BEHAVIORAL RESPONSES TO WEALTH TAXATION: EVIDENCE FROM COLOMBIA

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ABSTRACT

We study behavioral responses to personal wealth taxes in Colombia. We utilize tax microdata from 1993 to 2016 linked with the leaked Panama Papers to investigate offshoring to the country's key tax havens. We leverage variation from discrete jumps in tax liability and four major reforms to the wealth tax system, including changes in tax rates and duration, using bunching and difference-in-difference techniques. We find compelling evidence that taxpayers instantly reduce the wealth they declare in response to a wealth tax. Moreover, these effects can persist for years even after the wealth tax is no longer in place, providing the first evidence of a hysteresis effect for a temporary tax policy. The response is driven by misreporting items that authorities cannot cross-verify, such as overstating debt and understating non-third-party-reported business assets. Additionally, the wealthiest taxpayers respond to wealth tax increases by hiding assets in hard-to-track entities in tax havens.

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A data appendix is available at http://www.nber.org/data-appendix/w32134

1 Introduction

Interest in progressive wealth taxation has grown as a way to combat inequality and generate revenue, especially in the post-COVID-19 era. Yet, there is no consensus on the effects of such taxation (Advani and Tarrant, 2021; Scheuer and Slemrod, 2021). Scholars differ: some highlight enforcement challenges and potential tax evasion (Bastani and Waldenström, 2020; Kopczuk, 2019; Oh and Zolt, 2020), while others emphasize enduring impacts on wealth distribution and government revenue due to wealth accumulation dynamics (Jakobsen et al., 2020; Piketty, 2014; Saez and Zucman, 2019a,b). As the debate persists, further research is needed to comprehensively assess the pros and cons of a wealth tax.

This paper helps fill the gap by estimating behavioral responses to wealth taxation. We use extensive administrative tax microdata from Colombia (1993 to 2016) and leverage cross-sectional and time variation in individuals' exposure to the wealth tax. Colombia features *average* wealth tax rates and discrete notches at certain wealth thresholds. For instance, a taxpayer reporting slightly below 1 billion pesos in 2010 (USD 520,830) owed no tax, but an additional peso led to a 1% tax on all taxable wealth, totaling 10 million pesos (USD 5,208.3). Significant policy changes in 2003, 2006, 2010, and 2014, including tax duration, exemption thresholds, and rate schedules (0 to 6%) create substantial identifying variation and provide one of the world's largest wealth tax policy experiments.

We find that Colombian taxpayers promptly reduce their reported wealth to fall below higher tax brackets when faced with wealth tax increases. The pioneering work by Saez (2010), Chetty et al. (2011), and Kleven and Waseem (2013) relating the amount of bunching to the elasticity with respect to the net-of-tax rate has been challenged due to the identifying assumptions that underly bunching estimation (Blomquist et al., 2021). Unlike previous research relying on assumptions and counterfactual distributions, our approach compares actual wealth holdings before and after tax reforms using taxpayers' annual assets and debts reports (e.g., bank deposits, equities, business assets, real estate, vehicles). We validate our findings through cross-sectional, panel, and dynamic difference-in-difference (DD) analyses, addressing recent concerns. For instance, leveraging variation from Colombia's temporary wealth tax, our results indicate that a 1% increase in (one minus) the wealth tax rate leads to an immediate 2% rise in reported wealth for the marginal buncher. This effect remains consistent across both bunching and DD approaches, offering

quantitatively similar results. Focusing on the immediate impacts, we evaluate various wealth tax regimes and find that up to one-fifth of revenue is lost due to taxpayers' instant response.

Notwithstanding, our study uncovers a lasting impact of wealth taxes that persists even after the tax policy has ended. We provide the first empirical evidence of a hysteresis effect resulting from a transitory tax policy, where taxpayers continue to report lower levels of wealth for years following the tax's implementation. This effect persists beyond the tax's expiration and cannot be attributed to tax incentives or fixed adjustment costs. Instead, taxpayers strategically adjust their reported wealth to avoid detection and future taxation. Those who initially bunched in response to the tax persistently report lower wealth, while even those initially below the exemption threshold also avoid surpassing the expired threshold as a preemptive measure against future taxes. This implies that a temporary wealth tax can have enduring impacts on wealth distribution and government revenues through hysteresis effects.

We then demonstrate that taxpayers' response to the wealth tax is driven by their misreporting of assets that authorities cannot verify. Leveraging the panel structure of the microdata and the variation induced by the reform, we employ an instrumental variables (IV) approach. We characterize the taxpayers who engage in bunching as a response to the wealth tax and those who do not, using a technique inspired by Abadie (2003) and Imbens and Rubin (1997). Unlike Switzerland and France, Colombia has third-party reporting of financial wealth. However, coverage of non-financial assets is only partial and valuation of certain assets, like stocks in closely-held private businesses, poses challenges—a common issue among wealth-taxing countries (OECD, 2018). Our analysis reveals that bunchers tend to possess more non-third-party-reported assets, which are easier to adjust, and fewer fixed assets like real estate that are not easily modifiable. Moreover, by breaking down the response of bunchers to the wealth tax, we shed light on their evasion strategies. Specifically, we find that bunchers underreport business assets not subject to third-party reporting and artificially inflate liabilities. Consistent with some of the evidence from Europe (Brülhart et al., 2022; Seim, 2017), Colombian taxpayers capitalize on the differential coverage of third-party information trails to underreport what is less likely to attract authorities' attention.

Additionally, we uncover that wealth taxation spurs the wealthiest individuals to obscure assets in hard-to-track entities situated in tax havens. To investigate this margin of response, we combine the Colombian tax records with the leaked Panama

Papers, which detail clients of Mossack Fonseca, one of the world's top creators of hard-to-trace companies, trusts, and foundations. Notably, Panama had been a preferred tax haven for Colombians, rendering the Panama Papers highly pertinent for studying offshoring in our study population. Once again, we leverage tax changes resulting from reforms to identify causal effects. Our analysis reveals that since the reinstatement of the wealth tax in Colombia, an increasing number of Colombians have established offshore entities annually, distinguishing them from counterparts in other countries, even after flexibly controlling for general time trends. Furthermore, escalations in wealth tax rates have prompted affluent taxpayers to shift their assets to tax havens. Employing an event-study design, we demonstrate that individuals who incorporate offshore entities in years when wealth is taxed subsequently report fewer assets to Colombian authorities, indicating a strategy of concealing assets in hard-to-track entities to minimize the impact of the wealth tax.

Our findings contribute three key insights to the emerging empirical literature on behavioral responses to wealth taxes, primarily concentrated in Europe (Agrawal et al., 2022; Alstadsæter et al., 2022; Bjørneby et al., 2023; Brülhart et al., 2022; Durán-Cabré et al., 2019; Jakobsen et al., 2020; Ring, 2019; Seim, 2017; Zoutman, 2018).[1] First, we present novel evidence demonstrating persistent changes in taxpayer behavior induced by a wealth tax. Our study is the first to illustrate dynamic responses by taxpayers to tax adjustments, underscoring the significance of hysteresis in the realm of wealth taxes. This phenomenon could potentially extend to other tax policies where the tax base remains relatively stable over time (Advani et al., 2023) or when tax policy announcements signal future tax likelihood. Moreover, our findings have implications for recent wealth tax proposals, indicating that even temporary wealth taxes enacted during exceptional circumstances can leave lasting impacts on wealth distribution and government revenue.

Second, we address offshore tax avoidance, a strategy commonly employed by affluent individuals to avoid capital taxes. Previous studies have demonstrated that many wealthy individuals in the United States, Scandinavia, the Netherlands, Colombia, and Argentina utilize offshore accounts to conceal income and assets (Alstadsæter et al., 2019; Guyton et al., 2021; Leenders et al., 2023; Londoño-Vélez and Ávila-Mahecha, 2021; Londoño-Vélez and Tortarolo, 2022). However,

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[1]Summarized by Advani and Tarrant (2021) and Scheuer and Slemrod (2021), these studies present a broad spectrum of elasticity estimates and diverse behavioral responses. The elasticity values span from 0.054 to 43.2, an 800-fold range, with interpretations ranging from real distortions to predominantly sheltering responses.

the causal link between higher capital taxes and increased offshore tax sheltering remains unclear, necessitating identifying tax variation and tracking individuals' offshore decisions. We overcome these challenges by leveraging substantial shifts in average wealth tax rates, paired with microdata linking taxpayers to their offshoring choices, to reveal that wealthy individuals react to capital taxes by relocating assets to tax havens, aiming to alleviate their tax liabilities. Our findings carry significant implications for discussions on increased capital taxes in both developed and developing nations. They are particularly relevant to OECD countries because wealthy individuals in Colombia, an upper-middle-income OECD member with substantial inequality, resemble their counterparts in other OECD nations (Bérgolo et al., 2023). Additionally, our study reinforces the global impact of tax havens on capital taxation, as previously demonstrated by Zucman (2013) and Tørsløv et al. (2022). In summary, our findings provide valuable insights into the behavior of affluent taxpayers concerning wealth taxation and the potential for offshore tax avoidance in the presence of tax havens.

Third, we offer compelling evidence of a notable bunching reaction from wealthy individuals in response to prominent shifts in wealth taxation, reflecting a positive elasticity. In contrast to European studies, where observed bunching elasticities have been nearly zero and significantly smaller than DD elasticities, our findings present a different scenario. While some scholars have argued that the bunching approach might not fully capture taxpayers' complete response to the tax and mainly detects evasion, we demonstrate that both bunching and DD methodologies yield similar estimates under similar tax variations and comparable taxpayers. Our results suggest that considerable increases in wealth tax rates, the most substantial among prior studies, primarily prompt immediate and persisting misreporting effects.

Our results also contribute to the burgeoning literature on tax design and compliance in developing countries (e.g., Bachas and Soto, 2021; Naritomi, 2019; Pomeranz, 2015). While much of this research centers on firm behavior, we address the understudied group of high-net-worth individuals, a pivotal population for designing and evaluating redistributive fiscal policy. In such contexts where a small fraction of individuals at the top typically holds the majority of wealth (Alvaredo et al., eds, 2018), progressive wealth taxation can wield significant redistributive influence. The renewed interest in wealth taxes following the COVID-19 pandemic underscores the relevance of comprehending the effects of these taxes in these settings. Colombia serves as a valuable case study for understanding responses to wealth

taxation due to its longstanding history of taxing wealth, multiple policy reforms, and tax schedules conducive to impact analysis. Additionally, as an upper-middle-income country, it occupies a position in the midrange of global income distribution and offers insights relevant to a substantial number of other countries, some of which—such as Argentina, Bolivia, and Ecuador—have recently introduced temporary wealth taxes in the pandemic aftermath.

The remainder of this paper is organized as follows. Section 2 describes Colombia's wealth tax system. Section 3 describes the data. Section 4 demonstrates how wealth taxes trigger an immediate and persistent response and discusses why wealth taxation can generate hysteresis effects. Section 5 decomposes the anatomy of the response. Section 6 concludes.

2   The Colombian Wealth Tax

Colombia, an upper-middle-income country, had a GDP per capita of USD 14,154 at purchasing power parity in 2016 (World Bank International Comparison Program database). Its tax-to-GDP ratio is 19.8%, lower than the OECD average of 34.3% (OECD/ECLAC/CIAT/IDB, 2018). Personal income and wealth taxes are managed by the central tax authority, *Dirección de Impuestos y Aduanas Nacionales* (DIAN), with individual taxation, treating spouses as separate tax units.

Colombia has a history of taxing both individual and corporate net worth, as detailed in Appendix B. Recurrent wealth taxation began in 1935 and persisted until 1992. After a ten-year hiatus, President Uribe Vélez reinstated wealth taxation in 2002 to fund *Seguridad Democrática*, the government's anti-drug trafficking, guerrilla, and paramilitary efforts. Subsequent wealth taxes were not earmarked for security purposes or were not earmarked at all. This tax applies to the stock of assets, excluding debt and two main non-taxable assets: (i) up to USD 137,000 of primary residence value, and (ii) the net equity value of domestic company shares, preventing double wealth taxation of firms and individuals during our study period.

Similar for other countries like Brazil and Argentina, the Colombian tax authority records *wealth* information in yearly *income* tax statements because reported wealth

plays a supportive role in income tax enforcement.[2] Individuals are required to file an *income* tax return if their total assets, gross income, credit card purchases, bank deposits, or financial investments exceed specific cutoffs. For example, individuals with significant assets or credit card purchases must file the income tax return even if they have no income. Consequently, all income tax filers provide details about their end-of-year financial assets (e.g., cash, bank deposits, stocks, bonds, unlisted securities, financial assets held abroad), non-financial assets (e.g., real estate, land, large durables, non-corporate business assets, non-financial assets held abroad), and debt (e.g., mortgages, interpersonal debts). We explain later that while some of these items are reported by banks and other financial institutions, others are not.

Income tax filers reporting taxable and nontaxable *wealth* above a certain threshold qualify for the wealth tax and must file a separate tax statement. However, the wealth tax exemption threshold is set considerably high, excluding over 99% of adults from its reach. In 2017, merely 0.2% of adults paid the wealth tax, a smaller proportion compared to other countries implementing wealth taxation (OECD, 2018). Consequently, the Colombian wealth tax targets the extreme upper end of the wealth distribution. This design choice, in part, results in personal wealth taxes contributing only 0 to 0.27% of GDP between 2002 and 2017. For context, in 2016, this equivalent share was 0.18% in Spain, 0.43% in Norway, and 1% in Switzerland (OECD, 2018).

Colombia's wealth tax follows a piecewise linear schedule, with each bracket having a fixed *average* tax rate, as shown in Panel (a) of Figure 1 for the 2010 tax year. In that year, individuals with net worth below 1 billion pesos or USD 520,830 were exempt from the wealth tax, making up all but the top 0.12% of adults. In contrast, those declaring one additional peso paid 1% of their taxable wealth, resulting in a tax of USD 5,208. Tax rates increased to 1.4% for taxpayers with net worth between 2 and 2.99 billion, and 3% for those owning between 3 and 4.99 billion. The wealthiest 0.01% of adults, who held 5 billion pesos or more, faced a 6% tax rate on their taxable wealth. This notched schedule generates discrete tax jumps at bracket thresholds.

Over the past two decades, a series of reforms has altered the positions of bracket cutoffs and the wealth tax rates, illustrated in Panel (b) of Figure 1. This has resulted in notable fluctuations in both the tax-paying population and the rate schedule. Colombia's top wealth tax rate ranged from 0 to 6% between 2000 and 2016,

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[2]Colombia employs net worth to determine the minimum income tax base or "presumptive income," assuming that a taxpayer's taxable income is at least a fixed portion of their preceding year's taxable net worth (e.g., 6% in 1999–2006, 3% in 2007–2016). In 2016, presumptive income taxation was applicable to 4.5% of all taxpayers, increasing to 10% for those with 1 billion wealth.

constituting one of the world's largest wealth tax policy experiments. We will exploit this powerful tax variation for identification purposes.

Colombia enacts tax reforms roughly every four years, after presidential elections held in June within our study period (2002, 2006, 2010, and 2014). These reforms are usually announced a few months after the new president takes office in August and are adopted by December 31st.[3] Since wealth owned on December 31st is reported in income tax statements filed six to eight months later, taxpayers have ample time to become aware of the tax changes and adjust accordingly.

