

Zanoni, Wladimir; Carrillo-Maldonado, Paul; Pantano, Juan; Chuquimarca, Nicolás

Working Paper

Irrational bunching? Tax regimes, brackets, and taxpayer behaviors

IDB Working Paper Series, No. IDB-WP-1600

Provided in Cooperation with:

Inter-American Development Bank (IDB), Washington, DC

Suggested Citation: Zanoni, Wladimir; Carrillo-Maldonado, Paul; Pantano, Juan; Chuquimarca, Nicolás (2024) : Irrational bunching? Tax regimes, brackets, and taxpayer behaviors, IDB Working Paper Series, No. IDB-WP-1600, Inter-American Development Bank (IDB), Washington, DC, <https://doi.org/10.18235/0013005>

This Version is available at:

<https://hdl.handle.net/10419/299493>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/3.0/igo/>

WORKING PAPER N° IDB-WP-1600

Irrational Bunching? Tax Regimes, Brackets, and Taxpayer Behaviors

Wladimir Zanoni
Paul Carrillo-Maldonado
Juan Pantano
Nicolás Chuquimarca

Inter-American Development Bank
Country Department Andean Group

May 2024



Irrational Bunching? Tax Regimes, Brackets, and Taxpayer Behaviors

Wladimir Zanoni
Paul Carrillo-Maldonado
Juan Pantano
Nicolás Chuquimarca

Inter-American Development Bank
Country Department Andean Group

May 2024



**Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library**

Irrational bunching? tax regimes, brackets, and taxpayer behaviors / Wladimir Zaroni, Paul Carrillo-Maldonado, Juan Pantano, Nicolás Chuquimarca.

p. cm. — (IDB Working Paper Series ; 1600)

Includes bibliographical references.

1. Income tax-Ecuador. 2. Self-employed-Taxation-Ecuador. 3. Progressive taxation-Ecuador. I. Zaroni López, Wladimir, 1975-. II. Carrillo-Maldonado, Paul. III. Pantano, Juan. IV. Chuquimarca, Nicolás. V. Inter-American Development Bank. Country Department Andean Group. VI. Series.

IDB-WP-1600

<http://www.iadb.org>

Copyright © 2024 Inter-American Development Bank ("IDB"). This work is subject to a Creative Commons license CC BY 3.0 IGO (<https://creativecommons.org/licenses/by/3.0/igo/legalcode>). The terms and conditions indicated in the URL link must be met and the respective recognition must be granted to the IDB.

Further to section 8 of the above license, any mediation relating to disputes arising under such license shall be conducted in accordance with the WIPO Mediation Rules. Any dispute related to the use of the works of the IDB that cannot be settled amicably shall be submitted to arbitration pursuant to the United Nations Commission on International Trade Law (UNCITRAL) rules. The use of the IDB's name for any purpose other than for attribution, and the use of IDB's logo shall be subject to a separate written license agreement between the IDB and the user and is not authorized as part of this license.

Note that the URL link includes terms and conditions that are an integral part of this license.

The opinions expressed in this work are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.



Irrational Bunching? Tax Regimes, Brackets, and Taxpayer Behaviors ^{*}

Wladimir Zanoni[†] Paul Carrillo-Maldonado[‡] Juan Pantano[§]
Nicolás Chuquimarca[†]

This version: April 12, 2024

Abstract

In this study, we examine the behavior of self-employed taxpayers who “bunch” at an income level just below a critical threshold, which triggers a transition from a simple tax regime to a more complex one. Under the simple regime, individuals complete their tax forms independently, while the complex regime mandates the use of a public accountant for maintaining accounting records. Utilizing data from the Ecuadorian tax authority from 2011 to 2014, we initially observed and documented the bunching behavior prompted by the shift between regimes. Subsequently, we assess the impact of this regime transition on the amount of taxes paid by those self-employed taxpayers who choose to fill taxes in the complex regime. Our methodology employs both parametric and semi-parametric “donut” estimators to evaluate these effects. We find that the regime shift indeed prompts taxpayers to bunch below the income threshold, opting to remain within the simpler regime. Interestingly, those who transition into the complex regime tend to pay less in taxes. This pattern holds across various bunching windows and is consistent across several estimators used. Our results suggest that accountants are the key mechanism behind the effects, for they help taxpayers better navigate tax deductions and benefits, leading individuals to pay zero taxes.

Keywords: Tax Regimes, Progressive Taxes, Personal Income Tax, Bunching.

JEL Codes: H24, H26, D12

^{*}We thank Oscar Valencia, Luis Alejos, Alejandro Rasteleti, Osmel Manzano, and Sebastian Gallegos for their feedback. Our thanks are also due to the participants of the research workshop in Ecuador, facilitated by Julien Renaud, as well as the attendees of the IADB’s FMM and CAN research workshops. We are especially thankful to Jorge Paredes and Emily Díaz for their invaluable research assistance.

[†]Inter-American Development Bank (IADB)

[‡]Universidad de Las Americas (UDLA)

[§]University of Arizona

1. Introduction

In this paper, we investigate the behavior of self-employed taxpayers in Ecuador, specifically as their business income increases. This study's concern differs from the traditional focus on behavioral changes due to increases in marginal tax rates across existing tax brackets as studied in the rich literature exemplified by the works in (Saez, 2001, 2010; Chetty, Friedman, Olsen, & Pistaferri, 2011; Kleven, 2016). Instead, we explore the impact on self-employed taxpayer behavior resulting from transitions across different tax regimes (i.e. different sets of rules and procedures designed to ensure compliance with tax laws and obligations) as the income obtained from their economic activities rises. In Ecuador, as in many countries, as the business income, sales, or equity of self-employed individuals increase, the complexity of tax regimes they are subject to, in terms of compliance and oversight, tends to escalate. Whenever there are thresholds across these dimensions that trigger regime changes, there is an opportunity for taxpayers to “bunch” in the neighborhoods of those thresholds to avoid obligations induced by regime shifts. Ultimately, their strategic behavior calibrating their effort and/or reporting would influence the amount of tax they pay. In this paper, our research question is twofold. On the one hand, we seek to test the hypothesis that self-employed individuals in Ecuador bunch when they are subject to a change in tax regime change (from an easy to a complex-to-file tax regime) triggered by a threshold in their business income. On the other hand, we want to evaluate the causal impact of being subject to a more complex regime on taxes paid by self-employed individuals.

Answering our research question is relevant for various reasons. Primarily, it contributes to the discourse on the design of optimal tax systems started by Mirrlees (1971). By describing the complexities of the behavior of taxpayers in response to the regulatory and enforcement frameworks they encounter, our research offers insights for tax authorities in their pursuit of maximizing revenue and crafting effective tax systems as done in (Best, Brockmeyer, Kleven, Spinnewijn, & Waseem, 2015). While the rationale for bunching at lower tax rates is conventionally to minimize tax liabilities, our study tests whether bunching at income thresholds that trigger regime changes (i.e. changes in regulations and enforcement frameworks) might be motivated by different factors, such as circumventing the increased obligations and scrutiny of more complex regimes. This insight is crucial for tax authorities crafting progressive tax systems. They aim to balance fiscal efficiency and fairness by implementing tax brackets and regulations that ensure adherence to tax laws. Yet the effectiveness of tax regimes achieving those dual objectives is broadly under-researched, particularly in terms of understanding how regimes (again, different guidelines for tax compliance) interact with tax brackets to define progressive tax systems. Our contribution expands the understanding of bunching responses to distinct tax incentives, not limited to those triggered by changes in marginal taxes across brackets income as it is pursued by (Harju, Matikka, & Rauhanen, 2019; Liu, Lockwood, Almunia, & Tam, 2021; Akcigit, Philippe, Lequien, Gravouelle, & Stantcheva, 2022).

To address our research question, we build a case study from Ecuador. Between 2011 and 2014, Ecuadorian self-employed taxpayers had to transition by law from a *simple* to a *complex* tax regime as their business income surpassed a specific threshold (USD 100,000 in this case). This transition involved a shift from a straightforward tax declaration process to a more elaborate one, where the taxpayer was also required by law to keep detailed accounting books, and a registered accountant had to sign the tax forms when filing. We analyze taxpayer filings and their bunching near this threshold using administrative records from

the Ecuadorian tax authority, employing established methodologies first introduced by Saez (2001, 2010), and later refined and implemented by Chetty et al. (2011); Kleven and Mazhar (2012); Bosch, Dekker, and Strohmaier (2020); Alosa (2023).

Our analysis uncovers significant bunching at the income threshold that triggers a regime change, revealing a surprising trend: individuals under the simpler regime, where bunching is observed, actually pay more taxes on average than those under the complex regime. This apparently counter-intuitive behavior (apparently irrational bunching) that we discovered in the observational data motivated us to explore the causal influence of the regime change (from simple to complex) on taxes paid. We conducted this analysis using multiple versions of the so-called donut estimator developed by Dowd (2020). Our work is indirectly linked with that of Smith and Miller (2021); Alosa (2023) in examining the responses of self-employed taxpayers to distinct institutional frameworks or incentives on tax and deductions dimensions. We expand the understanding of taxpayer behavior beyond the well-documented responses to tax bracket changes Alosa (2023); Saez (2010). We also increase the knowledge on self-employed taxpayer behavior as in Boeri, Giupponi, Krueger, and Machin (2020).

Our work fits into the literature of reported income responses to taxation as in Harju et al. (2019); Liu et al. (2021); Akcigit et al. (2022). The first research efforts conducted by Harju et al. (2019); Liu et al. (2021) are centered on VAT registration incentives. Harju et al. (2019) encounter that for small businesses, compliance costs due to the VAT forms explain most of the bunching behavior observed in the data. Work by Liu et al. (2021) finds a negative relation between bunching behavior and product mark-up, with the lower mark-up product firms (i.e., the lower difference between retail price and unit cost) increasingly engaging in bunching behavior.

Differently from Harju et al. (2019); Liu et al. (2021) who, as we indicated, evaluate changes in taxes paid across brackets, our paper investigates the regime effect on taxes paid when there is an overall change in the tax report system, which includes new dimensions in reporting and the hiring of a licensed professional. Our work also differentiates from that in Alosa (2023), where he investigate changes in taxpayer behaviors derived from the substitution of a progressive tax scheme based on profits by a flat tax based on income. Instead, we consider a regime change that leaves the progressive scheme untouched but opens changes in the regulatory and enforcement framework and introduces a new agent (the accountant). The taxpayer who transitions regimes receives trained advice on key reporting matters such as deductions, income sources, and equity arrangements. Finally, our work joins the discussion on whether differentiated tax regimes create inefficiencies and/or increase complexity that ultimately cause revenue losses for governments (Adam & Miller, 2021). Our study examines behaviors in response to tax regimes common to many tax systems, making our findings applicable beyond the specific country and regime change analyzed here. The insights from our paper are relevant for tax policy and economic development in various economic contexts, regardless of income levels.

The paper is structured as follows: Section 2 outlines our case study, focusing on the transition of self-employed individuals in Ecuador from a simple to a complex tax regime as their income increases. Section 3 describes the data. Section 4 documents the occurrence of “bunching” just below the income threshold at which the tax regime changes. Section 5 evaluates the impact of a regime change on taxes paid. Section 6 describes ideas for a simple model that describes the taxpayer behavior. The paper concludes with Section 7, which syn-

thesizes our findings and discusses their broader implications for tax policy and economic behavior.

2. Ecuador's Self-Employed Taxpayers: A Case Study

This section presents the Ecuadorian case study documenting how self-employed taxpayers in 2011-2014 had to file their income taxes¹. At that time, as of today, self-employed taxpayers were required to declare all sources of income, encompassing those from their business activities, wages, capital gains, and other sources.² Additionally, they needed to report their costs and related expenses to the tax authority. Once the difference between income and expenses was calculated, individuals could apply for deductions and exemptions as outlined in the tax law (known in Spanish as *Ley de Regimen Tributario Interno*), resulting in their taxable income. Based on this income level, taxpayers would be placed within a progressive tax bracket system, determining the taxes they would ultimately need to pay.

