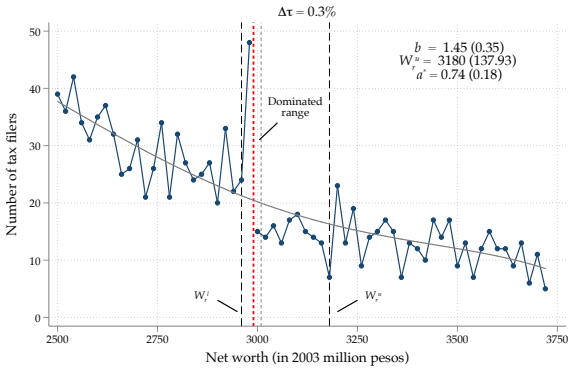
Online Appendix

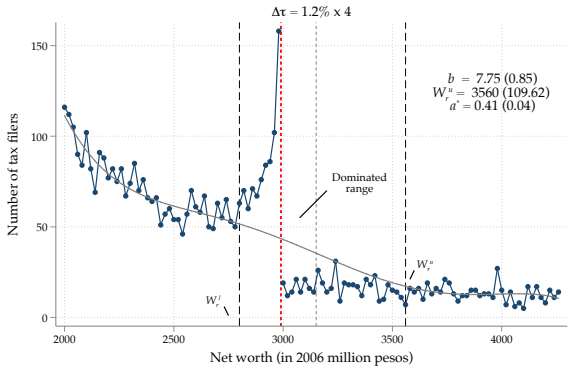
A Figures and Tables

Figure A.1: Taxpayers' Response to Temporary and Recurrent Wealth Taxation

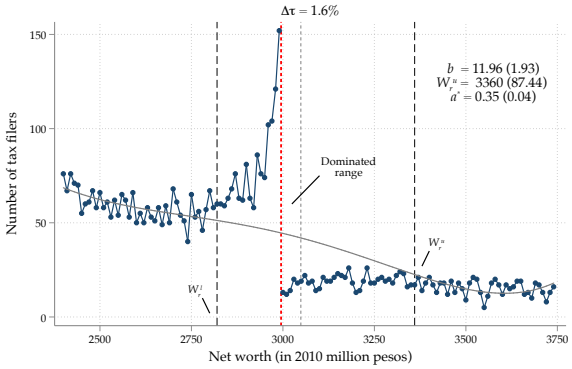
(a) 2003: τ Jumps from 0% to 0.3%



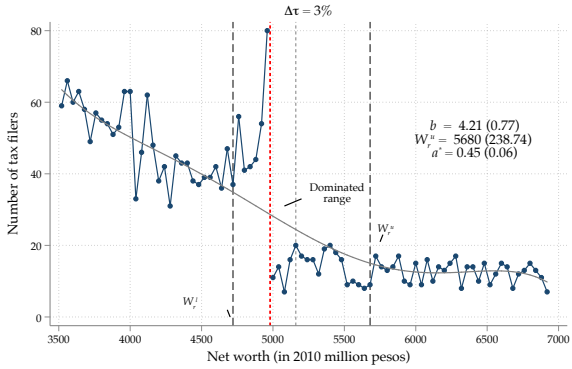
(b) 2006: τ Jumps from 0% to 4.8% (1.2%×4)



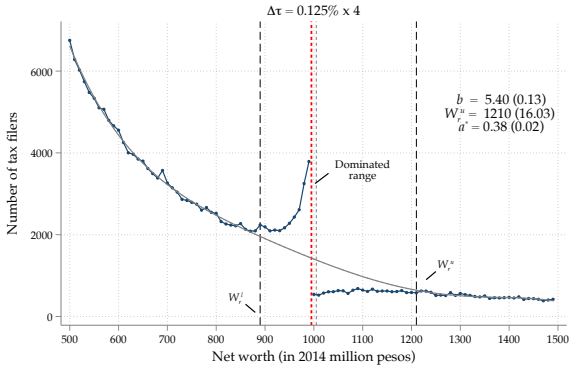
(c) 2010 Third Notch: τ Jumps from 1.4% to 3%



(d) 2010 Fourth Notch: τ Jumps from 3% to 6%



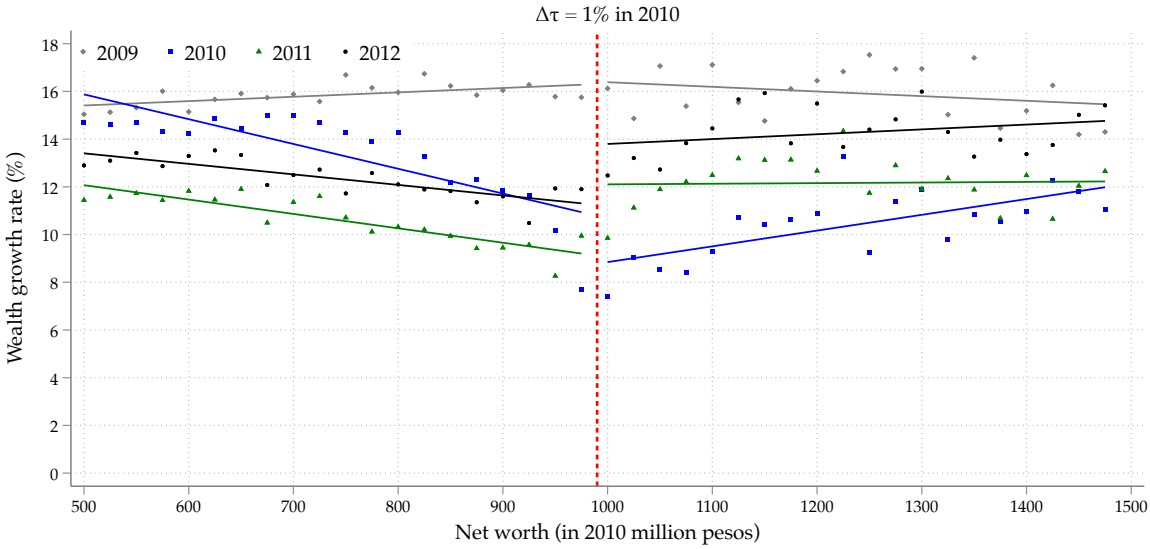
(e) 2014: τ Jumps from 0% to 0.5% (0.125%×4)



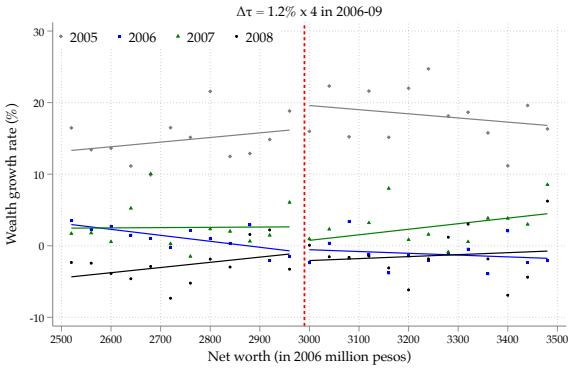
Notes: This figure compares the behavioral response to the wealth tax across four different tax regimes. The panels display taxpayer density by net worth in 2003, 2006, 2010, and 2014 and fit the counterfactual distribution. The parameters are estimated as in Figure 3. The notch size $\Delta\tau$ is $1.2\% \times 4$ in 2006 because individuals reporting 3 billion or more in wealth that year were taxed through 2009. The notch size is $0.125\% \times 4$ in 2014 for similar reasons. Bin width is 20 million pesos in Panels (a) and (b), 10 million pesos in Panels (c) and (e), and 40 million pesos in Panel (d). The estimated parameters are summarized in Table 1. *Source:* Authors' calculations using administrative tax microdata from DIAN.

Figure A.2: Wealth Growth Rates Before and After a Wealth Tax

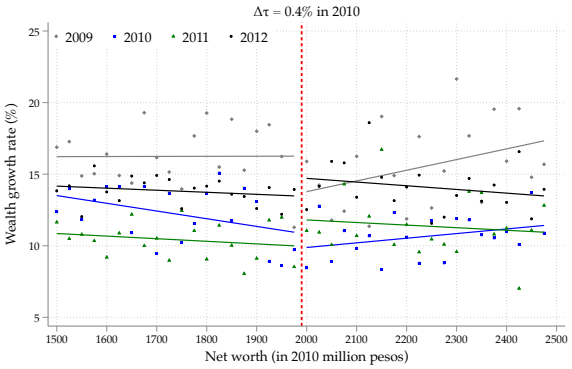
(a) Pre/Post Temporary Exemption Notch



(b) Pre/Post Recurrent Exemption Notch



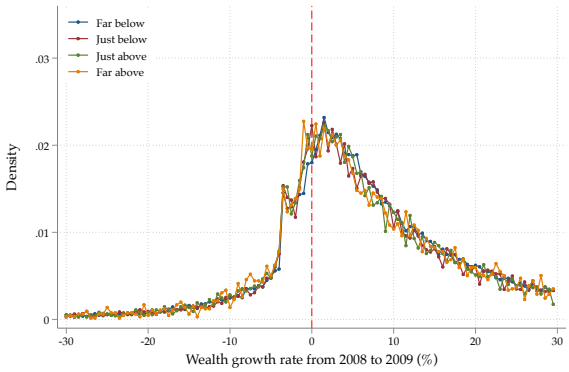
(c) Pre/Post Non-Exemption Notch



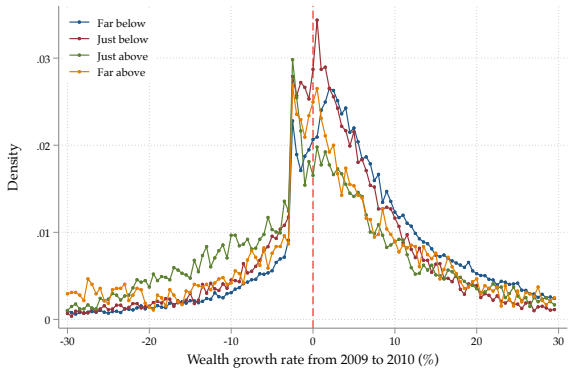
Notes: This figure shows the average yearly wealth growth rates by wealth bins surrounding various tax brackets (vertical red line) before and after a wealth tax hike. The markers represent each bin's average wealth growth rate, and the lines fit linear models below and above each cutoff. Panel (a) focuses on 2010's temporary 1% wealth tax and groups taxpayers into bins of 25 million pesos. Panel (b) focuses on the recurrent 1.2% wealth tax of 2006–09 and groups taxpayers into bins of 40 million pesos. Panel (c) focuses on 2010's 1.4% wealth tax and groups taxpayers into bins of 25 million pesos. *Source:* Authors' calculations using administrative tax microdata from DIAN.

