify that the new taxpayers exhibited substantial real effects (i.e., lower indebtedness, income, investments, and capital accumulation) compared to non-taxpayers, especially those with high leverage. Our findings suggest that taxing wealth of SMEs has significant implications on their capital structures and real outcomes as those firms are highly dependent on bank credit.

JEL: G21, G28, F34, E32

Keywords: Wealth taxes, firms' capital structure, bank credit, trade credit, real effects.

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1. Introduction

Taxing wealth has been used by governments in both advanced and emerging economies to increase revenues, substitute other taxes, encourage the use of productive capital, and reduce wealth inequality (Rudnick and Gordon, 1996; Piketty, 2014; Perret, 2018; Saez and Zucman, 2019; Guvenen et al., 2019; Adam and Miller, 2021; Scheuer and Slemrod, 2021). From optimal taxation, and assuming equal rate of returns on assets, a tax rate on capital income can be equivalent to a wealth tax rate (Saez and Zucman, 2019). Based on this equivalence, literature on taxation and its impacts on firms and individuals focuses on the capital income tax, rather than on the wealth tax; even though, this equivalence does not hold when returns are heterogeneous, as shown by Guvenen et al. (2019, 2022). Corporate income taxes tend to increase firms' leverage by increasing debt finance, since interest payments are deductible from the tax base (Gertler and Hubbard, 1990; Rajan and Zingales, 1995; Faccio and Xu, 2015, Heider and Ljungqvist, 2015). However, little is known on how taxing wealth affects firms' leverage or the firms' sources of financing such as bank credit and trade credit, and its associated real effects.

This paper studies the financial and real effects of the 2010 wealth tax reform (i.e., reform to the *Impuesto al Patrimonio*) in Colombia. The wealth tax reform took place during a “serious public calamity” due to climate change affectations that demanded more public revenues, according to authorities. It was introduced under the declaration of the “state of economic, social, and ecological emergency” by a presidential decree on December 29, and put in place since January 1, 2011. The government established a one-off wealth tax on financial, non-financial firms and individuals, which contrasted with the wealth tax of many advanced economies where it was imposed only on individual's wealth. The reform consisted in the extension of the tax base by including new taxpayers defined as firms with reported wealth between COP 1 billion and COP 3 billion (i.e., around USD 285,000 and USD 860,000, respectively). The number of wealth taxpayer firms increased from 3,441 firms in 2010 to 11,118 firms in 2011 (i.e., 7,677 new taxpayers, 2.23 times the number of taxpayers of the previous year). Consequently, government tax revenues from the wealth tax increased by 90 percent (from 0.4% of GDP to 0.7% of GDP between 2010 and 2011), while their participation in the total tax revenues raised from 3% to 5%. Remarkably, 94% of taxpayers were corporations.

These figures suggest that the wealth tax reform was effective in increasing the number of taxpayers firms and the government's tax revenues, consistent with recent evidence on changes in

corporate taxes on developing economies (Bachas and Soto, 2021). However, from the taxpayers' perspective, this was a fiscal shock with potential financial and real effects, which are the focus of this study. On average, the wealth tax accounted for 27 percent of the total tax payment in 2011 (i.e., the fiscal year of the tax reform). Therefore, we answer the following questions: i) Can changes in wealth tax affect the supply of bank credit and the reliance on trade credit in SMEs? and, ii) What are the associated real effects of the wealth tax reform on SMEs?

To answer these questions, we employ difference-in-difference (D-in-D) methods to compare the effects of the wealth tax reform among similar SMEs that only differs in their liquid capital that condition their tax treatment. Under this setting, our treatment group corresponds to firms that were included as new taxpayers of the wealth tax, while the control group includes similar firms that continue as non-taxpayers before and after the wealth tax reform. Using information from wealth tax reports at the firm level, we observe the actual taxpayers and non-taxpayers during the evaluated period (2009-2012). Thus, we correctly identify treatment and control groups avoiding potential selection bias (Bertrand et al., 2004; Abbring and van den Berg, 2015). We employ a unique administrative dataset composed by the universe of corporate credits among banks and non-financial firms (bank-firm-loan level data from the Colombian credit registry) matched with firms' and banks' balance-sheet data (regulatory information at the firm and bank level) and with confidential tax reports at the firm and bank levels from the Colombian Tax Authority (*Dirección de Impuestos y Aduanas de Colombia, DIAN*).

We follow an approach similar to Khwaja and Mian (2008) to identifying the changes in the supply of credit to firms affected by the wealth tax relative to similar firms below the tax threshold. Under this approach, the inclusion of bank*time fixed effects allows to control for bank liquidity shocks that could affect their supply of credit. Additionally, the use of region*industry*time fixed effects allows to control for potential demand of credit at the regional and industry level (Amiti and Weinstein, 2018; Beck et al, 2018).

As financially constrained firms tend to substitute bank credit for trade credit (Amberg et al., 2021), we perform a second exercise, using the amount of trade credit (i.e., non-financial firms' credit or suppliers' credit) to identify changes in the reliance of firms on trade credit because of the wealth tax. Lastly, we evaluate the associated real effects of the wealth tax over the firms' outcomes, including total debt, income, investment, and capital accumulation. Importantly, we identify firms that potentially anticipated the wealth tax by reducing their assets or increasing their

liabilities by comparing the change in their liquid capital between 2009 and 2010. These firms, that accounted for 12% of the control group, were dropped from the sample to avoid potential anticipation issues. Unlike those wealth tax reforms since 2003, which had to pass through Congress before they were approved, the 2010 reform was *a de facto* one and scarcely anticipated by firms on the new wealth bracket cutoffs, as was said above.

We find four main results. First, we identify that the wealth tax is associated with lower bank credit and significantly higher loan rates. We find that banks reduced the supply of credit to those affected firms on around 8.7 percentage points (pp) and charged significantly higher loan rates (about 50 basis points more) compared to firms below the tax threshold (i.e., control group). The estimated effects are larger over firms with ex-ante high leverage. This result is consistent with a reduction of bank risk-taking in the segment of firms affected by the reform.

Second, we find compelling evidence suggesting that affected firms increased the reliance on trade credit (i.e., credit from their suppliers) compared to non-taxpayers. The point estimate suggests a relative increase of about 15.9 pp in the use of trade credit by new taxpayers compared to firms below the tax threshold. However, among taxpayers, those with ex-ante high leverage only increase trade credit by around 11.1 pp (i.e., around 30% less than taxpayers with low leverage). Third, we identify that after the wealth tax reform taxpayers' firms exhibited lower indebtedness on around 11.8 pp compared to non-taxpayers' firms, and that those with high ex-ante leverage ratio exhibited an additional 4.6 pp decline in their total debt, compared with taxpayers with low leverage ratio. This result suggests that affected firms were unable to fully substitute credit. Moreover, the results indicate that those affected firms by the wealth tax reduced their total income and total investments by 11 pp and 16 pp, respectively, relative to firms below the tax threshold. In addition to this, those firms exhibited lower capital accumulation on around 5.7 pp compared to non-taxpayers' firms. Affected firms with high leverage ratio reduced in an additional 4 pp more their capital accumulation (i.e., compared with taxpayers with low leverage ratio). This finding is consistent with the view that firms with low capital invest less (Boissel and Matray, 2022). Overall, the results indicate that the new taxpayers exhibited substantial real effects, especially those with ex-ante high leverage.