In that tax system and time (i.e. in the set of regulations and enforcement that go along with the tax brackets schedule as income increases), differences in the tax regime affecting self-employed individuals were triggered by independent thresholds across three dimensions: 1) the level of their business income; 2) their business expenses, and; 3) the amount of the capital associated to the business activity. The income threshold was set at USD 100,000, for equity at USD 60,000, and for business activity expenses at USD 80,000. Individuals reporting income, expenses, and capital below those thresholds would file their taxes using a simple tax form named *form 102A* (the simple regime). If they exceed any of those thresholds, they would fall into a tax regime in which they were “obligated to keep accounting books” (OKAB– the complex regime). In the OKAB regime, taxpayers were required to provide detailed information on assets, liabilities, and equity through *Form 102*. This form was not only more complex than Form 102A, but it mandated taxpayers to maintain formal accounting records and obtain a certified accountant’s signature when filing income taxes. A key feature of the OKAB regime is that once individuals were classified as OKAB taxpayers, they remained in that regime in subsequent years, even if their income, expenses, and capital fell below the thresholds in the future³. The comparison of taxpayer behaviors within the simple and the OKAB regimes provides a case study for designing tax systems aimed at maximizing revenue collection and ensuring fairness. It is especially relevant for understanding behaviors in those systems that add regulations to complement the infrastructure of progressive tax brackets.

Note that self-employed taxpayers in the OKAB regime were required to hire SRI-certified accountants, enabling them to seek assistance in navigating the exemptions and deductions permitted under this regime. This requirement creates incentives for potential collusion: accountants employed by taxpayers increase their value by more effectively exploiting the deductions and exemptions outlined in this complex regime. Taxpayers can also manipulate their income and expenses when they stay in the simple regime, but this does not require the legal expertise of an accountant. The degree to which a self-employed taxpayer

¹Other studies use Ecuadorian administrative records to explain the tax filing behavior of firms. See, for instance, Carrillo, Pomeranz, and Singhal (2017) and Deza, Carrillo-Maldonado, and Ruiz-Arranz (2021).

²The Ecuadorian tax authority classifies self-employed individuals across various occupations, broadly classified as professionals and entrepreneurs.

³Despite rarely requested or granted, taxpayers could only return to the simple regime under a personal request at the SRI offices, conditional on justifying they fell below across all the thresholds

can select a tax regime is achieved either by adjusting effort upfront to avoid surpassing an income/expenses/capital threshold or by managing reports after the fact—is determined by a utility maximization exercise. This process considers individual preferences and constraints, with the risk of tax fraud detection playing a significant role as a determining factor.

Despite the fact that the three variables that trigger regime changes (income, expenses, and capital) had thresholds that prompted the OKAB regime, the most prominent and easily enforced criterion was business income. Figure (1) shows a positive relationship between costs/expenses and income for taxpayers who report between USD 80,000 to 120,000 in gross business income. Therefore, accounting for business income indirectly accounts for expenses in a positive manner. By surveying the income threshold, we indirectly control the cost threshold. An essential point to mention is that individuals who stay under the simple regime do not report equity, which makes it difficult for adequate detection to occur. Consequently, we use the business income threshold for the period 2011-2014 (USD 100,000) as the salient frontier between the simple and OKAB regimes.

Figure 1: Business Expenses vs Income

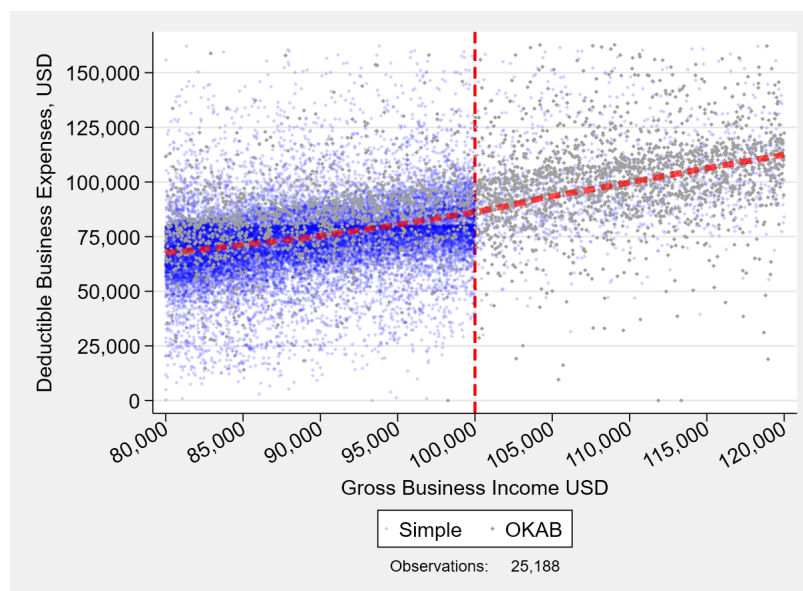


Table (1) presents the taxpayers’ quantity in the simple and OKAB regimes between 2011 and 2014 for distinct gross business income distribution ranges.⁴ Interestingly, we observe that the number of taxpayers in the OKAB regime nearly quadrupled for the observations unrestricted by any range.

After considering the data only for the USD 80,000-120,000 range, we observe that only about 10% of individuals remain under the OKAB regime. This percentage decreases to less than 5% when we account for taxpayers under the USD 90,000-110,000 range. We built our analytic database with all the observations in the USD 80,000-120,000 gross business income range. From now on, all the elements will be built using the analytic database.

⁴All includes the taxpayers who report gross business income greater than USD 0. USD 80,000-120,000 accounts for taxpayers who report gross business income between USD 80,000 and 120,000. Finally, USD 90,000-110,000 accounts for taxpayers only in that interval.

Table 1: Number of Taxpayers in Simple and OKAB 2011–2014

Year	All			USD 80,000–120,000			USD 90,000–110,000		
	Simple	OKAB	Total	Simple	OKAB	Total	Simple	OKAB	Total
2011	242,568	3,631	259,761	4,782	331	5,113	2,170	146	2,316
2012	287,919	7,227	295,162	4,946	776	5,722	2,200	394	2,594
2013	307,987	10,523	318,510	5,617	927	6,544	2,406	492	2,898
2014	329,270	12,931	342,201	6,851	958	7,809	3,006	474	3,480

Note: This table reports all the taxpayers who report greater than USD 0 in gross business income. All the taxpayers contained in this table are either (1) always in the Simple regime or (2) switched from Simple to OKAB at some point between 2011 and 2014. The entire subsample consists of self-employed taxpayers inside the “OTROS” tax type (other types include “GENERAL,” which usually applies to firms, and “RISE,” which usually applies to microenterprises).

3. Data

3.1 Data sources: the tax forms for each regime

We examine data from two distinct tax declaration forms utilized in Ecuador, namely *Form 102* and *Form 102A*, which are provided to self-employed individuals in and out of the OKAB regime, respectively. For the empirical analysis, we use the data from the population of taxpayers filing either of those forms during the 2011–2014 time span and declaring a gross business income within the USD 80,000–120,000 interval.

As indicated, Form 102A was specifically designed for self-employed taxpayers and those not obligated to keep formal accounting records, often falling within a regime here referred to as “Simple”. During the analysis period of 2011–2014, this tax form was characterized by its comprehensive yet straightforward approach to tax declaration, accommodating approximately 102 distinct fields to ensure thorough reporting. It meticulously recorded primary income sources, including but not limited to business income, professional fees, and possibly rental income, reflecting the diverse economic activities of the taxpayers it served. Moreover, standard deductions were clearly outlined to include personal expenses allowable within the Ecuadorian tax framework, such as health, education, and housing, which were pivotal in calculating the taxable base for the period.

Form 102A included essential sections for taxpayer identification and capturing personal and business details to prevent discrepancies. The income reporting segment was designed to be intuitive, guiding taxpayers through various types of income and allowable deductions, thereby simplifying the complex tax calculation process. The form thus served not only as a tax declaration template but also as a user-friendly tool that encouraged compliance and facilitated the tax payment process for individuals with simpler financial situations.

In contrast, entities and individuals were required to maintain comprehensive accounting records under the so-called OKAB regime. Form 102 comprised approximately 199 fields, capturing a wider spectrum of financial data than Form 102A. This included diverse income sources and deductions, aiming for an accurate calculation of taxable income. The form fulfills the purpose of capturing the finances of self-employed individuals with complex accounting scenarios and retrieving a detailed fiscal snapshot.

The requirement for a certified accountant’s endorsement on Form 102 underscored the tax authority’s intent for all tax information to be a true reflection of the official accounting

records. Form 102 intended to address the immediate demands for complex financial reporting and relied on the collaborative effort between taxpayers and financial professionals to maintain the tax system's integrity.

The primary distinction between Forms 102 and 102A in the Ecuadorian tax system stems from the complexity of the taxpayers' financial activities they are meant to address. Form 102, designed for those required to maintain detailed accounting records, aligns with a complex tax regime due to its capacity to handle intricate financial transactions through approximately 199 distinct fields. This complexity allows for a detailed breakdown of income sources and deductions and ensures accuracy in tax calculations, necessitating verification by a certified accountant. Conversely, Form 102A caters to a simpler financial landscape intended for taxpayers without the obligation for formal accounting, thus featuring fewer fields and simplifying the tax declaration process. This makes Form 102A suitable for individuals and entities with straightforward financial activities.

Despite targeting different taxpayer segments, *Form 102* and *Form 102A* share similarities in several key areas, facilitating comparative analysis across the simplified and OKAB tax regimes. Common fields include taxpayer identification (with unique IDs and some demographic details like age, marital status, and province of residence), income reporting sections for various income sources (such as employment, business activities, and other avenues), and deductions. Both forms also classify the occupation(s) and economic activities of the individuals. This overlap in data fields enables a detailed comparison of tax liabilities and income patterns of individuals and entities across different tax regimes.

3.2 The taxpayers

Our analytical database focuses on taxpayers with positive self-employment incomes ranging from USD 80,000 to 120,000 from 2011 to 2014, a period when the USD 100,000 eligibility threshold for the OKAB regime remained constant. Out of 25,188 records in the database, 88.1% come from tax filings under the Simple regime, with the remainder under the OKAB regime. The analysis in Table (2) reveals differences in socioeconomic factors, regions where the taxpayers are located, and sectors of economic activities where the individuals work between the two regimes. In that table, we present the means of the variables in each group (Simple vs. OKAB regime). The difference in those means is presented along with stars referencing the statistical significance of such differences.

As reflected in the above table, individuals under the OKAB regime were slightly older (average age 43.1) than those under the Simple regime (average age 42.2). They had been in the tax system longer (10.7 years under OKAB vs. 9.1 years under Simple), indicating that more experienced taxpayers were under the OKAB regime. The OKAB regime also had a higher proportion of married individuals (65.6%) compared to the Simple regime (59.0%). However, the gender distribution was similar across both regimes.

Geographically, there are notable differences: taxpayers under the Simple regime were more likely to reside in the Costa region (50%), while those under the OKAB regime were more common in the Sierra region (54%). The Amazon and Galapagos regions had a slightly higher representation in the OKAB regime. Occupation-wise, the Simple regime saw more individuals (3.1%) in trade than did the OKAB regime (1.8%). In contrast, the OKAB regime had higher proportions in professional activities and trade.

3.3 Tax form declarations

In Table (3), we compare tax-related attributes between taxpayers under the Simple and OKAB tax regimes over the 2011–2014 period, revealing distinct behavioral patterns in income declaration and tax optimization strategies. The table is complemented with plots of the distributions of those variables in Figure (2).

First, a significant proportion of taxpayers under both regimes were wage earners, with a slightly higher percentage under the OKAB regime (25.5% vs. 21.4% under the Simple regime). This implies that many individuals under both tax regimes earned a share of their income through salaried employment. It's worth noting that the resemblances in wage distributions under each tax regime, as depicted in Figure (2b), can be explained by the Ecuadorian tax system's practice of deducting payroll taxes directly from the pay of formal employees. This deduction reduces the degree of discretion taxpayers had in manipulating their reporting for this income source.