Figure A.3: Distribution of Wealth Growth Rates

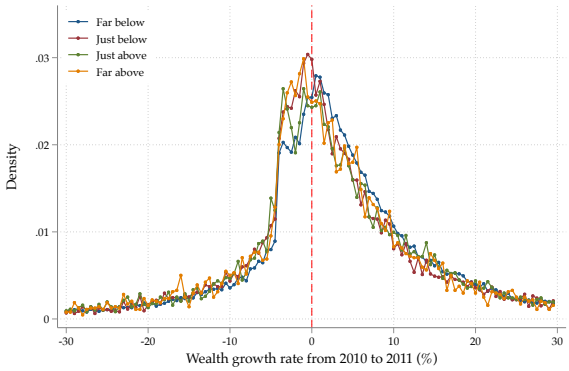
(a) Growth Rate from 2008 to 2009



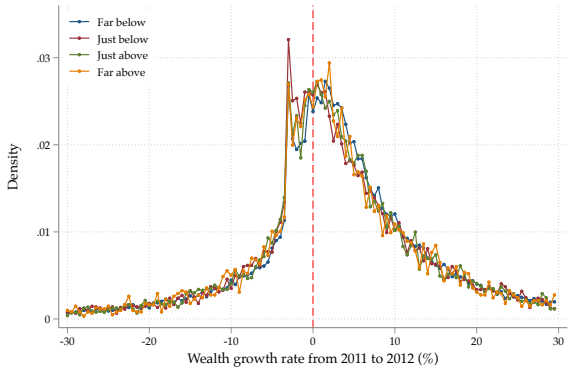
(b) Growth Rate from 2009 to 2010



(c) Growth Rate from 2010 to 2011

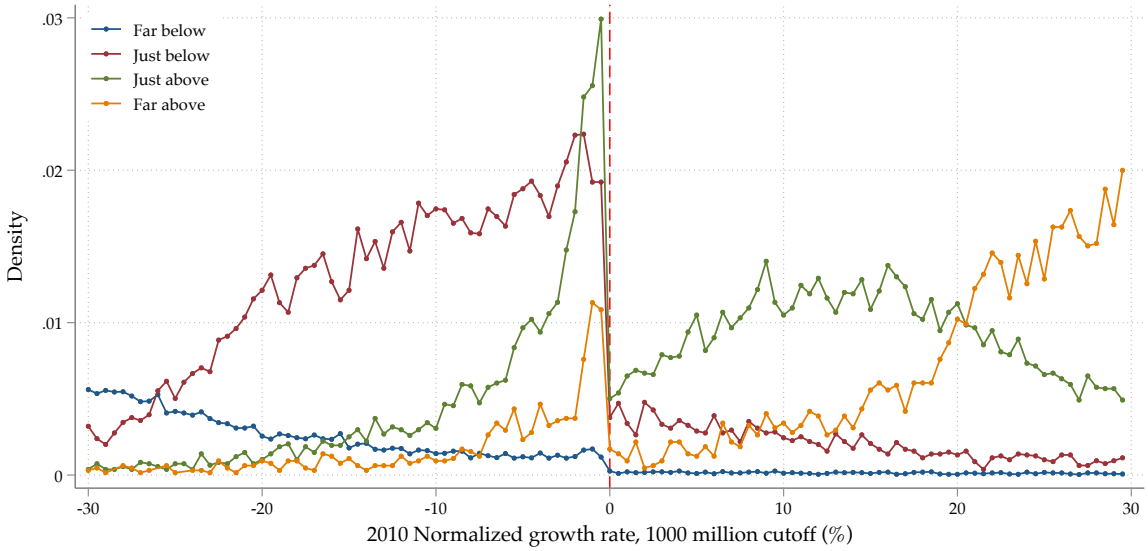


(d) Growth Rate from 2011 to 2012



Notes: The figures plot the distribution of wealth growth rates for individuals with different levels of reported wealth around 1,000 million pesos (the 2010's wealth tax exemption cutoff) in 2009. Individuals categorized as 'far below' had wealth between 500 and 799 million pesos, those 'just above' between 800 and 999 million, those 'just above' between 1,000 million and 1,250 million, and those 'far above' between 1,250 and 1,499 million. Panel (a) plots the distribution of wealth growth rates from 2008 to 2009, before the reform. All groups of taxpayers had similar distributions of growth rates before the reform, and some taxpayers piled around -3.5%, meaning they did not adjust for inflation. Panel (b) plots the distribution of growth rates from 2009 to 2010, after the reform. There is a downward shift in the distribution of growth rates for taxpayers 'just above' the exemption threshold. Panels (c) and (d) plot the distribution of growth rates from 2010 to 2011 and 2011 to 2012, respectively. Taxpayers 'just below' the threshold do not adjust for inflation, piling at negative growth rates. *Source:* Authors' calculations using administrative tax microdata from DIAN.

Figure A.4: Distribution of Normalized Wealth Growth Rates



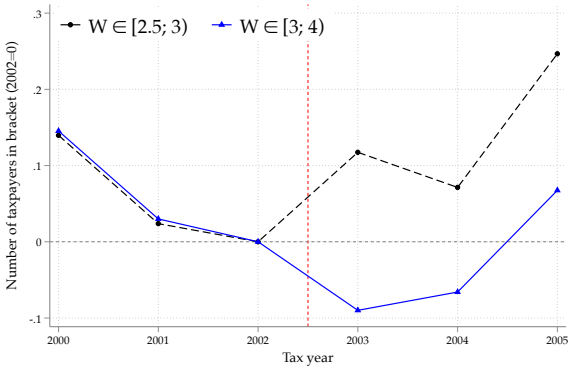
Notes: The figure plots the normalized distribution of wealth growth rates for individuals with different levels of reported wealth around 1,000 million pesos (the 2010's wealth tax exemption cutoff) in 2009. Following Garbinti et al. (2023), we define the "normalized growth rate" as the growth rate in excess of the growth rate that would make individuals cross the exemption threshold:

$$\tilde{g}_{i,t,1000M} = \underbrace{\frac{W_{i,t+1} - W_{i,t}}{W_{i,t,}}}_{\text{actual growth rate}} - \underbrace{\frac{1000M - W_{i,t}}{W_{i,t}}}_{\text{growth rate needed to be at threshold}} = \frac{W_{i,t+1} - 1000M}{W_{i,t}}.$$

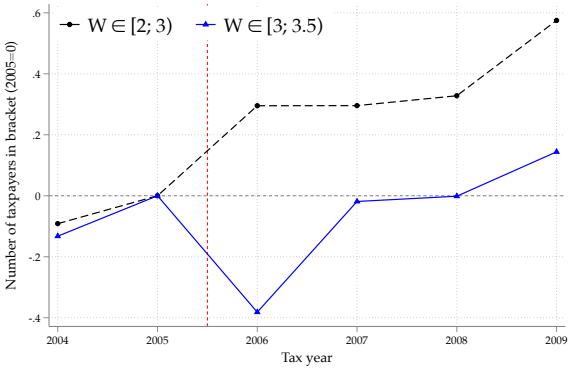
For example, if $\tilde{g}_{i,t,1000M} = 0$, individual i locates exactly at the threshold. If $\tilde{g}_{i,t,1000M} < 0$, individual i locates below the 1,000 million peso cutoff. The figure shows that taxpayers positioned 'just above' the exemption threshold, whom Figure A.3 showed reported negative growth rates, strategically locate themselves just below the cutoff point (in green). Despite their initial position above the threshold in 2009, they intentionally position themselves slightly below it to circumvent the wealth tax. Similarly, certain taxpayers located 'far above' the threshold, who also report lower growth rates, also avoid the wealth tax, although the degree of bunching is comparatively smaller (in yellow).
Source: Authors' calculations using administrative tax microdata from DIAN.

Figure A.5: Number of Taxpayers Above and Below Wealth Tax Bracket Cutoffs

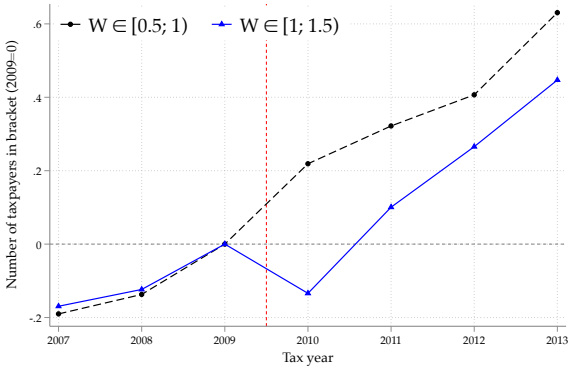
(a) Exemption cutoff at $W_r^{2003,04,05} = 3$ billion



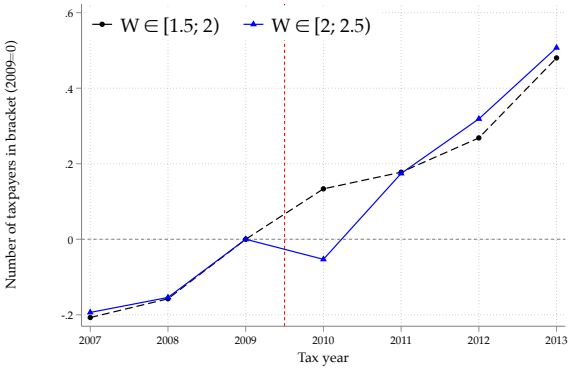
(b) Exemption cutoff at $W_r^{2006} = 3$ billion



(c) Exemption cutoff at $W_r^{2010} = 1$ bllion

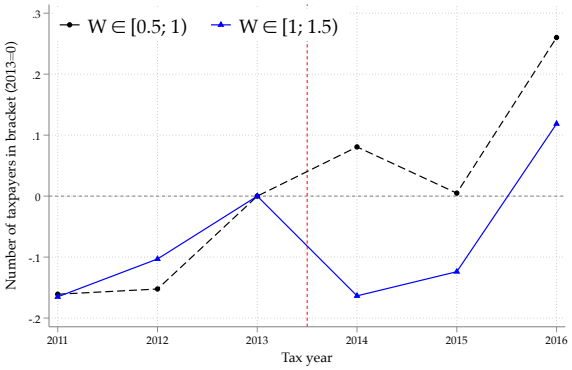


(d) Non-Exemption cutoff at $W_r^{2010} = 2$ bllion



(e) Non-Exemption cutoff at $W_r^{2010} = 5$ bllion

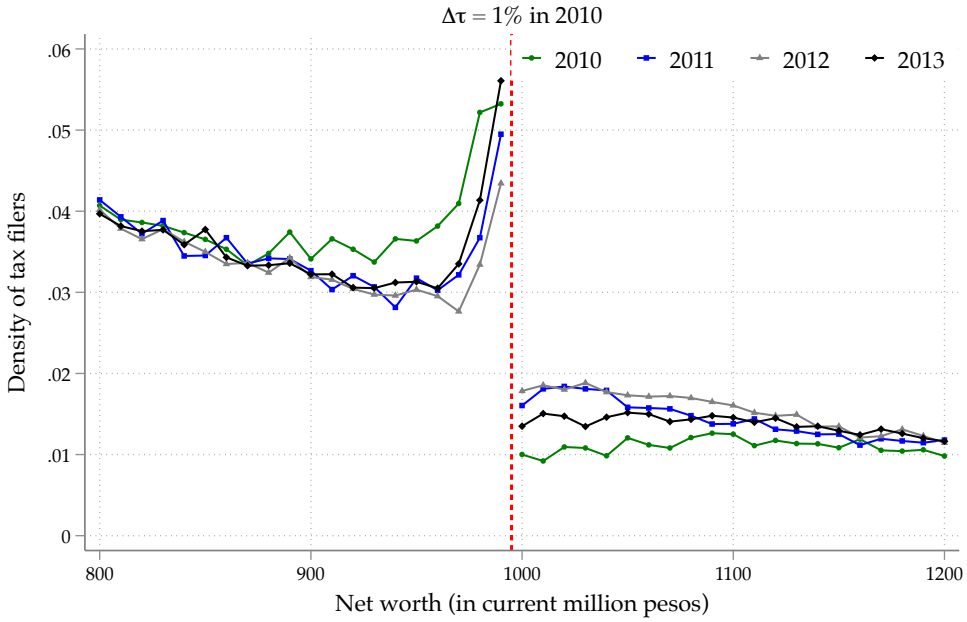
(f) Exemption cutoff at $W_r^{2014} = 1$ bllion



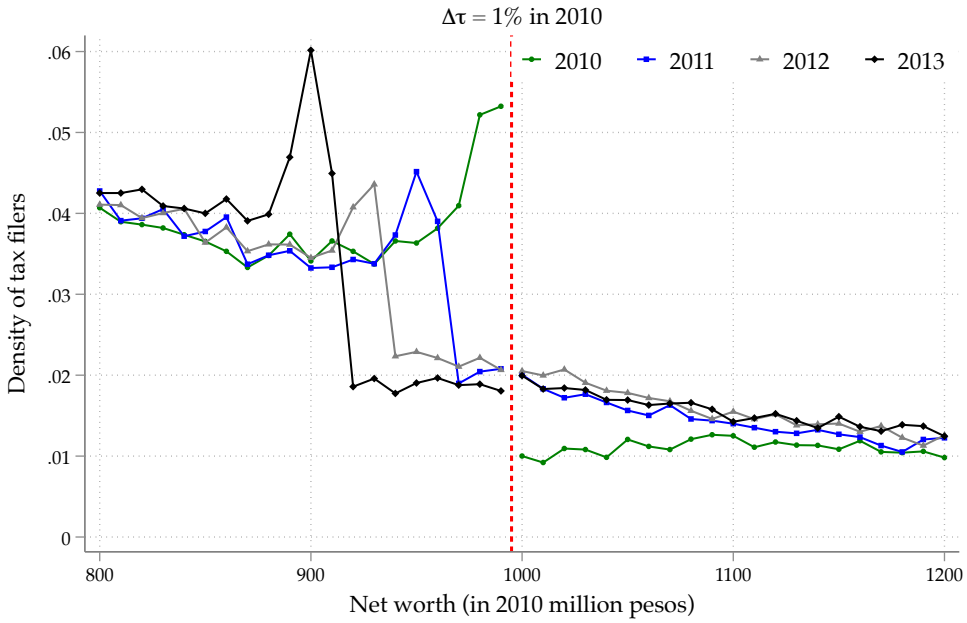
Notes: The figure shows the number of taxpayers reporting wealth in below and above a bracket cutoff (in constant, reform-year pesos), normalized to zero in the pre-reform year. We do not plot the series around 2010's third notch of $\Delta\tau = 1.6$ percent at $W_r^* = 3$ billion pesos, as it interferes with the wealth tax put in place between 2006 and 2009 at a similar cutoff. *Source:* Authors' calculations using administrative tax microdata from DIAN.