Our results contribute to three strands in the literature. First, we extend the growing evidence on the financial effects of corporate taxes to the financial effects of wealth taxes. Corporate taxes affect banks' funding cost, leverage, and capital structure (Horváth, 2020; Bremus

et al., 2020; Gambacorta et al., 2021). Moreover, corporate income tax affects the firms' capital structures by increasing leverage (Heider and Ljungqvist, 2015). We show that wealth taxes are associated with lower bank credit, especially over highly leveraged firms, which is consistent with evidence on less risk-taking by banks in the segment of firms affected by the tax reform. In addition to this, we identify that affected firms increased their reliance on trade credit, thereby partially substituting bank credit by trade credit. This finding adds to the literature on the incidence of bank's corporate income taxes on the supply of credit to firms because they lead to higher bank leverage, and results in lower credit supply to firms affecting their debt financing and investment decisions (Sobiech et al., 2021). Also, it extends the evidence on the role of trade credit as substitute of bank credit in SMEs (Hardy et al., 2022). As small firms heavily rely on bank credit (Berg et al., 2018; Delis et al., 2021), trade credit is used by firms to cover liquidity shocks (Amberg et al., 2021), even in times of heightened uncertainty. García and Montoriol (2013) showed that during the great financial crisis of 2008-09, suppliers with high liquidity increased the provision of trade credit. Moreover, there is evidence that a tax on financial operations among banks and firms in Colombia (it is called *Gravamen a los Movimientos Financieros*, GMF) reduced bank credit and increased trade credit (Restrepo et al., 2019). We find that the wealth tax induced a partial substitution between bank credit and trade credit motivated by a reduction in the supply of bank credit to firms, especially among those with high leverage.

Second, we contribute to the literature on the real effects of taxation. In this sense, it complements the recent evidence that shows that taxes on firms' dividends induced higher liquidity that relaxed credit constraints and increased investment (Boissel and Matray, 2022), because the tax induced additional retained earnings to reduce the tax burden. In contrast, we find that new taxpayers of the wealth tax exhibited lower bank credit, and less indebtedness, investments, and capital accumulation, especially for those firms with high leverage. This finding is consistent with the view that firms with low capital invest less and become riskier.

Lastly, our findings complement evidence on the behavioral economics of wealth taxes, found mostly from advanced economies (Seim, 2017; Jacobsen et al., 2020; Advani and Tarrant, 2021; Brulhart et al., 2022; Jacurty and Sussmuth, 2023). Under that approach, Londoño and Ávila (2021, 2023) evaluate the behavioral responses to *personal* wealth taxes in Colombia during 1993-2016 linked to the *Panama Papers* (i.e., the offshoring to Colombia's most relevant tax havens). Londoño and Ávila (2021, 2023) show that wealth tax hikes cause taxpayers to lower their reported

wealth instantly. Besides, taxpayers inflate (interpersonal) debt, underreport non-third-party-reported business assets, and hide assets in hard-to-track entities in tax havens. According to these authors, two-fifths of the wealthiest 0.01 percent evade taxes and hide one-third of their wealth offshore. That is, individuals both evaded and eluded the wealth tax. From the same approach, Gomez (2019) studies the behavioral response of firms to the wealth tax in Colombia and finds that in years 2006 and 2010 there were between 23.8% and 35.7% more firms at the wealth cutoffs where the tax rate changes. This implies elasticities of corporate wealth with respect to the statutory tax rate of 0.250 and 0.447 for firms with wealth around COP 3,000 million. We extend this evidence by showing the financial and real effects of the wealth tax reform on *corporations*, specially over SMEs that became taxpayers of the wealth tax in 2011.

To our knowledge, this is the first paper that evaluates the effects of an unexpected change in wealth taxes on firms' capital structures and real effects, including the supply of bank credit and the use of trade credit.

The remaining of the paper has three sections besides this introduction. Section 2 provides de background of the wealth tax reform. Section 3 describes the data. Section 4 presents and explains the methodology and results. Lastly, section 4 concludes.

2. Background of the tax reform

The wealth tax was introduced in the Colombian tax system in 1935 and eliminated in 1992 (Rico, 2004). Then it was reintroduced in 2002 for the universe of filers of the 2001 income tax. The wealth tax rate was set at a flat rate of 1.2% of all net wealth (assets minus liabilities) reported by individuals and firms in their 2001 income tax returns and whose gross wealth (assets without subtracting liabilities) on August 31, 2002, was equal to or above COP 169.5 million (Table A1).¹ According to the government, the aim of the tax was to finance the war against drug trafficking, guerrillas, and paramilitary groups. Then, in 2003, the tax was introduced on the declarants of the income tax with a reported wealth equal to or above COP 3 billion and the rate was set on 0.3% on the net wealth owned as of January 1, 2004, and for the fiscal years 2004, 2005 and 2006.² In

¹ Presidency decree 1837 (“Declaration of the state of internal commotion”) and 1838 of August 11, 2002. The deductions allowed were debts, the net worth of assets in national firms, and the mandatory contributions to pension funds.

² Law 863 of December 29, 2003. The tax is caused annually by the possession of wealth on January 1st of each taxable year whose value exceeds COP 3 billion.

2006, the tax was extended to years 2007, 2008, 2009 and 2010 on the taxpayers with a reported wealth equal or above COP 3 billion.³ The tax rate was set on 1.2% of the net wealth held as of January 1st of each year from 2007 to 2010.

Then, the tax reform of 2009 reintroduces the wealth tax on the declarants of the income tax, but for the year 2011.⁴ The tax was generated by the reported wealth as of January 1, 2011, whose value is equal to or greater than COP 3 billion. The tax rates are 2.4% for a reported wealth equal to or greater than COP 3 billion without exceeding COP 5 billion and 4.8% for a reported wealth equal to or greater than COP 5 billion. The tax had to be paid in eight equal installments during the years 2011, 2012, 2013, and 2014.

By the end of 2010, due to a “serious public calamity,” because the climate change affectations that demanded more public revenues, the government declares “the state of economic, social and ecological emergency.”⁵ Based on this exceptional and unexpected decision, a wealth tax reform was imposed by a presidency decree on December 29, 2010.⁶ The reform established that the wealth tax is caused only once (one-off tax) and on financial and non-financial firms’ and individuals’ filers that, on January 1, 2011, had a reported wealth equal to or above COP 1 billion (i.e., around USD 285,000). The tax base was defined as assets minus liabilities (including debt) and the value of shareholdings on national corporations. The tax had to be paid in 8 equal installments during 2011 to 2014. Unlike previous reforms of the wealth tax, the 2010 reform included as *new taxpayers* firms with a reported wealth equal to or greater than COP 1 billion and below or equal to COP 3 billion. As a matter of fact, the reform was a *de facto* one and scarcely anticipated by firms on these new wealth bracket cutoffs, not alike those reforms since 2003 which had to pass through Congress before they were approved, as the results of Gómez (2019) and Londoño y Ávila (2021, 2023). According to our estimates, about 12% of the firms in the control group may have potentially anticipated the wealth tax and we dropped them from the sample to get rid of any potential anticipation.

³ Law 1111 of January 1, 2006. As said before, the tax liability was set on the taxpayers that met the wealth cutoff reported on January 1, 2007. Hence, firms that had wealth greater than COP 3 billion at that time had to pay the tax from 2008 to 2010, even if during these years they reported a lower wealth than the cutoff. In contrast, firms that had wealth below COP 3 billion by January 1, 2007, but wealth above it in any other year paid no wealth tax.

⁴ Law 1370 of December 30, 2009.

⁵ Decree 4580 of December 7, 2010.