Second, it's worth observing that, consistent with the regimes' design, the OKAB taxpayers reported a higher average gross business income (USD 100,976) compared to those under the Simple regime (USD 90,389). This higher reported income was accompanied by significantly larger deductions being claimed by taxpayers under the OKAB regime (USD 95,699 compared to USD 78,627 under the Simple regime). These deductions may be indicative of a deliberate strategy employed by OKAB regime taxpayers, who were required to hire an accountant. Apparently, the accountants played a crucial role in assisting OKAB regime taxpayers in reducing their taxable income and, consequently, their overall tax liability. We also want to direct attention to the distributions of Gross Business Income by the regime in Figure (2c). The distribution of that income source among the taxpayers under the Simple regime has a drop around the USD 100,000 threshold that, by documenting misreporting by taxpayers under that regime, contrasts with the almost uniform distribution of Gross Business Income among taxpayers under the OKAB regime.

Furthermore, the differences in the deductions distributions by regime that we present in Figure (2e) show that accountants, who have to sign the tax forms of individuals under the OKAB regime, are more efficient at smoothing out the distribution of deductions than taxpayers themselves are when they file taxes under the Simple regime. This suggests that the accountants (again, mandatory for those under the OKAB regime) are more strategic than individual taxpayers in helping minimize the amount of tax paid.

Third, the data show a stark contrast in non-labor income between the two regimes. While only 6.8% of taxpayers under the Simple regime reported non-labor income, this figure is lower for those under the OKAB regime (2.7%). However, the average non-labor income reported by those under the OKAB regime (USD 5,858) is significantly higher than for those under the Simple regime (USD 2,126), indicating that although fewer OKAB taxpayers reported non-labor income, those that do report substantially higher amounts. This pattern could be due to the OKAB regime's ability to, by means of a more complex tax form, accommodate more complex income structures, like investments and property rentals, which are likely to be more prevalent among higher-income individuals.

Finally, the distribution across tax brackets reveals a strategic alignment between the two regimes. A higher proportion of taxpayers under the OKAB regime fell within the 0% tax bracket compared to the proportion under the Simple regime (55.9% vs. 32.1%), and a lower percentage fell within the higher tax brackets (2.8% vs. 5.6%). This could be a result of more-

sophisticated tax planning and optimization facilitated by accountants in response to the OKAB regime, enabling the legal minimizing of tax liabilities. Notably, a substantial portion of taxpayers under the Simple regime (6.3%) had gross annual incomes over USD 100,000, indicating potential tax misconduct, as they were required to be under the OKAB regime at that income level. This suggests a deliberate choice by some high-income individuals to stay under the Simple regime, possibly to avoid the scrutiny and complexity associated with the OKAB regime despite its potential tax optimization benefits.

The data reveal that taxpayers navigate their fiscal choices, balancing the maximization of utility against tax obligations, by adopting strategies that exploit the intricacies of the available tax regimes. This strategic behavior is evidenced in the response of regime selection, reported incomes, and deductions to optimize benefits and minimize taxes. Table (3) shows a significant difference in the average taxes paid under the Simple and OKAB regimes, principally due to the varying probabilities of paying no tax. Individuals in the OKAB regime demonstrate a marked propensity to report in a manner that results in no tax liability, a decision likely influenced by the use of an accounting professional. This tendency is accentuated among those with complex business arrangements and multiple income streams, for whom the OKAB regime provides ample opportunities for tax minimization. The table also illustrates that the OKAB taxpayers often have a wider array of income sources, such as wages and non-labor earnings, compared to their counterparts in the Simple regime. Ultimately, the decision to opt for the OKAB regime is driven by its perceived potential to diminish tax burdens, possibly to nil, especially for those with sophisticated economic activities and diverse income channels.

4. Bunching at the threshold

In this section, we investigate taxpayer “bunching” behavior, where individuals adjust their reported Gross Business Income to hover around USD 100,000. As explained, this threshold separates those taxpayers who can file under the Simple regime from those who must file under the OKAB regime. We illustrate the bunching phenomenon by providing density estimates of taxpayers on either side of the threshold. These estimates draw upon insights from seminal work by Saez (2001, 2010) and more-recent contributions by Kleven and Mazhar (2012) and Bosch et al. (2020). Saez (2010) laid the groundwork for documenting bunching behavior to the left of the threshold in the context of kinks in the U.S. tax schedule. Further development in the notches literature carried on by Kleven and Mazhar (2012) documented bunching behavior in the setting of average changes in the taxes paid. These authors emphasize the importance of ensuring equivalence on the bunching mass (excess and missing) on both sides of the threshold but keep the notion that the lower bound can be visually identified.⁵ Bosch et al. (2020) refine this approach in estimating the bunching window by finding all contiguous midpoints around the threshold that lie outside the confidence interval of the predicted density for a given combination of lower and upper bounds. By testing multiple combinations, they are able to derive a bunching window distribution.

The present study combines the mass criteria from Kleven (2016) with the combinatorial approach from Bosch et al. (2020) to estimate a bunching window set where all of its elements can be ranked under the excess mass criteria. We initially partition the income range of USD 80,000–120,000 into USD 500 bins. We then employ a local polynomial model, utilizing data

⁵The authors’ main rationale for visual identification is that excess bunching is sharp below the threshold.

Table 2: Socio-Demographic Attributes by Tax Regime (2011–2014)

Variables	(1) Simple	(2) OKAB	(3) Diff. (2-1)	Obs.
Age	42.222 (10.029)	43.137 (9.789)	0.915*** (0.195)	25,188
Years in the tax system ¹	9.116 (6.652)	10.669 (6.629)	1.553*** (0.129)	25,188
Single	0.351 (0.477)	0.277 (0.448)	-0.074*** (0.009)	25,188
Married	0.590 (0.492)	0.656 (0.475)	0.066*** (0.010)	25,188
Other Marital Status ²	0.059 (0.236)	0.067 (0.250)	0.008* (0.005)	25,188
Female	0.343 (0.475)	0.361 (0.480)	0.018* (0.009)	25,188
Region: Sierra ³	0.444 (0.497)	0.532 (0.499)	0.088*** (0.010)	25,188
Region: Costa ⁴	0.504 (0.500)	0.398 (0.490)	-0.106*** (0.010)	25,188
Region: Amazon and Galapagos ⁵	0.052 (0.222)	0.071 (0.256)	0.019*** (0.004)	25,188
Sector: Manufacture	0.002 (0.041)	0.003 (0.052)	0.001 (0.001)	25,188
Sector: Trade	0.031 (0.174)	0.018 (0.134)	-0.013*** (0.003)	25,188
Sector: Professional	0.012 (0.111)	0.025 (0.155)	0.012*** (0.002)	25,188
Sector: Others	0.364 (0.481)	0.300 (0.458)	-0.064*** (0.009)	25,188
Observations	22,196	2,992	25,188	.

Note: The % of taxpayers by year were 21.8% in 2011, 23.8% in 2012, 25.6% in 2013, and 28.9% in 2014.

1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year.

2. Other Marital Status include divorced, widowed, and free union.

3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country.

4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands.

5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands.

Table 3: Tax-Related Attributes by Tax Regime (2011–2014)

Variables	(1) Simple	(2) OKAB	(3) Diff. (2-1)	Obs.
Wage Earner (Yes = 1) ¹	0.214 (0.410)	0.255 (0.436)	0.041*** (0.008)	25,188
Wages (USD)>0	9,215 (9,353)	8,959 (9,242)	-256 (369)	4,759
Non-Labor Income (Yes = 1) ²	0.068 (0.252)	0.027 (0.163)	-0.041*** (0.005)	25,188
Non-Labor Income (USD)	2,126 (6,528)	5,858 (10,198)	3,732*** (767)	1,601
Gross Business Income, USD	90,389 (7,600)	100,976 (11,563)	10,587*** (159)	25,188
Deductions, USD	78,627 (17,023)	95,699 (20,212)	17,072*** (340)	25,188
% With Income Tax>0	0.672 (0.470)	0.441 (0.497)	-0.231*** (0.009)	25,188
Taxes Paid, USD	867 (1,513)	524 (1,226)	-343*** (29)	25,188
Taxes Paid Among Those Who Pay, USD	1,290 (1,691)	1,188 (1,620)	-103** (48)	16,234
% in Tax Bracket 00%	0.321 (0.467)	0.559 (0.497)	0.238*** (0.009)	25,188
% in Tax Bracket 05%	0.126 (0.332)	0.106 (0.307)	-0.020*** (0.006)	25,188
% in Tax Bracket 10%	0.102 (0.302)	0.073 (0.259)	-0.029*** (0.006)	25,188
% in Tax Bracket 12%	0.112 (0.315)	0.070 (0.256)	-0.041*** (0.006)	25,188
% in Tax Bracket 15%	0.283 (0.450)	0.164 (0.371)	-0.118*** (0.009)	25,188
% in Tax Brackets 20%-35% ³	0.056 (0.231)	0.028 (0.165)	-0.028*** (0.004)	25,188
% With Gross Business Income (USD) < 100k	0.937 (0.243)	0.422 (0.494)	-0.515*** (0.006)	25,188
% With Gross Business Income (USD) > 100k ⁴	0.063 (0.243)	0.578 (0.494)	0.515*** (0.006)	25,188
Observations	22,196	2,992	25,188	.

Note: The % of taxpayers by year are 21.8% in 2011, 23.8% in 2012, 25.6% in 2013, and 28.9% in 2014.

1 The Wage Earner variable identifies whether the taxpayer receives wages for salaried work.

2 The Non-Labor Income variable combines income from any of the following sources: property rent, non-property rent, royalties, financial interest payments, income from abroad, dividends, and other declared income.

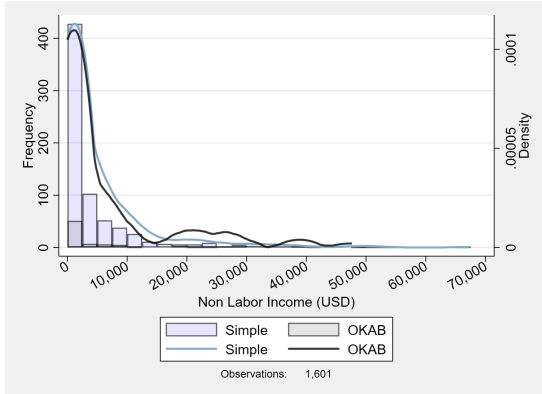
3 Between the tax brackets of 20% and 30% the shares of observations by regime are

- Tax Bracket 20%: 0.036 Simple, 0.025 OKAB
- Tax Bracket 25%: 0.016 Simple, 0.001 OKAB
- Tax Bracket 30%: 0.000 Simple, 0.00 OKAB
- Tax Bracket 35%: 0.001 Simple, 0.00 OKAB

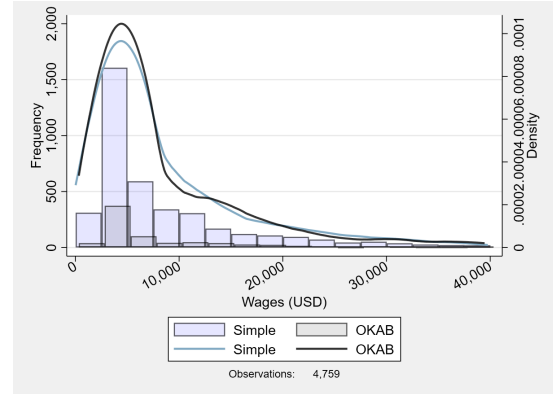
4 6.3% of taxpayers under the Simple regime reported Gross Business Income above USD 100,000, all of whom transitioned from the Simple to the OKAB regime in subsequent periods after a notice from the tax authority.