Figure A.6: Bunching Response to the Announcement of a Wealth Tax Reform

(a) Current pesos

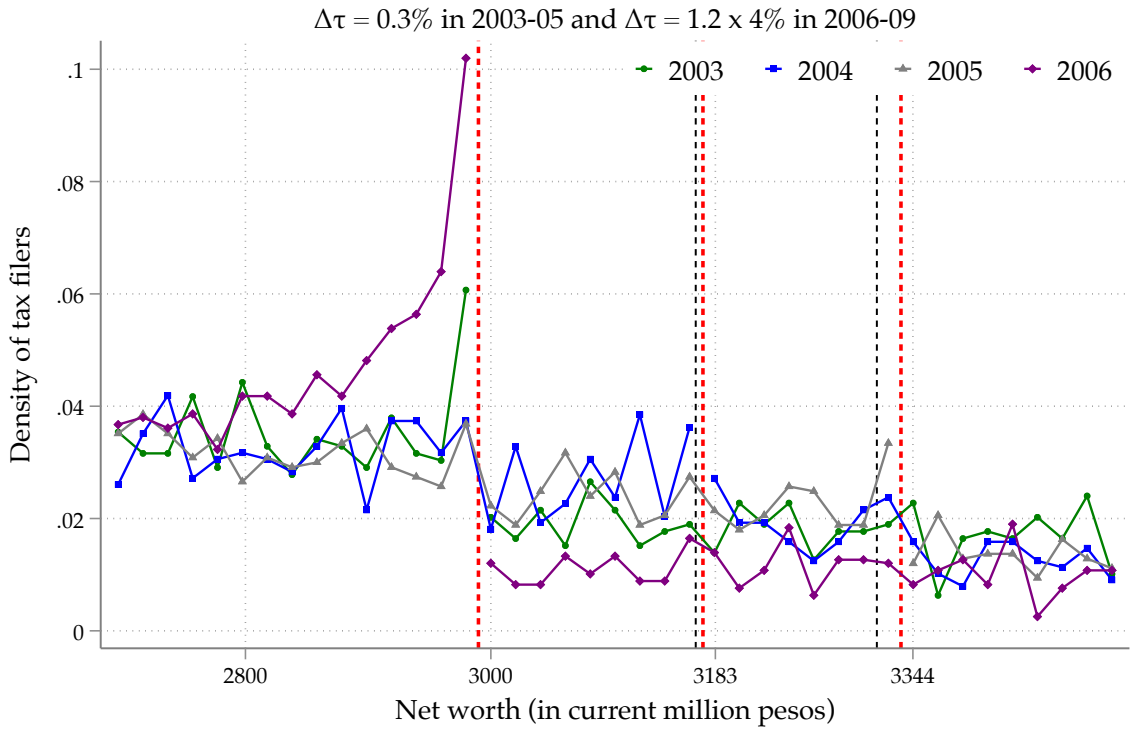


(b) Constant pesos



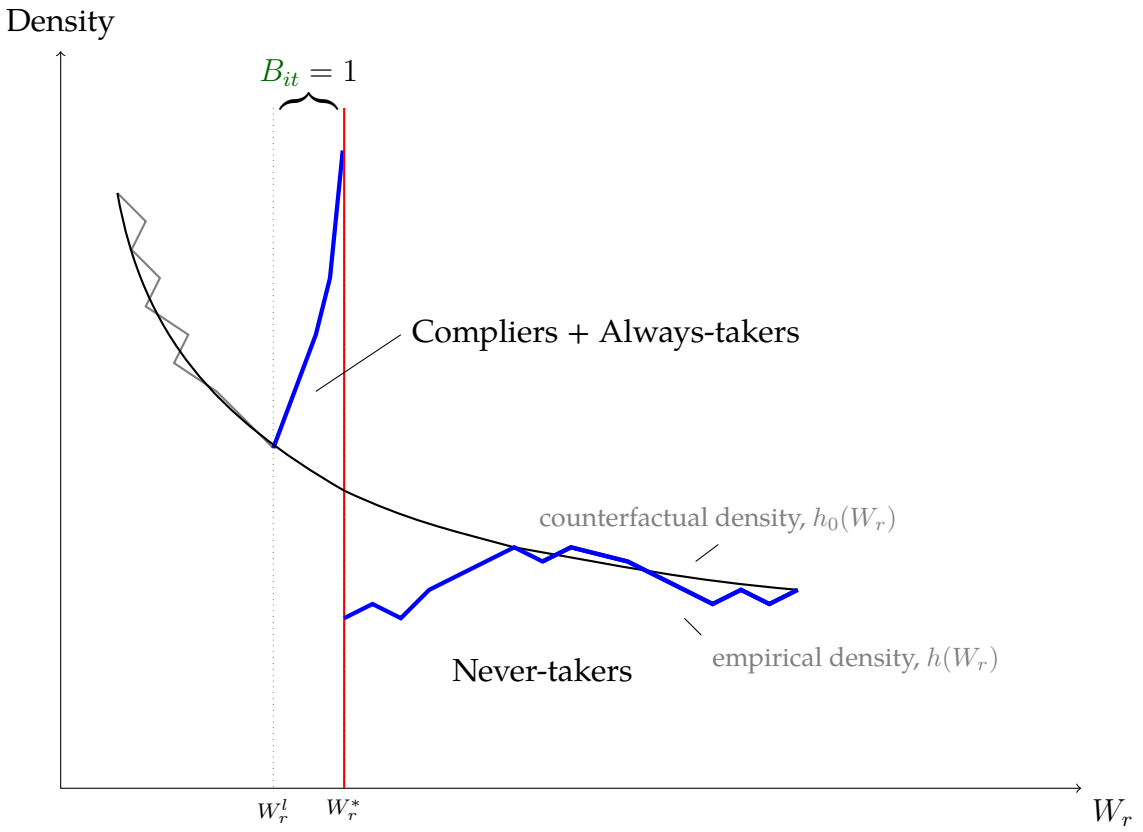
Notes: These figures show that bunching increases after the announcement of a wealth tax reform in 2013. Panel (b) shows that, because taxpayers bunch below the cutoff in *current* pesos, they report less wealth in *real* terms. *Source:* Authors' calculations using administrative tax microdata from DIAN.

Figure A.7: Bunching Below Statutory Cutoffs in 2003, 2004, 2005, and 2006



Notes: This figure shows that taxpayers bunch below the statutory bracket cutoffs. Taxpayers owning 3 billion pesos or more in 2003, 2004, and 2005 were subject to a 0.3% wealth tax in those years. These exemption cutoffs were defined in 2003 pesos by Law 863/2003. In 2004, the statutory cutoff (red vertical line) matched closely with the implied inflation-adjusted cutoff (black vertical line). However, in 2005, the statutory cutoff exceeded the inflation-adjusted cutoff, and taxpayers bunch below the statutory cutoff. Notably, taxpayers' bunching response does not build up over time between 2003 and 2005. In 2006, a tax reform levied a wealth tax of 1.2% between 2006 and 2009 for taxpayers owning 3 billion pesos or more in 2006, and taxpayers bunch in response to this wealth tax hike. *Source:* Authors' calculations using administrative tax microdata from DIAN.

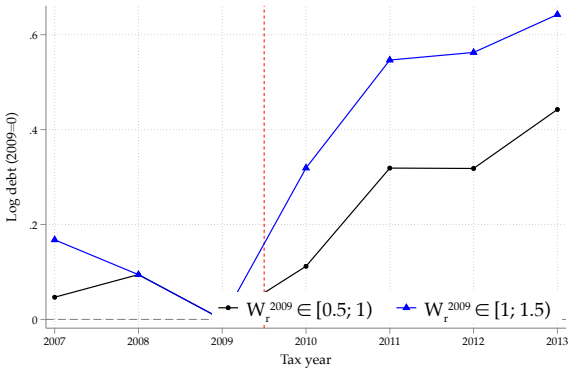
Figure A.8: Compliers (i.e., bunchers) analysis



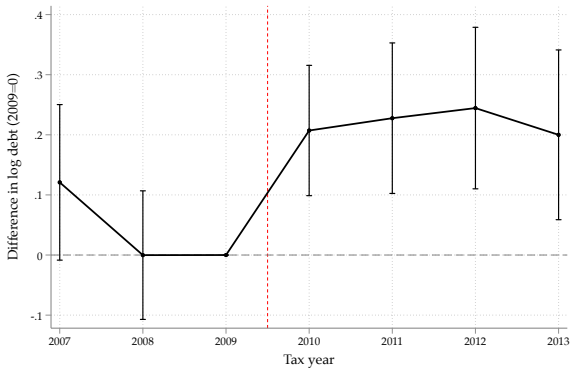
Notes: This figure illustrates the analysis of compliers characteristics in the context of bunching in response to discontinuities in a tax schedule. The blue (black) line represents the hypothetical empirical (counterfactual) density of taxpayers by reported wealth W_r. $B_{it} = 1$ if individual i is located in bunching range $[W_r^l, W_r^*)$ in year t. Tax filers located in this range will be a mix of compliers (i.e., those who react to tax notches by bunching below the cutoff) and always-takers (i.e., those who would be located in that range even in the absence of tax notches). Tax filers located above W_r^* are never-takers (i.e., those who will not or cannot bunch in response to the tax notch).

Figure A.9: The Effect of a Wealth Tax on Debt and the Likelihood of Any Capital Gain

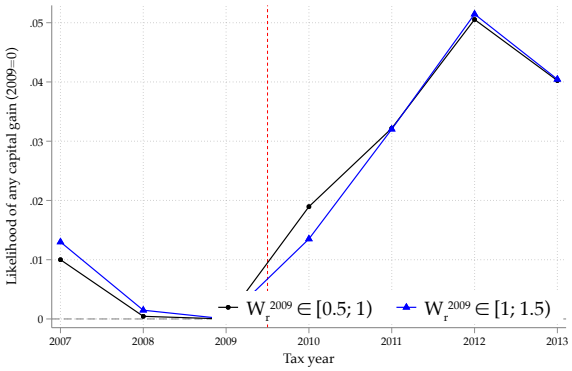
(a) Log Debt



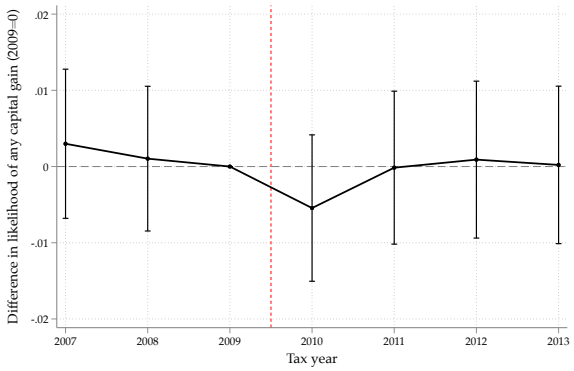
(b) Difference between T and C in Panel (a)



(c) Likelihood of Realizing Any Capital Gain

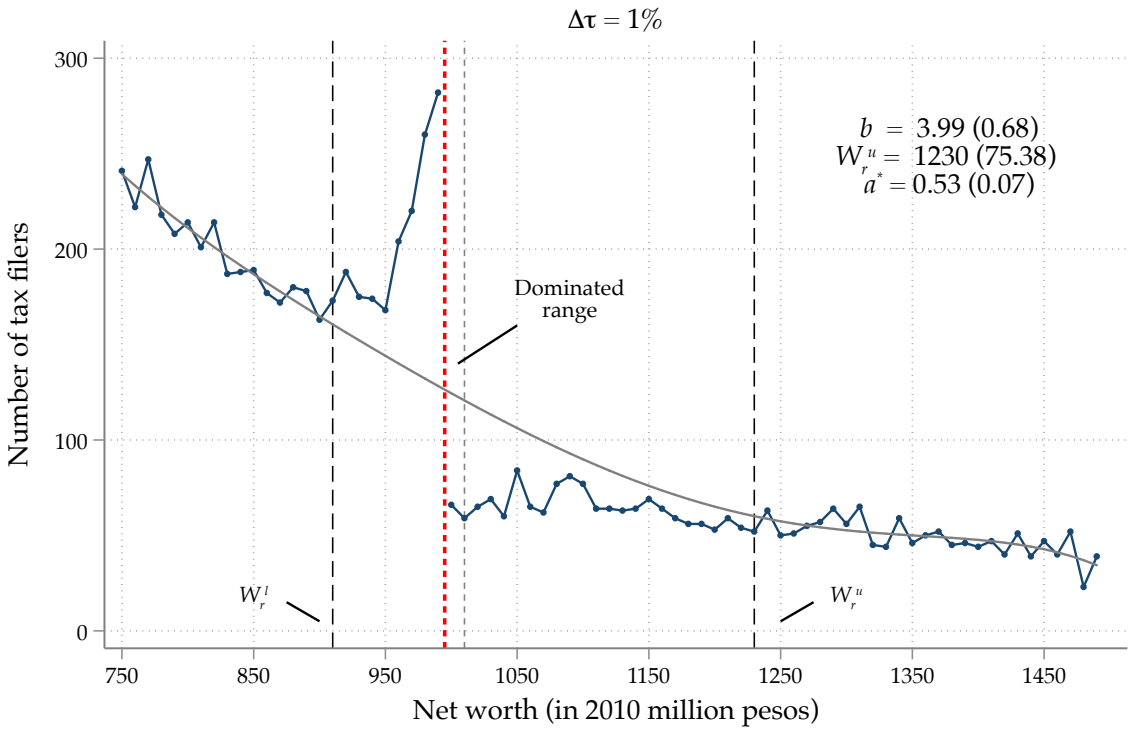


(d) Difference between T and C in Panel (c)