[Figure 1 here]

Taxpayers can evade taxes by underreporting assets and overstating liabilities. While third parties report most financial assets—like bank balances, loans, bonds, deposits, listed equities, voluntary pension contributions, and mortgage debt—non-financial assets such as real estate and vehicles have less third-party reporting. Some assets—cash, large durables, art, unlisted equities, non-corporate business assets (e.g., inventories), and interpersonal debts—have almost no third-party reporting, making them more susceptible to evasion.[4] Cross-checking information is not systematically done, and during the study period, there was no dedicated unit for high-net-worth taxpayer affairs (OECD, 2017). Additionally, reporting aggregate total assets in a single box on the tax return makes it difficult to trace changes and can facilitate evasion, as shown by Garbinti et al. (2023) in France.

Since wealth is a stock, the tax authority can compare reported values across different years, request documentation for reductions in wealth that do not align with changes in other parts of the tax return, and audit taxpayers who should be filing wealth taxes. However, we lack precise figures on the number of wealth tax audits conducted or verification activities targeting high net worth taxpayers, as the tax authority discloses no information on these actions.

Colombia also imposes various capital-related taxes, encompassing property tax, capital income (interest, rental, and dividend income), realized capital gains, and

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[3]Unlike many other Latin American countries, Colombia elected center and right-wing candidates during our study period. As described in Appendix B and Flores-Macías (2014), Colombia's wealth tax was implemented by a center-right-wing government focused on financing the needs of the war against illegal armed groups, rather than as part of a leftist movement for progressive redistribution.

[4]The informal economy, including income from drug trafficking, might not be unobserved by the tax authority (or the econometrician). Drug trafficking income accounted for 1.2–2.3% of GDP between 2008 and 2013 (Mejía and Rico, 2011, 2014). Such income is often laundered through assets like rural lands (with incomplete cadasters), cattle (CNMH, 2016), and luxury items like art and Paso Fino horses (Soto, 2014), none of which are third-party reported.

wealth transfers including inheritances, donations, and inter vivos gifts. Prior to 2012, inheritances, donations, and gifts incurred a progressive tax with a maximum rate of 33%, excluding the first USD 15,000 for spouses and descendants. From 2013 to 2022, these transfers were subject to a flat 10% tax rate, with an exemption of the first USD 25,000 for inheritances (USD 17,400 for donations and gifts), or double if the transferred asset was the transferor's primary residence. It is noteworthy that receiving a wealth transfer might necessitate the transferee to file an income tax return, as total owned assets can impact income tax filing obligations, potentially leading to additional tax burdens, including taxes on presumptive income in subsequent years.

3   Data

Our data originates from three primary sources. The first dataset is a longitudinal panel of individual-by-year income tax returns spanning FY 1993–2016, encompassing 20.5 million observations. These records contain information on most items recorded in income tax declarations, including total assets and debt by December 31 each year. Assets are categorized into six groups until 2004: (i) cash, bank deposits, certificates of deposit, and other investments (e.g., bonds, life insurance, voluntary retirement fund); (ii) accounts receivable; (iii) stocks and contributions; (iv) inventories; (v) fixed assets (real estate, land, vehicles, boats); and (vi) other assets (e.g., jewelry, art, intellectual property). Since 2004, this detailed wealth breakdown is mandatory only for record-keeping taxpayers, i.e., retail and commercial business owners. On average, these taxpayers constitute 10–15% of income taxpayers, rising to 20% among the wealthy in our estimation sample.

The second dataset encompasses individual-by-year wealth tax returns for all filers during wealth tax years from 2002 to 2017. Those reporting wealth in their income tax statements surpassing the exemption threshold are required to submit a wealth tax return. The dataset includes their breakdown of taxable and non-taxable net wealth, as well as their associated wealth tax liability.

The final dataset originates from three major leaks published by the International Consortium of Investigative Journalists (henceforth ICIJ), with the largest being the "Panama Papers" from Panamanian law firm Mossack Fonseca. The Panama Papers hold particular significance for the study of offshoring by Colombians due to Panama's historical appeal as a destination for Colombians to hold offshore assets. Panama's proximity, use of Spanish, and political stability have attracted wealthy

Colombians. As detailed in our related paper, Panama is a prominent choice for Colombians to hold foreign assets, following the United States, and was a key tax haven for Colombia (Londoño-Vélez and Ávila-Mahecha, 2021). Mossack Fonseca's involvement in establishing shell companies across more than twenty jurisdictions, even after Colombia reintroduced and adjusted its wealth tax, further underscores the relevance of the Panama Papers.

The Panama Papers offer details such as offshore entity beneficial owners' names, entity contact addresses, and incorporation dates. However, this data has limitations, covering only Mossack Fonseca-created offshore entities, with some officers' information missing due to extraction challenges or uncollected ownership details. The public records lack wealth amount or tax evasion data. It is important to acknowledge legal reasons for offshore company creation, with many compliant individuals reporting to tax authorities as required.

We linked personal names from individual tax records with ICIJ data to identify Colombian offshore entity shareholders. Among 1,751 unique shareholders with Colombian personal or entity contact addresses, we matched 1,208 individuals (70%). The high match rate stems from Hispanic naming conventions (two given names, followed by a paternal and maternal surname). The remaining 30% lacked matches due to incomplete names (e.g., only one given name and one surname) and common names. Some individuals never filed taxes between 1993 and 2015, whether required or not. Some cases may be erroneously linked to Colombia by ICIJ. We provide further details in Londoño-Vélez and Ávila-Mahecha (2021).

4   Behavioral Responses to Wealth Taxation

This section utilizes reform-induced variation in exposure to wealth taxes and notched tax schedule discontinuities to estimate behavioral responses. First, Section 4.1 shows that wealth taxes trigger an immediate response. Next, Section 4.2 demonstrates hysteresis effects. Lastly, Section 4.3 discusses why wealth taxation can generate persistent effects.

4.1   Instantaneous Responses to Wealth Taxes

For illustration, consider the 2010 wealth tax reform during La Niña extreme weather phenomenon. Colombia aimed to increase revenue to deal with flooding disasters.

The government expanded the wealth tax base by lowering the exemption threshold from 3 billion to 1 billion pesos (USD 1,562,490 to 520,830). Additionally, they raised the wealth tax rates and introduced two new brackets, with rates of 1% and 1.4% if declaring at least 1 billion or 2 billion pesos, respectively, as shown in Figure 1.

Figure 2 compares taxpayers' density pre- and post-reform based on wealth reported in 2009's income tax return, filed two months *before* the reform announcement, and 2010's return, due seven months *after* reform adoption. The distribution without taxes appears smooth (gray curve). Conversely, after the wealth tax hike, an immediate bunching emerges beneath the new tax brackets (blue curve), indicating a direct behavioral response to the wealth tax policy.

[Figure 2 here]

In contrast to income taxes, where responses can include both real and sheltering reactions (avoidance and evasion), immediate bunching in the wealth distribution primarily indicates sheltering. Adjusting the stock of wealth quickly is difficult due to the lumpiness of assets and the volatility of asset prices, making rapid real adjustments challenging within a year. While acquiring more loans might seem like a quick solution, it may not lead to bunching if the debt is used to fund assets, like mortgages.

We begin with a simple static conceptual framework, which offers a natural starting point for grasping taxpayer incentives under a wealth tax. It also helps link our study with prior estimates of wealth tax elasticities in Europe; Appendix C provides the details, drawing from Allingham and Sandmo (1972), Almunia and Lopez-Rodriguez (2018), and Kleven and Waseem (2013). In essence, individuals seek to maximize their utility, determined by their latent wealth W minus the wealth tax $T(W_r) = \tau W_r$ based on *reported* wealth W_r. Taxpayers can strategically underreport their wealth, balancing the expected tax savings against the misreporting costs, including potential fines and penalties upon detection by authorities. These costs exhibit convexity and can vary among taxpayers due to, for instance, differences in cheating risks (e.g., no third-party reporting), owning non-liquid or indivisible assets (e.g., real estate), limited comprehension of the tax schedule, or aversion to audit risk. Introducing a tax notch $\Delta\tau$ above a threshold W_r^* incentivizes taxpayers to underreport wealth and bunch below W_r^* to avoid the higher tax. The extent of bunching is proportional to e, the elasticity of reported wealth with respect to the net-of-tax rate.

4.1.1 Estimation

To estimate the reported wealth response ΔW_r^*, we employ the standard "point of convergence" method by Kleven and Waseem (2013) (see details in Appendix C.1). We slice the data into bins of reported wealth and count taxpayers in each bin c^j to construct an empirical density. The counterfactual distribution is obtained from the following regression:

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

where W_r^j is the reported wealth 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 (1) 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. This is an advantageous feature of our setting, circumventing concerns related to nonidentification and assumptions about the implicit functional form or individual heterogeneity distribution (Blomquist et al., 2021).[5] Then, 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 prior studies determining the lower limit W_r^l visually, we enhance estimation by employing a data-driven procedure leveraging pre-reform data to ascertain the location of W_r^l. The upper bound $W_r^u = W_r^* + \Delta W_r^*$ is the counterfactual reported wealth of the marginal buncher. Total excess bunching $\hat{b}$ is the estimated excess mass $\hat{B}$ relative to the average height of the counterfactual density beneath (Chetty et al., 2011).

Following Kleven and Waseem (2013) and Kleven (2018), we relate the wealth

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[5]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).

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:

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

Notably, e_R does not depend on a specific utility functional form (however, Appendix C also develops a "structural" elasticity assuming additional parametric structure).

4.1.2 Results

We first leverage the variation from the 2010 wealth tax discussed previously. Figure 3 illustrates the distribution around the first and second notches. The red vertical line indicates the notch point in each panel. Panels (a) and (c) show the counterfactual distribution (gray line) estimated using a fifth-order polynomial (Equation 1). The wealth tax causes substantial bunching. The exemption threshold led to a fivefold increase in excess bunching, strongly rejecting the null hypothesis of no bunching (implied t-statistic of 28.82). The marginal buncher would have reported 20% more wealth without the wealth tax (=200/1,000 million pesos). Table 1 shows that the resulting elasticity is 2 (s.e. 0.35), indicating that a 1% increase in the net-of-tax rate results in a 2% rise in reported wealth.[6,7]

An advantage of our approach is that we have access to both pre- and post-reform reported wealth distributions, allowing us to test the sensitivity of our estimates. Panel (b) of Figure 3 compares the counterfactual densities obtained from cross-sectional data (black line) and pre-reform data (gray line). Reassuringly, our estimated parameters are robust to using these counterfactual densities. For example, the elasticity using the pre-reform counterfactual is 3.125 (s.e. 0.62; see Table 2), and we cannot reject the null of equality.[8]

[Figure 3 here]

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[6]Table 1 shows that 43% of taxpayers do not respond to the wealth tax despite nonresponse being a 'dominated' choice. Possible explanations for this lack of reaction, as discussed in Section C.1, encompass factors like owning non-liquid assets, limited familiarity with the tax schedule, aversion to audit risk, or a steadfast commitment to maintaining honesty.

[7]Wealth taxes are isomorphic to capital income taxes when the rate of return is equal across individuals (Guvenen et al., 2023). A wealth tax elasticity of 2 implies a capital income tax elasticity of 0.08 under a 5% return (details are available in Appendix D).

[8]For the (inflation-adjusted) pre-reform counterfactual density, we scale each series so that their total areas sum up to 1, assuming constant year-on-year wealth growth across the plotted distribution.

Next, we consider wealthier taxpayers situated around the second notch. This notch does not influence the probability of being subject to the wealth tax; rather, it results in a modest rise in the tax rate from 1% to 1.4% ($\Delta\tau = 0.4$). Consequently, the marginal buncher would have reported 9% more wealth (=180/2,000 million pesos). The elasticity is 1.0 and, although the estimation has less precision, we can rule out elasticities greater than 3 within a 95% confidence interval. Once again, the parameters estimated using Equation (1) and the pre-reform counterfactual are not statistically different.

[Table 1 here]

Table 1 and Figure A.1 present estimates of taxpayers' responses to various other changes in the wealth tax occurring in 2003, 2006, 2010, and 2014. The wealth tax prompts a substantial and precisely estimated response.[9] Employing the approach outlined in Saez et al. (2012), we calculate that Colombia instantly loses up to 20% of the anticipated revenue increase due to taxpayers' immediate response.[10] Moreover, the design of the tax policy influences taxpayers' behavior. Notably, recurring wealth taxes appear to evoke more substantial responses compared to temporary taxes. While caution is warranted due to the limited data points, it is noteworthy that the recurrent wealth tax from 2006 to 2009 triggered a response 55% larger than that elicited by the temporary tax of 2010 at an equivalent nominal threshold (=(560-360)/360).[11]

Additionally, while taxpayers respond to exemption and non-exemption notches, they respond more to exemption notches. First, exemption notches determine whether taxpayers owe *any* wealth tax, making them more salient for taxpayers. Second, exemption notches require additional effort to file a wealth tax return (Benzarti, 2020). Third, exemption notches raise the chances of future audits since authorities typically target individuals whose declared wealth (based on their income tax statement) exceeds the exemption threshold, prompting taxpayers to avoid such scrutiny.[12] We will later demonstrate how this can trigger hysteresis effects.

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[9]An exception is for 2003 due to the small number of very wealthy taxpayers around that high tax bracket; notwithstanding, we can rule out elasticities greater than 4.1 in a 95% confidence interval.

[10]The total effect on tax revenue is $dT = dM + dB = NW_r\Delta\tau(1 - \sqrt{2e\Delta\tau/(1-\tau)})$ using Equation (2).

[11]To compare elasticities, the 2006 reform elasticity scales the reported wealth response on $\Delta\tau = 1.2\times4\%$ because wealth owned on December 31, 2006, determined the next four years' tax liability. Therefore, the elasticity with respect to (one minus) the *annual* wealth tax rate of 1.2% is 1.45 (=0.36×4), threefold the elasticity of 0.44 for the temporary tax of 2010 for that same nominal threshold of 3 billion pesos.

[12]However, it is important to note that crossing the exemption threshold does *not* trigger a broader shift in individuals' tax environment. All taxpayers file the income tax and are subject to similar cross-checks and verifications across other individual tax bases.

4.1.3 Robustness using DD

This section supplements the bunching analysis with DD, focusing on elasticities obtained in the reform year. The following section discusses the longer-term responses to wealth taxation.

We compare wealth reported over time between taxpayers potentially more and less exposed to wealth taxes. We focus on a balanced sample of taxpayers who reported wealth above and below reform-induced tax changes. Given the prompt response to tax adjustments, we classify taxpayers as 'treated' if their *pre-reform* wealth exceeds the inflation-adjusted bracket cutoff and as 'control' if it is below, T_i^{pre}.[13] To investigate these effects, we utilize three sources of tax variations stemming from two reform episodes. First, we examine the short-lived 1% wealth tax in 2010 comparing taxpayers who reported wealth between 1,000 and 1,500 million pesos in 2009 (treated) with those reporting between 500 and 999 million pesos (control). Second, we examine the impacts of the recurring 1.2% wealth tax during 2006–09 by comparing taxpayers who reported wealth between 3,000 and 4,999 million pesos in 2005 (treated) against those reporting between 2,500 and 2,999 million pesos (control). Third, we evaluate the consequences of a non-exemption notch introduced in 2010, entailing a higher tax rate for those reporting between 2,000 and 2,500 million pesos in 2009 (treated), as compared to those reporting between 1,500 and 1,999 million pesos (control).