Figure 2: Density Distributions for Tax Behavior Variables by Regime, 2011–2014

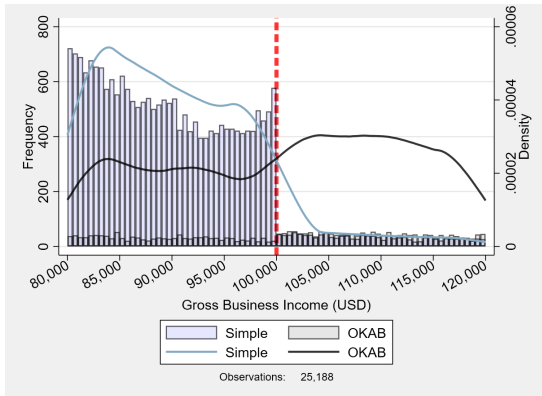
(a) Non-Labor Income, USD



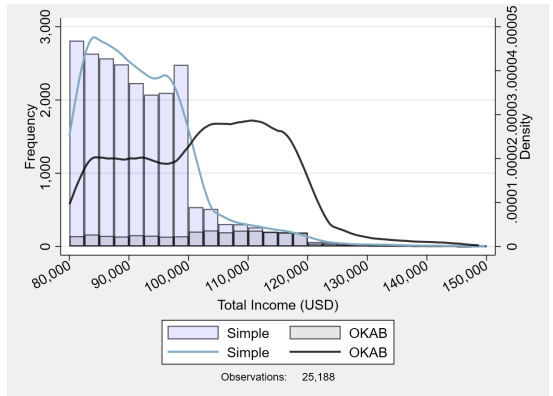
(b) Wages, USD



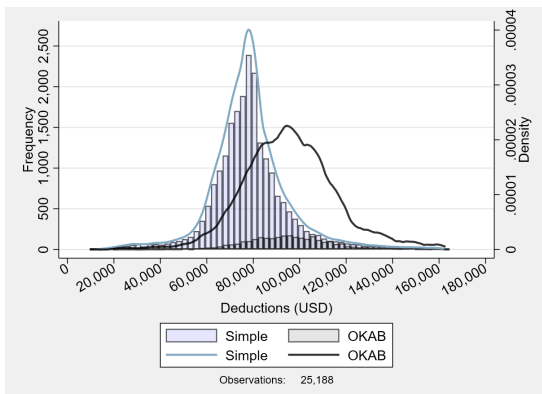
(c) Gross Business Income¹, USD



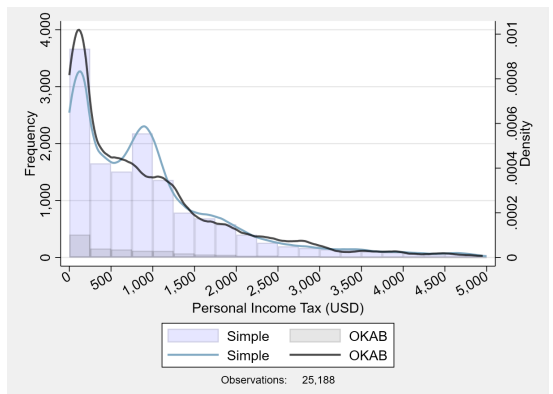
(d) Total Income², USD



(e) Deductions, USD



(f) Personal Income Tax³, USD



Note: All the histograms except for panels (c) and (f) use a width parameter of USD 2,500 for the histogram plot and a bandwidth parameter of USD 2,000 for the density plot (See Stata `kdensity` documentation for further details).

1. The red dashed line in the plot represents the threshold where taxpayers change regimes (from the Simple to the OKAB). The width parameter for the histogram plot is set to USD 500, and the density bandwidth is set at USD 2,000 (See Stata density documentation for further details).

2. Total Income = Non-Labor Income + Wages + Gross Business Income

3. The width parameter for the histogram plot is set to USD 250, and the density bandwidth is set at USD 100 (See Stata density documentation for further details).

from outside some arbitrary lower and upper bounds, to predict the number of individuals expected in each of these USD 500 bins within the current bunching window. Comparing these counterfactual density predictions to the actual data allows us to calculate the mass of individuals bunching on each side of the threshold. We systematically test various combinations of lower and upper bounds and then select the models that minimize the difference in the above-referenced mass difference between the right and left sides of the threshold (i.e., the excess mass criteria). The formal derivation of this procedure can be found in Appendix (A).

Table (4) presents the 10 models with the lowest excess mass and their respective lower and upper bounds of the bunching window. Furthermore, this table reports the degree and the root mean squared error (RMSE) of the underlying local polynomial used in the counterfactual prediction.

Figures (3) and (4) display both the actual and counterfactual density estimates for individuals within the Gross Business Income distribution, centered around USD 100,000 for every model in the table (4). The shaded regions in the figures represent the mass of individuals on each side of this threshold. Out of the 10 models, the bunching window is estimated to start as low as USD 92,000 and end as high as USD 109,500. The heterogeneity in the lower and upper bounds for the bunching window reflects that point selection for the bunching bounds is an art rather than a science. Conditional on this limitation, the more conservative approach is to rest within a bunching window set, as we do in the present study.

Table 4: Bunching Window Set, Excess Mass Criteria

Model Ranking	Excess Mass ¹	Poly. Degree	Lower Bound	Upper Bound	RMSE
1	0.198	2	94,500	107,000	39.909
2	4.267	3	95,500	106,000	33.819
3	5.667	3	94,500	107,500	28.093
4	6.612	1	94,500	103,000	73.859
5	8.090	2	94,000	107,500	36.980
6	9.773	3	92,000	109,500	25.755
7	10.615	3	93,500	109,000	25.193
8	11.831	3	92,500	109,500	25.456
9	15.837	2	93,500	108,000	34.697
10	18.178	3	93,000	109,500	25.107

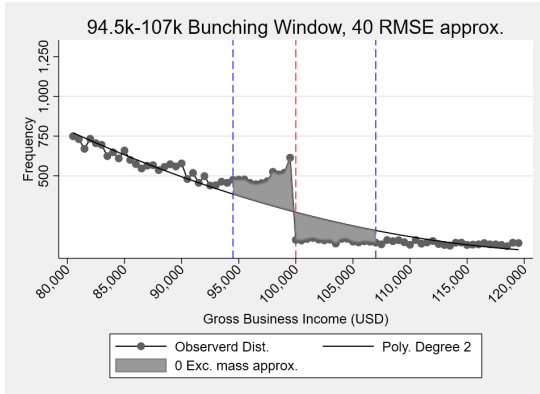
Note: The set of lower and upper bounds values tested is $z_L \in \{92000, 92500, \dots, 96000\}$, and $z_U \in \{102000, 102500, \dots, 112000\}$.

¹ Excess mass reported in this table is the absolute difference between the observed and predicted frequencies in the bins.

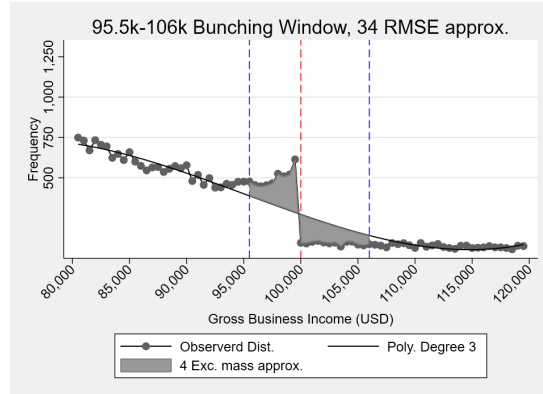
The figures suggest that taxpayers reported incomes just below this threshold to avoid transitioning to the more complex OKAB regime. This clustering of reported incomes near the USD 100,000 mark represents a deliberate response to the tax system’s structure. This behavior was consistent throughout the 2011–2014 period as shown in panels (11a) to (11d) in Figure (11) in the Appendix. Each year exhibits a similar income clustering just below the 100,000 USD threshold, indicating a sustained behavioral response rather than a transient phenomenon. The robustness of the bunching phenomenon has also been verified across a range of histogram bin sizes, spanning from USD 100 to USD 1,000. Comprehensive details can be found in Figure (12) in the Appendix (B).

Figure 3: Bunching Window Distribution, Models 1–5

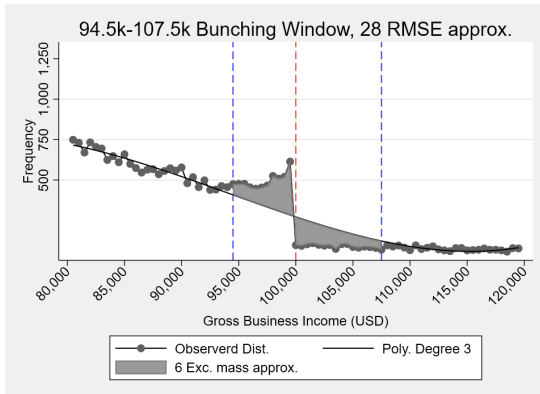
(a) Model Ranking=1



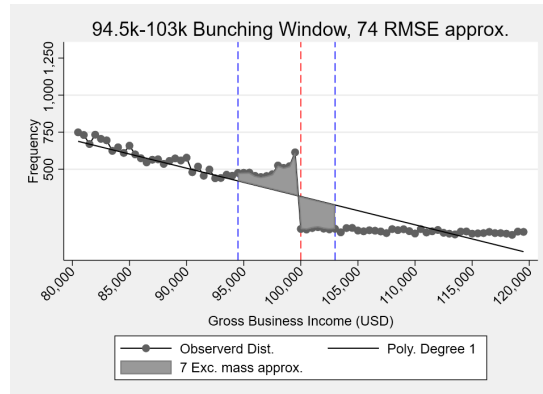
(b) Model Ranking=2



(c) Model Ranking=3



(d) Model Ranking=4



(e) Model Ranking=5

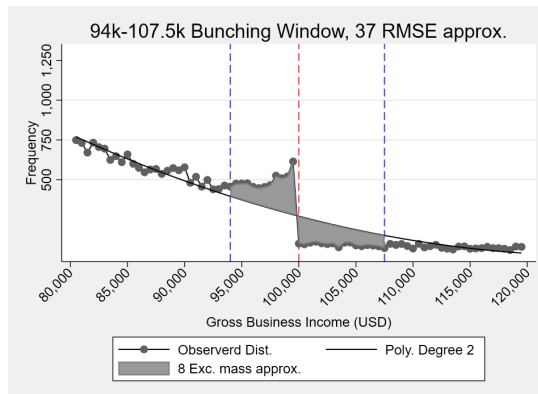
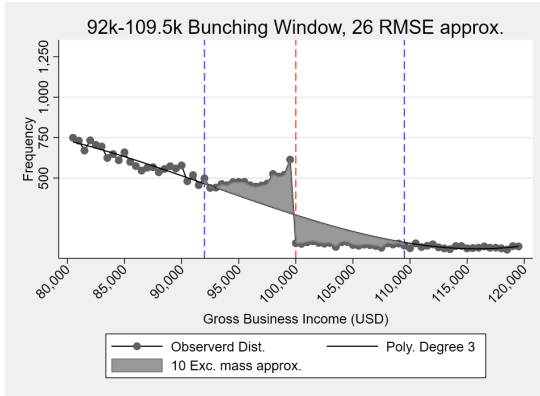
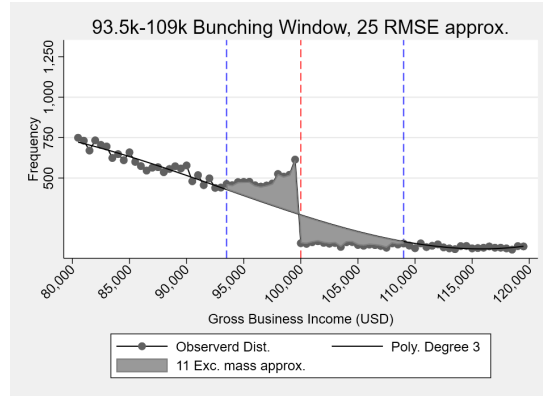