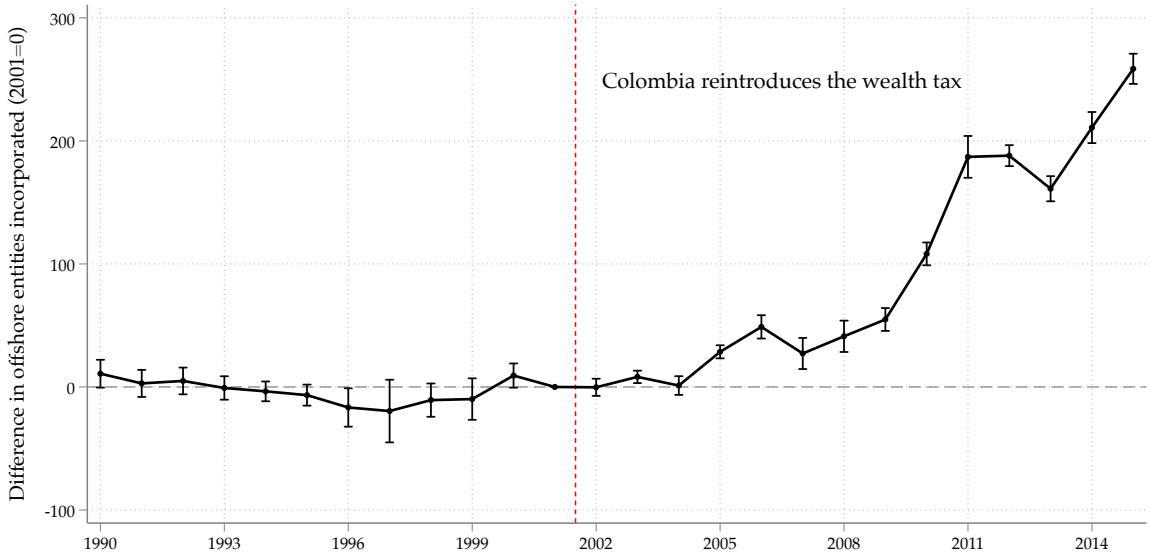
Notes: These figures show the effects of wealth taxation on various outcomes using DD and a balanced sample of taxpayers above and below the exemption notch of 2010's temporary wealth tax. The outcome is the inverse hyperbolic sine of debt in Panels (a) and (b), and realizing a capital gain in Panels (c) and (d). The panels on the left show the evolution of the series for treated (in blue) and control (in black) taxpayers, normalized to zero in the pre-reform year. The panels on the right show the differences between these two series, i.e., the β_j coefficients from specification (4) and associated 95% confidence intervals based on robust standard errors clustered at the individual level. *Source:* Authors' calculations using administrative tax microdata from DIAN.

Figure A.10: Bunching Among Business Owners Required to Keep Records



Notes: This figure displays the density of taxpayers required to keep records by their net worth in 2010, and fits the counterfactual distribution. The key parameters are estimated as in Figure 3. Bin width is 10,000,000 pesos (2010 USD 5,208.30 in 12/31/2010). *Source:* Authors' calculations using administrative tax microdata from DIAN.

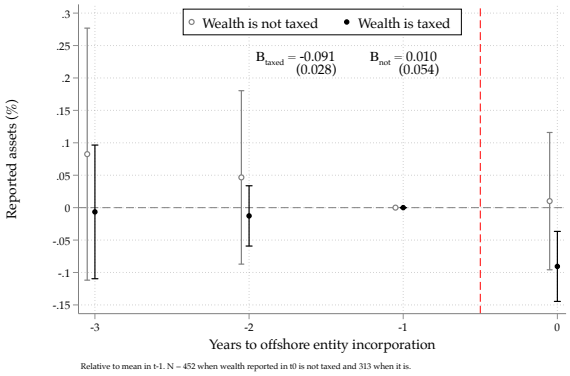
Figure A.11: Colombians Incorporate More Offshore Entities since the Wealth Tax



Note: This figure compares the number of new offshore entities incorporated every year through Mossack Fonseca by Colombians versus people in 31 other Latin American and OECD countries (excluding countries that are themselves tax havens). The series plots the β_j coefficient in the following event-study specification: $y_{it} = \alpha_i + \delta_t + \sum_{j \neq 2001} \beta_j Year_{j=t} \cdot Colombia_i + \epsilon_{it}$, and the associated 95% confidence intervals based on robust standard errors clustered at the country level. Both panels include active and inactive offshore entities. *Source:* Authors' calculations based on the Panama Papers and the Offshore Leaks microdata published by ICIJ. Accessed June 12, 2017.

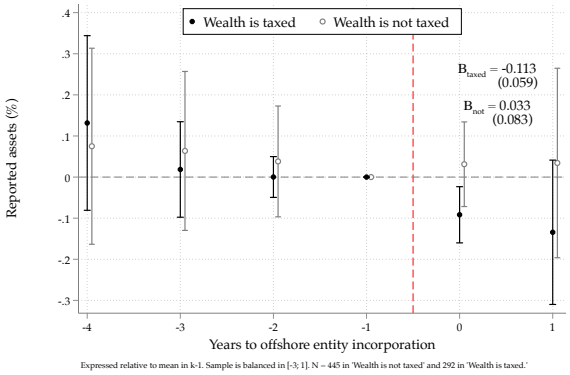
Figure A.12: Robustness Check: The Effect of Opening an Offshore Entity on Assets Reported to the Tax Authority Using Different Event Time Windows

(a) Balanced in $k \in [-3, 0]$

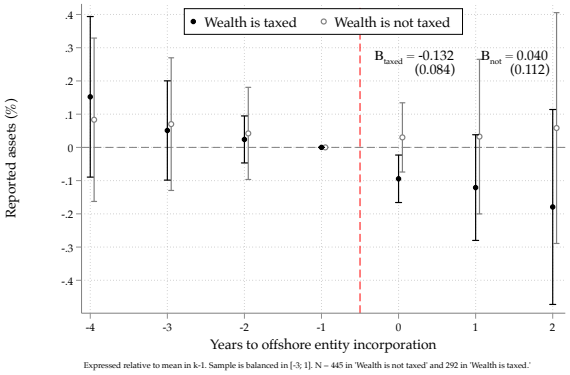


(b) Balanced in $k \in [-3, 2]$

(c) Balanced in $k \in [-4, 1]$

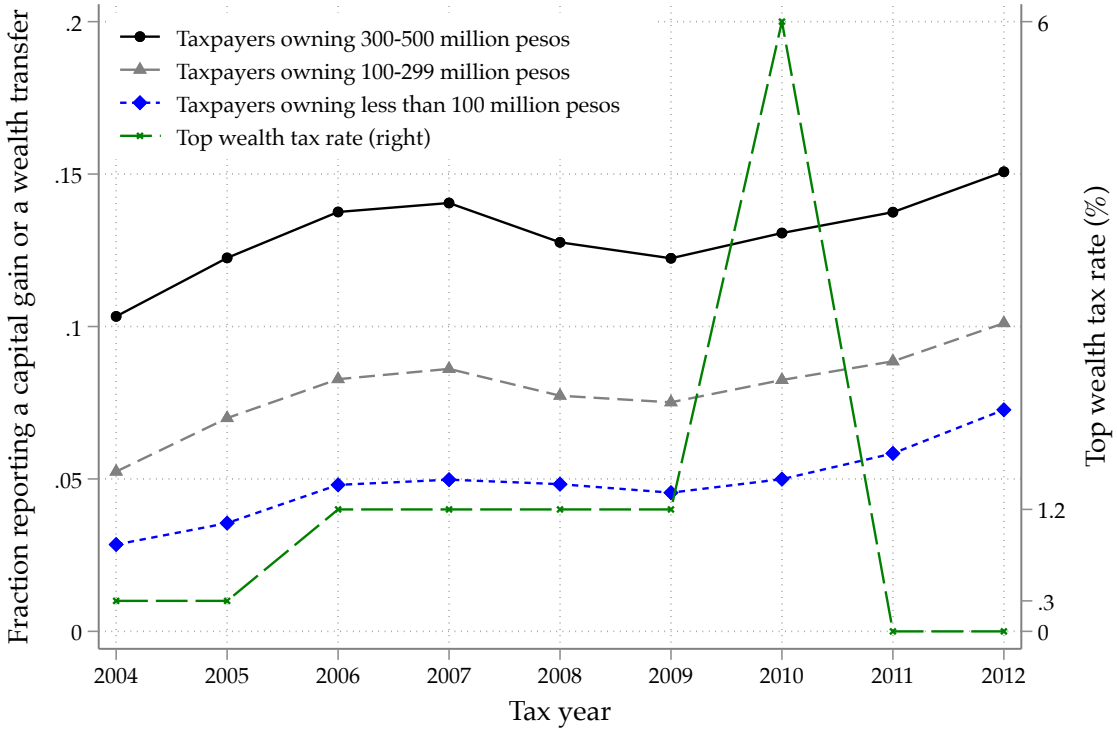


(d) Balanced in $k \in [-4, 2]$



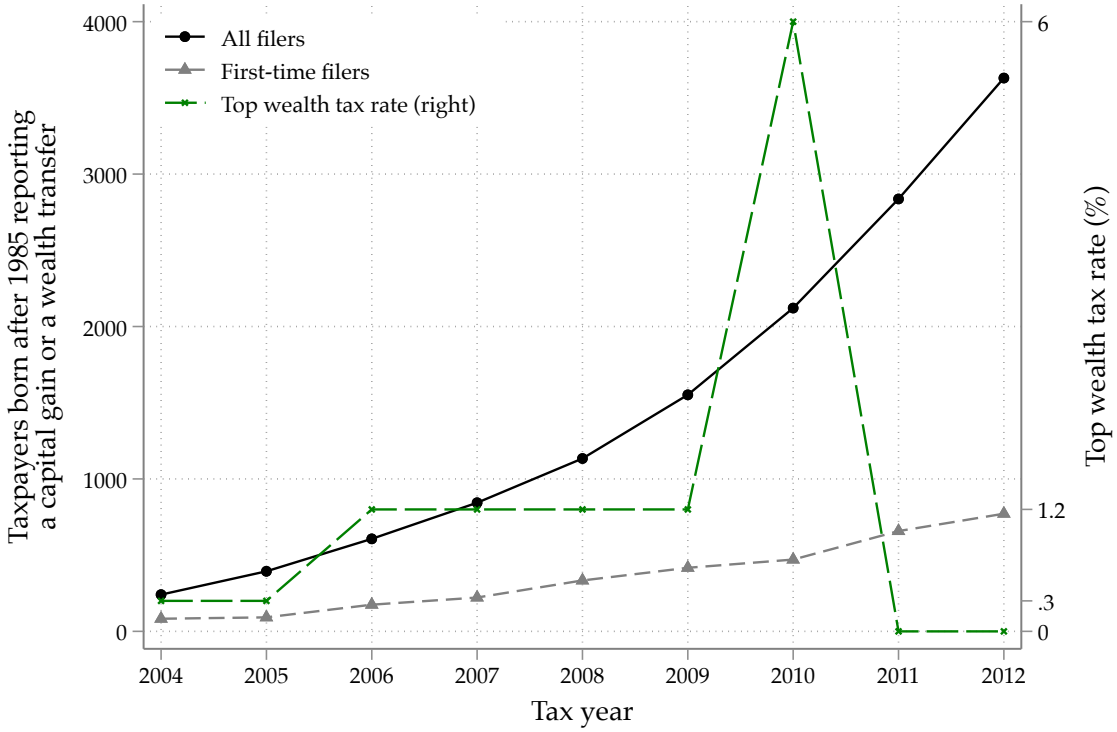
Notes: These figures present robustness checks on the β_k coefficients from event-study specification (6), varying the event time window across balanced samples of taxpayers in the Panama Papers. The sample is balanced in event time $k = [-3, 0]$ in Panel (a) and $k = [-3, 1]$ in Panels (b)–(d). *Sources:* Authors' calculations using administrative tax microdata from DIAN and ICIJ.

Figure A.13: The number of taxpayers reporting a realized capital gain or wealth transfer



Notes: This figure compares the number of income tax filers realizing a capital gain or receiving a wealth transfer between 2004 and 2012 by wealth groups (in constant 2010 pesos). The blue series focuses on taxpayers owning less than 100 million pesos, while the gray series focuses on taxpayers owning between 100 and 299 million, and the black series focuses on taxpayers owning between 300 and 500 million. The green series plots the evolution of Colombia's top wealth tax rate (right axis).
Source: Authors' calculations using administrative tax microdata from DIAN.