The elasticity comes from the following IV-2SLS specification:

$$\log(W_{it}) = \alpha_i + \delta_t + e \cdot \log(1 - \tau_{it}) + \nu_{it} \tag{3}$$

where W_{it} is individual i's reported wealth in year t, α_i and δ_t are individual and year fixed effects, τ_{it} is the wealth tax rate for taxpayer i in year t, and ν_{it} is the error term. We instrument $\log(1 - \tau_{it})$ using the DD indicator $Post_t \cdot T_i^{pre}$. The estimated elasticity $\hat{e}$ scales the reported wealth response (reduced form) by the difference in the net-of-tax rate (first stage) and is a Wald estimator: $\hat{e} = \frac{\mathbb{E}[\log(W_{it})|Post_t \times T_i^{pre}=1] - \mathbb{E}[\log(W_{it})|Post_t \times T_i^{pre}=0]}{\mathbb{E}[\log(1-\tau_{it})|Post_t \times T_i^{pre}=1] - \mathbb{E}[\log(1-\tau_{it})|Post_t \times T_i^{pre}=0]}$ where $\mathbb{E}[\cdot]$ is the expectations operator.

To enhance the comparability of bunching and DD, we account for two key distinctions in computing the reduced-form and first-stage effects. Firstly, taxpayers'

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[13]Unlike income taxes, where transitory shocks can generate mean reversion bias in panel analyses (Saez et al., 2012), such issues are less applicable to wealth taxes. Capital accumulates and individual wealth returns show notable persistence over time (Fagereng et al., 2020), making significant transitory shocks unlikely to affect taxpayers' treatment status.

pre-reform wealth is the relevant counterfactual: it is used to assign treatment status in DD and to generate the counterfactual density in bunching. Secondly, the first-stage calculation differs: bunching uses a hypothetical tax difference based on taxpayer location relative to the tax discontinuity, while DD typically uses the realized post-reform tax difference between treated and control taxpayers. Since treated taxpayers can avoid the tax hike by bunching, the post-reform first stage in DD is smaller, proportional to the degree of bunching. Therefore, the DD first stage is based on pre-reform wealth, eliminating first-stage uncertainty as in bunching.

Table 2 summarizes the results. In Panel (a), the estimates from the 2010 temporary 1% wealth tax are comparable between the two methods. Bunching yields an elasticity of 3.125 (s.e. 0.62), while DD provides an elasticity of 4.0 (s.e. 0.291), with 95% confidence intervals that overlap. Panel (b) displays similar findings for the second notch. Panel (c) again shows similar results for the 2006–09 recurrent wealth tax: the bunching elasticity is 0.363 (s.e. 0.16) and the DD elasticity is 0.758 (s.e. 0.29) with overlapping 95% confidence intervals.[14] These aligned results show that our estimated elasticities are robust to various estimation choices and reinforce the generalizability of the bunching estimates.

4.2   Persistent Responses to Wealth Taxes

Having documented the immediate response to wealth taxation, we now shift our focus to taxpayers' behavior over time following changes in the wealth tax. We will start by examining taxpayers' responses to the temporary wealth tax of 2010, which introduced a sharp and unexpected change in exposure to the wealth tax. Then, we will show that the results hold for other wealth tax regimes.

The 2010 levy was announced and implemented as a temporary measure, with the government committing to not impose another wealth tax during the quadrennium. Panel (a) of Figure 4 shows taxpayers owning around 1,000 million pesos in 2011 and 2012 after the tax ended. Despite no tax, they stayed below 1,000 million pesos. Over time, excess mass concentrates below the exemption threshold and persists even two years after the tax termination. Notably, taxpayers bunch below a *nominal* wealth value. As there is inflation, reported *real* wealth decreases, shown in Panel (b).

Consequently, wealth taxes impact taxpayers' wealth *growth rates*. Typically

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[14]In Panel (c) of Table 2, we do not estimate the bunching elasticity using the pre-reform counterfactual. The reason is that there was bunching above 3 billion pesos (in 2003 pesos) in 2003–05, caused by the 0.3% tax rate, leading to an inconsistent pre-reform baseline, as illustrated in Figure A.7.

positive due to returns, savings, and price appreciation, wealth taxation can lead to smaller or even negative rates. Figure A.2 shows that, prior to 2010, wealth growth rates were uniformly high across the depicted wealth distribution (in gray). In contrast, growth rates dropped in 2010 when wealth is taxed (in blue) and remained lower in 2011 and 2012 (in green and black, respectively). The initial reduction was more pronounced for taxpayers just above the exemption threshold, consistent with them reporting small or even negative rates to achieve bunching. Additionally, in 2011 and 2012, taxpayers just below the threshold reported even lower growth rates than those above it, reflecting their intention to remain below the cutoff even after the tax expired.[15]

Similar patterns of behavior occur for exemption thresholds in other tax regimes. Panels (c) and (d) of Figure 4 demonstrate that taxpayers continue to bunch below the cutoff that determined the obligation of paying annual wealth taxes over a span of four years from 2006 to 2009. That is, bunching persists in 2007, 2008, and 2009, even though reported wealth during those years did *not* impact taxpayers' wealth tax liability, which was solely based on wealth reported in 2006. Furthermore, wealth growth rates declined after the tax increase, with a notable downward shift in the distribution of growth rates for taxpayers initially positioned 'just above' the exemption threshold (Figure A.2). The wealth growth rates remain meaningfully lower even two years later.[16]

In contrast, Panels (e) and (f) of Figure 4 show that bunching dissipates below non-exemption notches. Unlike exemption notches, which trigger changes in reporting requirements and scrutiny levels, non-exemption notches primarily involve higher tax rates. The presence of 'de-bunching' from non-exemption notches is also mirrored in the behavior of wealth growth rates, which are more likely to recover two years later (Figure A.2). Notably, the transient effects induced by non-exemption notches are in

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[15]Figure A.3 shows the extent of wealth losses based on taxpayers' pre-tax proximity to the exemption threshold. Taxpayers 'just above' this threshold (reporting between 1,000 and 1,249 million pesos) experienced a uniform downward shift in their growth rate distribution in the tax year, with many reporting *negative* growth rates between 2009 and 2010 to bunch below the threshold (in green). Moreover, taxpayers 'just below' the threshold (reporting wealth between 800 and 999 million pesos) reported negative growth rates between 2011 and 2012, refusing to adjust for inflation to avoid surpassing the threshold years after the tax expired (in red).

[16]Interestingly, Colombian taxpayers predominantly respond to the wealth tax by bunching. This tendency in mainly observed among taxpayers positioned 'just above' the threshold, in contrast to the behavior observed in Garbinti et al. (2023), where the response to filing requirements mainly originates from those 'just below' the threshold. Furthermore, the distribution of *normalized* growth rates, as per their approach, renders direct comparisons between groups unfeasible (Figure A.4). Consequently, we do not adopt their dynamic bunching methodology in our analysis.

stark contrast to the hysteresis observed with exemption notches. This consistency holds true for all reform instances, as depicted in Figure A.5. As elucidated in Section 4.3, the absence of dynamic misreporting incentives around non-exemption notches implies that wealth taxes yield primarily temporary impacts.

[Figure 4 here]

4.2.1 A Dynamic DD Analysis Supports These Findings

Examining the evolution of reported wealth years after the tax change using a dynamic DD research design supports our findings that wealth taxes can generate persistent effects. Using a dynamic DD approach based on the design described in Section 4.1.3, we use an event study specification:

$$\log(W_{it}) = \alpha_i + \delta_t + \sum_{j \neq K-1} \beta_j Year_{j=t} \cdot T_i^{pre} + u_{it} \tag{4}$$

where W_{it} is individual i's reported wealth in year t, α_i and δ_t are individual and year fixed effects, $Year_{j=t}$ is an indicator for the year t, T_i^{pre} indicates the treated group, and u_{it} is the error term. We normalize the β_j coefficients to express effects relative to the pre-reform year $K - 1$.

Figure 5 displays the DD results. Left panels show treated (blue) and control (black) taxpayer wealth evolution; right panels present differences (β_j from Equation (4)) with 95% confidence intervals. No pre-trends support the DD identifying assumption of "parallel trends." Moreover, the DD figures align with bunching analysis: (1) swift divergence post-tax increase; (2) sustained response even three years after the tax's expiry, denoting hysteresis; (3) no lasting effects for non-exemption notches. Interestingly, Panel (d) reveals that the impact of a recurring wealth tax does not compound. While the DD coefficient could have grown annually from treated taxpayers paying an annual 1.2% tax, it stabilizes after the first year, indicating a one-time adjustment drives the overall response. This result indicates that our study can capture the longer-term response to a wealth tax within a relatively short timeframe.

[Figure 5 here]

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4.3 Why Does Wealth Taxation Cause Hysteresis Effects?

The enduring hysteresis effects of wealth taxes hold significant implications for both the distribution of reported wealth and government revenue. Understanding the factors driving these effects is pivotal for designing effective wealth tax policies. Notably, the sustained response cannot be attributed to tax incentives, as they do not influence individuals' wealth tax liability in either tax regime. Instead, we investigate three potential explanations for the wealth tax-induced hysteresis: (i) fixed real adjustment costs, (ii) intentional evasion by taxpayers to evade detection, and (iii) taxpayers anticipating future wealth taxes. To preview our results, we find that the evidence aligns most closely with taxpayers strategically avoiding detection and proactively addressing anticipated future wealth tax obligations.

Fixed Adjustment Costs. The presence of fixed adjustment costs could imply that taxpayers who initially bunched to avoid the wealth tax would not revert to their pre-tax level of reported wealth. However, this hypothesis is contradicted by four pieces of evidence in our context that challenge the idea of adjustment frictions driving hysteresis:

1. *Immediate response:* As Gelber et al. (2020) explain in the context of the U.S. Social Security Annual Earnings Test, adjustment frictions prolong the time required to fully adapt to a policy change. Thus, if significant adjustment costs were present, taxpayers' response to policy changes would be gradual and build up over time. However, the results from bunching and DD analyses indicate that the response to the wealth tax is instantaneous and does not build up over time (Figures 2–5).

2. *Anticipatory response:* Gelber et al. (2020) argue that fixed adjustment costs could manifest as a lack of anticipatory response to policy changes. Their argument is that if agents were forward-looking and placed weight on the future, they should begin to respond in anticipation of a policy change in the absence of fixed adjustment costs. We can test for this in our setting by examining taxpayers' observed response to the wealth tax announcement of September 2013. One month before the 2013 income tax filing deadline, the government proposed a wealth tax for those owning 1,000 million pesos or more on January 1, 2015. Figure A.6 reveals an immediate reaction to this announcement, with individuals bunching below the proposed cutoff in 2013 in anticipation of the future policy change. The presence of an

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anticipatory response discounts the idea that real adjustment costs are driving the observed hysteresis.

3. *Inconsistent dynamics:* While the dynamics should be comparable for exemption and non-exemption notches because the cost of moving assets around is similar for both notch types, the results demonstrate that bunching persists below exemption notches but dissipates quickly after the tax expires below non-exemption notches. This is consistent with the presence of a fixed cost associated with entering the wealth *filing* domain, as we describe below and develop in Appendix E. (Notably, allowing for a fixed *filing* cost is not at odds with our finding of negligible fixed *adjustment* costs.)

4. *Notch size impact:* If adjustment costs were driving the hysteresis, we would anticipate more de-bunching for larger tax notches, in line with arguments by Chetty et al. (2011) and Chetty (2012) that larger tax changes should overcome optimization frictions. However, Figure A.5 reveals similar de-bunching behavior across notch sizes for both small ($\Delta\tau = 0.4$) and large ($\Delta\tau = 3$) tax changes.

Strategic Behavior to Avoid Detection. Another plausible reason for the hysteresis effect is that taxpayers who initially bunched to avoid the tax might deliberately persist in underreporting, even after the tax is no longer in place. This strategy avoids drawing attention from authorities and signaling potential tax evasion. Our conversations with Colombian officials and tax specialists provide informal backing for this evasion-centered explanation, and two pieces of evidence additionally substantiate it:

1. *The role of perceived audit risk:* To understand the potential role of audit risk, we analyze bunching patterns of exemption and non-exemption notches. The Colombian tax authority closely examines taxpayers whose wealth declared in their income tax statement surpasses the wealth tax exemption threshold. Consequently, de-bunching from an exemption notch attracts attention, suggesting that the taxpayer bunched simply to avoid the tax. In contrast, de-bunching from a non-exemption notch, which does not alter the filing requirement (both taxpayers above and below it must file), does not affect the perceived audit risk. Our finding that taxpayers remain bunched below exemption thresholds but de-bunch from non-exemption notches when their reported wealth does not influence their tax obligation supports the notion of a strategic behavior to avoid detection.

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2. *Preemptive behavior to ease misreporting:* As previously mentioned, taxpayers promptly modified their reported wealth in their 2013 income tax declarations upon learning about a forthcoming exemption threshold adjustment (Figure A.6). This proactive adjustment aimed to minimize the possibility of scrutiny from authorities. Moreover, it could elucidate the more pronounced reaction to the 2014 wealth tax relative to the 2010 wealth tax, as indicated in Table 1. This divergence in elasticities may arise from taxpayers foreseeing the former tax change but not the latter. As we discuss below, a simple model of taxpayer behavior with dynamic misreporting rationalizes this finding of misreporting "smoothing," whereby forward-looking taxpayers anticipate the dependency between today's reporting behavior and future misreporting costs, leading them to misreport years before a wealth tax is levied.

Anticipation of Future Wealth Taxes. Another plausible explanation for the persistent impact of wealth taxes is the anticipation of future tax reforms. Governments often establish tax policies changes at specific thresholds, creating focal points alongside financial motivations (Kleven, 2016). This could lead to a sustained response to wealth taxes if individuals below nominal cutoffs strategically avoid crossing them to escape potential future wealth taxes.

In Colombia, where consistent nominal thresholds have been employed to define wealth tax brackets over years (1, 2, 3, and 5 billion pesos, as highlighted in Figure 1), this behavior is probable. Moreover, these thresholds determining *average* wealth tax rates are particularly salient. Thus, individuals below these marks might persistently avoid crossing them even when the tax is no longer in place, anticipating the return of wealth taxes. Furthermore, more taxpayers end up bunching at the threshold from below over time, due to wealth accumulation and inflation.