Figure 4: Bunching Window Distribution, Models 6–10

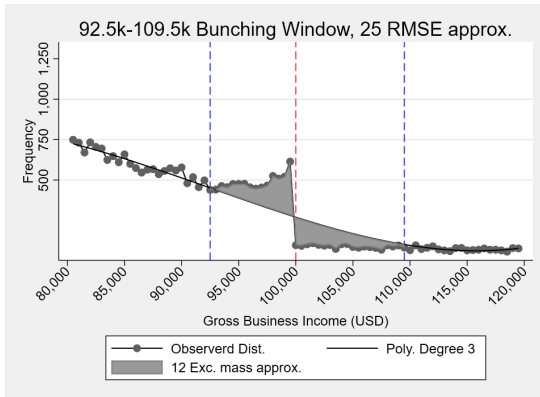
(a) Model Ranking=6



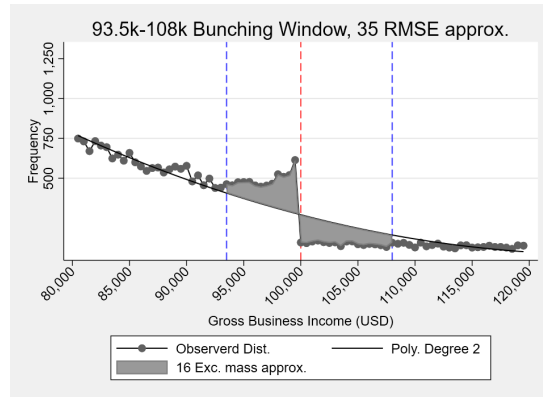
(b) Model Ranking=7



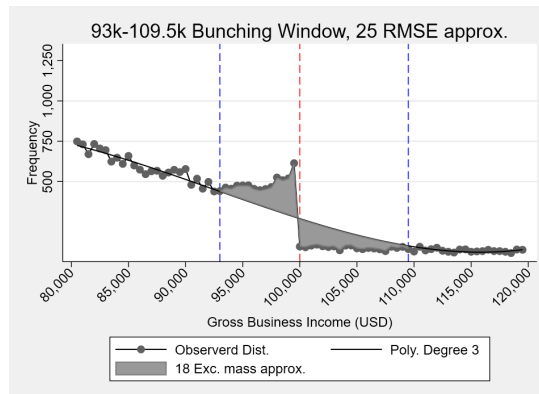
(c) Model Ranking=8



(d) Model Ranking=9



(e) Model Ranking=10



4.1 Do accountants bunch?

One way to qualify the behavioral drivers of bunching is by examining the tax-related behavior of accountants because, out of all taxpayers, they form the group with the best knowledge about how to navigate across the two regimes (Simple and OKAB) to maximize utility. Finding bunching among the accountants will suggest that bunchers are, in fact, paying less tax in the Simple regime than in the OKAB regime because their bunching behavior is theoretically not driven by uncertainty about the OKAB regime.

The histogram displayed in Figure (5) shows the distribution of Gross Business Income among accountants over the 2011–2014 period (there are 384 observations corresponding to 292 accountants). Reported Gross Business Income drops noticeably: there is a clustering of taxpayers around the USD 100,000 threshold depicted by the red dashed line, which suggests that there is bunching behavior at that threshold among accountants. To further disentangle the bunching evidence of accountants, we present a comparison of tax attributes in Table (5). We observe that although being in the OKAB regime, accountants, on average, report gross business income below the eligibility threshold. This may occur when accountants transition regimes in year t and report below the threshold in year $t + 1$. When a taxpayer transitions to the OKAB regime, he is expected to keep reporting under the new regime even if he does report below the threshold for subsequent year⁶. The deductions pattern, however, remains unchanged. Accountants under the OKAB regime deduct USD 12,326 more on average in OKAB regime (USD 92,757 vs. 80,431), a figure below the USD 17,072 difference of deductions for all taxpayers (deductions difference in Table (3)). This indicates that accountants, even under the Simple regime, are able to find more deductions (around USD 2,000) compared to the group as a whole. This is a suggestion that accountants maximize the deduction space independently of the tax regime.

Accountants reporting under the OKAB regime do pay more taxes when comparing taxpayers with taxes paid greater than USD 0 (i.e. those who actually pay USD 1,429 in the OKAB regime vs. USD 1,406 in the Simple regime). However, when considering all observations, including those who pay USD 0, the pattern encountered in Table (3) remains. Accountants under the OKAB regime pay less. The latter may be due to a greater share of accountants who decide to engage in reporting misconduct (8.1%), that is, reporting over USD 100,000 without a regime change. This does not remain uncovered by the tax authority, which forces these taxpayers to report under the OKAB regime for the next year. Another way in which the taxes paid difference may be explained is to observe the share of accountants that report below USD 100,000 but fill the *F102* form. That share is more than 50%, proposing that accountants, once they transitioned, decide to report below the threshold and still benefit from the greater complexity and deduction space offered by the OKAB regime.

5. What is the impact of the OKAB regime on tax paid?

As we previously discussed in relation to Table (3), our findings indicate that, on average, taxpayers positioned to the left of the threshold and subject to the Simple tax regime paid more in taxes compared to those situated to the right of the threshold. This finding appears

⁶A taxpayer can go back to the simple regime by filling a request form and meeting below the thresholds conditions in the previous year. The bureaucratic procedure can be done online on the tax authority web page (Servicio de Rentas Internas, SRI, 2024); however, in the 2011-2014 period, this process needed to be done in the SRI offices and was rarely granted.

Figure 5: Gross Business Income among Accountants (2011–2014)

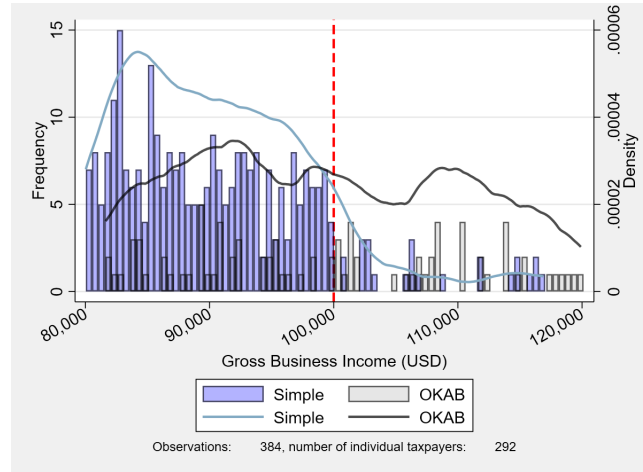


Table 5: Tax-Related Attributes by Tax Regime (2011–2014) for Accountants

Variables	(1) Simple	(2) OKAB	(3) Diff. (2-1)	Obs.
Gross Business Income, USD	90,756 (7,719)	99,390 (11,012)	8,634*** (1,042)	384
Deductions, USD	80,431 (16,346)	92,757 (16,758)	12,326*** (1,996)	384
% With Income Tax > 0	0.686 (0.465)	0.466 (0.502)	-0.220*** (0.058)	384
Taxes Paid, USD	965 (1,489)	666 (1,283)	-299* (175)	384
Taxes Paid Among Those Who Pay, USD	1,406 (1,616)	1,429 (1,569)	23 (275)	244
% With Gross Business Income (USD) < 100k	0.919 (0.273)	0.523 (0.502)	-0.396*** (0.041)	384
% With Gross Business Income (USD) > 100k ¹	0.081 (0.273)	0.477 (0.502)	0.396*** (0.041)	384
Observations	296	88	384	.

Note: The % of taxpayers by year were 24.48% in 2011, 18.49% in 2012, 28.65% in 2013, and 28.39% in 2014.

¹ 8.1% of taxpayers under the Simple regime reported Gross Business Income above USD 100,000, all of whom transitioned from the Simple to the OKAB regime in subsequent periods after a notice from the tax authority.

counterintuitive, given that the existing literature suggests taxpayers tend to cluster at the lower end of tax brackets strategically to minimize their tax liability (Saez, 2001, 2010; Chetty et al., 2011; Harju et al., 2019; Akcigit et al., 2022). However, note that if information about the tax liabilities under the complex regime is uncertain, the strategic behavior to intentionally “bunch” in the Simple regime may not be solely motivated by a desire to reduce one’s tax burden within this regime. Avoiding risk might be a driver of such behavior.

An experiment would be the gold standard to determine whether the OKAB regime is causally linked to the differences in taxes paid between those under the OKAB and the Simple regimes. This experiment would entail identifying taxpayers with similar predetermined characteristics and incomes at the eligibility threshold, followed by random assignment of some of them to the OKAB regime and others to the Simple regime. Subsequently, their tax-related outcomes would be carefully measured and compared, and differences in those outcomes could be attributed to the impact of the complex regime. Such an experimental approach would mitigate potential confounding variables, enabling researchers to isolate the causal effect of the OKAB regime on the observed paid tax disparities with the Simple one. While conducting a full-scale experiment was not feasible in this context, administrative records offer an opportunity to utilize quasi-experimental methods for estimating the impact in which we are interested. Next, we describe the quasi-experimental approaches and results obtained in our attempt to answer the research question in the title of this section.

5.1 Implementing a “donut” estimator

Our first approach to explore the impact of the OKAB tax regime on taxes paid computes an OLS regression where the amount of taxes paid is the outcome variable. The independent variable, which coefficient we seek to estimate, is an indicator, which takes a value of one when the taxpayers fill out taxes under the OKAB regime, and zero if taxes are filled in the Simple regime (we only have observations for taxpayers in either of those regimes). In the absence of strategic bunching behavior, the coefficient estimate associated with that indicator variable would capture the OKAB regime’s effect on taxes paid. However, as previously seen in Figure (2c), taxpayers bunch, and consequently, we can expect their strategic behavior to bias the estimate of the OKAB treatment effect when using such an OLS estimator. To attenuate the concern from the fact that taxpayers’ bunching can bias the effect of interest, we implement a version of the so-called “donut” estimator (Dowd, 2020). Our donut estimator uses the same OLS regression framework just explained but excludes data on self-selected individuals within a bandwidth hole around the business income eligibility threshold that simulates the empirical bunching window.

Note that individuals who are positioned near the right (left) side of the USD 100,000 threshold and have chosen the OKAB (Simple) regime likely made this choice because they—especially those located near the threshold—perceived higher benefits in that particular regime compared to the alternative one. One crucial assumption underlying the DE estimator is that as we move further away from the threshold, taxpayers’ strategic behavior diminishes. This is because individuals further from the threshold are more likely to report their actual business income. Therefore, we can use data from non-bunchers located to the left (right) of the threshold and outside of the bandwidth hole to gain insights into the potential outcomes for taxpayers strategically positioned on either side of the threshold.