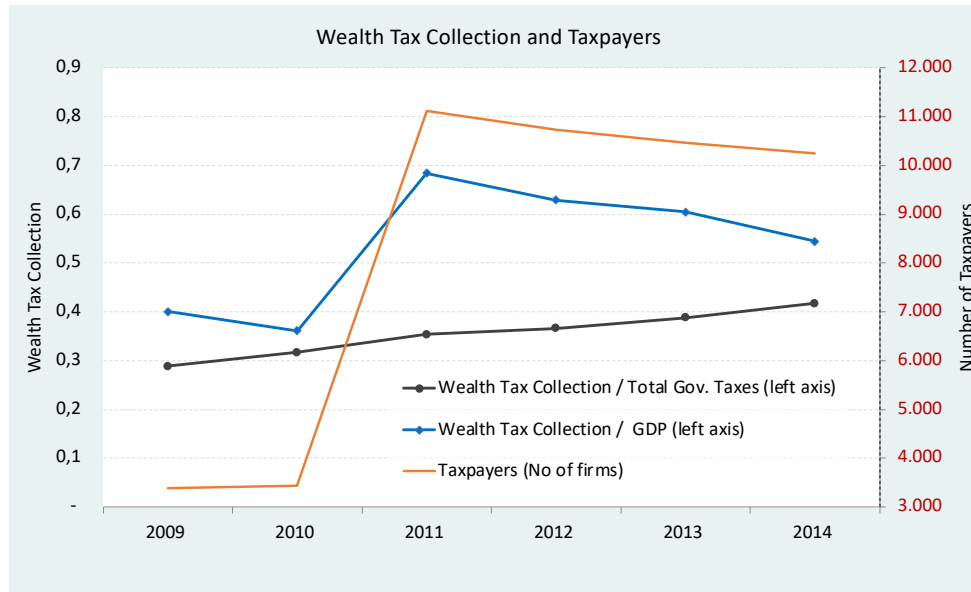
⁶ Decree 4825 of December 29, 2010.

The firms in the new bracket cutoffs are SMEs with relatively low capital and with a high dependence on bank and trade credit. The reform to the wealth tax created a progressive tax system in which each tax bracket cutoff has a different statutory tax rate: i) 1.0% if COP 1 billion \leq reported wealth < COP 2 billion; ii) 1.4% if COP 2 billion \leq reported wealth < COP 3 billion. This reform was complemented with another one, this time through Congress, that restated the wealth tax brackets cutoffs and rates introduced by the 2009 tax reform. Thus, the tax rate is 2.4% to reported wealth in the COP 3 billion \leq reported wealth < COP 5 billion range, and 4.8% to reported wealth \geq COP 5 billion. Thus, the notched wealth tax set up cause discontinuities in tax liability at bracket cutoffs.⁷

The presidency decree on December 29, 2010, also introduced a 25% surcharge on the tax rate for firms with reported wealth above COP 3 billion (i.e., around USD 860,000), as stated by the tax reform of 2009. Thus, the affected firms are mainly those with reported wealth between COP 1 billion and COP 3 billion (i.e., new wealth taxpayers) and those firms with reported wealth greater than COP 3 billion (i.e., old taxpayers that now pay a surcharge of 25%). Table A1 depicts the evolution of the wealth tax in Colombia, where we observe that since 2004 firms with reported wealth above COP 3 billion were the target taxpayers. The tax reform of 2010 introduced firms with reported wealth above COP 1 billion as new taxpayers. Government tax revenues from the wealth tax increased by 90 percent (from 0.4% of GDP to 0.7% of GDP between 2010 and 2011), while their participation in the total tax revenues raised from 3% to 5% (Figure 1). Remarkably, 94% of taxpayers were corporations. The number of firms included as taxpayers also increased dramatically from 3,441 in 2010 to 11,118 in 2011 (i.e., 7,677 new taxpayers, 2.23 times the number of taxpayers of the previous year). This suggest that, from the government's view, the wealth tax reform was successful in increasing the government's revenues and the tax base.

⁷ Law 1430 of December 29, 2010.

Figure 1. Wealth tax collection in Colombia



Source: Authors calculations based on figures from the Ministry of Finance.

2.1. Wealth tax, firm leverage, and potential anticipation

In this section we discuss some of the potential implications of the wealth tax reform on SMEs. Small firms (usually) do not have reserves to cover new taxes. These firms only constitute reserves for established taxes (for instance, the corporate income tax rate at the time of the tax reform of interest was 33%). The wealth tax is levied on the firms' liquid capital (Capital=Assets – liabilities). Thus, firms with higher retained profits (i.e., high accumulated capital) will exhibit a higher tax burden. To reduce the tax burden, firms can distribute retained profits to shareholders before the tax is in place if they can anticipate it and there are no taxes on dividends (or if the dividend tax rate is lower than the wealth tax rate). If neither the tax is not anticipated nor there is distribution of dividends, retained profits are invested (i.e., working capital, inventories, cash, etc.) and firms need to decrease cash holdings or increase debt to pay the shareholders, and hence, they will exhibit higher leverage (i.e., higher debt to assets ratio). The contrary is observed when firms increase their retained earnings and do not distribute dividends (Boissel and Matray, 2022).

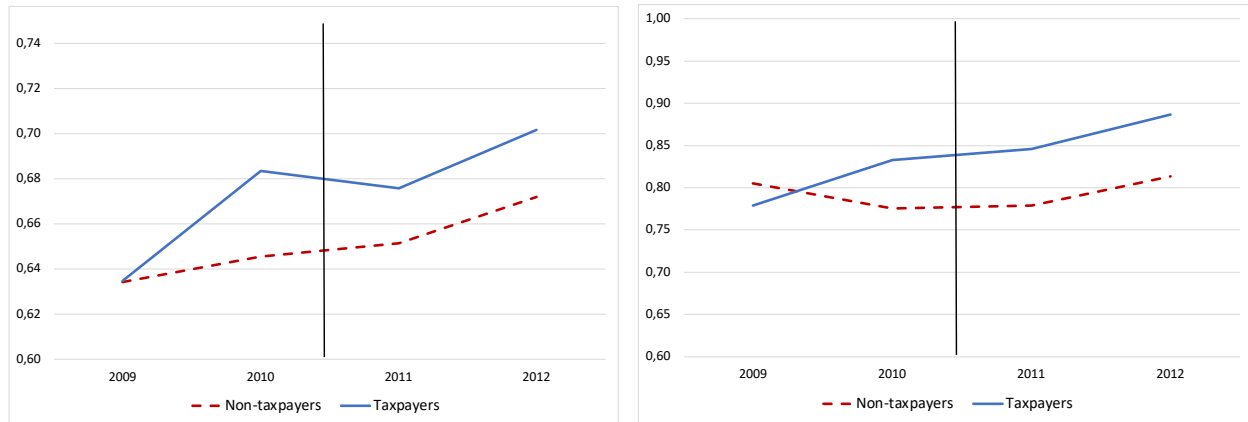
To explore this hypothesis, **Figure 2** (Panel A) presents the evolution of the Debt-to-Cash ratio (i.e., financial obligations over operational income) at the firm-level during 2009 and 2012. The vertical line corresponds to the year of the implementation of the wealth tax reform (i.e., 2011).

We define treated firms are those subject to the wealth tax and with liquid capital between COP 1,000 million and COP 1,500 million, and non-treated (control) firms, firms not subject to the tax, as those with liquid capital between COP 500 million and COP 999 million.