However, while anticipating future wealth taxes likely contributes to the persistence, empirical patterns indicate that it is not the sole factor. Consider the 2003–05 wealth tax on those owning 3 billion pesos or more. Unlike other regimes, these exemption cutoffs were adjusted for inflation in 2004 and 2005 (Law 863/2003). If taxpayers were solely concerned with staying below nominal thresholds, they would remain beneath the original 3 billion peso mark. Nevertheless, Figure A.7 demonstrates that taxpayers bunched below inflation-adjusted cutoffs, tailoring their wealth annually to avoid taxes. This behavior goes beyond simple inflation adjustment; in 2005, the statutory exemption cutoff exceeded the inflation-adjusted

threshold, yet taxpayers still bunched below the former, not the latter. This suggests that taxpayers are strategic in their tax planning and not solely reacting to nominal thresholds.

To recap, we demonstrate a significant bunching of taxpayers in response to the wealth tax. This behavior is primarily driven by taxpayers initially just above the tax threshold, who effectively sidestepped the tax by claiming losses in their reported wealth. While bunching is prominent for exemption and non-exemption notches, the phenomenon of hysteresis manifests exclusively in the former case. Taxpayers who bunched to avoid the wealth tax will continue misreporting years later to avoid scrutiny from authorities. Moreover, as time progresses, even taxpayers situated further down the wealth distribution start to employ tactics to prevent their wealth from surpassing the exemption threshold. They consistently report lower growth rates in their wealth, further contributing to the persistence of the hysteresis effect. Building on Garbinti et al. (2023), Appendix E shows that these findings are consistent with a simple model of taxpayers' behavior involving dynamic misreporting and a fixed cost of entering the wealth filing domain. Since authorities compare reported wealth values across different years, misreporting is an intertemporal decision for taxpayers as current misreporting behavior affecting future misreporting costs.

5 The Anatomy of the Behavioral Response

This section decomposes the anatomy of the behavioral response, focusing on two mechanisms individuals use to deliberately underreport their wealth: misreporting wealth with minimal third-party oversight and obscuring assets utilizing offshore entities located in tax havens. Lastly, we explore additional possible channels through which taxpayers might react to the wealth tax.

5.1 Misreporting Items with Little Third-Party Reporting

We aim to characterize bunchers, comparing them with individuals who do not bunch in response to a wealth tax, and identify the specific adjustments bunchers make to avoid the wealth tax.

We utilize the compliers characteristics approach, based on Abadie (2003) and Imbens and Rubin (1997). Figure A.8 illustrates this setup. Taxpayer i is considered to be in the bunching region ($B_{it} = 1$) if they report wealth between W_r^l and the

tax notch W_r^* in year t. Taxpayers who respond by bunching below the notch are referred to as "bunchers"—the *compliers* in the potential outcomes framework (Imbens and Angrist, 1994). Taxpayers can locate themselves just below the tax notch even without a wealth tax, meaning that taxpayers with $B_{it} = 1$ include a mix of *compliers* and *always-takers*—individuals who would locate below the threshold regardless of the wealth tax. Conversely, taxpayers situated above the tax notch are *never-takers*, as they do not engage in bunching despite the existence of a wealth tax.

We utilize panel microdata and reform-induced tax variation to estimate causal effects. Pooling individuals who file taxes before and after a reform, we use the following IV-2SLS specification:

$$y_{it} = \alpha_1 + \gamma_1 t + \beta_1 B_{it} + \epsilon_{it} \tag{5}$$

where y_{it} is the reported asset amount for taxpayer i in year t (expressed as a share of total assets), t is a time trend accounting for changes in wealth composition, B_{it} is an indicator for being located in the bunching region, and ϵ_{it} is the error term. Since wealth tax hikes prompt bunching, we instrument B_{it} with a reform year indicator Z_t. The exclusion restriction assumes that a wealth tax hike solely influences taxpayers' wealth composition through bunching incentives, which is reasonable when focusing on a narrow range of taxpayers surrounding the tax discontinuity.

We leverage the 2010 reform's tax variation, focusing on taxpayers around the tax exemption threshold. The tax variation around this cutoff is large and elicited a strong bunching response, and the substantial sample size enables precisely estimating effects.[17] Table 3 presents the results of this analysis. Panel (a) displays the debt-to-asset ratio for different taxpayer groups: bunchers, always-takers, and never-takers in Columns (1), (3), and (4), respectively. Never-takers exhibit a higher debt-to-asset ratio than always-takers, consistent with wealthier individuals displaying greater financial leverage, while bunchers do not consistently exhibit higher or lower debt levels than others. Column (2) displays the β_1 coefficient from the 2SLS estimation based on specification (5), capturing the wealth tax's impact on bunchers' debt-to-asset ratio. The wealth tax increases this ratio by 3.3 percentage points (with a t-statistic of 7.8), indicating that bunchers take on 35% (=0.033/0.094) more debt to

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[17]In contrast, the sample size further up the wealth distribution is smaller, rendering estimates noisy. Unlike the subsequent section's analysis, we do not pool taxpayers across different tax notches because their response to the wealth tax can vary differ based on their initial asset composition, which can vary significantly even within the top 0.1% of the distribution.

circumvent the wealth tax.[18]

Importantly, this additional debt is not used to fund the acquisition of assets. If taxpayers were to employ debt to obtain assets, like when acquiring a home through a mortgage, the augmented debt would be counterbalanced by the increased value of the assets, resulting in no change in net wealth. However, we observe bunchers declaring more debt alongside diminished net worth, positioning themselves below the tax threshold intentionally. A concrete illustration of this behavior is the strategic reporting of debts between individuals: a taxpayer who, beforehand, had wealth surpassing the tax threshold claims to owe money to friend or family member whose wealth falls below the threshold. This tactic exempts both parties from the wealth tax. Given that interpersonal debts are not subject to third-party reporting, this behavior is less likely to attract attention as a means of evading taxes. Instances of such debt manipulation were verified through tax audits, and our conversations with authorities reveal taxpayers being found to have fabricated debts with others to alleviate their tax liabilities. This practice was a widely acknowledged as a methods of avoidance by the tax authority. It was a focal point in the government's voluntary disclosure program, as investigated by Londoño-Vélez and Ávila-Mahecha (2021).

Additionally, bunchers deliberately underreport specific assets to evade the wealth tax. To delve into this aspect of the behavioral response, we narrow our focus to record-keeping taxpayers, who submit more detailed reports with a finer breakdown of assets, as described in Section 3. This subset, primarily encompassing business owners, constitute about 20% of our estimation sample. To gauge the consistency between record-keeping taxpayers and the broader population, we re-estimate the behavioral response to the wealth tax, decomposing its impact on bunchers' debt-to-asset ratio using Specification (5). The results, presented in Panel (b) of Table 3 and Figure A.10, show a quantitatively similar behavioral response ΔW_r^* for record-keeping taxpayers and the full taxpayer sample, and there are no significant differences in the estimated parameters. Moreover, the behavioral response pattern remains consistent: record-keeping bunchers also inflate their liabilities as a means to sidestep the wealth tax.[19] These findings suggest that the responses of record-keeping taxpayers provide valuable insights into how the broader taxpayer population responds.

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[18]A DD analysis also support this finding: taxpayers exposed to a wealth tax raise their reported debt and this effect persists for a minimum of four years (Figure A.9).

[19]As business owners, record-keeping bunchers display higher leverage than other taxpayers and enhanced control over reported wealth, with a narrower bunching segment.

In Table 3, Panel (b) examines the breakdown of assets for record-keeping taxpayers. In Columns (3) and (4), we can observe that the proportion of financial assets expands as wealth increases, while the situation is reversed for fixed assets, such as real estate, land, and vehicles. Column (1) illustrates the asset composition of bunchers under no wealth tax. Among these taxpayers, the majority (52.7%) of their wealth is tied up in fixed assets. Financial assets constitute around a quarter, while the rest is distributed among inventory (10.9%), accounts receivable (6.6%), and other assets like art collectibles and club shares (3.8%). Comparing this composition to that of always-takers and never-takers in Columns (3) and (4), we can discern differences. Bunchers possess fewer fixed assets, which are less liquid and not as readily adaptable. Additionally, they hold a smaller portion of accounts receivable (which undergo third-party reporting), while a larger percentage is allotted to "other" assets (typically not subject to third-party reporting). These observations imply that bunchers may find it more feasible to adjust their reported assets. This is because they own a smaller proportion of assets that are illiquid and subject to third-party reporting requirements.

Lastly, Column (2) shows no significant effect of the wealth tax on the proportion of fixed assets among bunchers, suggesting challenges in adjusting indivisible and illiquid assets. Moreover, the evidence that these taxpayers engage in the sale or transfer of assets to evade the tax is limited: there is no significant increase in the likelihood of realizing capital gains.[20] Interestingly, even though bank deposits and stocks are highly liquid, bunchers do not make adjustments to these assets in response to the tax. Instead, they notably reduce the reported value of their inventories by 22% (=-0.024/0.109, with a p-value of 0.046). Additionally, there might be a reduction in the value of other assets by around 55.3% (=-0.021/0.038, with p-value of 0.092).[21] This strategy of decreasing reported inventories and possibly diminishing the value of other assets holds significance due to the fact that neither inventories nor other assets are subjected to third-party reporting. As such, the act of underreporting these assets could likely escape detection by the tax authority (Chetty et al., 2013, 2011; Kleven et al., 2011).

[Table 3 here]

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[20]While bunchers are 5.7 percentage points more likely to realize a capital gain in response to wealth taxation, this effect is only marginally significant and sensitive to the estimation sample. Additionally, it does not hold for record-keeping taxpayers, suggesting caution in interpretation. Figure A.9, which employs a DD approach to compare capital gain likelihood, also indicates no discernible effect.

[21]Reduced reporting of these assets by bunchers mechanically increases the share of the remaining assets.

5.2 Hiding Assets in Hard-to-Track Entities in Tax Havens

To minimize the impact of the wealth tax, some individuals resort to hiding assets in offshore tax havens. Recent research suggests widespread offshore evasion. For instance, Londoño-Vélez and Ávila-Mahecha (2021) found that approximately 40% of Colombia's wealthiest 0.01% individuals admit to concealing wealth offshore, which is three times higher than the rate observed in Scandinavia and four times higher than the rate in the Netherlands (Alstadsæter et al., 2019; Leenders et al., 2023). Colombian evaders commonly stash about one-third of their wealth offshore, akin to Scandinavian and Dutch counterparts. We will now demonstrate that offshore evasion in Colombia, to some extent, stems from the intention to avoid the wealth tax. This will be achieved by linking the tax microdata and leaked Panama Papers, while utilizing the reform-induced tax variation to establish causal relationships.

Individuals named in the Panama Papers primarily belong to Colombia's financial and political elite, encompassing prominent business figures, politicians, lawyers, and journalists, with one case associated with drug trafficking (Connectas, 2016; La Silla Vacía, 2016). Descriptive statistics are presented in Table 4, comparing the named taxpayers and all other taxpayers who ever filed taxes between 1993 and 2016. Named individuals tend to be male, old, and twice as likely to be wage-earners or capital rentiers, relying mainly on capital income. Interestingly, those in the Panama Papers possess wealth and capital income over ten times higher than the average Colombian taxpayer not mentioned in the leak. Figure 6 illustrates this further, depicting the likelihood of being named in the Panama Papers across different wealth groups. The probability rises sharply with reported wealth, from 0.02% for the P95–P99 group to 2.7% for the top 0.01%. The top 0.01% is about 40 times more likely to appear in the Panama Papers than the top 5% overall. Despite potential underreporting, they are among Colombia's wealthiest. Notably, their wealth exceeds historical wealth tax exemption thresholds. Thus, this examination of offshoring offers insights into how ultra-rich individuals respond to wealth taxes.

[Table 4 here]

Table 4 indicates that individuals named in the Panama Papers tend to engage more in tax sheltering. They have a notably higher likelihood of being situated in a bunching region during wealth tax reform years (2003, 2006, 2010, or 2014). This trend persists even when flexibly controlling for reported wealth quantiles and baseline

covariates, as shown in Table A.1. Figure 7, Panel (a), graphically demonstrates the relationship between wealth taxation and offshore activities. The solid back line represents new offshore entities (companies, trusts, and funds) established by Colombians through Mossack Fonseca in tax havens from 1995 to 2015, while the dashed blue line corresponds to Colombia's top statutory wealth tax rate. Both lines closely parallel each other, revealing a correspondence between increasing wealth tax and rising offshoring activities. Since the introduction of Colombia's wealth tax in 2002, the annual creation of offshore entities has increased tenfold, peaking in 2015 with a cumulative total of 1,784 entities formed since 1973. Notably, the significant increasing in the top tax rate in 2010 lead to a prominent surge in offshoring activities.

Additionally, Panel (b) reveals that Colombians have established more offshore entities than wealthier or more populous countries like the U.S., Mexico, and Brazil since 2010. This remains consistent even when compared to 31 other Latin American and OECD countries using an event study specification. Results, illustrated in Figure A.11, confirm Colombians have consistently incorporated more offshore entities each year since the reintroduction of the wealth tax.

[Figure 7 here]

Figure 8 helps us understand who is more likely to respond to wealth tax hikes through offshoring by comparing the likelihood of creating offshore entities for taxpayers more versus less affected by the wealth tax. The solid blue series illustrates the offshoring probability in year t for taxpayers who reported assets of 3,000 million pesos or more in $t-1$. These individuals, with greater exposure to wealth taxes, exhibit a higher tendency to engage in offshoring compared to taxpayers reporting less than 1,00 million pesos (solid black), who are not subject to wealth taxes. Particularly, the ultra-wealthy are notably inclined to offshore after wealth tax hikes, as seen in 2006 and 2010. In contrast, taxpayers with lower wealth levels, not subject to wealth taxes, show less responsiveness to such tax increases.

[Figure 8 here]

Numerous activities via offshore entities are legal, with legitimate reasons for Colombians to hold wealth offshore. For example, security concerns during the tumultuous 1990s and 2000s might have led wealthy Colombians to safeguard their fortunes abroad while adhering to foreign wealth declaration requirements in

Colombia. However, our analysis reveals that taxpayers employed offshore entities to conceal assets from the tax authorities and reduce wealth tax obligations.

To examine this, we employ an event-study design that analyzes changes in reported assets around the creation of offshore entities:

$$A_{it} = \alpha_i + \gamma_t + \sum_{k \neq -1} \beta_k D_{it}^k + u_{it} \tag{6}$$

where A_{it} represents assets reported by taxpayer i in year t to the Colombian tax authority, α_i are individual fixed effects, γ_t are year fixed effects, D_{it}^k are indicators for incorporation event k years ago, and u_{it} is the error term.[22] The parameters of interest, β_k, represent reported asset differences relative to the year before offshore entity creation. A decrease in reported assets during entity incorporation ($\hat{\beta}_0 < 0$) implies asset concealment, while downward trends afterward indicate increased offshore wealth hiding. We present results separately based on whether taxpayers establish offshore entities in year affecting wealth tax liability. Negative, statistically significant $\hat{\beta}_k$ values when assets affect tax liability indicate asset concealment for tax reduction.

Figure 9 displays the outcomes of this analysis. There is no noticeable change in reported assets before establishing an offshore entity, supporting the parallel trends assumption (joint F test p-value = 0.8858). Creating an offshore entity does not affect reported assets when there is no wealth taxation, implying other motivations. However, in the context of wealth taxation, it leads to a 7.7% drop in reported assets, with the effect growing in the subsequent year, indicating a greater asset concealment within the entity. On average, reported assets decline by 9.5% over the two post-event years following offshore entity creation.