Figure A.14: Evolution of the number of taxpayers born after 1985 reporting a realized capital gain or wealth transfer



Notes: This figure compares the number of income tax filers born after 1985 realizing a capital gain or receiving a wealth transfer between 2004 and 2012. The black series plots the number of tax filers, while the gray series plots the number of first-time filers. The green series plots the evolution of Colombia's top wealth tax rate (right axis). *Source:* Authors' calculations using administrative tax microdata from DIAN.

Table A.1: Being named in the Panama Papers is correlated with bunching

	Dependent variable: Ever been located in a bunching region			
	(1)	(2)	(3)	(4)
Named in Panama Papers	0.028***	0.026***	0.025**	0.025**
	(0.010)	(0.010)	(0.010)	(0.010)
Wealth FE (100 quantiles)	X			
Wealth FE (200 quantiles)		X	X	X
Demographic controls			X	X
Other controls				X
Dep. Mean	0.013	0.013	0.013	0.013
N	3,301,926	3,301,926	3,274,390	3,274,390
R^2	0.235	0.24	0.243	0.243

Notes: This table presents the OLS coefficient on a regresion of ever being located in a bunching region $[W_r^l, W_r^*)$ in either 2003, 2006, 2010, or 2014 on an indicator for being named in the Panama Papers leak. Column (1) includes wealth percentile fixed effects, where reported net wealth is obtained from the most recent income tax return (FY 2016 for almost two-thirds of the sample). To more accurately capture the very top of the distribution, Column (2) uses 200 wealth quantiles instead. Column (3) adds baseline demographic controls, like sex and being born after 1985. Column (4) adds additional controls, like the number of years in which an individual filed taxes and an indicator for being required to keep accounting books. The results suggest being named in the Panama Papers leak is highly correlated with bunching behavior. $*p < 0.1, **p < 0.05, ***p < 0.01$. *Source:* Authors' calculations using administrative tax microdata from DIAN and ICIJ.

Table A.2: Taxpayers Set Up Offshore Entities to Bunch Below Cutoffs

	Dependent variable: Incorporated an offshore entity	
	Bunching range (narrower) (1)	DD range (wider) (2)
In bunching region	0.0016*	0.0052***
	(0.0009)	(0.0018)
Dependent variable mean	0.00029	0.00028
First stage F-stat of excluded instruments	411.34	509.61
N	62,988	569,802

Notes: This table presents the 2SLS coefficient in a regression of incorporating an offshore entity through Mossack Fonseca in a given year on an indicator for being located below the notch point, a time trend, and notch fixed effects. The endogenous regressor is instrumented with a reform dummy (2003, 2006, 2010, 2014) interacted with notch fixed effects to allow the first stage to vary across notches. The sample is balanced and restricted to taxpayers located around the notch in two pre-reform and one post-reform year for all seven notches. In Column (1), the sample is restricted to the very narrow bunching range identified by the bunching analysis. In Column (2), the sample is expanded to a less narrow range around the notch—similar to that used in the DD analysis. Standard errors are clustered at the individual level. The results suggest wealth tax-induced bunching increased offshore entity incorporations by 0.52 percentage points. On a mean of 0.028 percent, this represents an eighteenfold increase in incorporations. $*p < 0.1, **p < 0.05, ***p < 0.01$. *Source:* Authors' calculations using administrative tax microdata from DIAN and ICIJ.

B A Brief Recount of Wealth Taxation in Colombia

Colombia began taxing the wealth of its wealthiest citizens in 1935 using a progressive schedule (Law 78/1935). A series of reforms modified its marginal tax rates and tax bases over the next five decades (Law 45/1942, Law 135/1944, Law 81/1960, Law 9/1983). The wealth tax was abolished in 1992, only to be re-established a decade later. Multiple subsequent reforms changed both tax rates and base over the last two decades.

Álvaro Uribe was inaugurated president of Colombia on August 7, 2002 amid a precarious security situation and dismal economic conditions. Four days after inauguration, Uribe declared a state of emergency, enabling him to take extraordinary legislative measures to boost revenue to finance heightened military spending against illegal armed groups, including FARC (Decree 1837/2002).[1] Decrees 1838, 1885, and 1949 of August 2002 introduced a wealth tax dubbed "special tax for Democratic Security," in reference to Uribe's security policy (Flores-Macías, 2014).[2] The tax rate was established at a flat rate of 1.2% of *all* net worth reported by individuals and firms in their FY 2001 income tax returns (filed two months prior) and whose *gross* wealth—assets without subtracting debts—on August 31, 2002 is $169.5 million Colombian pesos or more.[3] In other words, the *average* tax rate jumps for individuals with *gross* wealth at or above $169.5 million pesos. This reform affected 48.05% of individual income tax filers: around 158,430 individual filers and 151,101 corporations were subject to this tax. However, individual taxpayers contributed less than one-quarter of this tax revenue, with the bulk being paid for by corporations.

The following year—and months after taxpayers filed FY 2003 income taxes—Uribe extended the "special" tax on wealth to continue funding the exigencies of war against illegal armed groups. Individuals with net worth of $3 billion (thousand million) pesos or more (base year 2004) by January 1, 2004, January 1, 2005, and January 1,

[1] "*The adoption of temporary yet effective extraordinary measures is non-postponable to give Colombians their individual and collective security and to respond to the unprecedented challenge posed by criminal groups... every individual must make a significant tax effort to enable the State to ensure public security in vast parts of its territory*" (Decree 1837/2002, our translation).

[2] It should be noted that the exigencies of the war against drug cartels and illegal armed groups had previously led to the creation of forced investment bonds, in 1996 and 1998. Tax filers with net worth above 150 million pesos in 1996 were required to invest 0.5% of taxable net worth in "Bonds for Security" (Law 345/1996), while taxpayers with net worth above 210 million pesos in 1998 were required to invest 0.6% of taxable net worth in "Solidarity Bonds for Peace" in 1999 and 2000 (Law 487/1998).

[3] Two deductions are allowed: (i) net wealth value of assets in national businesses, and (ii) mandatory contributions to pension funds.

2006 would be subject to this tax (Law 863/2003).[4] For these individuals, the tax was levied at a flat rate of 0.3% on *all* taxable wealth (i.e., net worth minus two allowances) for FY 2003–2005 using tax form 420.[5] This reform thus generates a notch around 3 billion pesos, the threshold at which the average rate jumps from 0 to 0.3%. This reform annually affected only 1,420 individual taxpayers and some 4,850 firms, with the overwhelming majority (97%) of the tax burden falling on corporations.

After Uribe's re-election, the wealth tax was extended for tax years 2007–2010 (Law 1111/2006), and the *average* rate was quadrupled to 1.2% for taxpayers with $3 billion (thousand million) pesos or more in wealth by January 1, 2007. Again, the 1.2% was levied on *all* net worth after substracting two allowances, thus generating a notch around the 3 billion pesos threshold.[6] Importantly, even though the tax was levied on net worth held in tax years 2006, 2007, 2008, and 2009, only taxpayers with net worth of at least 3 billion pesos in 2007 were levied. That is, an individual reporting 2,999,999,999 pesos in FY 2006 and 3 billion pesos or more in 2007, 2008, or 2009 will *not* be subject to the wealth tax. This reform annually affected only some 1,800 individual filers and 5,690 corporations, with 97% of the tax burden falling on firms.

In 2009, Uribe introduced a temporary wealth tax with increasing average rates of 2.4% for taxable wealth held by January 1, 2011 between $3–5 billion pesos, and 4.8% for taxable wealth of $5 billion pesos or more for 2011 (Law 1370/2009).[7] However, in December the following year, and allegedly to cover expenses to palliate the disastrous effects of the 2010 extreme weather conditions, newly-elected Santos reduced the filing thresholds to $1 billion pesos and introduced two additional rates: 1% for taxable wealth between $1–2 billion pesos and 1.4% for wealth between $2–3 billion pesos. In addition, Santos imposed a 25% surcharge on taxpayers covered in Law 1370/2009. This raised the previous rates to 3% for taxable wealth between $3–5 billion pesos and 6% for wealth of $5 billion pesos or more. The tax was to be paid in up to eight equal payments between 2011 and 2014 (Law 1430/2010). Once again, these are *not* marginal tax rates but *average* tax rates on *all* taxable net worth. This affected 31,690

[4] This represented 3,183 million pesos in 2005 (Decree 4344/2004) and 3,344 million pesos in 2006. Note that net worth possessed January 1, year t, refers to the amount declared in the income tax in FY $t-1$ updated to valuations in year t.

[5] Allowances are (i) net wealth value of assets in national businesses, and (ii) the first 200 million pesos of the principal residence (increased to 212,200,000 pesos for FY 2005 and 222,959,000 for FY 2006).

[6] These allowances are (i) net wealth value of assets in national businesses, and (ii) the first 220 million pesos of the principal residence.

[7] Allowances are (i) net wealth value of assets in national businesses, and (ii) the first 319,215,000 pesos of the principal residence, and some other items.

individual filers and 21,512 firms, with 94% of the tax revenue being collected from corporations.

On September 10, 2014, the Minister of Finance announced a bill to establish a four-year, progressive wealth tax for individuals with net worth of at least 1 billion pesos on January 1, 2015. The bill proposed the following tax schedule: an average rate of 0.4% for net worth \$1–3 billion, a marginal rate of 1.1% for net worth \$3–5\$ billion, 2% for net worth \$5–8 billion, and 2.25% for net worth of \$8 billion and above. Importantly, this announcement was made *before* individual taxpayers' deadline to submit their income tax return for FY 2013; in fact, some taxpayers could file their return up to 22 October, 2014 (Decree 2972/2013). Insofar as some taxpayers may have submitted their 2013 tax return expecting wealth taxation, we may see reporting responses starting FY 2013.

A four-year wealth tax was established in December 2014, albeit with a different tax schedule and significantly lower marginal rates that the initial proposed bill (Law 1739/2014). Individuals and corporations with net worth of 1 billion pesos and above on January 1, 2015 would be required to file a wealth tax return. A tax would be levied on net worth held on January 1, 2015, 2016, 2017 and 2018 for individuals using form 440. Importantly, even though the tax was levied on net worth held in tax years 2014–2017, only taxpayers with net worth of 1 billion pesos or more in FY 2014 were levied. That is, an individual reporting 999,999,999 pesos in FY 2014 and 1 billion pesos or more in 2015, 2016, or 2017 will *not* be subject to the wealth tax. For individuals, the tax rate is an *average* rate of 0.125% for taxable wealth below 2 billion, and a *marginal* rate of 0.35% for taxable wealth between 2 and 3 billion, 0.75% for taxable wealth between 3 and 5 billion, and 1.5% for taxable wealth of 5 billion and above.[8,9] The reform thus generates a notch around 1 billion pesos in net worth and kinks at 2, 3, and 5 billion pesos in taxable net worth. This reform affected 4.19% of filers, with again the bulk of the burden falling on corporations.[10,11]

[8] If the wealth tax base in either year t 2016, 2017 or 2018 is bigger (smaller) than that in 2015, the resulting tax base will be the minimum between 2015 tax base plus (minus) 25% of the inflation rate in year $t-1$ and the tax base in year t.

[9] For corporations, the wealth tax is phased out between 2015 and 2017 according to the following schedule: in 2015, the tax rates are an average rate of 0.2% (0.15% in 2016, and 0.05% in 2017) for taxable wealth below 2 billion pesos, and a marginal rate of 0.35% (0.25% in 2016, and 0.10% in 2017) for taxable wealth between 2 and 3 billion, 0.75% (0.5% in 2016, and 0.2% in 2017) for taxable wealth between 3 and 5 billion, and 1.15% (1% in 2016, and 0.4% in 2017) for taxable wealth of 5 billion and above.

[10] Allowances are (i) net wealth value of assets in national businesses, and (ii) the first 12,200 UVT of the principal residence, and some other items.

[11] Note that, in both cases, the first marginal tax rate applies to *all* taxable wealth below 2 billion, *not* only taxable wealth between 1 and 2 billion.

Improvements in Third-Party Reporting: The number of third-party reporting institutions, as well as the coverage of reported items, has been subject to significant changes over the past years. In 2006, Colombia established the list of public and private institutions required to provide third-party reports, and allowed uploading these reports through its newly-created online web portal, *sistema Muisca*. In 2012, the tax authority sought to further improve tax technology (e.g., Resolutions 111–118 from October 31 2012, Law 1607/2012), expanding the coverage of third-party reports and requiring this information be submitted online. Since then, taxpayers have been granted online access to all their third-party reported information. Note, however, that there is no return pre-filling and that taxpayers were not required to neither file nor pay their taxes electronically during our period of study (OECD, 2017).

The Issue of Valuation: The value of some assets reported in tax records is often below its corresponding market values, i.e., the price at which an asset would be traded in a competitive market. For instance, real estate is reported at cadastral values. In Colombia, as in many developing countries, cadastres are typically outdated; updating cadastres requires massive fieldwork and labor-intensive operations, as Colombia—unlike OECD countries—does not use values from transactions to estimate property values.[12] As a result, cadastral values today represent between 60 and 70% of market values.[13] Moreover, unlisted equities are recorded at the price at which they are bought rather than their market price. For other illiquid assets that are infrequently traded and therefore hard-to-value, including artwork and high-value jewellery, insured values could be used instead of market values; in practice, underreporting is rampant.