Figure 2. Leverage Ratio among Taxpayers and Non-taxpayers of the Wealth Tax

Panel A: Debt-to-Cash ratio (firm-level)

Panel B: Debt-to-Assets ratio(firm-level)

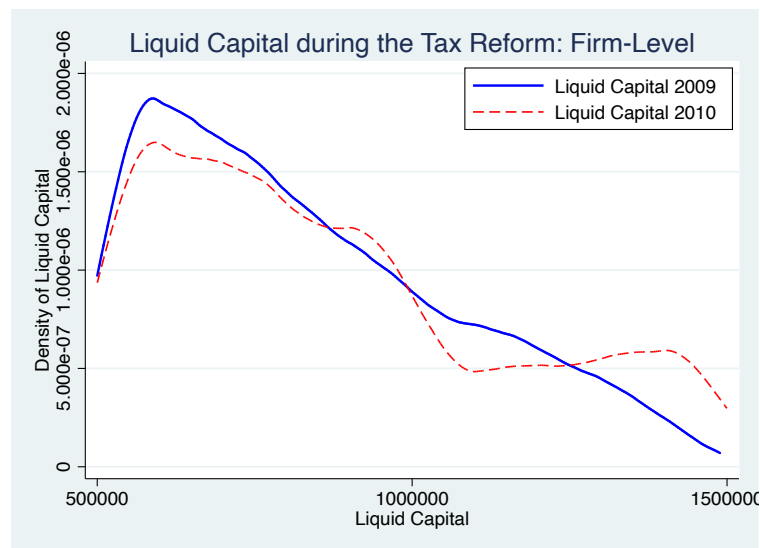


Notes: Panel A depicts the ratio of total financial obligations over operational income (Debt-to-Cash ratio) and panel B shows the ratio of total debt to total tangible assets at the firm-level (Debt-to-Assets ratio). Both figures show the median computed for the period 2009 to 2012. Vertical line corresponds to 2011 (i.e., the year of the implementation of the wealth tax reform). Taxpayers are those firms subject to the wealth tax and with capital between COP 1,000 million and COP 1,500 million, while non-taxpayers (control) firms are those with capital between COP 500 million and COP 999 million (i.e., the wealth tax threshold).

We observe that firms subject to the wealth tax exhibit high Debt-to-Cash ratio relative to firms below the tax threshold (control group). Similarly, in **Figure 2** (Panel B) we observe that firms affected by the wealth tax also have a higher ratio of tangible assets to total debt (Debt-to-Assets ratio) compared with firms below the tax threshold. These figures suggest that the new taxpayers are firms with relatively high leverage. We employ the value of tangible assets rather than total assets as these types of assets can be used as collateral for bank credit. Moreover, we observe no significant changes in the evolution of leverage ratios before the implementation of the wealth tax reform, suggesting no anticipation. As mentioned before, unlike previous reforms of the wealth tax, the 2010 reform included as *new taxpayers* firms with a reported wealth equal to or greater than COP 1 billion and below or equal to COP 3 billion. As a matter of fact, as stated above, the reform was a *de facto* one and surely not anticipated by firms on these new wealth bracket cutoffs, not alike those reforms since 2003 which had to pass through Congress before

they were approved. To confirm this prediction, in **Figure 3** we identify firms that potentially anticipated the wealth tax by comparing the change in their liquid capital around the tax threshold during 2009 and 2010. We observe that 188 firms out of the 1,552 firms that are part of the control group (i.e., 12% of this group), reduced their liquid capital in 2010 from the observed level in 2009, indicating a potential anticipation of the wealth tax. We dropped from the sample those firms to avoid potential anticipation issues⁸.

Figure 3. Liquid capital among taxpayers and non-taxpayers of the wealth tax



Notes: This figure compares the change in the liquid capital (net wealth) of firms around the tax threshold between 2009 and 2010. We find that 188 firms out of the 1,552 firms of the control group (12%) reduced their liquid capital in 2010 from the observed level in 2009. This could suggest a potential anticipation of the wealth tax (or a negative shock that affected their liquid capital). We dropped from the sample those firms to avoid potential anticipation issues.

3. Data

We employ four data bases. First, we use administrative information from the Colombian credit registry (*Superintendencia Financiera de Colombia*) (SFC) that includes the universe of corporate loans at the bank-firm-loan level. Banks must report all their loans to the SFC on a quarterly basis. Reports are mandatory, updated electronically, and include detailed characteristics of all the new and continuing loans made to firms by every bank in Colombia. All loans must be

⁸ In alternative specifications we use these firms to test the potential effects of the wealth tax anticipation on the supply of credit and loan rates. Results are reported in the Appendix.

reported regardless of their size. For each loan, the dataset includes the issuing bank, the borrower, the outstanding amount, the (annualized) interest rate, the maturity of the loan, the fraction covered by collateral, the borrower's credit score, and some information about the borrowing firm (size, location, and sector). The credit registry also provides information on the value of provisions at the loan level. We keep only private commercial banks in the sample to avoid any noise coming from credits from public banks which may be directed or subsidized by policy decisions. We exclude loans granted individuals pursuing entrepreneurial activity as we do not have information on their balance sheet outcomes. The sample includes 71,406 bank-firm-quarter loans spanned during the period 2009q1-2012q4 among 28 banks with 5,320 firms (SMEs). Importantly, these firms neither issue bonds or stocks nor have access to international credit markets; thereby their financing needs depend on bank credit and trade credit. We match the credit data with a second database from SFC that includes quarterly banks' balance sheet data. The number of bank-level observations are 252 and include measures of capitalization, liquidity, and leverage, among others.

Third, we employ regulatory data on firms' balance sheets, including financial statements, from *Superintendencia de Sociedades* (i.e., the Colombian agency that oversees corporations). The database includes a unique identification number, company name, place of incorporation, sector, balance sheet information on assets, sales, liabilities, capital, debt, investments, revenues, and trade credit, and income statements. We remove observations with negative assets, negative liabilities, or negative revenues. In addition, we exclude firms undergoing liquidation at the start of the sample period. We compute measurements of firms' leverage (i.e., Debt-to-Cash and Debt-to-Assets) and identify the use of trade credit (i.e., payable accounts). The sample includes 27,866 observations at the firm-year level during 2009 and 2012. We match the data using the firms' identification numbers.

Fourth, we use a confidential data base on tax reports by deciles at the firm-level from the Colombian tax authority (*Dirección de Impuestos y Aduanas Nacionales*, DIAN). Thus, we identify the firms affected (taxpayers) and non-affected (non-taxpayers) by the wealth tax reform during the full period (2009-2012), which is a key advantage for our identification strategy.

Treatment and control groups are defined using both the firms' liquid capital (assets minus liabilities) as threshold and the tax reports. More concretely, our treatment group is composed by firms with liquid capital between COP 1 billion and COP 1.5 billion (i.e., above the first tax bracket cutoff) since 2009 and that were subject to the wealth tax from 2011 onwards. The control group

is composed by firms with liquid capital between COP 0.5 billion and COP 0.999 billion (i.e., below the first tax bracket cutoff) since 2009 and that were not subject to the wealth tax from 2011 onwards. Table 1 describes the sample and compares financial ratios, including bank credit and trade credit, between treatment and control groups. Firms in the control group are relatively smaller than those in treatment group, and have lower assets, liabilities, capital, and leverage ratios. These firms also have less bank credit and trade credit. Most of firms (around 71%) are in the trade and manufacture sectors, with similar distributions across industries between treated and control groups.