[Figure 9 here]

Finally, we illustrate how offshoring can be used by taxpayers for strategic bunching below tax thresholds to minimize wealth tax obligations. We employ a stacked version of specification (5) where the outcome Y_{it} denotes whether individual i established an offshore entity via Mossack Fonseca in year t. To enhance statistical power, we use tax variations from the 2003, 2006, 2010, and 2014 reforms, pooling all notches and pre- and post-reform years. We augment specification (5) by including

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[22]We use a balanced taxpayer sample from $k = K - 3$ to $k = K + 1$ to avoid excluding recent offshore entities incorporations. Figure A.12 displays β_k coefficients for different event time windows, serving as a robustness check.

notch fixed effects and interactions of the reform indicator with the notch fixed effects to accommodates varying first-stage effects (impact of wealth tax hike on bunching) across notches. The exclusion restriction posits that offshoring is driven solely by bunching incentives due to wealth tax, which is plausible for taxpayers located within a narrow window around the tax discontinuities.

Results are shown in Table A.2. In Column (1), we consider taxpayers within the identified bunching ranges from Table 1. Bunchers significantly use offshore entities to strategically reduce their wealth tax burden, with a fivefold increase in the likelihood of creating such entities compared to the mean. In Column (2), we extend the sample to include wider ranges around each notch, similar to those used in the DD analysis (Section 4.1.3), magnifying the estimated coefficient. This approach reveals an eighteenfold increase in offshoring, reinforcing the use of tax havens to minimize wealth tax liabilities.

5.3 Other Potential Margins of Response

Taxpayers could respond to the wealth tax through other channels. Inter vivos gifting, where assets are gifted during one's lifetime, might seem a potential strategy. However, Colombian tax laws treat gifts and donations similarly to inheritances, subjecting them to taxation with a low exemption threshold. For example, transfers exceeding USD 15,000 in 2010 faced a progressive tax with a top marginal tax rate of 33%. Moreover, gifts might trigger income tax filing for recipients (since it also depends on assets), possibly exposing them to additional tax burdens.

Despite these considerations, we explore the possibility of inter vivos giving as a response to the wealth tax. Two challenges arise: donors seldom report gifts, and family network information is limited. We address this by focusing on donees, who must declare these gifts along with realized capital gains and inheritances on their income tax return. Firstly, we examine whether low-wealth taxpayers received wealth transfers or realized capital gains during significant wealth tax hikes. The underlying assumption is that low-wealth taxpayers are likelier to receive gifts when a wealth tax hike occurs. Additionally, taxpayers significantly below the wealth tax exemption threshold might be more likely to receive gifts than those close to the cutoff, as this would allow both the donor and the donee to avoid the wealth tax. However, our analysis does not reveal significant changes in these outcomes, suggesting a limited response (Figure A.13). Secondly, we turn our attention to

younger taxpayers born after 1985, anticipating that there might be an increase in the number of wealth transfers if the wealthy strategically transferred assets to younger relatives. Furthermore, we expect to see a rise in the number of young taxpayers who receive a gift and file a tax return for the first time. Nevertheless, we do not observe a substantial increase in young individuals receiving wealth transfers following significant tax hikes (Figure A.14). These results suggest that inter vivos gifting is not a major channel through which wealthy Colombians respond to the wealth tax.

Some researchers show that European taxpayers use strategic portfolio rebalancing to evade wealth taxes, favoring hard-to-value assets like non-traded firms and family-owned businesses. This behavior could be more common in countries with favorable tax rates for such assets (Alvaredo and Saez, 2009; Bjørneby et al., 2023; Seim, 2017). However, Colombia did not provide preferential tax rates or exemptions for such holdings under its wealth tax regime. Furthermore, our analysis in Table 3 indicates that the wealth tax did not significantly affect the proportion of stocks and shares held by individuals engaging in bunching, regardless of their trading status. Nonetheless, these findings rely on data from record-keeping taxpayers, possibly leaving room for non-record-keeping taxpayers to respond differently, particularly by shifting towards hard-to-value assets.[23]

6   Conclusion

Our findings have implications for the design of wealth tax policy and future research. From a policy perspective, enhancing the tax authority's information about taxpayers' wealth becomes crucial. This involves measures like expanding third-party reporting, cross-validating data for enforcement, and requiring detailed wealth reporting by asset type, although recent evidence suggests that the latter could generate adverse effects (Garbinti et al., 2023). Alongside wealth taxation efforts, effective strategies against offshore evasion are vital. These include measures like creating registries of beneficial ownership, foreign asset reporting, and international cooperation through automatic tax information exchange agreements (TIEAs) to combat offshore tax

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[23]It is worth noting that all forms of response to taxation, including misreporting, gifting, and portfolio choices, introduce inefficiencies and contribute to the overall tax burden. Although our data may not allow us to observe all the different response mechanisms, any behavior along these lines is reflected in our estimated elasticity of reported wealth.

havens' role in wealth concealment.

There are two promising avenues for future research. First, delving into Colombia's gradual phasing out of the wealth tax on firms, which culminated in its complete elimination in 2018, might uncover shifts in asset from individuals to corporations. This shift's impact and the growing role of challenging-to-monitor family firms warrant investigation (Slemrod, 2019). Second, Colombia's recent initiatives aimed at tackling personal wealth tax evasion through methods like voluntary disclosures and automatic TIEAs introduce new dynamics. Beginning in 2016, Colombian authorities have received annual data about foreign financial accounts owned by Colombian taxpayers in the United States, courtesy of the Foreign Account Tax Compliance Act (FATCA), as well as from over 100 other countries through the Common Reporting Standard. Evaluating how these initiatives interact with the observed behavioral responses to wealth taxes, particularly considering the diminished evasion opportunities due to these TIEAs, presents an intriguing avenue for research. In fact, given that the effective tax rate on a real behavior hinges on the potential for avoidance and evasion, taxpayers may react differently when these opportunities become constrained. This could potentially lead to real behavioral changes (Slemrod, 1990, 1995). Consequently, wealth taxation's influence might extend to areas such as bequests, consumption patterns, savings behavior, and investment decisions.

References

Abadie, A., "Semiparametric instrumental variable estimation of treatment response models," *Journal of Econometrics*, 2003, *113*, 231–263.

Advani, A. and H. Tarrant, "Behavioural responses to a wealth tax," *Fiscal Studies*, 2021, *42* (3–4), 509–537.

Advani, Arun, William Elming, and Jonathan Shaw, "The Dynamic Effects of Tax Audits," *The Review of Economics and Statistics*, 03 2023, pp. 1–17.

Agrawal, D. R., D. Foremny, and C. Martínez-Toledano, "Wealth Tax Mobility and Tax Coordination," 2022. Working Paper.

Allingham, M.G. and A. Sandmo, "Income Tax Evasion: A Theoretical Analysis," *Journal of Public Economics*, 1972, *1*, 323–338.

Almunia, M. and D. Lopez-Rodriguez, "Under the radar: The effects of monitoring firms on tax compliance," *American Economic Journal: Economic Policy*, 2018, *10* (1), 1–38.

Alstadsæter, A., M. Bjørneby, W. Kopczuk, S. Markussen, and K. Røed, "Saving Effects of a Real-Life Imperfectly Implemented Wealth Tax: Evidence from Norwegian Micro Data," *AEA Papers and Proceedings*, May 2022, *112*, 63–67.

— **, N. Johannesen, and G. Zucman**, "Tax evasion and inequality," *American Economic Review*, 2019, *109* (6), 2073–2103.

Alvaredo, F., L. Chancel, T. Piketty, E. Saez, and G. Zucman, eds, *World Inequality Report*, Harvard University Press, 2018.

Alvaredo, Facundo and Emmanuel Saez, "Income and Wealth Concentration in Spain from a Historical and Fiscal Perspective," *Journal of the European Economic Association*, 2009, *7* (5), 1140–1167.

Bachas, P. and M. Soto, "Corporate Taxation under Weak Enforcement," *American Economic Journal: Economic Policy*, November 2021, *13* (4), 36–71.

Bastani, S. and D. Waldenström, "How Should Capital be Taxed?," *Journal of Economic Surveys*, 2020, *34* (4), 812–846.

Benzarti, Y., "How Taxing is Tax Filing? Using Revealed Preferences to Estimate Compliance Costs," *American Economic Journal: Economic Policy*, November 2020, *12* (4), 38–57.

Bérgolo, M., J. Londoño-Vélez, and D. Tortarolo, "Tax progressivity and taxing the rich in developing countries: lessons from Latin America," *Oxford Review of Economic Policy*, 08 2023, *39* (3), 530–549.

Bjørneby, M., S. Markussen, and K. Røed, "An imperfect wealth tax and employment in closely held firms," *Economica*, 2023, *90* (358), 557–583.

Blomquist, S., W. Newey, A. Kumar, and C.Y. Liang, "On Bunching and Identification of the Taxable Income Elasticity," *Journal of Political Economy*, 2021, *129* (8), 2320–2343.

Brülhart, M., J. Gruber, M. Krapf, and K. Schmidheiny, "Behavioral Responses to Wealth Taxes: Evidence from Switzerland," *American Economic Journal: Economic Policy*, November 2022, *14* (4), 111–50.

Cattaneo, M.D., S. Calonico, and R. Titiunik, "Robust Nonparametric Confidence Intervals for Regression-Discontinuity Designs," *Econometrica*, 2014, *82* (6), 2295–2326.

Chetty, R., "Bounds on Elasticities with Optimization Frictions: A Synthesis of Micro and Macro Evidence on Labor Supply," *Econometrica*, 2012, *80* (3), 969–1018.

— **, J. Friedman, and E. Saez**, "Using Differences in Knowledge Across Neighborhoods to Uncover the Impacts of the EITC on Earnings," *American Economic Review*, 2013, *103* (7), 2683–2721.

— **, — , T. Olsen, and L. Pistaferri**, "Adjustment Costs, Firm Responses, and Micro vs. Macro Labor Supply Elasticities: Evidence from Danish Tax Records," *Quarterly Journal of Economics*, 2011, *126* (2), 749–804.

CNMH, *Tierras y conflictos rurales. Historias, políticas agrarias y protagonistas*, CHMH, 2016.

Connectas, "Todos en la cama-Colombia," 2016.

Durán-Cabré, J.M., A. Esteller-Moré, and M. Mas-Montserrat, "Behavioral Responses to the (Re)introduction of Wealth Taxes: Evidence from Spain," 2019. Universitat de Barcelona Working Paper.

Fagereng, A., L. Guiso, D. Malacrino, and L. Pistaferri, "Heterogeneity and Persistence in Returns to Wealth," *Econometrica*, 2020, *88* (1), 115–170.

Flores-Macías, G.A., "Financing Security Through Elite Taxation: The Case of Colombia's "Democratic Security Taxes"," *Studies in Comparative International Development*, 2014, *49* (4), 477—-500.

Garbinti, B., J. Goupille-Lebret, M. Muñoz, S. Stantcheva, and G. Zucman, "Tax Design, Information, and Elasticities: Evidence From the French Wealth Tax," Working Paper 31333, National Bureau of Economic Research June 2023.

Gelber, A., D. Jones, and D.W. Sacks, "Estimating Earnings Adjustment Frictions: Method and Evidence from the Earnings Test," *American Economic Journal: Applied Economics*, 2020, *12* (1), 1–31.

Guvenen, F., G. Kambourov, B. Kuruscu, S. Ocampo, and D. Chen, "Use It or Lose It: Efficiency and Redistributional Effects of Wealth Taxation," *The Quarterly Journal of Economics*, 01 2023, *138* (2), 835–894.

Guyton, J., P. Langetieg, D. Reck, M. Risch, and G. Zucman, "Tax Evasion at the Top of the Income Distribution: Theory and Evidence," Working Paper 28542, National Bureau of Economic Research March 2021.

Imbens, G.W. and D.B. Rubin, "Estimating Outcome Distributions for Compliers in Instrumental Variables Models," *Review of Economic Studies*, 1997, *64*, 555–574.

__ **and J.D. Angrist**, "Identification and Estimation of Local Average Treatment Effects," *Econometrica*, 1994, *62*, 467–475.

Jakobsen, K., K. Jakobsen, H. Kleven, and G. Zucman, "Wealth Taxation and Wealth Accumulation: Theory and Evidence from Denmark," *Quarterly Journal of Economics*, 2020, *135*, 329–388.

Kleven, H., "Bunching," *Annual Review of Economics*, 2016, *8*, 435–464.

__ , "Calculating Reduced-Form Elasticities Using Notches," August 2018.

__ **and M. Waseem**, "Using notches to uncover optimization frictions and structural elasticities: Theory and evidence from Pakistan," *The Quarterly Journal of Economics*, 2013, *128* (2), 669–723.

__ , **M.B. Knudsen, C. Kreine, S. Pedersen, and E. Saez**, "Unwilling or Unable to Cheat? Evidence From a Tax Audit Experiment in Denmark," *Econometrica*, 2011, *79* (3), 651–692.

Kopczuk, W., "Comment on "Progressive Wealth Taxation" by Saez and Zucman," *Brookings Papers on Economic Activity*, 2019.

Kostøl, Andreas R. and Andreas S. Myhre, "Labor Supply Responses to Learning the Tax and Benefit Schedule," *American Economic Review*, November 2021, *111* (11), 3733–66.

La Silla Vacía, "Así son los colombianos de Panamá Papers," May 2016.

Leenders, W., A. Lejour, S. Rabaté, and M. van 't Riet, "Offshore tax evasion and wealth inequality: Evidence from a tax amnesty in the Netherlands," *Journal of Public Economics*, 2023, *217*, 104785.

Londoño-Vélez, J. and J. Ávila-Mahecha, "Enforcing Wealth Taxes in the Developing World: Quasi-Experimental Evidence from Colombia," *American Economic Review: Insights*, June 2021, *3* (2), 131–48.

Londoño-Vélez, Juliana and Dario Tortarolo, "Revealing 21% of GDP in Hidden Assets: Evidence from Argentina's Tax Amnesties," 2022. UNU-WIDER Working Paper 2022/103.

Mejía, D. and M. Rico, "La microeconomía de la producción y el tráfico de cocaína en Colombia," in A. Gaviria, ed., *Política antidroga en Colombia*, Uniandes, 2011, pp. 1–12.

_ **and** _ , "Drogas y políticas de drogas en Colombia," 2014.

Naritomi, J., "Consumers as Tax Auditors," *American Economic Review*, September 2019, *109* (9), 3031–72.

OECD, *Tax Administration 2017: Comparative Information on OECD and Other Advanced and Emerging Economies*, OECD Publishing, 2017.

_ , *The Role and Design of Net Wealth Taxes in the OECD*, OECD Publishing, 2018. OECD Tax Policy Studies No. 26.

OECD/ECLAC/CIAT/IDB, *Revenue Statistics in Latin America and the Caribbean*, OECD Publishing, 2018.

Oh, J. and E.M. Zolt, "Wealth Tax Design: Lessons from Estate Tax Avoidance," January 2020. UCLA School of Law, Law-Econ Research Paper No. 20-01.

Piketty, T., *Capital in the Twenty-First Century*, Harvard University Press, 2014.