[12] Property transaction data is limited and, when available (e.g., real estate sales are reported by notaries), it usually suffers from underreporting due to tax avoidance.

[13] By law, cadastral values must represent at least 60% of market values (Law 1450/2011). Historically, Bogota has updated cadastral values closer to market values more systematically than other cities in Colombia.

C Bunching Theory, Estimation, and Extensions

C.1 A Static Framework of Taxpayer Misreporting and Estimation

We use a simple static conceptual framework to estimate taxpayers' response to wealth taxes, drawing from Kleven and Waseem (2013) and Almunia and Lopez-Rodriguez (2018). A static framework serves as a natural starting point to connect our work with previous research; we will introduce a dynamic framework later.

Individuals aim to maximize their utility strategically underreporting their wealth to avoid taxes, while also considering potential fines and penalties if detected by tax authorities (Allingham and Sandmo, 1972). Utility is derived from actual wealth W, subjected to a proportional (average and marginal) tax rate τ on reported wealth, $T(W_r) = \tau W_r$. The government's limited knowledge about W permits underreporting, incurring a cost captured by a convex function $c(u)$, where u represents the fraction of unreported wealth (it is more costly to underreport larger portions of wealth). A positive wealth tax rate $\tau > 0$ reduces W_r below W, determined by the elasticity of reported wealth with respect to the net-of-tax rate, e.

If $c(u)$ and e are homogeneous, then differences in W_r are solely due to variations in W. Under a smooth tax system, the smooth wealth distribution $f(W)$ transforms into a smooth reported wealth distribution $h_0(W_r)$. However, if a proportional tax notch $\Delta\tau$ is introduced at the cutoff W_r^* such that $T(W_r) = \tau W_r + \Delta\tau \cdot W_r \cdot \mathbb{1}(W_r > W_r^*)$, taxpayers who report wealth within the interval $(W_r^*, W_r^* + \Delta W_r^*]$ will bunch at W_r^*, with the degree of bunching rising in $\Delta\tau$ and e, and falling in $c(u)$ (Figure C.1 illustrates this). Since there is a direct link between $f(W)$ and $h_0(W_r)$, the extent of bunching is $B = \int_{W_r^*}^{W_r^* + \Delta W_r^*} h_0(W_r) dW_r$.

Heterogeneity in $c(u)$ can create diverging incentives for individuals with the same underlying W to bunch. These differences arise due to various factors, such as variations in the risks of being caught cheating (e.g., absence of third-party reporting), ownership of illiquid or indivisible assets (e.g., real estate), limited understanding of or attention to the tax schedule, aversion to audit risk, or a strong preference for honesty.[14] Consequently, taxpayers with higher costs may not respond to the tax notch, as the (perceived or actual) misreporting costs exceed the expected tax savings from bunching, an implication that upcoming subsections will support.

Furthermore, the tax notch creates a dominated region, where moving down to

[14] Additionally, taxpayers might perceive higher audit risks if they bunch *exactly* at the notch, prompting them to choose a position further below it (illustrated in Panel (a) of Figure C.2).

W_r^* increases net-of-tax wealth regardless of specific preferences.[15] Taxpayers within this dominated range benefit by reducing wealth through non-durable consumption (since taxes apply to durable assets like cars and yachts) or by giving away wealth (which, unlike the U.S. tax regime, is not generally tax-exempt in Colombia). The presence of taxpayers in this region indicates high resource costs influenced by factors like ownership of lumpy assets, limited tax schedule awareness or understanding, risk aversion, or a preference for honesty (see Kleven, 2016; Kostøl and Myhre, 2021). We exploit this aspect to quantify the proportion of individuals with high resource costs within the dominated range: $a^* \equiv \int_{W_r^*}^{W_r^D} h(W_r)dW_r / \int_{W_r^*}^{W_r^D} h_0(W_r)dW_r$.[16]

To estimate the reported wealth response ΔW_r^*, we employ the standard "point of convergence" method (Chetty et al., 2011; Kleven and Waseem, 2013). We slice the data into bins of reported net worth, and the count of taxpayers in each bin c^j is used to construct an empirical density $h(W_r)$. The counterfactual distribution $h_0(W_r)$ is obtained from a regression of the following form

$$c^j = \sum_{i=0}^{p} \beta_i \cdot (W_r^j)^i + \sum_{i=W_r^l}^{W_r^u} \gamma_i \cdot 1[W_r^j = i] + \eta^j \tag{7}$$

where W_r^j is the reported net worth level in bin j and p is the polynomial order. The excluded range $[W_r^l, W_r^u]$ encompasses the area affected by the notch point, either due to excess or missing mass.

We present results based on two counterfactual distributions. First, following standard practice, we estimate predicted values from specification (7) while omitting the contribution of dummies in the excluded range, $\hat{c}^j = \sum_{i=0}^{p} \hat{\beta}_i \cdot (W_r^j)^i$. Second, we use the observed pre-reform distribution as the counterfactual density to test the sensitivity of our estimates—an advantageous feature of our setting. This approach circumvents concerns related to nonidentification and assumptions about the implicit functional form or individual heterogeneity distribution, as highlighted by Blomquist

[15] The width of the dominated range $\Delta W_r^D = \Delta\tau \cdot W_r^*/(1-\tau-\Delta\tau)$ ensures the same level of net-of-tax wealth as the notch point. Appendix C shows that even individuals in the dominated range with $e = 0$ should be bunching. Additionally, Appendix C considers the case of heterogeneity in e but not in $c(u)$.

[16] If taxpayers overcame these costs, the resulting response ΔW_r^* would be proportional to $B/(1-a^*)$. Estimating a^* from the dominated range understates average resource costs, overstates the buncher share 1-a^*, and provides a *lower bound* for the response ΔW_r^*. As a robustness check, Table C.1 computes these bounds using the "bunching-hole" method from Kleven and Waseem (2013).

et al. (2021).[17]

Equipped with a counterfactual density, we calculate excess and missing masses as the difference between observed and counterfactual bin counts in the relevant reported wealth ranges, $\hat{B} = \sum_{j \in [W_r^l, W_r^*)} (c^j - \hat{c}^j)$ and $\hat{M} = \sum_{j \in [W_r^*, W_r^u]} (\hat{c}^j - c^j)$. Unlike some prior studies that visually determine the lower limit W_r^l, we enhance estimation by employing a data-driven procedure to ascertain the location of W_r^l leveraging pre-reform data. We begin with a conservative initial value for the upper bound $W_r^u \approx W_r^*$ and an initial estimate of the counterfactual $\hat{c}^{j0}$, progressively incrementing the upper bound while reestimating the counterfactual until $\hat{B}^k = \hat{M}^k$.[18] The resultant estimated upper bound $W_r^u = W_r^* + \Delta W_r^*$ corresponds to the counterfactual reported wealth of the marginal buncher, i.e., the marginal taxpayer that responds to the tax change. If e varies across taxpayers, some mass between W_r^* and $W_r^* + \Delta W_r^*$ can be attributed to low elasticities and optimization frictions, in which case this approach identifies the response from the highest-elasticity individuals. Following Chetty et al. (2011), we define total excess bunching $\hat{b}$ as the estimated excess mass $\hat{B}$ relative to the average height of the counterfactual density beneath.

Given knowledge of τ, $\Delta\tau$, and ΔW_r^*, we obtain a reduced-form estimate of e. Following Kleven and Waseem (2013) and Kleven (2018), we relate the wealth reporting response ΔW_r^* to the change in the *implicit* marginal tax rate t^* between W_r^* and $W_r^* + \Delta W_r^*$ created by the notch:

$$e_R \equiv \frac{\Delta W_r^*}{W_r^*} \cdot \frac{1 - t^*}{\Delta t^*} \approx \left(\frac{\Delta W_r^*}{W_r^*} \right)^2 \cdot \left(\frac{1 - \tau}{\Delta \tau} \right) \cdot \frac{1}{2} \tag{8}$$

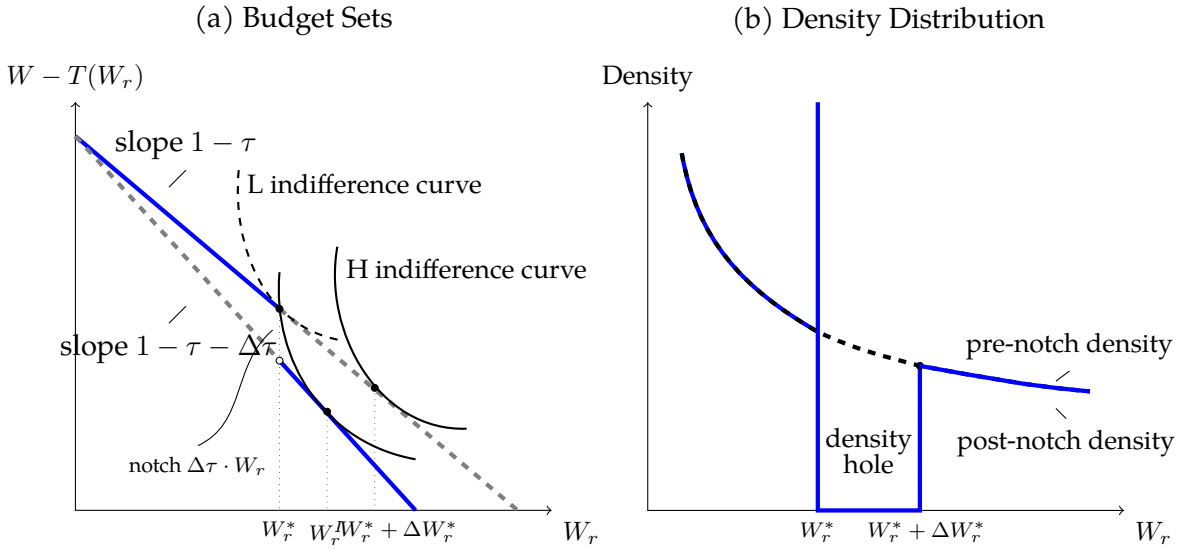
where the approximation holds for small notches ($\Delta\tau \approx 0$). Notably, e_R does not depend on a specific utility functional form (however, in Appendix C, we develop a "structural" elasticity assuming additional parametric structure). To calculate standard errors, we bootstrap the entire estimation procedure by drawing 1,000 random samples with replacement, defining the standard error for each parameter

[17] Additionally, this approach enables us to assess the potential influence of extensive margin responses—i.e., not declaring at all—that would shift down the distribution within the upper bracket. In our setting, this would mean jointly reducing total assets, gross income, credit card purchases, bank deposits, and financial investments, since taxpayers surpassing any one of the five separate thresholds must file a return. We can rule out extensive margin responses using the pre-reform distribution. For instance, the probability of not filing in 2010 as a function of pre-reform W_r in the equivalent range $[W_r^l, W_r^u]$ is smooth around W_r^*: the p-values for the first and second notches are 0.152 and 0.281, respectively, using the rdrobust command by Cattaneo et al. (2014).

[18] Since there is a finite number of bins, we impose the condition $|\hat{B} - \hat{M}| < 0.03$.

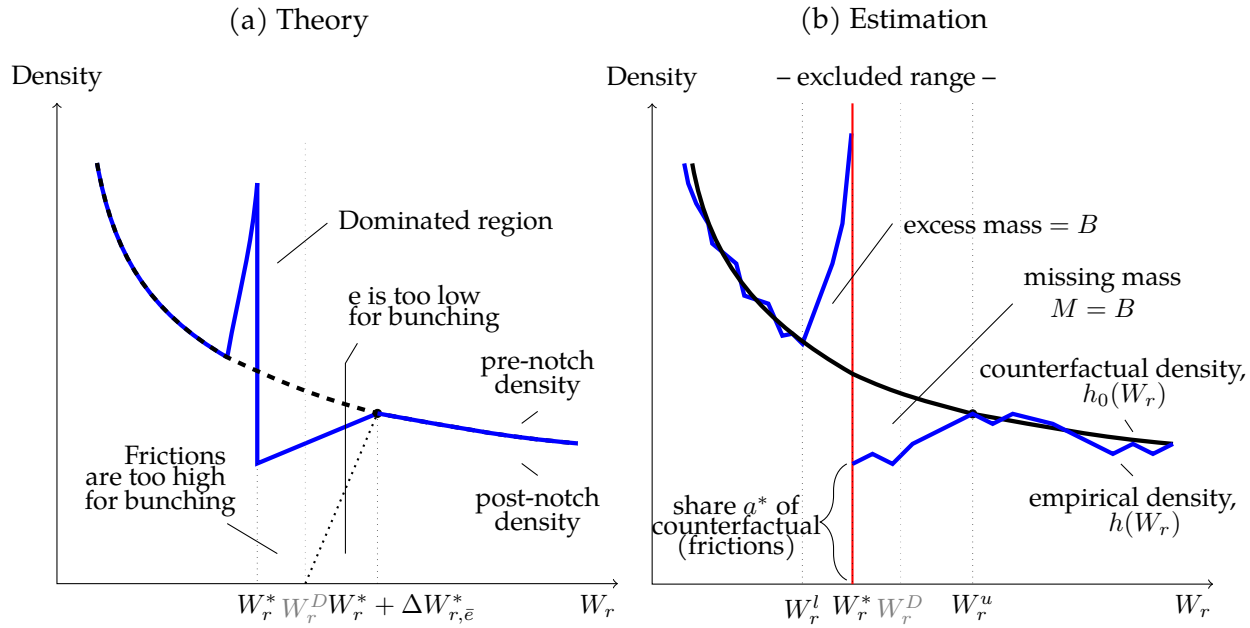
as the standard deviation of estimate distribution.