The implementation of this estimator is straightforward. Consider equation (1, where the taxes paid y_i for taxpayer i are modelled as a function of the indicator for selection in the

OKAB regime D_i . The coefficient δ_1 in this equation provides the regime effect estimation. The model includes a covariates vector \mathbb{X} intended to hold constant predetermined factors that explain heterogeneity in the regime selection and taxes paid. In the empirical specification, the covariates we included were age, sex, years in the tax system, marital status, work at manufacture, trade or professional, province of residence, education, and year fixed-effects. The “donut” attribute of the estimator comes from the fact that taxpayers around the USD 100,000 threshold are symmetrically excluded so that the data used to compute the coefficient estimates comes from taxpayers outside of the set (bandwidth hole) defined by the lower and upper bounds zl_k and zu_k of that window as indicated in equations (2) and (3).

$$y_i = \beta_0 + \delta_1 D_i + \mathbb{X}\beta + \epsilon_i, \quad \forall z \in [80,000; zl_k) \cap (zu_k; 120,000] \quad (1)$$

$$zl_k = 100,000 - 1,000k, \quad k = 0, 1, 2, \dots, 10 \quad (2)$$

$$zu_k = 100,000 + 1,000k, \quad k = 0, 1, 2, \dots, 10 \quad (3)$$

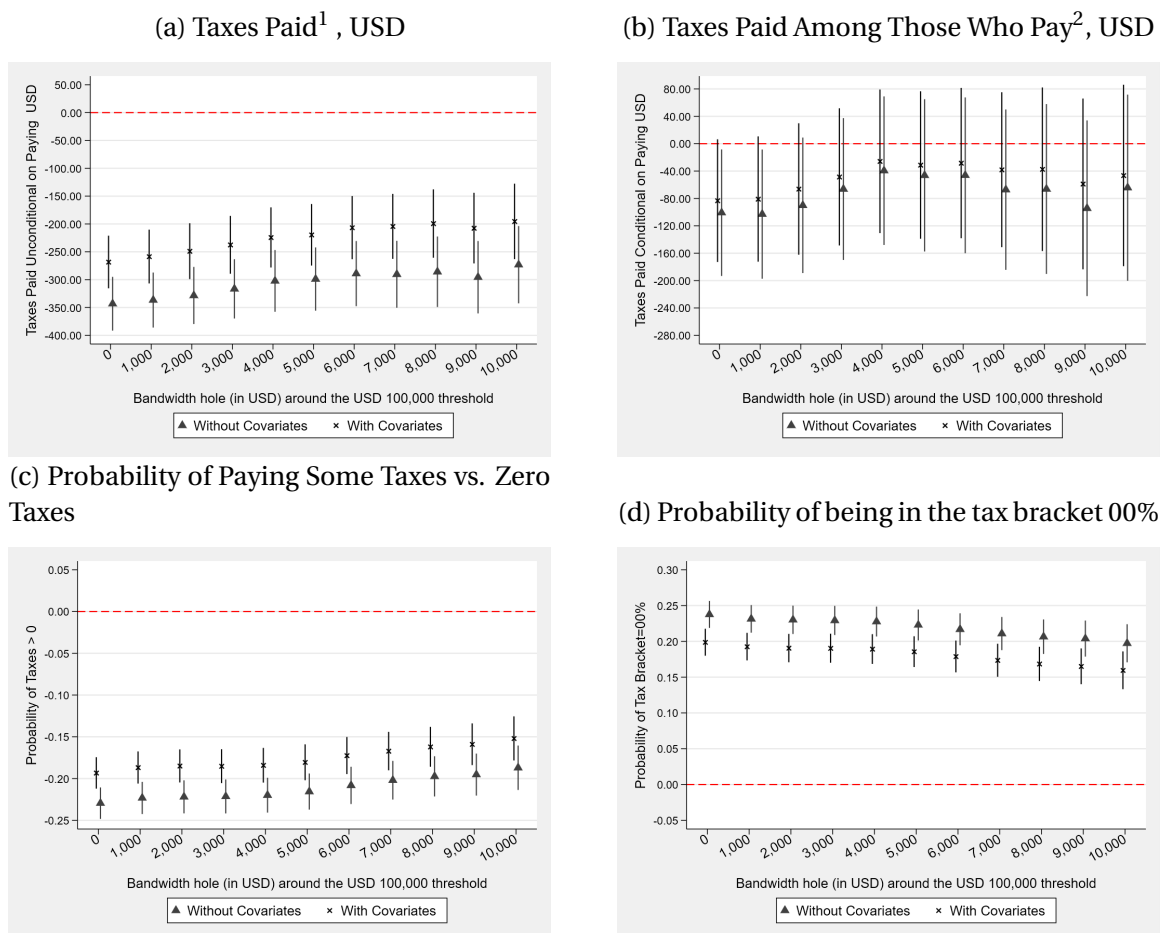
Figure (6) shows various coefficient estimates of the effects of the OKAB regime on four outcomes using that donut estimator. We estimated the OKAB regime effects, not only on taxes paid, but on (b) The amount of taxes paid among those who pay some tax; (c) The probability of paying some taxes vs. zero taxes, and; (d) The probability that the taxable income of the individual is the lowest bracket (i.e. the 0% tax bracket). As mentioned, the estimates differ along the horizontal axis in that we incrementally excluded taxpayers from within bandwidths that grew symmetrically around the business income threshold in intervals of USD 1,000 dollars (henceforth called the bandwidth holes). For comparison purposes, we included estimates of the OKAB regime employing the donut estimator, including the \mathbb{X} covariates (the cross-and-line plots) and without those covariates (6 plot).

The set of graphs depicted in Figure (6) collectively analyze the effects of the OKAB tax regime utilizing the donut estimator approach, which, as we just explained, considers the exclusion of data points within various bandwidth holes around a \$100,000 income threshold to correct for possible biases due to taxpayers’ bunching behavior.

Graph (a) indicates that the taxes paid by individuals seem to increase marginally as the bandwidth hole widens; nevertheless, the overall effect of the OKAB regime on tax payments remains relatively stable, with no statistically significant variations in the coefficient estimates across different bandwidths. This stability suggests a consistent impact of the regime across different income ranges outside the bunching holes. In contrast, Graph (c) suggests a slight but not statistically significant growth in the probability of paying zero taxes as the bandwidth expands. This trend, while not substantial enough to indicate statistical significance, hints at a possible increase in tax avoidance or evasion strategies as the income approaches the threshold. When it comes to taxes paid among those who pay at least something (Graph b), the impact of the OKAB regime seems negligible across the bandwidths explored, with almost no statistically significant effects observed. Finally, Graph (d) shows a higher probability for individuals under the OKAB regime to fall into the zero-tax bracket, a finding that when paired with the data in Graph (c), suggests a potential strategy employed by accountants or taxpayers to leverage the OKAB regime for reducing tax liabilities, possibly by legally adjusting reported incomes to qualify for the lowest tax bracket.

The differences between estimates with and without covariates suggest the degree of bias induced by the selection of observables in the bunching process. More detail on the regression output associated with the coefficient estimates from Figure (6) is presented in Appendix Table (12).

Figure 6: Donut estimator - First Approach



Notes: The figures show the estimated coefficients of the OKAB regime in models with and without covariates for the different bandwidth holes around the threshold. For taxes paid, figure (c) in the absence of exclusions (Bandwidth = 0), the effect of the regime is approximately USD -270 for the model that includes covariates and USD 350 for the one that does not include them. Remember that this first approximation assumes a symmetrical bandwidth. That is, the USD 5,000 bandwidth excludes all observations between USD 95,000 and 105,000. The whiskers of the coefficients show the 95% confidence interval.

1 Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0.

2 Taxes Paid Among Those Who Pay comprises the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

The donut estimator applied in our analysis inherently assumes that taxpayers exhibit symmetrical behavior around the income eligibility threshold for the OKAB regime. However, as evidenced in Table (4), the actual bunching behavior begins at approximately USD 92,000 and extends to USD 109,500, which deviates from a symmetrical distribution according to the excess mass criteria. Furthermore, this method systematically omits data within the 'donut hole' — the designated bandwidth around the threshold — presupposing that the observable characteristics on either side of the bandwidth are homogeneous. This assumption could lead to biased results if certain variables, such as age, years in the tax system, or the industry of self-employed individuals, differ significantly between those in the Simple and OKAB regimes. Additionally, the estimator's linear nature may not accurately reflect

the complex, potentially non-linear relationships in the data, which could either mitigate or exaggerate the perceived effects of the tax regime. In light of these potential limitations, we have explored alternative estimation techniques that relax some of the initial model’s assumptions in hopes of mitigating these shortcomings.

5.2 A semi-parametric approach to the “donut” estimator

In this section, we introduce a donut estimator that relaxes the symmetric bandwidth and the linear data-generating process assumptions to separately predict counterfactual outcomes of the bunching behavior below and above the USD 100,000 threshold. The overall idea is that by answering how taxpayers would have behaved in the absence of the OKAB regime at each side of the threshold, we can measure their difference and estimate the regime’s treatment effect. A new set of estimates was generated with reference to all the bunching windows identified in Table (4), and the four outcomes studied⁷. A more detailed explanation follows.

We assume that the data-generating process driving the behaviors of taxpayers outside of the bunching window can be leveraged to estimate the counterfactual taxpaying behavior exhibited by individuals within the bunching window. Under that assumption, the differences in counterfactual outcomes between taxpayers immediately to the right and left of the OKAB eligibility threshold can be considered an estimate of the effect of the OKAB regime. The disparity in the predicted counterfactual outcomes for taxpayers on either side of the threshold precisely at the threshold value helps us identify the impact of the tax regime.

We calculate the value of the counterfactual difference in the outcomes of interest in four steps. First, we estimate each outcome variable as a function of covariates set (age, sex, years in the tax system, marital status, work at manufacture, trade or professional, province of residence, education, and year fixed-effects) for all taxpayers left (right) of the bunching window (separately). Second, we fit each model and obtain the predicted residuals—the variability of the outcome variable not explained by those covariates—left and right of the bunching window. Third, we estimate a model of those predicted residuals left (right) as a function of gross business income to recover the coefficient estimate of business income on the residualized outcome. Finally, we make counterfactual point estimates at the USD 100,000 threshold both to the left and right and compute the difference in the counterfactual predictions (right-left): this is our estimate of the regime’s impact on the outcome variable.

More formally, consider the outcome variable y_i for taxpayer i . Income is set up as z_i , and \mathbb{X} is a matrix of dimensions $i \times j$ denoting j covariates for i taxpayers. The first stage estimates the outcome as a function of covariates \mathbb{X} using the information to the left (right) of the bunching window; see equations (4) and (5). Let z_L, z_U denote the bunching window lower and upper bounds.

$$y_{i,\text{left}} = \beta_0 + \mathbb{X}\beta_j + \varepsilon_{i,\text{left}}, \quad \forall z_i \in [80,000, z_L) \quad (4)$$

$$y_{i,\text{right}} = \beta_0 + \mathbb{X}\beta_j + \varepsilon_{i,\text{right}}, \quad \forall z_i \in (z_U, 120,000] \quad (5)$$

⁷(a) The total amount of taxes paid (including zero taxes); (b) The amount of taxes paid among those who pay some tax; (c) The probability of paying some taxes vs. zero taxes; and (d)The probability that the taxable income of the individual is the lowest bracket (i.e. the 0% tax bracket)

The first-stage equations return the predicted residuals at each side ($\hat{\epsilon}_{i,\text{left}}$ and $\hat{\epsilon}_{i,\text{right}}$). The second stage takes the residuals as inputs and estimates a polynomial model of the outcome residual on gross business income $\phi(z_i)$. Again, the estimation employs data points outside the bunching window to avoid any endogeneity problems. Follow equations (6) and (7), where $\phi(z_i)$ represent the polynomial form ranging from 1 (linear) up to 3 (cubic).

$$\hat{\epsilon}_{i,\text{left}} = \gamma_0 + \phi(z_i) + \delta_i, \quad \forall z_i \in [80,000, z_L] \quad (6)$$

$$\hat{\epsilon}_{i,\text{right}} = \gamma_0 + \phi(z_i) + \delta_i, \quad \forall z_i \in [z_U, 120,000] \quad (7)$$

Finally, we fit the two models to draw counterfactual estimations at the USD 100,000 threshold. The difference from the counterfactual incomes at the right and left $\omega_{y,T}$ displays the regime impact on the outcome variable y_i .

$$\omega_{y,T} = \tilde{\epsilon}_{T,\text{right}} - \tilde{\epsilon}_{T,\text{left}} \quad (8)$$

To validate our analytical method, we probe for variances in the observable attributes of taxpayers within selected bandwidths flanking the bunching windows' thresholds. Identifying such discrepancies in pre-determined traits across the thresholds reinforces our premise that incorporating covariates to derive the residual variation in tax outcomes is essential. This step helps to offset any potential biases arising from the selection into bunching driven by observable factors. We calculate these mean differences using data from taxpayers within a USD 1,500 range to the left and right of the bunching windows' boundaries.

Table (12) shows the differences in means of attributes of taxpayers situated within these designated groups.⁸ For instance, taking a bunching window with Gross Business Income between USD 92,000 and 109,500, our analysis involves taxpayers within the intervals [90,500;92,000) and (109,500;111,000], thus encompassing a USD 1,500 margin on either side of the bunching window limits. The results, as displayed in Table (12), reveal consistent disparities across the ten bunching windows, particularly with regard to the number of years taxpayers have been in the tax system—reflected as the gap between the tax form year and their initial registration year—as well as within the "Others" category of the sector for self-employed individuals. These findings not only affirm the presence of systematic differences but also underscore the necessity of adjusting for such characteristics to ensure the precision of our estimators.