Pomeranz, D., "No taxation without information: Deterrence and self-enforcement in the value-added tax," *American Economic Review*, 2015, *185* (8), 2538–2569.

Ring, M.A.K., "Wealth Taxation and Household Saving: Evidence from Assessment Discontinuities in Norway," 2019.

Saez, E., "Do taxpayers bunch at kink points?," *American Economic Journal: Economic Policy*, 2010, *2* (3), 180–212.

__ **and G. Zucman**, "Response to Summers and Sarin, "A wealth tax presents a revenue estimation puzzle", Washington Post, April 4.," June 2019.

__ **and __**, *The Triumph of Injustice*, W. W. Norton & Company, 2019.

__ **, J. Slemrod, and S.H. Giertz**, "The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review," *Journal of Economic Literature*, 2012, *50* (1), 3—-50.

Scheuer, F. and J. Slemrod, "Taxing our Wealth," *Journal of Economic Perspectives*, February 2021, *35* (1), 207–30.

Seim, D., "Behavioral Responses to Wealth Taxes: Evidence from Sweden," *American Economic Journal: Economic Policy*, 2017, *9* (4), 395–421.

Slemrod, J., "The Economic Impact of the Tax Reform of 1986," in J. Slemrod, ed., *Do Taxes Matter? The Impact of the Tax Reform Act of 1986*, MIT Press, 1990, pp. 1–12.

__ , "Income Creation or Income Shifting? Behavioral Responses to the Tax Reform Act of 1986," *American Economic Review*, 1995, *85* (2), 175–80.

__ , "Tax Compliance and Enforcement," *Journal of Economic Literature*, December 2019, *57* (4), 904–54.

Soto, M., *Los Caballos de la Cocaína*, Círculo de Lectores de Colombia, 2014.

Tørsløv, T., L. Wier, and G. Zucman, "The Missing Profits of Nations," *The Review of Economic Studies*, 07 2022. rdac049.

Zoutman, F.T., "The Effect of Capital Taxation on Household Savings," 2018. Working Paper.

Zucman, G., "The missing wealth of nations: Are Europe and the U.S. net debtors or net creditors?," *Quarterly Journal of Economics*, 2013, *128* (3), 1321—-1364.

Figure 1: The Personal Wealth Tax Schedule in Colombia

### (a) Wealth Tax Liability as a Function of Reported Wealth (FY 2010)
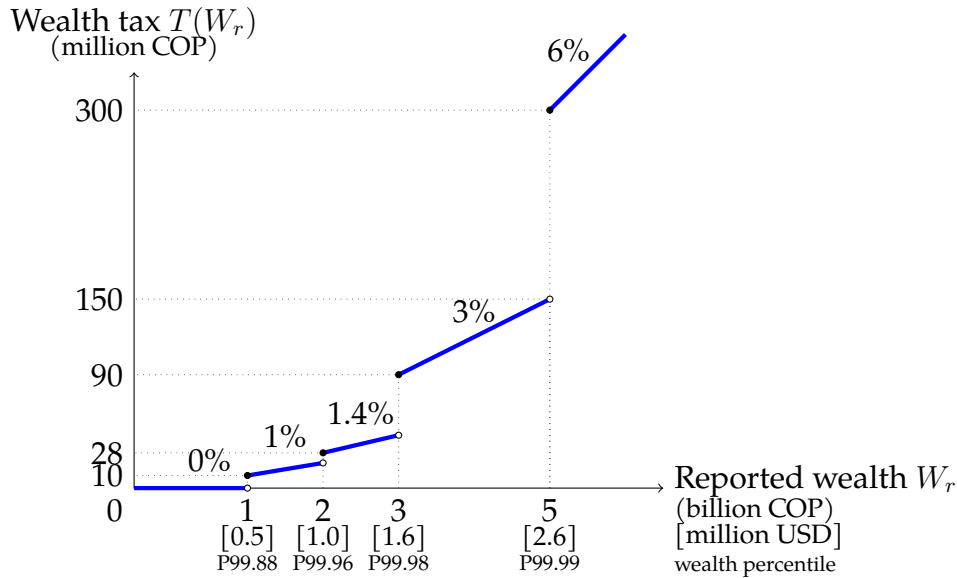
(b) Evolution of Statutory Annual Wealth Tax Rates by Bracket Cutoff
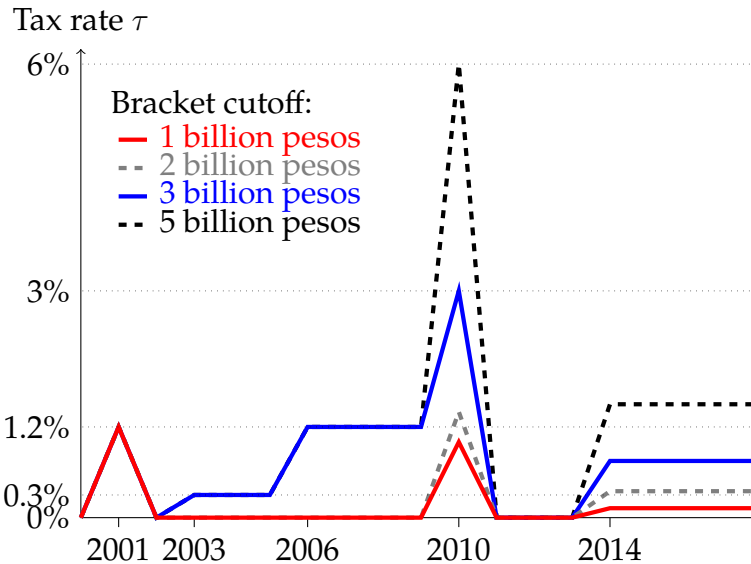
Notes: These figures depict the personal wealth tax schedule for Colombia. Panel (a) plots wealth tax liability $T(W_r)$ by reported wealth W_r in FY 2010. Each bracket of W_r is associated with a fixed average tax rate on taxable net wealth τ. As a result, $T(W_r)$ jumps discretely at the notch points. That year, the wealth tax brackets affected the top 0.12%, top 0.04%, top 0.02%, and top 0.01%, respectively. Panel (b) plots the statutory wealth tax rate in FY 2000–2018. $T(W_r)$ is determined using (taxable and non-taxable) net worth in all years, but 2001, when it is determined using total assets. In 2006–2009, $T(W_r)$ is determined based on W_r in 2006. In 2014–2018, tax eligibility (but not τ) is determined in 2014. Tax brackets are expressed in current values for all years except 2004 and 2005, when they are expressed in 2003 pesos. The tax schedule refers to average tax rates for all brackets in FY 2001–2013. In FY 2014–2018, the first bracket is an average tax rate, but the rest are marginal rates.

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Figure 2: Wealth Taxation Causes an Immediate Response by Taxpayers
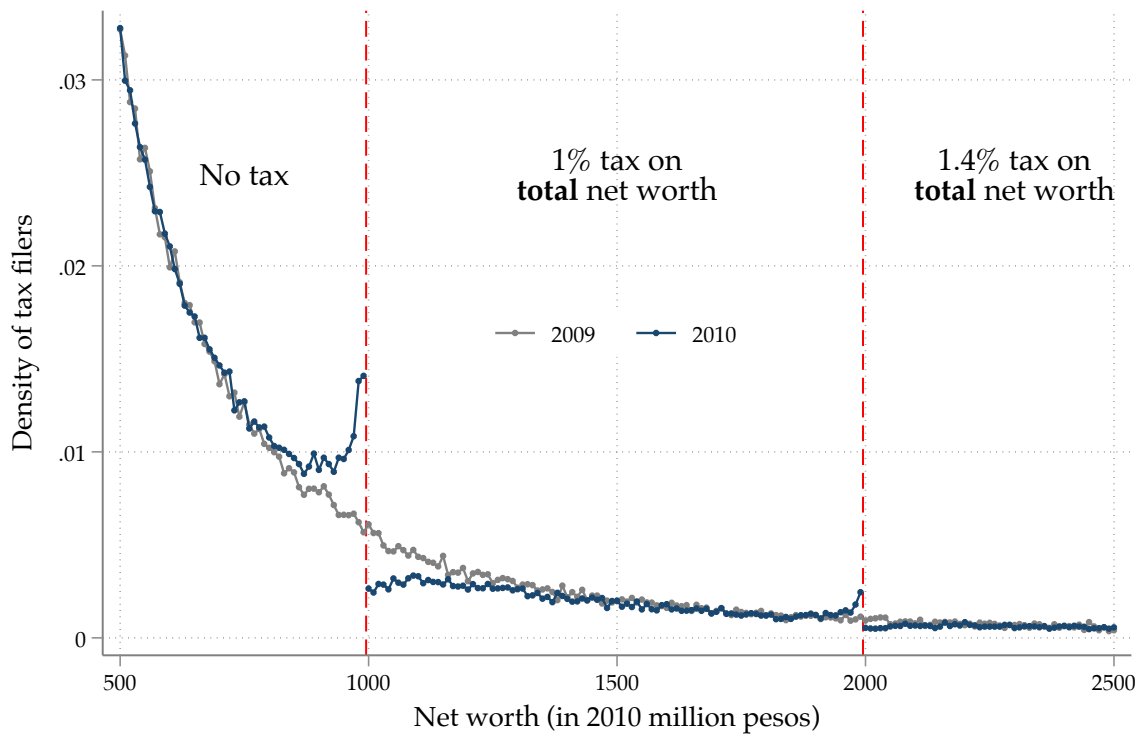
Notes: This figure shows that people respond to a wealth tax by immediately bunching below the tax discontinuities. The two series overlay the distribution of tax filers by reported wealth before (2009) and after (2010) a wealth tax reform made taxpayers reporting 1 billion pesos (USD 520,830) or more be eligible for the wealth tax. Two notches were introduced at 1 and 2 billion pesos (red vertical lines), generating jumps in the wealth tax liability at these thresholds. While the distribution of tax filers is smooth in the absence of these tax notches, there is an immediate emergence of excess and missing masses just below and above them, respectively. This observed bunching of taxpayers below the notch points is a direct behavioral response to wealth taxation. Bin width is 2010 10 million pesos (2010 USD 5,208.30 in 12/31/2010). *Source:* Authors' calculations using administrative data from DIAN.

Figure 3: The Estimates are Robust to the Counterfactual Density

(a) Exemption Notch: τ Jumps from 0% to 1%

### (b) Robustness of (a) using Pre-Reform Data
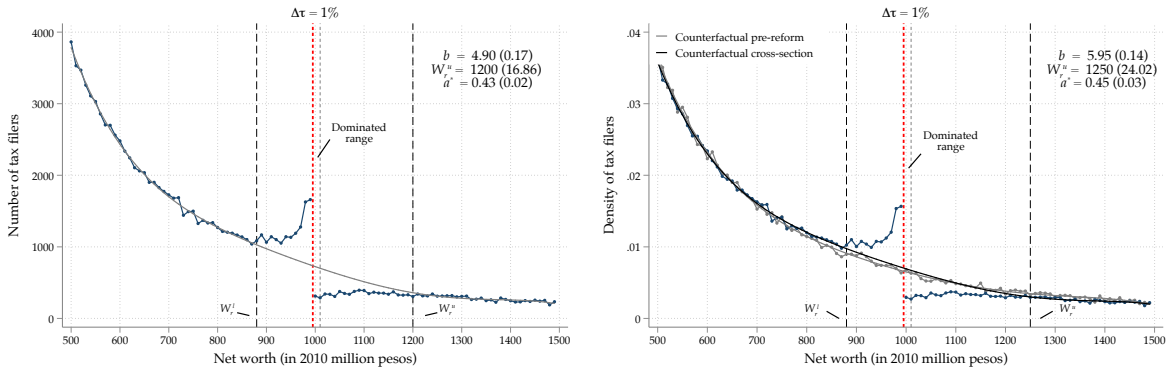
(c) Second Notch: τ Jumps from 1% to 1.4%

### (d) Robustness of (c) using Pre-Reform Data
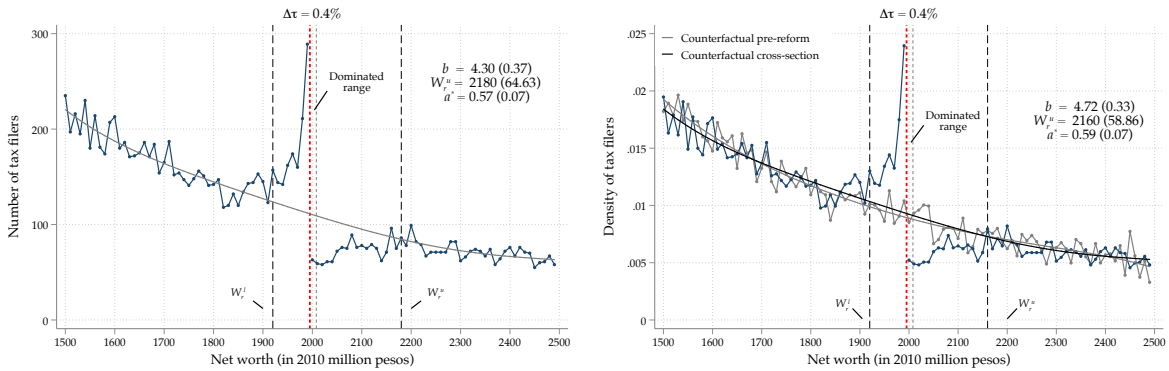
Notes: This figure reports the estimated parameters of the behavioral response to the wealth tax. Panels (a) and (b) display taxpayer density by 2010 net worth around the first notch (i.e., the exemption threshold), while Panels (c) and (d) focus on the second notch. In Panels (a) and (c), the counterfactual density is obtained from the regression of a polynomial of degree 5 on all data points outside the $[W_r^l, W_r^u]$. Instead, Panels (b) and (d) use 2009 (i.e., pre-reform) data (in gray) as the counterfactual. b is the estimated excess mass relative to the average height of the counterfactual density beneath and W_r^u is the net worth of the marginal buncher, obtained with the point of convergence method (Kleven and Waseem, 2013). a^* is the share of individuals in the dominated range that do not bunch. The standard errors in parentheses are estimated from 1,000 bootstrap samples with replacement. Bin width is 10 million pesos (2010 USD 5,208.30 in 12/31/2010). The estimated parameters are summarized in Tables 1 and 2. *Source:* Authors' calculations using administrative tax microdata from DIAN.