Figure C.1: Response to a Tax Notch Under Homogeneous e and No Frictions



Notes: These figures illustrate the implications of a proportional tax notch ($\Delta\tau > 0$) in a budget diagram in Panel (a) and a density distribution diagram in Panel (b). For simplification, we assume the notch is associated with a small change in the marginal tax rate above the cutoff, so that we can ignore intensive responses by those who stay above the notch. This implies that pre- and post-notch densities coincide above $W_r^* + \Delta W_r^*$. Panel (a) shows the budget constraint of two individuals, L and H, assuming $W_r \leq W$. L has the lowest pre-notch reported wealth W_r (lowest true wealth W) among those who locate at the point; she chooses W_r^* both before and after the tax change. Individual H has the highest pre-notch reported wealth (highest true wealth) among those who locate at the notch point; she chooses reported wealth $W_r^* + \Delta W_r^*$ before the tax change and is exactly indifferent between the notch point W_r^* and the interior point W_r^I after the tax change. Panel (b) shows the corresponding distribution of net worth in the presence of such tax schedule in the baseline model, under homogeneous elasticities and no optimization frictions. There is bunching at the notch point by all individuals between L and H, i.e., who have reported wealth in an interval $(W_r^*, W_r^* + \Delta W_r^*]$. Figure C.2 extends Panel (b) by incorporating heterogeneous elasticities and optimization frictions.

Figure C.2: Bunching Theory and Estimation: Density Distribution of W_r



Notes: These figures illustrate the bunching approach to a proportional tax notch ($\Delta\tau > 0$) that discontinuously raises tax liability for those reporting wealth above W_r^*. For simplification, this notch is associated with a small change, such that intensive responses by those who stay above the notch can be ignored. This implies that pre- and post-notch densities coincide above $W_r^* + \Delta W_r^*$. Panel (a) depicts the theoretical effect of this notch on the density distribution of reported net wealth in the presence of heterogeneous elasticities and optimization frictions. Before the notch, the distribution of reported wealth is smoothly decreasing around the cutoff (dashed black line). A group of individuals responds to the notch by underreporting wealth below W_r^*. The notch thus generates excess mass at W_r^* and corresponding missing mass between the interval $(W_r^*, W_r^* + \Delta W_r^*]$ (solid blue line). Some individuals in the range $(W_r^*, W_r^D]$ cannot bunch below the notch point due to high optimization frictions (to compare this result with the baseline case of no frictions and homogeneous elasticities, see Figure C.1). Panel (b) illustrates the bunching estimation. The blue line represents the (hypothetical) empirical density of taxpayers. The black solid line represents the counterfactual density, which is estimated by either fitting a flexible polynomial to the empirical density and excluding observations in a range $[W_r^l, W_r^u]$, or by using observed pre-reform density. We denote W_r^u as the net worth of the marginal buncher, obtained with the point of convergence method such that the excess mass (B) below W_r^* and the missing mass (M) above W_r^* are equal ($B = M$).

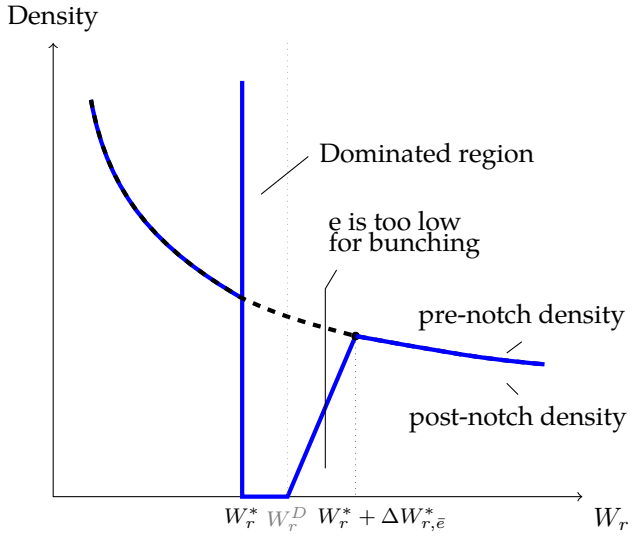
C.2 Heterogeneity in Elasticities But Not in Cost Function

If there is heterogeneity in elasticities e, the tax notch creates different incentives to bunch for individuals with the same latent wealth W. Behavioral responses can be characterized as in the baseline model detailed above at each elasticity level: the bunching segment at elasticity e is given by $(W_r^*, W_r^* + \Delta W_{r,e}^*)$, where $\Delta W_{r,e}^*$ is increasing in e and equals ΔW_r^D for $e = 0$. If $e > 0$, the bunching interval will be larger

than the region of strictly dominated choice ($\Delta W_r^* > \Delta W_r^D$). The dominated range therefore represents a lower bound on the wealth reporting response to tax notches under any compensated elasticity in this frictionless model.

Indeed, Table C.1 shows that, in the absence of resource costs of sheltering (a strong assumption in our setting), the lower-bound ΔW_r^* obtained from Kleven and Waseem (2013)'s "bunching-hold" method would be 11% (=110/1,000 million pesos) for the first notch and 5.5% (=110/2,000 million pesos) for the second notch. The implied "lower-bound" e_R would be 0.6 and 0.37 for the first and second notches, respectively.

Figure C.3: Behavioral Responses to a Tax Notch: Heterogeneity in Elasticities



Notes: This figures extends the baseline model in Figure C.1 to allow for heterogeneity in elasticities. Individual density is empty in the strictly dominated range $(W_r^*, W_r^D]$ and then increases gradually until it converges with the pre-notch density at $W_r^* + \Delta W_{r,\bar{e}}^*$. Tax filers with reported wealth in the range $(W_r^D, W_r^* + \Delta W_{r,\bar{e}}^*]$ do not bunch because their elasticity is too low. Figure C.2 extend this figure further by incorporating optimization frictions.

The post-notch density is empty in the strictly dominated range, as depicted in Figure C.3. It then increases gradually—the elasticity being too low for some individuals to bunch—until converging with the pre-notch density at $W_r^* + \Delta W_{r,\bar{e}}^*$. With heterogeneity, the bunching method estimates the *average* response in the population $E\left[\Delta W_{r,e}^*\right]$. Excess bunching at the notch is then $B = \int_e \int_{W_r^*}^{W_r^* + \Delta W_{r,e}^*} \tilde{h}_0(W_r, e) dW_r de$ where $\tilde{h}_0(W_r, e)$ represents the joint reported wealth-elasticity distribution in the baseline without a notch, and $h_0(W_r) \equiv \int_e \tilde{h}_0(W_r, e) de$ represents the unconditional reported wealth distribution in the baseline case.

C.3 Framework for Recovering the Structural Elasticity

This section presents the conceptual framework used to identify the structural elasticity of reported wealth with respect to the net-of-tax rate. Unlike the reduced-form approach developed in Section 4, this section builds a parametrized model and assumes a specific utility functional form for $C(u)$.

Consider with a utility function of the form

$$u(W, W_r) = W - T(W_r) - W\left[\frac{1}{1+e} - \frac{W_r}{W} + \frac{1}{1+1/e}\left(\frac{W_r}{W}\right)^{1+1/e}\right] \tag{9}$$

where $T(W_r)$ represents wealth tax liability and the convex cost function $C(u)$ is parametrized by $W\left[\frac{1}{1+e} - \frac{W_r}{W} + \frac{1}{1+1/e}\left(\frac{W_r}{W}\right)^{1+1/e}\right]$.[19]

If tax liability implies a proportional (average and marginal) tax rate on reported wealth, $T(W_r) = \tau W_r$, then the individual maximization problem leads to the first order condition

$$\tilde{W}_r = W\,(1-\tau)^e \tag{10}$$

The optimality condition (10) indicates that a positive tax rate depresses $\tilde{W}_r$ below W, with the strength of the effect determined by e, the parameter of interest. If $e \to 0$, then individuals report their true wealth ($\tilde{W}_r = W$), while if $e \to \infty$, individuals report no wealth at all ($\tilde{W}_r = 0$).

The combination of the wealth distribution and the reported wealth function (10) yields a reported wealth distribution associated with the baseline linear tax system. We denote $H_0(W_r)$ and $h_0(W_r)$ the distribution and density functions for reported wealth associated with this baseline. Using the optimality condition (10), we obtain $H_0(W_r) = F\left(\frac{W_r}{(1-\tau)^e}\right)$ and hence $h_0(W_r) = H_0'(W_r) = f\left(\frac{W_r}{(1-\tau)^e}\right)/(1-\tau)^e$. Therefore, given a smooth tax system (i.e., no notches and no kinks), the smooth wealth distribution converts into a smooth reported wealth distribution.

Consider the marginal buncher H located at $W_r^* + \Delta W_r^*$ before the reform, whose wealth is $W^* + \Delta W^*$, and is indifferent between the notch point W_r^* and the best interior point W_r^I after the tax change. At notch point W_r^*, her utility level is given

[19] Note that $C(0) = 0$, i.e., there is no cost of underreporting when taxpayers do not underreport. Moreover, $C(u)$ is convex: $C'(u) = 1 - (1-u)^{1/e} \geq 0$ and $C''(u) = \frac{1}{e} \cdot (1-u)^{1/e-1} \geq 0$.

by

$$u^N = W^* + \Delta W^* - \tau W_r^* - (W^* + \Delta W^*) \cdot \left[\frac{1}{1+e} - \frac{W_r^*}{W^* + \Delta W^*} + \frac{1}{1+1/e} \left(\frac{W_r^*}{W^* + \Delta W^*} \right)^{1+\frac{1}{e}} \right] \tag{11}$$

Using the first order condition $W_r^I = (W^* + \Delta W^*)(1 - \tau - \Delta\tau)^e$, the utility level obtained at the best interior location can be written as

$$u^I = (W^* + \Delta W^*) \cdot \left[\frac{(1 - \tau - \Delta\tau)^{1+e}}{1+e} + \frac{1}{1+1/e} \right] \tag{12}$$

From the condition $u^I = u^N$ and using the relationship $W^* + \Delta W^* = (W_r^* + \Delta W_r^*)/(1-\tau)^e$, we can rearrange the terms so as to obtain

$$\frac{1}{1 + \Delta W_r^*/W_r^*} - \frac{1}{1+1/e} \left(\frac{1}{1 + \Delta W_r^*/W_r^*} \right)^{1+1/e} - \frac{1}{1+e} \left(1 - \frac{\Delta\tau}{1-\tau} \right)^{1+e} = 0 \tag{13}$$

This condition characterizes the relationship between the percentage reporting response $\Delta W_r^*/W_r^*$, the percentage change in the average net-of-tax rate created by the notch, $\Delta\tau/(1-\tau)$, and the structural elasticity e. Although it is not possible to obtain an analytical solution for e, this can be solved numerically given an estimate for ΔW_r^* and the observed value of the other arguments.

The disadvantage of this approach is that it relies on a functional form for utility. While the wealth reporting response ΔW_r^* can be non-parametrically identified, the underlying structural elasticity e from Equation (13) that could be used for out-of-sample prediction cannot. It is therefore useful to develop a reduced-form approach that does not rely on the specific functional form for individuals' utility, as we do in Section 4. As discussed in Kleven and Waseem (2013), under some assumptions Equation (2) for this reduced-form elasticity represents an upper bound on the structural elasticity e from Equation (13).

Finally, note that, as the compensated elasticity e converges to zero (L-shaped Leontief preferences), Equation (13) implies

$$\lim_{e \to 0} \Delta W_r^* = \frac{\Delta\tau \cdot W_r^*}{1 - \tau - \Delta\tau} \equiv \Delta W_r^D \tag{14}$$

This means that, as $e \to 0$, the bunching interval ΔW_r^* converges to the strictly dominated range ΔW_r^D. The dominated range therefore represents a lower bound on

the wealth reporting response to tax notches under any compensated elasticity in a frictionless model (Kleven and Waseem, 2013).

Table C.1 presents the estimated parameters. For each reform year, the table shows the notch point (column 2), whether this notch also defined eligibility for the wealth tax (column 3), the average tax rate jump (column 4), the size of the dominated range (column 5), the share of taxpayers in dominated ranges that are unresponsive to the tax notch (column 6), the lower and upper bounds on the reporting responses (columns 7 and 8, respectively), and the bounds on the elasticities based on either the parametric equation (13) (columns 9 and 10) or the reduced-form formula (2) (column 11 and 12).