Table 1. The sample: Financial variables at the firm-level

	Treated					Control					Mean differences
	Mean	SD	P25	P75	P90	Mean	SD	P25	P75	P90	
Bank credit	199	383	37	215	406	144	304	29	154	296	55,0*
Loan rate (%)	15,32	5,77	11,14	18,18	24,00	15,91	5,74	11,89	18,69	24,41	-0,6
Assets	3.722,4	3.152,6	2.174,5	4.206,9	6.235,5	2.748,5	3.457,8	1.473,7	3.010,1	4.446,1	-973,9*
Liabilities	2.507,5	3.139,2	981,9	2.945,4	4.970,9	1.929,4	3.424,2	693,4	2.131,0	3.580,1	-578,0*
Capital	1.215,0	191,5	1.092,9	1.370,8	1.447,2	819,1	211,3	653,3	943,5	1.111,7	-395,9*
Debt-to-Cash (ratio)	0,67	0,21	0,31	0,78	0,82	0,60	0,23	0,26	0,73	0,79	0,07*
Debt-to-Assets (ratio)	0,81	0,13	0,47	0,71	0,91	0,76	0,14	0,53	0,72	0,84	0,05*
Investment	49,5	221,0	15,4	85,5	100,0	35,4	197,3	11,2	48,4	63,0	14,1*
Revenues	6.908,8	11.439,2	2.489,7	7.494,5	14.093,8	4.890,7	6.029,0	1.813,2	5.616,2	9.773,8	-2.018,1*
Trade credit to liabilities (ratio)	0,23	0,05	0,05	0,37	0,53	0,25	0,06	0,05	0,40	0,56	0,02
Number of firms	1.562					3.757					

Notes: This table presents summary statistics of the variables at the firm level and mean differences tests. Difference in means is treated minus control firms. Bank credit is the annual amount of credit from all banks to firms, while loan rate is the weighted average loan rate in percentage (%). Treated firms are those subject to the wealth tax with liquid capital between COP 1,000 million and COP 1,500 million, while non-treated (control) firms are those with liquid capital between COP 500 million and COP 999 million at the end of 2010. Values in COP million. The sample includes 5,320 firms during the 2009-2012 period. *p<0.00.

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4. Methodology and Results

In this section, we describe the empirical approach used to evaluate the firms' financial and real effects of the wealth tax reform. We employ differences-in differences methods to evaluate the effects of the change in the tax policy on the supply of bank credit, the reliance on trade credit (i.e., credit from suppliers), and the associated real effects.

4.2. Supply of Bank Credit

In this section, we analyze whether firms affected by the wealth tax exhibited changes on the supply of bank credit. As mentioned in the previous section, the new taxpayers' firms of the wealth tax are SMEs that heavily rely on bank credit, and that, compared with the control group (i.e., non-taxpayers' firms), exhibit higher leverage. Evidence shows that low capitalized firms tend to obtain less bank credit, and that the decision to lend strongly depends on the risk-taking behavior of banks (Jimenez et al., 2014; Jimenez et al 2022, Morais et. al., 2020; Fraise et al., 2020). We use a D-in-D model to identify the effects of the wealth tax on the supply of credit among taxpayers' firms and non-taxpayers' firms. More concretely, we compare the amount of credit (and the loan rates) granted to firms subject to the wealth tax (treated) and those that were not subject to the wealth tax but have similar characteristics (control). The sample includes 71,406 bank-firm-quarter loans spanned during the period 2009q1-2012q4 among 28 banks with 5,320 firms. The sample is restricted to firms with multiple banking relationships to allow credit substitution across banks (Khwaja and Mian, 2008). The sample only includes firms that neither issue bonds or stocks nor have access to international credit markets, thereby they depend on bank credit and trade credit.

The model is represented by equation (1):

$$\begin{aligned} Credit_{f,b,q} = & \alpha + \beta_1 Post_q + \beta_2 Treated_f * Post_q + \beta_3 Treated_f * Post_q * High-Leverage_{f,q-1} + \beta_4 Firm_{f,q-1} \\ & + \beta_5 Macro_{q-1} + \gamma_f + \gamma_b + \gamma_{bf} + \gamma_{b,q} + \gamma_{s,q} + \gamma_{r,q} + e_{f,b,q} \quad (1) \end{aligned}$$

where $Credit_{f,b,q}$ are loan margins (i.e., loan volume and loan rates at the bank-firm-quarter level). $Loan\ volume_{f,b,q}$ is the log of credit amount (COP million) granted by bank b to firm f at time q . $Loan\ rate_{f,b,q}$ is the loan rate (in percentage points) charged by bank b to firm f at quarter q . $Post_q$ is 1 if the observation is between 2011q1 and 2012q4 and 0 if it is between 2009q1 and 2010q4. $Treated_f$ as a dummy variable equals 1 if the firm's liquid capital is between COP 1.0 billion and COP 0.5 billion (and the firm was subject to the wealth tax since 2011) and 0 if the firm's liquid capital is between COP 500 million and COP 999 million. $High-Leverage_{f,q-1}$ is an indicator variable equals 1 for those firms with a Debt-to-Cash ratio above the percentile 75th of the distribution across firms, and 0 otherwise. For robustness, we use the Debt-to-Assets ratio. $Firm_{f,q-1}$ includes the firm's leverage, and other firm characteristics (i.e., assets, income, liabilities, revenue, etc.) lagged one period. The model includes macroeconomic controls (i.e., GDP gap, inflation, and current account balance to GDP). $Bank_{f,q-1}$ are bank characteristics of capitalization, liquidity and credit risk, defines as Tier 1 capital ratio, liquid assets over total assets and past due loans over loan provisions. We include Firm FE (γ_f) and bank FE (γ_b) to control for the unobserved heterogeneity at the firm and bank level, respectively. Bank*time FE ($\gamma_{b,q}$) are included to control for liquidity shocks that affect the supply of bank credit. We also include bank*firm FE ($\gamma_{b,f}$) to account for lending relationships (Beck et al, 2018). Industry*time FE ($\gamma_{s,q}$) and region*time FE ($\gamma_{r,q}$) are included to control for the demand of credit at the industry and region level over time, which is crucial to correctly identify supply effects (Jimenez et al., 2014; Amiti and Weinstein, 2018; Degreyse et al., 2019).

The results for the supply of credit are presented in **Table 1**. We find that banks reduced the supply of credit to affected firms (taxpayers) compared to non-affected firms (non-taxpayers). In column (1), the estimated coefficient of $Treated_f$ indicates that taxpayers received 12.3 percentage points (pp) more bank credit compared to non-taxpayers' firms. In column (2) the interaction of $Post_y * Treated_f$ indicates that firms affected by the wealth tax received lower credit compared to non-affected firms. The estimated coefficient suggests a reduction in the supply of credit of 8.7 percent relative to non-taxpayers. We also observe that firms with ex-ante high leverage are associated with less bank credit. Moreover, the coefficient of the triple interaction of $High-Leverage_{f,q-1} * Post_q * Treated_f$ indicates that those taxpayers with high leverage received 2.4 pp less of credit compared to taxpayers with low leverage. This suggests that, within the new taxpayers, those with high leverage were more rationed by banks during the wealth tax reform.

Results are robust to the inclusion of region*time fixed effects (column 3). In column 4 the specification includes region*sector*time fixed effects to control for the demand of credit across regions and industries over time, and it shows a relative reduction of 6.3 pp in the supply of credit to affected firms.