Next, we present (in graphical and tabular form) our estimates of the impact of the OKAB regime on taxpayer behavior using the semi-parametric donut estimator described above. Central to our analysis is the use of observed data from individuals positioned outside the bunching window on both sides of the income threshold. As described, these data are essential for estimating counterfactual outcomes, drawing the counterfactual scenario of what the tax-related behaviors of these taxpayers would have been in the absence of the OKAB regime. Because the bunching window estimation returned several possible lower and upper bounds, we compute counterfactual estimates within the bunching windows for all the bunching windows in Table (4).

Figures (7), (8), (9), and (10) show the observed (outside of the bunching window) and coun-

⁸Appendix tables (14) to (23) show the mean values that generate the differences presented in Table (12)

terfactual (inside of the bunching window) distributions of the relevant outcome residuals as functions of business income. The lines are predicted values of the residuals (net of covariates) from exponential series models (that include up to a third-degree polynomial– and from which we chose the specifications with the lowest RMSE) trained in the data outside of the bunching window using OLS regressions. Our objects of interest are the differences in the predicted values of those models (the counterfactual estimates) just to the left and right of the threshold.

The estimates of the value of the differences in the counterfactual outcomes at both sides of the threshold, along with their standard errors (bootstrapped with 100 repetitions), are presented in full detail in Table (6).

The taxes paid analysis uncover the pattern first encounter in Table (3) and then confirmed in the first approach donut estimator in Figure (6). We observe taxes paid decreases with coefficients ranging from approximately USD -280 to -360 , although accompanied by larger standard errors, some upwards of 0.29. These larger standard errors suggest a more diverse taxpayer behavior influencing the unconditional tax amount, resulting in less precision in the estimates. When focusing on the amount of taxes paid conditionally (i.e., for those who do pay taxes), the estimated effects appear less significant, despite being predominantly negative. The coefficients here exhibit range from around USD -200 to -433, indicating that within the OKAB regime, there's a notable reduction in the taxes paid among taxpayers who are not at zero tax liability.

For the probability of paying more than zero in taxes, the estimated coefficients range from -0.15 to -0.13 across various bandwidths, maintaining a consistent negative sign. This indicates a persistent trend among taxpayers under the OKAB regime to declare incomes that position them in a non-taxable bracket. Notably, the standard errors for these estimates are relatively small, most under 0.06, suggesting a high level of precision in these estimates. The uniformity of this negative effect, regardless of the bunching window, underscores a broad behavioral pattern rather than one limited to a narrow income band around the threshold. In summary, these results statistically substantiate the qualitative understanding that the OKAB regime exerts a clear influence on taxpayer conduct around the eligibility threshold, manifesting in both the likelihood and the amount of taxes paid.

It's important to recognize that while we have adjusted certain assumptions from the initial donut estimator, the estimates of the OKAB regime's impact presented in Table (6) exhibit similar magnitudes to those in Table (12). This similarity suggests that despite methodological refinements, the underlying tax behavior captured by both models is consistent. The findings detailed in this section benefit from robustness that enhances their reliability: they are less sensitive to the specific assumptions of the model. They are more deeply rooted in the actual data-generating processes observed within the taxpayer population. Consequently, the estimates provided here likely offer a more accurate reflection of the influence of the OKAB regime on taxpayer behavior.

6. Tax and transaction costs of EO policies: ideas for a simple model

How do we rationalize our results in a micro model of the behavior of self-employed taxpayers who chose their labor supply? What are the roles of uncertainty about the accountants'

Table 6: Estimates of the OKAB Regime at the USD 100,000 Threshold

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Outcome	lb: 94.5K	lb: 95.5K	lb: 94.5K	lb: 94.5K	lb: 94.0K	lb: 92.0K	lb: 93.5K	lb: 92.5K	lb: 93.5K	lb: 93.0K
Variables	up: 107.0K	up: 106.0K	up: 107.5K	up: 103.0K	up: 107.5K	up: 109.5K	up: 109.0K	up: 109.5K	up: 108.0K	up: 109.5K
Taxes Paid ¹ , USD	-288.947**	-171.031	-307.193	-208.392	-299.698*	-370.655	-361.527**	-358.790*	-250.036	-340.763
se	136.945	140.498	157.619	111.684	166.135	206.685	184.055	209.190	158.176	234.785
Taxes Paid ATWP ² , USD	-1,201.156*	80.071	-1,245.855	-1,010.385	-1,297.965	-11.438	-6.385	4.434	208.471	-63.177
se	688.878	841.846	829.854	703.257	1,005.923	573.747	471.203	462.816	402.252	446.986
Prob. of Taxes > 0	-0.155**	-0.132	-0.151	-0.163***	-0.150**	-0.146	-0.157	-0.149*	-0.152*	-0.139
se	0.061	0.054	0.075	0.040	0.067	0.088	0.072	0.104	0.073	0.094
Probability of Tax Bracket=00%	0.147**	0.126	0.145	0.161***	0.144***	0.117	0.137	0.120*	0.142*	0.111
se	0.063	0.054	0.074	0.039	0.066	0.089	0.068	0.102	0.072	0.092

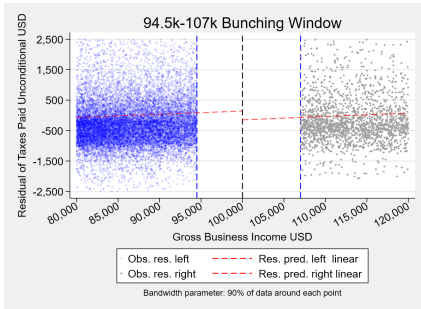
Notes: Significance levels are * ($p < .10$), ** ($p < .05$), *** ($p < .01$). Standard errors are estimated using a bootstrap procedure with 100 repetitions; they are reported in parentheses.

¹ Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0.

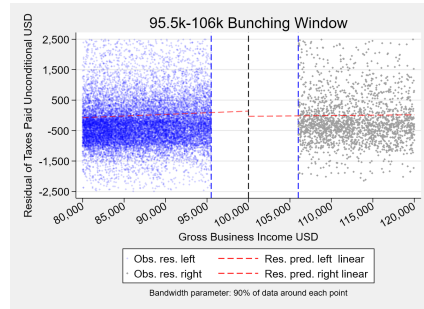
² Taxes Paid Among Those Who Pay comprises the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax. All the taxpayers with a lower personal income tax outcome are excluded from the estimation.

Figure 7: Tax Paid* USD

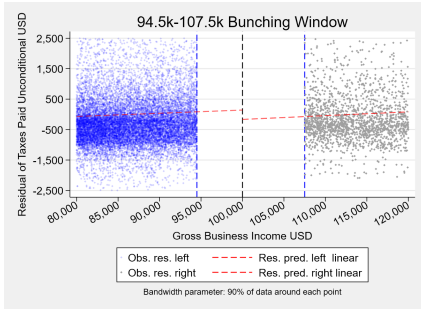
(a) Bunching Window 1



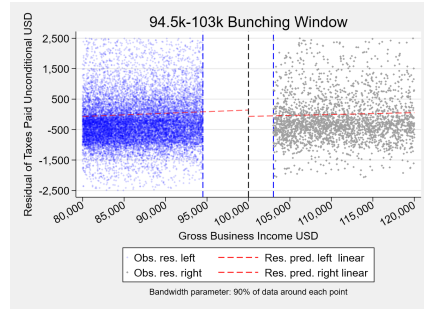
(b) Bunching Window 2



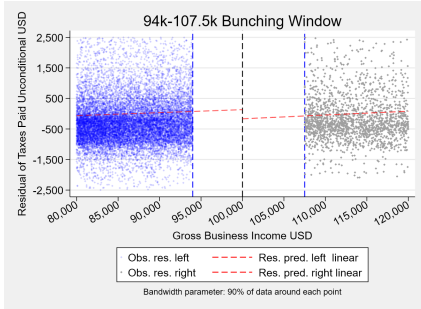
(c) Bunching Window 3



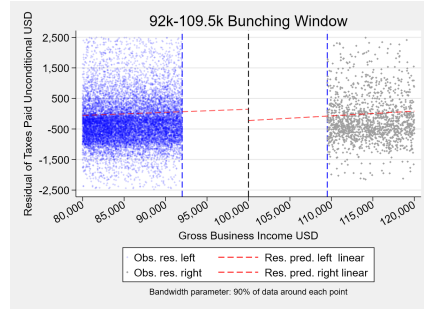
(d) Bunching Window 4



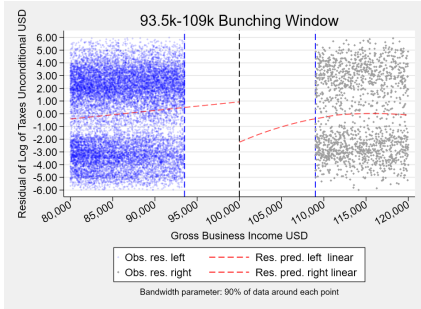
(e) Bunching Window 5



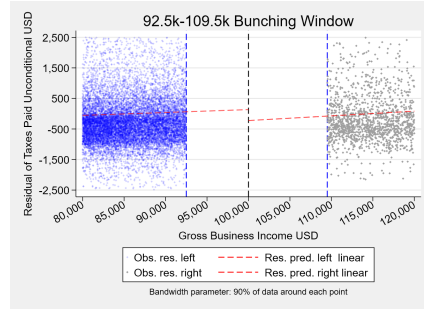
(f) Bunching Window 6



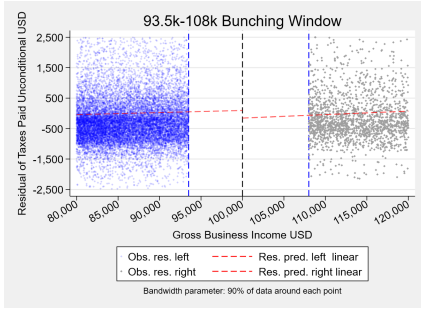
(g) Bunching Window 7



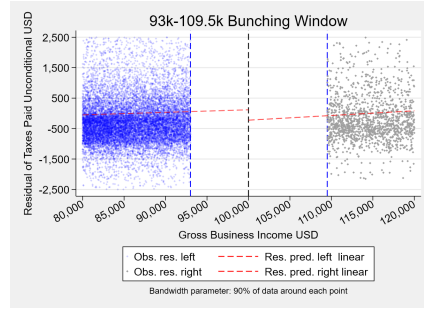
(h) Bunching Window 8



(i) Bunching Window 9



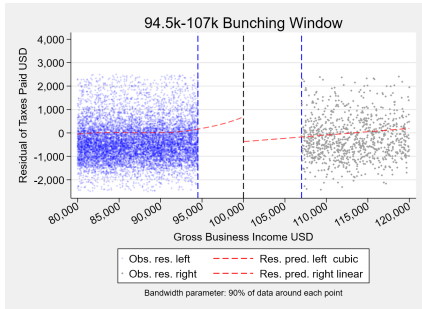
(j) Bunching Window 10



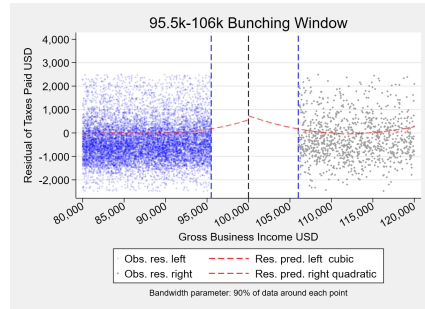
Note: The four sub-figures include all the bunching windows in Table 4. Each dot in the sub-figures represents one observation. For graphical purposes only, the dots are truncated between USD -2,500 and 2,500 for the y-axis. However, all the underlying processes for calculating the counterfactual estimation use all observations.