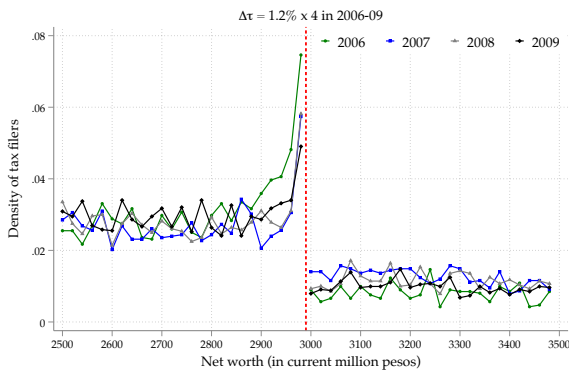## Figure 4: Wealth Taxes Can Cause Persistent Effects
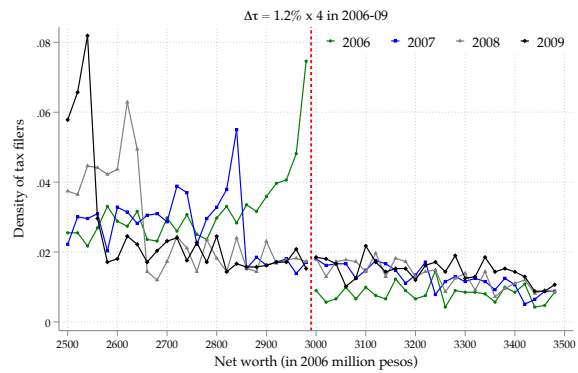
(a) Bunching Below Expired Exemption Notch
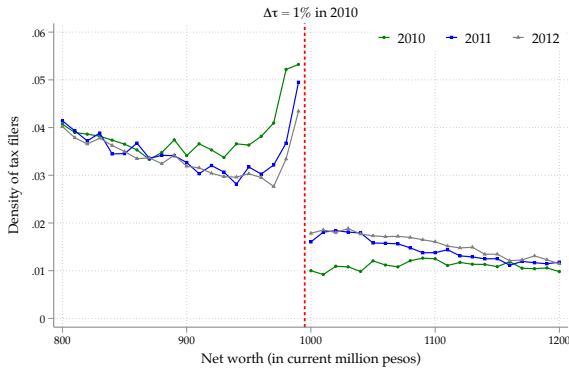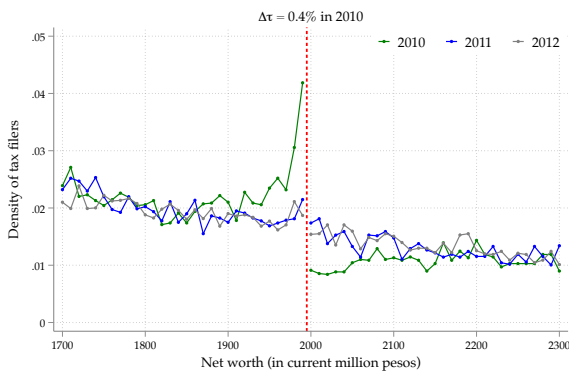
(b) Panel (a) in Constant 2010 Pesos
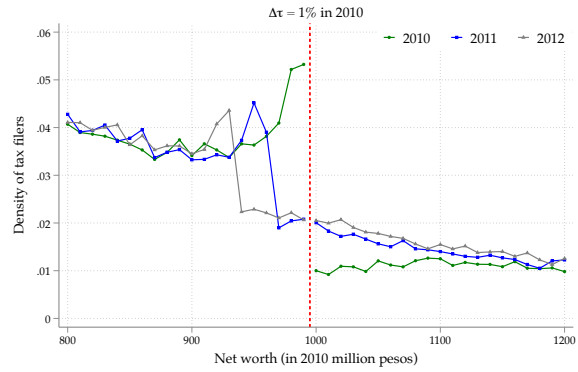
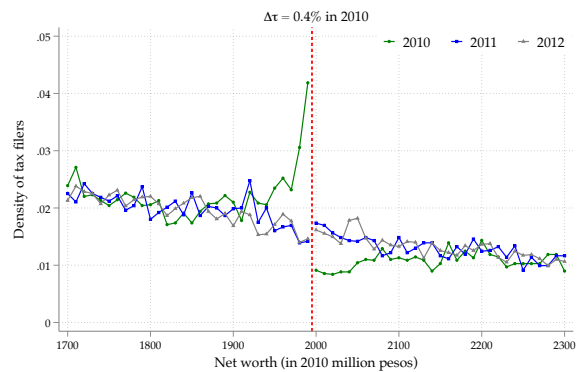(c) Bunching Below Expired Exemption Notch

(d) Panel (c) in Constant 2006 Pesos

(e) De-Bunching for Non-Exemption Notch

(f) Panel (e) in Constant 2010 Pesos

Notes: This figure shows that bunching below the exemption notch persists even when reported wealth does not affect the wealth tax liability; instead, for non-exemption notches, bunching disappears as soon as the wealth tax expires. Panels (a) and (b) focus on the exemption notch of 2010's temporary wealth tax, while Panels (c) and (d) focus on the exemption notch of 2006–09 recurrent 1.2% wealth tax (levied on those reporting 3,000 million pesos or more in 2006), and Panels (e) and (f) focus on the non-exemption notch of 2010's temporary wealth tax. The panels on the left (right) plot tax filer density by bins of current (constant) pesos. Due to inflation, bunching below a nominal cutoff implies reporting less real wealth over time. *Source:* Authors' calculations using administrative tax microdata from DIAN.

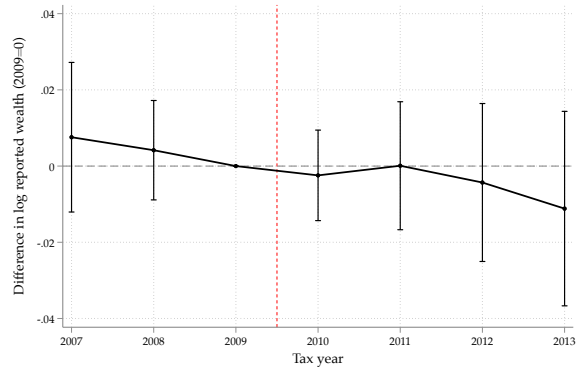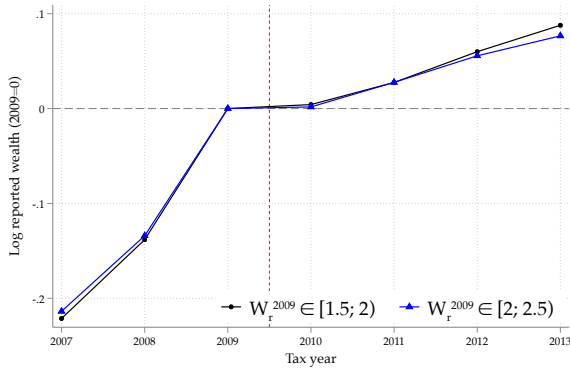## Figure 5: Difference-in-Differences Show Consistent Results

(a) Persistence: Temporary Exemption Notch

(b) Difference between T and C in Panel (a)
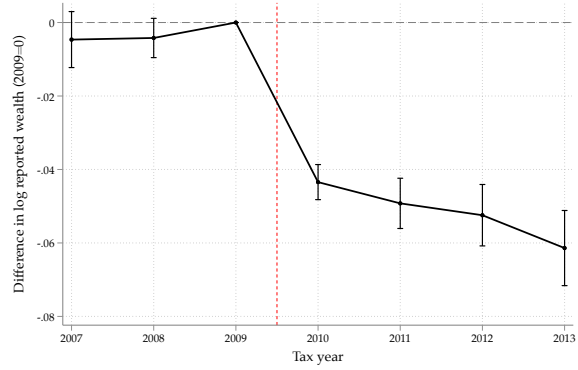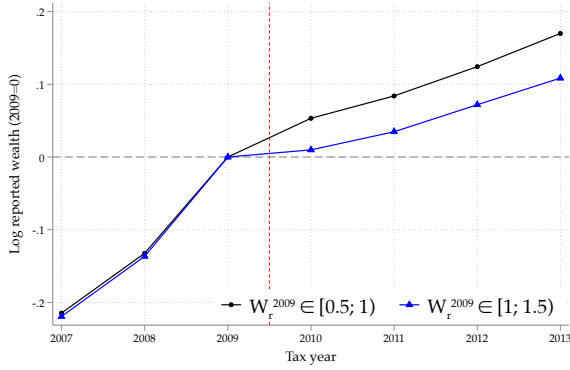
(c) Persistence: Recurrent Exemption Notch

### (d) Difference between T and C in Panel (c)
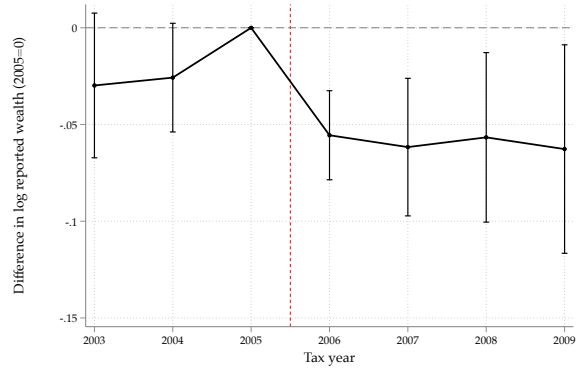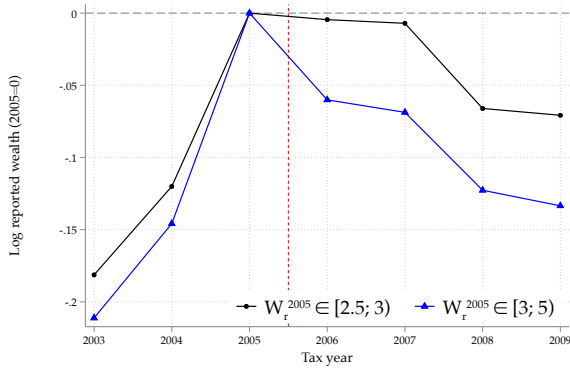
(e) No Persistence: Non-Exemption Notch

(f) Difference between T and C in Panel (e)

Notes: These figures show the effects of wealth taxation on reported wealth using difference-in-differences and a balanced sample of taxpayers. Panels (a) and (b) focus on the exemption notch of 2010's temporary wealth tax, while Panels (c) and (d) focus on the exemption notch of 2006–09 recurrent 1.2% wealth tax (levied on those reporting 3,000 million pesos or more in 2006), and Panels (e) and (f) focus on the non-exemption notch of 2010's temporary wealth tax. The panels on the left show the evolution of reported wealth 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:* Table 2 and authors' calculations using administrative tax microdata from DIAN. 40

Figure 6: Appearing in the Panama Papers Increases with Reported Wealth
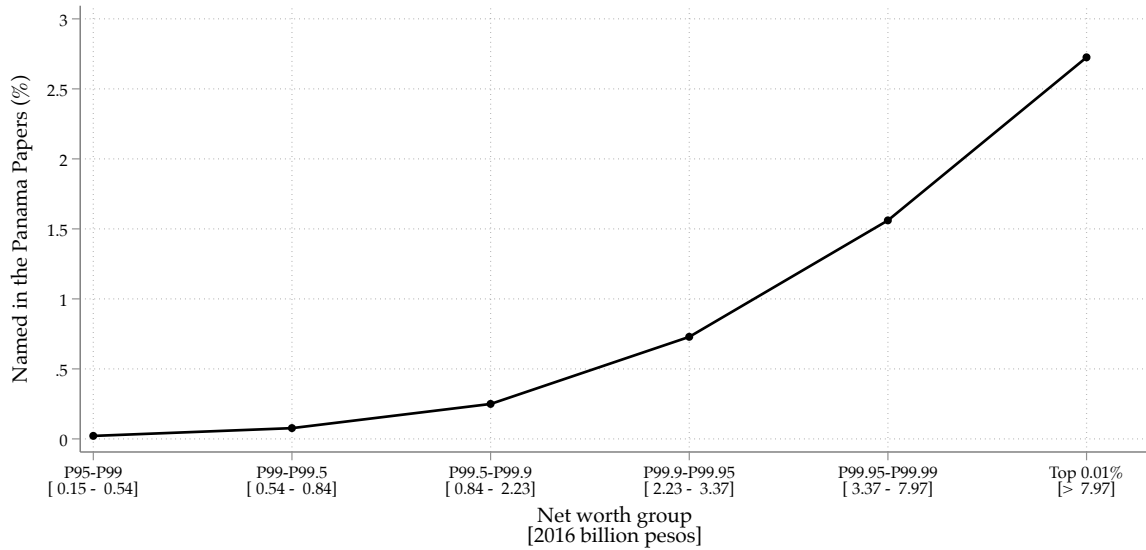
Note: This figure plots the likelihood of being named in the Panama Papers by wealth bins, where tax filers are ranked by wealth reported in their most recent income tax return (for 63% of taxpayers, this will be FY 2016). The probabilities differ from each other at the 1% level. In all, being named in the leak is nearly 40 times more likely for the wealthiest 0.01% than the top 5% overall. In 2016, 1 billion pesos ≈ USD 333,270 (12/31/2016). *Source:* Authors' calculations using administrative tax microdata from DIAN and ICIJ.

Figure 7: The Use of Offshore Entities is Correlated with the Wealth Tax

(a) Colombia and the Top Wealth Tax Rate
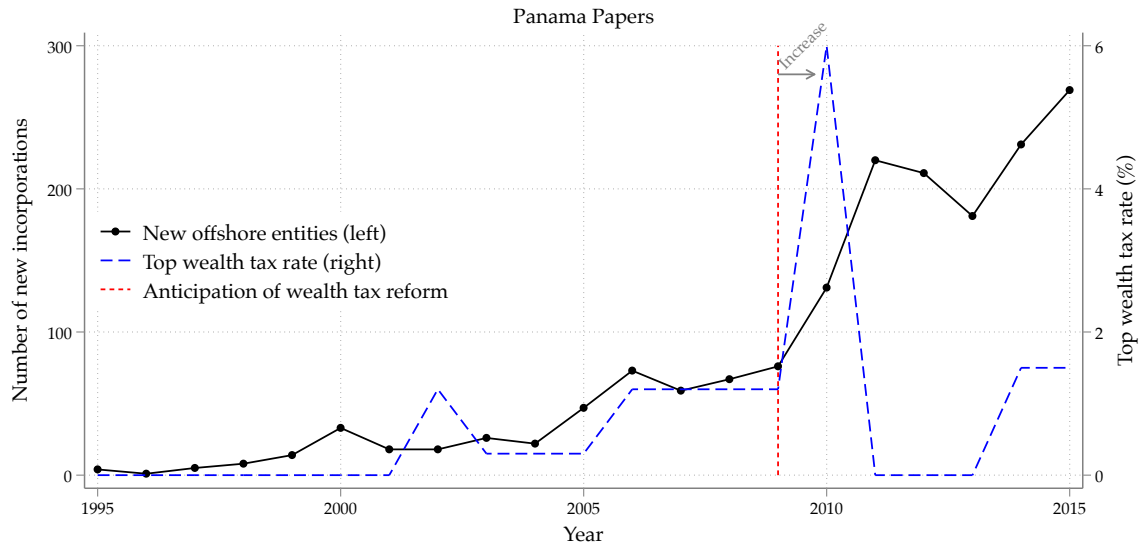
(b) Colombia versus Selected Countries
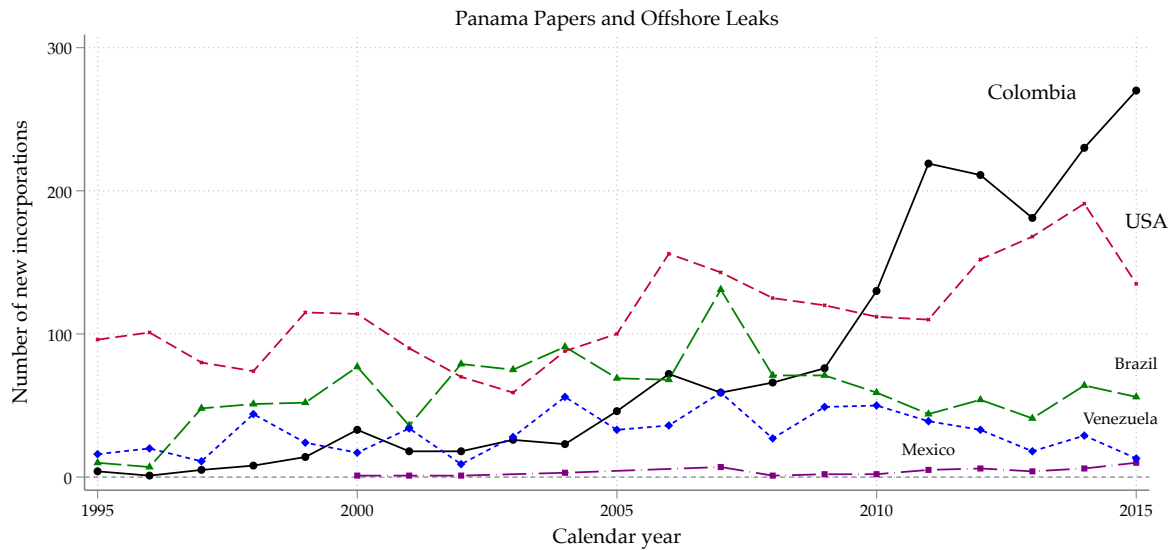
Note: These figures compare the flow of offshore entities incorporated in tax havens over time by Colombians. Panel (a) plots the number of new offshoring entities incorporated every year by individuals associated with Colombia (black solid line) against the top statutory annual wealth tax rate (blue dashed line). Wealth tax hikes are associated with more offshoring by Colombians to tax havens. Panel (b) plots the series for Colombia against four other countries. Colombians stand out in their use of offshore entities, even relative to larger and wealthier countries. Figure A.11 compares Colombia's series against 31 other Latin American and OECD countries using year and country fixed effects in an event-study regression specification. 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.