Table 1. The supply of bank credit and the wealth tax on SMEs

VARIABLES	(1)	(2)	(3)	(4)
	Log credit _{b,f,q}	Log credit _{b,f,q}	Log credit _{b,f,q}	Log credit _{b,f,q}
Post _q	0.0836 (0.0578)	0.0825 (0.0664)		
Post _q x Treated _f	-0.0794*** (0.0252)	-0.0871*** (0.0240)	-0.0783*** (0.0169)	-0.0632*** (0.0174)
Treated _f	0.1232*** (0.0263)	0.1371*** (0.0221)	0.1366*** (0.0234)	0.1372*** (0.0248)
High-Leverage _{f,q-1} x Post _q x Treated _f		-0.0243*** (0.0553)	-0.0214*** (0.0032)	-0.0207*** (0.0022)
High-Leverage _{f,q-1}	-0.0934** (0.0322)	-0.0891* (0.0312)	-0.0827* (0.0308)	-0.0973*** (0.0301)
Observations	71,406	71,406	71,406	71,406
R-squared	0.47	0.47	0.48	0.51
Firm FE	YES	YES	YES	YES
Bank FE	NO	YES	YES	YES
Bank-Time FE	NO	YES	YES	YES
Region-Time FE	NO	NO	YES	NO
Region-Sector-Time FE	NO	NO	NO	YES

Notes: Results of D-in-D regressions using quarterly bank-firm-loan level data. The dependent variable is the log of loan amount granted to firm f by bank b at quarter q . $Post_q$ is 1 when the observation is between 2011q1 and 2012q4 and 0 if it is between 2009q1 and 2010q4. $Treated_f$ is 1 if the firm's liquid capital is between COP 1,000 million and COP 1,500 million (and the firm was subject to the wealth tax since 2011) and 0 if the firm's equity is between COP 500 million and COP 999 million at the end of 2010. All models include Macro Controls and bank-firm FE. Robust standard errors clustered at the bank and quarter level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The results for loan rates are presented in **Table 2**. We observe that after the reform banks increased the loan rates to affected firms more compared to non-affected firms (non-taxpayers). In column (1), the interaction of $Post_q * Treated_f$ indicates that firms affected by the wealth tax were charged with a spread of around 47 bps compared to non-affected firms. Taxpayers exhibit a lower loan rate of about 114 bps compared to non-taxpayers' firms. The triple interaction suggests that new taxpayers with ex-ante high leverage are charged with a significant spread on around 36 bps, relative to taxpayers with low leverage. Results are similar across alternative specifications that

account for the demand of credit across regions and industries over time (column 3). In column (4) we confirm that the loan rate charged on the new taxpayers was around 35 bps more compared to non-taxpayers, and that among the new taxpayers those with high leverage were more affected by an additional spread of 33 bps. These results indicate that during the reform of the wealth tax, those new taxpayers were rationed in credit markets. This is observed as affected firms become riskier due to lower capitalization levels. The parallel trends tests are reported in **Figure A2** and confirm that after the implementation of the wealth tax reform, banks reduced the supply of credit to affected firms and increased loan rates significantly. The observed effects remain after four quarters.

Table 2. Loan rates and the wealth tax on SMEs

VARIABLES	(1)	(2)	(3)	(4)
	Loan Rate _{b,f,q}	Loan Rate _{b,f,q}	Loan Rate _{b,f,q}	Loan Rate _{b,f,q}
Post _q	1.1173*** (0.0278)	1.1265*** (0.0352)		
Post _q x Treated _f	0.4722*** (0.1447)	0.4943*** (0.1530)	0.3742** (0.1418)	0.3481*** (0.1161)
Treated _f	-1.1394*** (0.3424)	-1.1436*** (0.3824)	-1.5812*** (0.3002)	-1.5941*** (0.2210)
High-Leverage _{f,q-1} x Post _q x Treated _f		0.3631*** (0.0724)	0.3114*** (0.0917)	0.3385*** (0.0902)
High-Leverage _{f,q-1}		0.1631* (0.0823)	0.1745* (0.0804)	0.1831** (0.0912)
Observations	71,406	71,406	71,406	71,406
R-squared	0.41	0.41	0.42	0.43
Firm FE	YES	YES	YES	YES
Bank FE	NO	YES	YES	YES
Bank-Time FE	NO	NO	YES	YES
Region-Time FE	NO	NO	YES	NO
Region-Sector-Time FE	NO	NO	NO	YES

Notes: Results of D-in-D regressions using quarterly bank-firm-loan level data. The dependent variable is the loan rate in percentage points of the loans granted to firm f by bank b at quarter q . $Post_t$ is 1 when the observation is between 2011q1 and 2012q4 and 0 if it is between 2009q1 and 2010q4. $Treated_f$ is 1 if the firm's liquid capital is between COP 1,000 million and COP 1,500 million (and the firm was subject to the wealth tax since 2011) and 0 if the firm's equity is between COP 500 million and COP 999 million at the end of 2010. All models include Macro Controls and bank-firm FE. Robust standard errors clustered at the bank and quarter level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.3. Trade Credit

In the previous section, we observe that banks reduced the supply of credit (and charged higher loan rates) to SMEs affected by the wealth tax reform relative to firms below the tax threshold. In this section, we evaluate whether trade credit (non-financial firm-to-firm credit) increased as a source of financing among affected firms. That is, we evaluate whether firms increased their demand for trade credit as an alternative to finance their inputs. Evidence indicates that SMEs affected by fiscal shocks tend to rely on trade credit, especially those financially constrained firms (Restrepo et al., 2019). In trade credit, goods (inputs) act as collateral and there are less information asymmetries than in bank credit (Klapper, Laeven and Rajan, 2011). During the global financial crisis, supplier with high liquidity increased the provision of trade credit to their clients, specially to those financially constrained (García and Montoriol, 2013). In our sample, firms do not have access to alternative sources of funding: bonds, stocks, or foreign credit. We employ firm-level-year data and the tax reports to evaluate the use of trade credit before and after the wealth tax reform. The specification is presented in equation (2):

$$Trade\ Credit_{f,y} = \alpha + \beta_1 Post_y + \beta_2 Treated_f * Post_y + \beta_3 Treated_{f,y} * Post_y * High-Leverage_{f,y-1} + \gamma_f + \gamma_{s,y} + \gamma_{r,y} + \epsilon_{f,s,y} \quad (2)$$

where $Trade\ Credit_{f,y}$ is the log of the amount of credit (in COP million) contracted by firm f with non-financial firms at year y . $Post_y$ is 1 if the observation is between 2011 and 2012 and 0 if it is between 2009 and 2010. $Treated_f$ is 1 if the firm's liquid capital is between COP 1,000 million and COP 1,500 million (and the firm was subject to the wealth tax since 2011) and 0 if the firm's liquid capital is between COP 500 million and COP 999 million (i.e., below the tax threshold). $High-Leverage_{f,y-1}$ is an indicator variable equals 1 for those firms with a Debt-to-Cash ratio above the percentile 75th of the distribution across firms, and 0 otherwise in the previous year. The model includes firm FE (γ_f), sector*time FE ($\gamma_{s,y}$), and region*time FE ($\gamma_{r,y}$) to control for unobservable firm heterogeneity and the demand of trade credit at the industry and region over time.

The results are displayed in **Table 3**. The estimated coefficient of $Post_y$ suggests that the use of trade credit was 2.3 pp lower for all the evaluated firms after the fiscal shock, that is, treated and non-treated firms. Moreover, the estimated coefficient of $Treated_f$ suggests that during the

evaluated period treated firms used less trade credit compared to firms in the control group. However, the positive and statistically significant coefficient of the interaction $Post_y * Treated_f$ indicates that affected firms by the wealth tax increased the reliance on trade credit on around 15 pp compared to non-taxpayers. This result remains statistically significant across alternative specifications that account for sector*time and region*time fixed effects (Columns 2 and 3). The point estimate in column 3 suggests a relative increase of 15.8 pp in the use of trade credit by the new taxpayers compared to firms below the tax threshold. Results also reveal that those firms with high leverage received less trade credit. The estimated coefficient of the triple interaction of $Treated_{f,q} * Post_q * High-Leverage_{f,y-1}$ indicates that after the reform taxpayers with ex-ante high leverage received less trade credit from their suppliers in about 7.8 pp relative to non-taxpayers. Overall, the results suggest that firms affected by the wealth tax increased the reliance on trade credit, which is evidence of a substitution of bank credit for trade credit.