The table shows that the structural elasticities driving the large wealth reporting responses for the first notch in 2010 range between 0.47 to 1.42. The reduced-form elasticities, which represent an upper bound if the uncompensated reported wealth elasticity is not too strongly negative, are between 0.6 and 2.0.[20] These elasticities obtained for the first notch are all statistically significantly different from zero at the 1% level. By contrast, elasticities obtained from the second notch are smaller and often less precisely estimated: the structural elasticities between 0.32 to 0.84, and the reduced-form elasticities are between 0.37 and 1.0, but the upper bounds using the convergence method are not statistically significantly different from zero.

[20] Reduced-form elasticities are somewhat larger than structural elasticities, as the former provide an approximation (upper bound) of the true structural elasticity. Kleven and Waseem (2013) show that, given the size of the notch $\Delta\tau/(1-\tau)$ and a true functional form for utility, the bias of the reduced-form approach is determined by the percentage reporting response $\Delta W_r^*/W_r^*$.

Table C.1: Summary of Notches, Responses, and Elasticities

Year of Reform (1)	Notch Point (mill. pesos) (2)	Exemption Cutoff (3)	ATR Jump $\Delta\tau$ (%) (4)	Dominated Range ΔW_r^D (mill. pesos) (5)	Frictions a^* using ΔW_r^D (6)	Response ΔW_r^* (mill. pesos)		Structural Elasticity e		Reduced-Form Elasticity e_R	
						Bunching-Hole Method (7)	Convergence Method (8)	Bunching-Hole Method (9)	Convergence Method (10)	Bunching-Hole Method (11)	Convergence Method (12)
2003	3,000	✓	0.3	9	0.74	120	180	0.24	0.53	0.27	0.60
					(0.18)	(80.09)	(137.93)	(0.52)	(1.27)	(0.62)	(1.76)
2006	3,000	✓	1.2×4	151	0.41	340	560	0.07	0.21	0.13	0.36
					(0.04)	(52.04)	(109.62)	(0.03)	(0.10)	(0.04)	(0.16)
2010	1,000	✓	1.0	10	0.43	110	200	0.47	1.42	0.60	2.00
					(0.02)	(7.91)	(16.86)	(0.07)	(0.22)	(0.09)	(0.35)
2010	2,000		0.4	8	0.57	110	180	0.32	0.84	0.37	1.00
					(0.07)	(24.10)	(64.63)	(0.14)	(0.73)	(0.19)	(0.99)
2010	3,000		1.6	49	0.35	220	360	0.18	0.33	0.17	0.44
					(0.04)	(40.82)	(87.44)	(0.05)	(0.14)	(0.09)	(0.20)
2010	5,000		3.0	160	0.45	360	680	0.06	0.20	0.08	0.30
					(0.06)	(105.16)	(238.74)	(0.06)	(0.16)	(0.06)	(0.23)
2014	1,000	✓	0.0125×4	5	0.38	110	210	0.98	3.17	1.21	4.41
					(0.02)	(6.31)	(16.03)	(0.12)	(0.42)	(0.15)	(0.71)

Notes: This table presents elasticity estimates at different wealth levels exploiting four wealth tax reforms taking place in 2003, 2006, 2010, and 2014. Column (1) presents the year of the wealth tax reform. Column (2) indicates the bracket cutoff, expressed in current million pesos. Column (3) indicates whether this cutoff also marks the eligibility threshold, below which taxpayers are exempt from the wealth tax. Column (4) presents the size of the wealth tax notch. Column (5) presents the dominated range in current million pesos, defined as $\Delta\tau \cdot W_r^*/(1-\tau-\Delta\tau)$. Column (6) presents the estimate of frictions (the fraction of individuals in dominated ranges who are unresponsive). Columns (7)–(8) present the reporting responses in current million pesos using bunching-hole and convergence methods, respectively. Columns (9)–(12) present elasticities based on either the parametric equation (13) in columns (9)–(10) or the reduced-form formula (2) in columns (11)–(12). *Source:* Authors' calculations using administrative tax microdata from DIAN.

D Equivalence between Wealth and Capital Income Elasticities

Let τ_W be the wealth tax rate and τ_K the equivalent tax rate on capital income so that $\tau_W = r \cdot \tau_K$ where r is the rate of return on wealth. For instance, if τ_W is 1%, and r is 5%, then τ_K is 20%.

$$
\begin{aligned}
d(1-\tau_W) &= d(1-\tau_K) \cdot r \\
\frac{d(1-\tau_W)}{(1-\tau_W)} &= \frac{d(1-\tau_K)}{(1-\tau_K)} \cdot r \left(\frac{1-\tau_K}{1-\tau_W}\right) \\
\left[\frac{d(1-\tau_W)}{(1-\tau_W)} \cdot \frac{W}{dW}\right]^{-1} &= \left[\frac{d(1-\tau_K)}{(1-\tau_K)} \cdot r \left(\frac{1-\tau_K}{1-\tau_W}\right) \cdot \frac{W}{dW}\right]^{-1} \\
\epsilon_W &= \epsilon_K \cdot \left[\frac{1-\tau_W}{r(1-\tau_K)}\right]
\end{aligned}
$$

In our example, $\frac{1-\tau_W}{r(1-\tau_K)} = 24.75$. Therefore, to translate our estimated elasticities of reported wealth into the equivalent elasticities of capital income, we divide ϵ_W by a factor of 24.75.

E A Model of Taxpayer Behavior with Dynamic Misreporting

As in Garbinti et al. (2023), we assume that taxpayer i possesses wealth W_{it} in year t (which is given exogenously to the taxpayer) and reports wealth W^r_{it}. Misreporting involves a cost, but this cost has two components and depends on whether the taxpayer is required to file a wealth tax return, indicated by $k \in \{F, N\}$. First, there is the cost associated with misreporting the actual wealth, represented as $c^k_i(W_{it} - W^r_{it})$. Second, there is the intertemporal cost of misreporting, which depends on the reported *growth* of wealth between periods t and $t+1$, $h^k_i(W^r_{it} - W^r_{i,t+1})$. Since the tax authority can compare reported wealth values across different years, current misreporting affects future misreporting costs.

Both c^k_i and h^k_i are convex, but while c^k_i increases with the misreported wealth, h^k_i is *inversely* related to the reported growth. This means that the lower the reported growth, the higher the cost of misreporting. Unlike income, wealth accumulates over time due to factors such as inflation, savings, positive returns, and price appreciation.

As a result, if a taxpayer consistently reports the same level of wealth in subsequent years, tax authorities are likely to perceive it as misreporting since the reported amount fails to reflect the expected growth of wealth.[21]

A given taxpayer has a value V_{it} from not filing the wealth tax. As explained in the main text, filing involves additional effort and raises the chances of being audited in the future. Consider a taxpayer in year t who reports wealth above the exemption threshold, $W^{\S}$, and is therefore required to file the wealth tax. Assuming an infinite horizon, quasilinear utility, a tax rate τ, and a discount factor β_i, the utility of this taxpayer is:

$$\sum_{j=t}^{\infty} \beta^{j-t} \Big\{ W_{i,j} - \tau W^r_{i,j} - \mathbb{1}(W^r_{i,j} \leq W^{\S}) \cdot \big[c^N_i (W_{i,j} - W^r_{i,j}) + h^N_i (W^r_{i,j-1} - W^r_{i,j}) - V_{i,j} \big] \\ -(1 - \mathbb{1}(W^r_{i,j} \leq W^{\S})) \cdot \big[c^F_i (W_{i,j} - W^r_{i,j}) + h^F_i (W^r_{i,j-1} - W^r_{i,j}) \big] \Big\}$$

For a taxpayer in period t, with reported wealth $W^r_{i,t-1}$ in period $t-1$, $W^r_{i,t} < W^{\S}$ in period t, and who plans for $W^r_{i,t+1}$ to remain below $W^{\S}$ in period $t+1$, when they expect a wealth tax, the interior first-order condition with respect to $W^r_{i,t}$ is:

$$-\tau + c^{'N}_i (W_{i,t} - W^r_{i,t}) + h^{'N}_i (W^r_{i,t-1} - W^r_{i,t}) - \beta h^{'N}_i (W^r_{i,t} - W^r_{i,t+1}) = 0 \tag{15}$$

First-order condition (15) states that the taxpayer engages in misreporting their wealth until the point where the tax savings gained from misreporting, τ, are equal to the marginal cost of misreporting. Crucially, misreporting in one year, say year t, affects the cost of misreporting in the following year, year $t+1$. This intertemporal aspect adds complexity by introducing a consideration in the decision to misreport that may not exist or be as directly relevant for reporting income flows, which is typically a year-to-year consideration.

In period $t+1$, the first-order condition is:

$$-\tau + c^{'N}_i (W_{i,t+1} - W^r_{i,t+1}) + h^{'N}_i (W^r_{i,t} - W^r_{i,t+1}) - \beta h^{'N}_i (W^r_{i,t+1} - W^r_{i,t+2}) = 0 \tag{16}$$

Since $h^{'N}_i (W^r_{i,t} - W^r_{i,t+1}) = \tau - c^{'N}_i (W_{i,t+1} - W^r_{i,t+1}) + \beta h^{'N}_i (W^r_{i,t+1} - W^r_{i,t+2})$ from first-order condition (15), rearranging and combining first-order conditions (15) and

[21] To simplify the notation, we omit explicit expectation operators, but it is implied that all future payoffs are represented in their expected value.

(16) yields:

$$c_i^{'N}(W_{i,t} - W_{i,t}^r) + \beta c_i^{'N}(W_{i,t+1} - W_{i,t+1}^r) + h_i^{'N}(W_{i,t-1}^r - W_{i,t}^r) - \beta^2 h_i^{'N}(W_{i,t+1}^r - W_{i,t+2}^r) = \tau(1+\beta)$$

Therefore, a myopic taxpayer ($\beta = 0$) will simply solve the static problem with first order condition $c_i^{'N}(W_{i,t} - W_{i,t}^r) + h_i^{'N}(W_{i,t-1}^r - W_{i,t}^r) = \tau$. By contrast, a forward-looking taxpayer will start adjusting to the anticipation of crossing the threshold in the future and engage in "misreporting smoothing." This is consistent with the evidence that taxpayers just below the threshold report systematically lower wealth growth rates after a wealth tax.

Let $M_i^k(W_{i,t}, W_{i,t}^r)$ denote the continuation value of a taxpayer with wealth $W_{i,t}$ reporting $W_{i,t}^r$ in regime $k \in \{F, N\}$. Taxpayer i will bunch at the exemption threshold $W^{\S}$ if and only if:

$$\begin{aligned} &W_{i,t} - c_i^N(W_{i,t} - W^{\S}) - h_i^N(W_{i,t-1}^r - W^{\S}) + V_{i,t} + \beta M_i^N(W_{i,t}, W^{\S}) \\ &\geq W_{i,t} - \tau W_{i,t}^r - c_i^F(W_{i,t} - W_{i,t}^r) - h_i^F(W_{i,t-1}^r - W_{i,t}^r) + \beta M_i^F(W_{i,t}, W_{i,t}^r) \end{aligned} \tag{17}$$

Since we observe bunching mainly among taxpayers initially located just above the threshold, who claim a wealth loss to avoid the tax, the benefit of bunching (tax savings and not filing) exceeds the costs. In particular, the cost h_i^N of reporting negative wealth growth is not sufficiently large or steep to deter these taxpayers from locating at the threshold. Notably, the bunching indifference condition can hold for several years as long as the value from remaining in the nonfiling regime $V_{i,t}$ is high enough. As a result, bunching can persist for several years.

On the other hand, Section 4 showed significant bunching below non-exemption notches, where the tax rate increases but the filing requirement remains unchanged. Again, this result suggests that the cost of reporting low or even negative wealth growth for filing taxpayers h_i^F is not large enough to discourage bunching. Specifically, a taxpayer i will bunch at the non-exemption notch W^*, where $W^* > W^{\S}$, if and only if:

$$\begin{aligned} &W_{i,t} - \tau W^* - c_i^F(W_{i,t} - W^*) - h_i^F(W_{i,t-1}^r - W^*) + \beta M_i^F(W_{i,t}, W^*) \\ &\geq W_{i,t} - (\tau + \Delta\tau) W_{i,t}^r - c_i^F(W_{i,t} - W_{i,t}^r) - h_i^F(W_{i,t-1}^r - W_{i,t}^r) + \beta M_i^F(W_{i,t}, W_{i,t}^r) \end{aligned} \tag{18}$$

Notably, $V_{i,t}$ does not enter into the bunching indifference equation because taxpayers

above and below the non-exemption threshold file the wealth tax. Their decision-making focuses mainly on the immediate benefits and costs of misreporting, and intertemporal concerns play less of a role. As a result, we are less likely to observe the phenomenon of hysteresis in bunching behavior among these taxpayers.