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Figure 8: Wealthy Taxpayers Facing Wealth Tax Hikes Are More Likely to Offshore
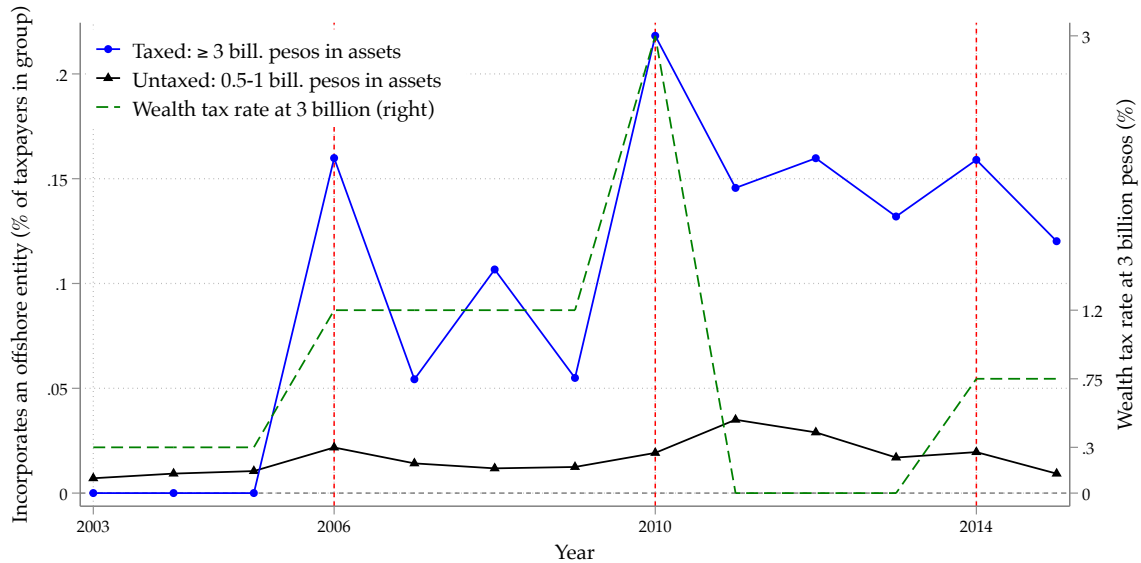
Note: This figure compares the likelihood of offshoring to a tax haven as a function of people's exposure to the wealth tax. The share of taxpayers who incorporate an offshore entity through Mossack Fonseca in a given year is higher for taxpayers who reported 3 billion pesos or more in assets the previous year (in blue) than taxpayers who reported 0.5–1 billion pesos (in black). Taxpayers owning 3 billion pesos or more would have likely faced a positive wealth tax rate (in green). As a result, they are more likely to offshore when there is a wealth tax hike, as in 2006 and 2010. By contrast, taxpayers reporting between 0.5 and 1 billion pesos in assets, who do not face wealth taxes, do not seem to offshore in response to wealth tax hikes. *Source:* Authors' calculations using administrative tax microdata from DIAN and the Panama Papers data from ICIJ.

Figure 9: Reported Assets Fall upon Offshore Entity Incorporation if Wealth is Taxed

Expressed relative to mean in k-1. Sample is balanced in [-3; 1]. N = 445 in 'Wealth is not taxed' and 292 in 'Wealth is taxed.'

Notes: This figure presents the β_k coefficients from event-study specification (6), separately for whether the offshore entity is incorporated in a year when reported assets determine wealth tax liability (i.e., 2003–2006, 2010, and 2014–2016). The outcome variable is total reported assets, and the coefficient is scaled by the mean in event time $k = -1$. An "event" is defined as the year an individual incorporates an offshore entity for taxpayers with only one offshore entity. The sample is balanced in event time and excludes taxpayers not appearing in the Panama Papers. The B_{taxed} and B_{not} coefficients plot the average post-event effect for the two series. When wealth is taxed, reported assets drop by 9.5% after incorporating an offshore entity through Mossack Fonseca, consistent with hiding assets offshore to reduce the wealth tax burden. As a robustness check, Figure A.12 plots β_k coefficients for different event time windows and sample balance restrictions. *Sources:* Authors' calculations using administrative tax microdata from DIAN and ICIJ.

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Table 1: Summary of Notches, Responses, and Bunching 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) (7)	Reduced-Form Elasticity e_R (8)
2003	3,000	✓	0.3	9	0.74 (0.18)	180 (137.93)	0.60 (1.76)
2006	3,000	✓	1.2×4	151	0.41 (0.04)	560 (109.62)	0.36 (0.16)
2010	1,000	✓	1.0	10	0.43 (0.02)	200 (16.86)	2.00 (0.35)
2010	2,000		0.4	8	0.57 (0.07)	180 (64.63)	1.00 (0.99)
2010	3,000		1.6	49	0.35 (0.04)	360 (87.44)	0.44 (0.20)
2010	5,000		3.0	160	0.45 (0.06)	680 (238.74)	0.30 (0.23)
2014	1,000	✓	0.0125×4	5	0.38 (0.02)	210 (16.03)	4.41 (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). Column (7) presents the reporting responses in current million pesos using the convergence method. Columns (8) presents the elasticity based on the reduced-form formula from Equation (2). All estimations use the cross-sectional counterfactual density from specification (1). Table C.1 includes the lower-bound ΔW_r^* and e_R using the bunching-hole method, as well as the elasticities based on a parametric equation for a comparison. *Source:* Authors' calculations using administrative tax microdata from DIAN.

Table 2: Comparing Bunching and DD Elasticities

	Bunching		Difference-in-Differences
	How is No-Notch Counterfactual Obtained?		
	Equation (1)	Pre-reform data	
	(1)	(2)	(3)
Elasticity formula $= \frac{\text{RF}}{\text{FS}}$	$\frac{\Delta W_r^*/W_r^*}{\Delta t^*/1-t^*} \approx \frac{0.5\cdot(\Delta W_r^*/W_r^*)^2}{\Delta\tau/(1-\tau)}$		$\frac{\mathbb{E}[\log(W_{it})\|Post_t\times T_i^{pre}=1]-\mathbb{E}[\log(W_{it})\|Post_t\times T_i^{pre}=0]}{\mathbb{E}[\log(1-\tau_{it})\|Post_t\times T_i^{pre}=1]-\mathbb{E}[\log(1-\tau_{it})\|Post_t\times T_i^{pre}=0]}$

Panel A: A Zero-to-Positive $\Delta\tau$ =1% from the Temporary Wealth Tax of 2010

Reduced Form	0.02	0.03125	-.0402
	(0.003)	(0.006)	(0.003)
First Stage	0.01/(1-0)=0.01		-0.01
Elasticity	2	3.125	4.0
	(0.35)	(0.62)	(0.291)

Panel B: A Within-Positive $\Delta\tau$ =0.4% from the Temporary Wealth Tax of 2010

Reduced Form	0.004	0.0032	-.007
	(0.003)	(0.002)	(0.007)
First Stage	0.004/(1-0.01)=0.004		-0.004
Elasticity	1	0.792	1.641
	(0.99)	(0.83)	(1.737)

Panel C: A Zero-to-Positive $\Delta\tau$ =1.2%$\times$4 from the Recurrent Wealth Tax of 2006–09

Reduced Form	0.0174		-0.036
	(0.007)		(0.014)
First Stage	0.012$\times$ 4/(1-0)=0.048		-0.048
Elasticity	0.3625		0.758
	(0.16)		(0.294)

Notes: This table compares the elasticities of reported wealth with respect to the net-of-tax rate using the bunching and DD methodologies. Standard errors are in parentheses. In the bunching approach, the reduced form and elasticity can be based on the counterfactual density from Equation (1) or on the pre-reform density. To improve the comparability with the bunching methodology, we focus on estimates using pre-reform reported wealth and compare effects one year after the reform. We do not estimate a bunching elasticity using the pre-reform counterfactual in Panel (c) because there is no smooth pre-reform counterfactual: wealth above 3 billion pesos (in 2003 pesos) was taxed at 0.3%, causing bunching in the pre-reform years of 2003-2005. *Sources:* Author's calculations using administrative tax microdata from DIAN.

Table 3: Characterizing Bunchers and How They Bunch in Response to the Wealth Tax

Dependent variable, Y	$E[Y(0)\|\text{Compliers}]$ (1)	$E[Y(1) - Y(0)\|\text{Compliers}]$ (2)	$E[Y\|\text{Always-takers}]$ (3)	$E[Y\|\text{Never-takers}]$ (4)
		Panel A: All taxpayers		
Debt-to-asset ratio	0.094	0.033	0.079	0.121
	(0.005)	(0.004)	(0.009)	(0.002)
Any realized capital gain	0.162	0.057	0.149	0.188
	(0.024)	(0.03)	(0.031)	(0.006)
		Panel B: Only taxpayers keeping records (e.g., business-owners)		
Debt-to-asset ratio	0.175	0.043	0.129	0.226
	(0.018)	(0.015)	(0.03)	(0.007)
Asset type (share of total assets)				
Fixed assets	0.527	-0.002	0.63	0.541
	(0.027)	(0.023)	(0.042)	(0.01)
Stocks and shares	0.17	0.015	0.091	0.161
	(0.02)	(0.019)	(0.027)	(0.007)
Inventories	0.109	-0.024	0.109	0.107
	(0.016)	(0.012)	(0.024)	(0.006)
Deposits, bonds, other investments	0.086	0.008	0.08	0.094
	(0.016)	(0.017)	(0.022)	(0.005)
Accounts receivable	0.066	0.025	0.074	0.08
	(0.016)	(0.013)	(0.02)	(0.005)
Other assets	0.038	-0.021	0.019	0.018
	(0.011)	(0.012)	(0.016)	(0.002)
Any realized capital gain	0.111	0.085	0.112	0.14
	(0.058)	(0.074)	(0.068)	(0.013)

Notes: This table presents the results of a compliers analysis using the set-up illustrated by Figure A.8. In this setting, a complier refers to a taxpayer bunching below the exemption cutoff in response to the wealth tax. The sample is a balanced panel of 8,016 income tax filers reporting net wealth between W_r^l and W_r^u in 2008, 2009, and 2010, of which 1,533 taxpayers are required to keep records. The endogenous variable is $B_{it} = 1$ if the individual has net wealth (in 2010 pesos) between W_r^l and W^*, i.e., the bunching region. Complier means in Column (1) are calculated as the coefficient on $1 - B_{it}$ in a 2SLS regression of $1 - B_{it}$ multiplied by Y_i and using 2010 as the instrument (Z_t). Column (2) presents the 2SLS coefficient β_1 from specification (5). Always-taker and never-taker means are calculated in analogous 2SLS regressions of $B_{it}(1-Z_t)Y_{it}$ on $B_{it}(1-Z_t)$ and $(1-B_{it})Z_tY_{it}$ on $(1-B_{it})Z_t$, respectively, again using 2010 as Z_t. The first stage coefficient is 0.313 (t-stat 35.3) for all taxpayers, and 0.275 (t-stat 13.13) for records-keeping taxpayers. Standard errors are clustered at the taxpayer level. The table suggests bunchers inflate their debt and underreport inventories, which are not covered by third-party reports, to artificially place themselves below the wealth tax exemption cutoff. *Source:* Authors' calculations using administrative tax microdata from DIAN.

Table 4: Who are the Taxpayers Named in the Panama Papers?

	Population of taxpayers not named in Panama Papers (1)	Taxpayers named in Panama Papers (2)
Number of individuals	3,300,718	1,208
Number of years filed tax return	6.21 [5.87]	15.83 [6.91]
In bunching region (percent)	1.30	16.14
Demographics		
Male (percent)	56.19	63.37
Born after 1985 (percent)	7.16	5.05
Rentier (percent)	13.21	27.40
Wage-earner (percent)	37.16	59.69
Other (percent)	49.63	12.91
Income and wealth (2017 millions)		
Gross wealth	327.83 [2,384.71]	3,356.34 [6107.75]
Net worth	262.84 [1,163.22]	2,768.72 [5,522.31]
Irregular capital income	12.81 [837.31]	140.08 [712.67]
P99 (percent)	9.54	69.04
P99.9 (percent)	0.94	32.95
P99.99 (percent)	0.09	7.12

Notes: This table presents descriptive statistics (means and standard deviations in brackets) for the 3.3 million Colombian income tax filers we observe between tax years 1993 and 2016 (Column 1) and for tax filers that appear named in the Panama Papers (Column 2). Taxpayers named in the Panama Papers are more likely to be located in the bunching region below the wealth tax notches (Table A.1 shows this holds even controlling for wealth and other covariates). Rentier, wage-earner and other are mutually exclusive economic activity codes, as self-reported by taxpayers to the tax authority. Rentier also includes individuals without an economic activity as well as dependents. Income and wealth values (in 2017 million pesos) and top percentile groups use the most recent tax return filed by an individual (for nearly two-thirds of the sample, this is FY 2016). The exchange rate for 1 million pesos is USD 335.13 in 12/31/2017. *Sources:* Authors' calculations using administrative tax microdata from DIAN and ICIJ.