Table 3. Trade Credit and the Wealth Tax on SMEs

VARIABLES	(1) Log(Trade Credit _{f,y})	(2) Log(Trade Credit _{f,y})	(3) Log(Trade Credit _{f,y})
Post _y	-0.0237*** (0.0021)		
Post _y x Treated _f	0.1593*** (0.046)	0.1512*** (0.0519)	0.1587*** (0.0582)
Treated _f	-0.0508*** (0.0186)	-0.0551*** (0.0172)	-0.0571** (0.0242)
High-Leverage _{f,y-1} x Post _y x Treated _f	-0.0484*** (0.0212)	-0.0423** (0.0272)	-0.0416** (0.0278)
Observations	27,866	27,866	27,866
R-squared	0.27	0.28	0.32
Firm FE	YES	YES	YES
Sector-Time FE	NO	YES	YES
Region-Time FE	NO	NO	YES

Notes: Results of D-in-D regressions using firm-level data. Trade Credit_{f,y} is the log of the amount of credit (in COP million) contracted by firm f with non-financial firms at year y . $Post_y$ is 1 when the observation is between 2011 and 2012 and 0 if it is between 2009 and 2010. $Treated_f$ is 1 if the firm's liquid capital is between COP 1.0 billion and COP 1.5 billion (and the firm was subject to the wealth tax since 2011) and 0 if the firm's liquid capital is between COP 500 million and COP 999 million at the end of 2010 (i.e., below the tax threshold). Robust standard errors clustered at the firm and year level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4.4. Real Effects

In this section we study the associated real effects of the wealth tax reform over the new taxpayers. To do this, we employ our measures of leverage used in equations (1) and (2) and compute three representative measures of firm-level outcomes: $Income_{f,y}$, $Investments_{f,y}$, $Total\ Debt_{f,y}$, and one of the firms' growth: capital accumulation ($\Delta Capital_{f,y}$). All variables are defined in logarithms of firm f in year y , respectively. We first analyze whether the wealth tax reform changes the firms' performance of the new taxpayers relative to non-taxpayers. Then, we study the effect of leverage on the firms' performance of the new taxpayers relative to non-taxpayers.

The specification is presented in equation (3):

$$z_{f,y} = \alpha + \beta_1 Post_y + \beta_2 * Post_y * Treated_f + \beta_3 Post_y * Treated_f * High-Leverage_{f,y-1} + \gamma_f + \gamma_{s,y} + \gamma_{r,y} + \varepsilon_{f,y} \quad (3)$$

Where $z_{f,y}$ are measures of firm-level outcomes including log of total income ($Income_{f,y}$), log of total investments ($Investments_{f,y}$), log of liabilities ($Total\ Debt_{f,y}$) and the change in net capital excluding depreciations ($\Delta Capital_{f,y}$) of firm f in year y . As before, $High-Leverage_{f,y-1}$ is an indicator variable equals 1 for those firms with a Debt-to-Cash ratio above the percentile 75th of the distribution across firms, and 0 otherwise in the previous year. $Post_y$ is 1 if the observation is between 2011 and 2012 and 0 if it is between 2009 and 2010. Similar to our previous exercises, we define $Treated_f$ equals to 1 if the firm's liquid capital is between COP 1,000 million and COP 1,500 million (and the firm was subject to the wealth tax since 2011) and 0 if the firm's liquid capital is between COP 500 million and COP 999 million at the end of 2010. The model includes firm FE (γ_f), sector*time FE ($\gamma_{s,y}$), and region*time FE ($\gamma_{r,y}$) to control for unobserved heterogeneity and common shocks across industries and regions, respectively.

Table 4 presents the results of a first exercise using the firm's total income and total investments as dependent variables. In columns 1 and 4 the specifications include only firm fixed effects and show that treated firms (taxpayers) are associated with higher income and investments compared to control group (non-taxpayers). Columns 2 and 5 add the economic sector fixed effects to the specification. The interaction of $Post_y * Treated_f$ indicates that firms affected by the wealth

tax in 2011 exhibited lower income and investments compared to non-affected firms. These effects are similar when we include region*time and sector*time fixed effects (columns 3 and 6, respectively). The estimated coefficient in column 3 indicates that firms affected by the wealth tax reduced their total income by 7.8 pp compared to non-taxpayers' firms. Similarly, the estimated coefficient in column 6 suggests that the new taxpayers reduced their total investments by 11.3 pp relatively to firms below the tax threshold.

Table 4. Real effects of the wealth tax reform on SMEs

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Income _{f,y}	Income _{f,y}	Income _{f,y}	Investments _{f,y}	Investments _{f,y}	Investments _{f,y}
Post _y	0.0012 (0.0083)	0.0012 (0.0081)		0.0421 (0.0318)	0.0513 (0.0322)	
Treated _f	0.1102*** (0.0383)	0.1133*** (0.0310)	0.1212*** (0.0352)	0.1624*** (0.0399)	0.1733*** (0.0571)	0.1681*** (0.0412)
Post _y x Treated _f	-0.0617** (0.0322)	-0.0640*** (0.0289)	-0.0784** (0.0405)	-0.1132** (0.0523)	-0.1241** (0.0670)	-0.1135*** (0.0418)
Observations	27,866	27,866	27,866	27,866	27,866	27,866
R-squared	0.31	0.32	0.36	0.41	0.44	0.46
Firm FE	YES	YES	YES	YES	YES	YES
Sector FE	NO	YES	YES	NO	YES	YES
Region*Time FE	NO	NO	YES	NO	NO	YES
Sector-Time FE	NO	NO	YES	NO	NO	YES

Notes: Results of D-in-D regressions using firm-level data to evaluate the effects of the wealth tax in 2011. *Post_y* is 1 if the observation is between 2011 and 2012 and 0 if it is between 2009 and 2010. *Treated_f* is 1 if the firm's liquid capital is between COP 1,000 million and COP 1,500 million (and the firm was subject to the wealth tax since 2011) and 0 if the firm's liquid capital is between COP 500 million and COP 999 million at the end of 2010. Robust standard errors clustered at the firm and year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

In **Table 5** we employ as firms' outcome the total debt of the firm and a measure of capital accumulation (Δ Capital_{f,y}) and include interactions with the firm's leverage to test whether firms with a high leverage ratio, ex-ante to the implementation of the wealth tax, exhibited changes in their total indebtedness and accumulation of capital after the tax reform. The results using the total debt of the firm are presented in columns 1 to 3. We find that after the wealth tax reform taxpayers' firms exhibited lower indebtedness on around 11.8 pp compared to non-taxpayers' firms.

Moreover, those affected firms with high ex-ante leverage ratio exhibited an additional 4.6 pp decline in their total debt compared with taxpayers with low leverage ratio. The results are robust across alternative specifications in columns 2 and 3. This evidence suggests that affected firms were unable to fully substitute credit.

The results using our measure of capital accumulation are presented in columns 4 to 6. We find that after the reform, firms affected by the wealth tax exhibited lower capital accumulation on around 5.7 pp compared to non-taxpayers' firms. In addition to this, those affected firms with high leverage ratio reduced in an additional 5.2 pp more their capital accumulation compared with taxpayers with low leverage ratio. The results are robust across alternative specifications in columns 3 and 6 that include region*time FE and sector*time FE. This suggests that SMEs affected by the wealth tax exhibited important contractions in the accumulation of capital, and that this was particularly more difficult for those firms with ex-ante high leverage.

Table 5. Real effects of the wealth tax reform on SMEs with high leverage

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Total Debt _{t,y}	Total Debt _{t,y}	Total Debt _{t,y}	Δ Capital _{t,y}	Δ Capital _{t,y}	Δ Capital _{t,y}
Post _t	0.0406 (0.0518)			0.1106** (0.0457)		
Treated _{t,y}	0.0823*** (0.0312)	0.0756*** (0.0240)	0.0691** (0.0376)	0.1826*** (0.0512)	0.1762*** (0.0440)	0.1691** (0.0403)
Post _t x Treated _t	-0.1180*** (0.0421)	-0.1173*** (0.0418)	-0.1253*** (0.0389)	-0.0574** (0.0205)	-0.0587** (0.0274)	-0.0731*** (0.0304)
High_leverage _{t,y-1}	0.0230** (0.0108)	0.0217** (0.0103)	0.0221** (0.0106)	-0.0430*** (0.0358)	-0.0346*** (0.0349)	-0.0324*** (0.0379)
High_leverage _{t,y-1} *Post _t	0.0150 (0.0140)	0.0141 (0.0128)	0.0145 (0.0134)	0.1180 (0.0910)	0.0931 (0.0511)	0.1193 (0.0851)
High_leverage _{t,y-1} Post _t x Treated _t	-0.0469*** (0.0212)	-0.0482** (0.0229)	-0.0513*** (0.0198)	-0.0324** (0.0156)	-0.0382* (0.0164)	-0.0418*** (0.0179)
Observations	27,866	27,866	27,866	27,866	27,866	27,866
R-squared	0.34	0.34	0.36	0.26	0.26	0.32
Firm FE	YES	YES	YES	YES	YES	YES
Sector FE	YES	YES	NO	YES	YES	NO
Region*Time FE	NO	YES	YES	NO	YES	YES
Sector*Time FE	NO	NO	YES	NO	NO	YES

Notes: Results of D-in-D regressions using firm-level data to evaluate the effects of the wealth tax in 2011. *Post_t* is 1 if the observation is between 2011 and 2012 and 0 if it is between 2009 and 2010. *Treated_t* is 1 if the firm's liquid capital is between COP 1,000 million and COP 1,500 million (and the firm was subject to the wealth tax since 2011) and 0 if the firm's liquid capital is between COP 500 million and COP 999 million at the end of 2010. Robust standard errors clustered at the firm and year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

5. Conclusions

Taxing wealth is a tax policy used by governments from both advanced and emerging economies to increase revenues, substitute other taxes or reduce wealth inequality. In 2010, the Colombian government implemented a tax wealth reform that almost doubled tax revenues from such a tax by including new taxpayers, mostly SMEs with low level of equity. This reform was implemented in response to a serious public calamity due to climate affectations. This paper evaluates how taxing wealth of relatively small non-financial firms with high dependency of bank credit has implications on their capital structures, by affecting the supply bank credit and the use of trade credit, and on their real outcomes such as corporate debt, income, investment, and capital accumulation.

Using administrative bank-firm-loan level data from the credit registry matched with regulatory balance-sheet data and tax reports at the firm-level, we find that SMEs (i.e., the new taxpayers) were more affected by the wealth tax relative to similar SMEs below the tax threshold (control group). Our results suggest that the increase in the wealth tax leads to several financial and real distortions. Affected firms (new taxpayers) significantly received lower bank credit and exhibited higher loan rates compared to non-affected firms, especially those firms with high ex-ante leverage. This result is consistent with a reallocation of bank credit within the SMEs segment and with less risk taking as those firms operate with high leverage. Moreover, those affected firms increased the reliance on trade credit, indicating a partial substitution between bank credit by trade credit. However, we find that affected firms exhibited lower total indebtedness, confirming that firms were unable to fully substitute credit. We also document substantial real effects (i.e., lower income, investments, and stock of capital), and show that these effects were significantly higher on those firms with high ex-ante leverage. Overall, our findings suggest that taxing SMEs' wealth induces several financial and real distortions on those firms due to the high dependency on bank credit.

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Table A1. Evolution of the Colombian Wealth Tax, 2002-2010

Tax reform	Year	Nominal cutoff	Tax rate	Taxpayers
Decrees 1837/2002 y 1838/2002	2002	All income taxpayers	1.2%	Individuals and firms
Law 863/2003	2004	> COP 3,000 million	0.3%	Individuals and firms
	2005	> COP 3,000 million	0.3%	Individuals and firms
	2006	> COP 3,000 million	0.3%	Individuals and firms
	2007	> COP 3,000 million	1.2%	Individuals and firms
Law 1111/2006	2008	Same taxpayers that met the 2007 cutoff	1.2%	Individuals and firms
	2009	Same taxpayers that met the 2007 cutoff	1.2%	Individuals and firms
	2010	Same taxpayers that met the 2007 cutoff	1.2%	Individuals and firms
	2011	COP 3,000 million ≤ net wealth < COP 5,000 million	2.4%	Individuals and firms
Law 1370/2009	2011	> COP 5,000 million	4.8%	Individuals and firms
		COP 1,000 million ≤ net wealth ≤ COP 2,000 million	1.0%	Individuals and firms
Decree 4825/2010	2011	COP 2,000 million < net wealth ≤ COP 3,000 million	1.4%	Individuals and firms
		COP 3,000 million < net wealth ≤ COP 5,000 million	2.4%	Individuals and firms
Law 1430/2010	2011	> COP 5,000 million	4.8%	Individuals and firms

Source: Authors' compilation based on information from the *Dirección de Impuestos y Aduanas Nacionales (DIAN)*

Figure A2. Credit conditions around the wealth tax reform: Short-window analysis

The figure displays the coefficients β_q estimated from the following regression conducted at the loan-level (i.e., bank-firm-quarter) including four quarters immediately before and after the implementation of the wealth tax reform (i.e., from 2009Q4 to 2011Q4):

$$y_{f,b,q} = \alpha + \sum \beta_q \text{Quarter}_q * \text{Treated}_f + \gamma_{f,b} + \gamma_{b,q} + \gamma_{s,q} + \varepsilon_{f,b,q}$$

where $y_{f,b,q}$ is one of the following loan-level variables for firm f , bank b , and quarter q . *Loan Volume* $_{f,b,q}$ is the log of loan value (measured in pesos) (Panel A) and *Interest Rate* $_{f,b,q}$ is the loan interest rate (measured in percent) (Panel B). Quarter_q is an indicator for quarter q . Treated_f is an indicator that equals one if the firm's liquid capital is above COP 1 billion (i.e., the tax threshold defining the taxpayers) in the quarter prior to the implementation of the reform (i.e., 2011Q1). $\gamma_{f,b}$, $\gamma_{b,q}$, $\gamma_{s,q}$ are firm-bank, bank-quarter, and sector-quarter fixed effects, respectively. We exclude the quarter prior to the implementation of wealth tax reform—2010Q4—so that all coefficients of interest are estimated relative to that quarter. The vertical bar in all panels includes the quarters around the implementation of the wealth tax reform. Standard errors are double clustered at the firm-bank and quarter level. The vertical bars display the 95 percent confidence levels.