Figure 8: Tax Paid* USD conditional on paying

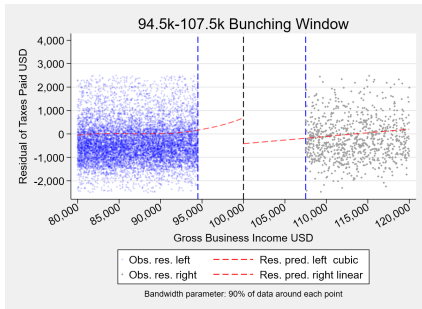
(a) Bunching Window 1



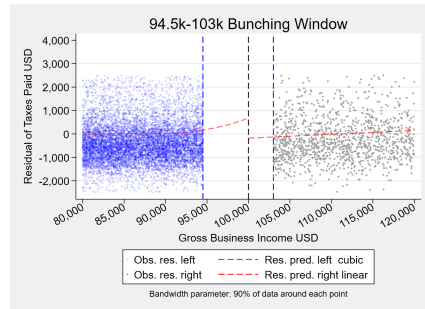
(b) Bunching Window 2



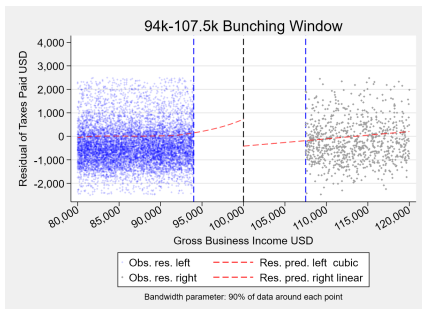
(c) Bunching Window 3



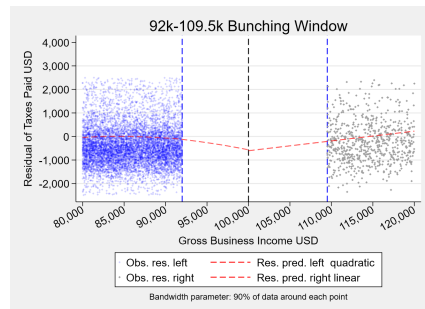
(d) Bunching Window 4



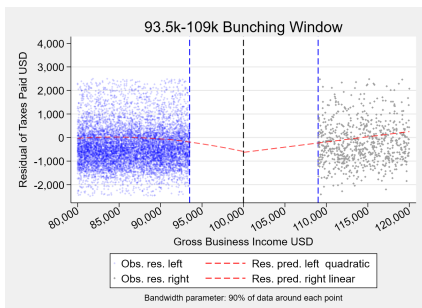
(e) Bunching Window 5



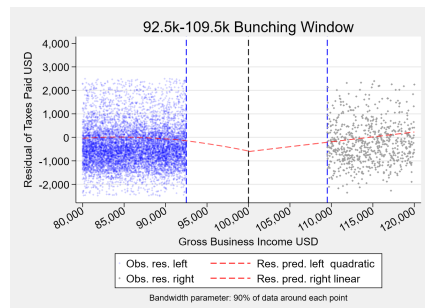
(f) Bunching Window 6



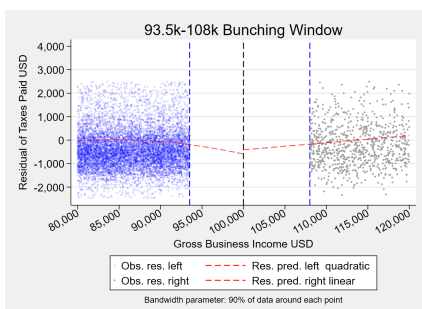
(g) Bunching Window 7



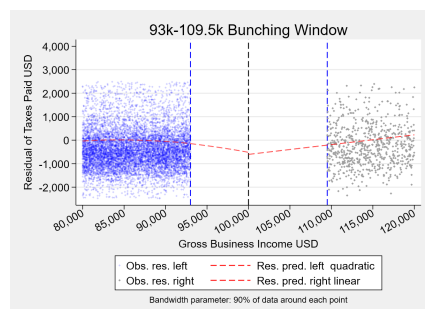
(h) Bunching Window 8



(i) Bunching Window 9



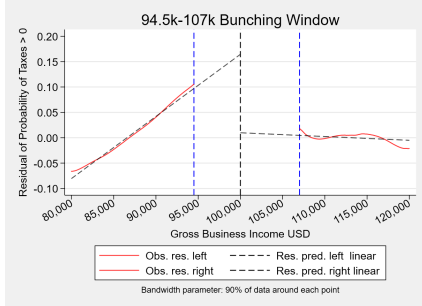
(j) Bunching Window 10



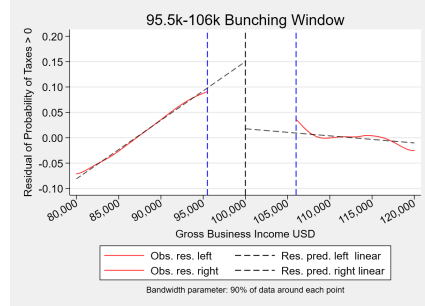
Note: The four sub-figures include all the bunching windows in Table 4. Each dot in the sub-figures represents one observation. For graphical purposes only, the dots are truncated between USD -2,500 and 2,500 for the y-axis. However, all the underlying processes for calculating the counterfactual estimation use all observations.

Figure 9: Probability of Paying Taxes

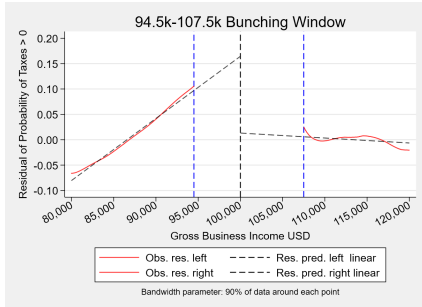
(a) Bunching Window 1



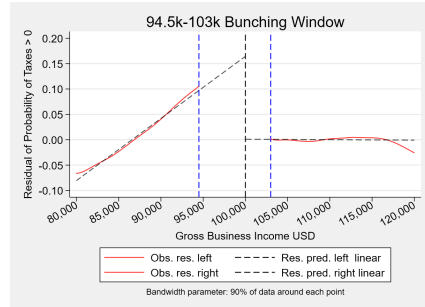
(b) Bunching Window 2



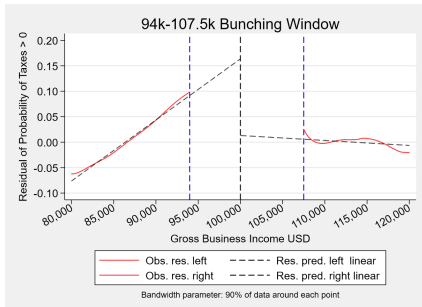
(c) Bunching Window 3



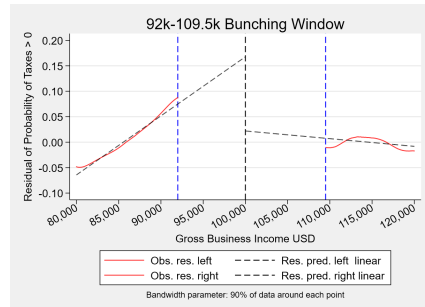
(d) Bunching Window 4



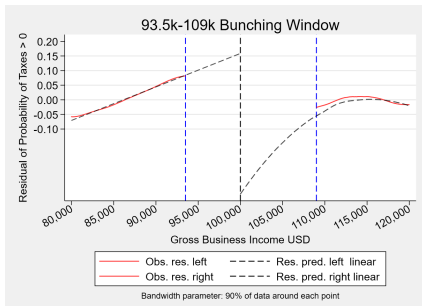
(e) Bunching Window 5



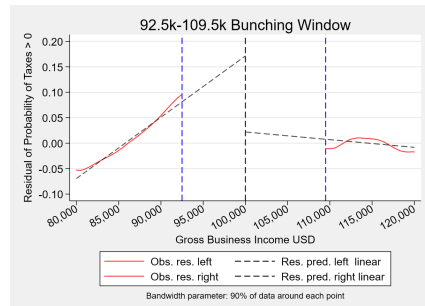
(f) Bunching Window 6



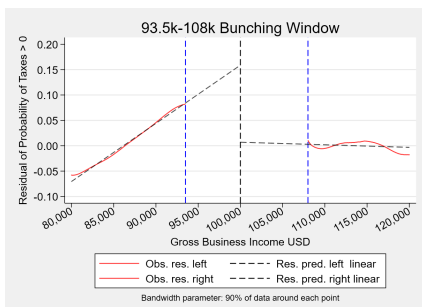
(g) Bunching Window 7



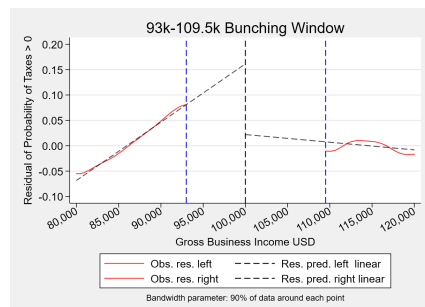
(h) Bunching Window 8



(i) Bunching Window 9



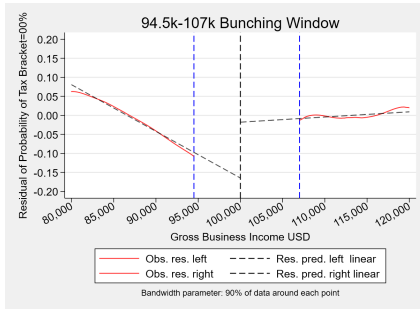
(j) Bunching Window 10



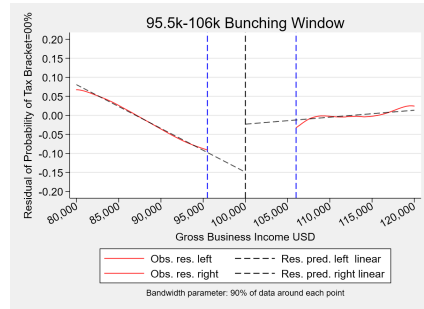
Note: The sub-figures include all the bunching windows estimated in Table 4. Given that the outcome of paying taxes (or not paying them) is a binary variable, residual estimation scatter points have the tendency to cluster around zero. Therefore, we decided to plot the observed data as a locally weighted regression using the lowest procedure in Stata. The use of a scatter at either the left or right of each bunching window would result in dot accumulation around zero in each sub-figure. The lowest procedure correctly captures the mean probability behavior alongside the Gross Business Income axis.

Figure 10: Probability of Being in the 0.00% Tax Bracket

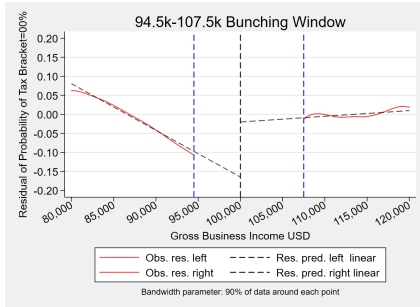
(a) Bunching Window 1



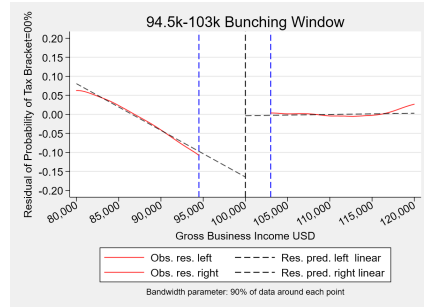
(b) Bunching Window 2



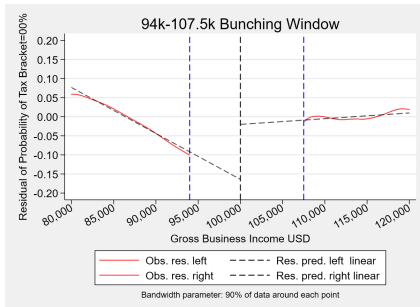
(c) Bunching Window 3



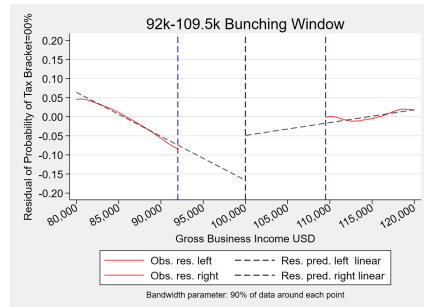
(d) Bunching Window 4



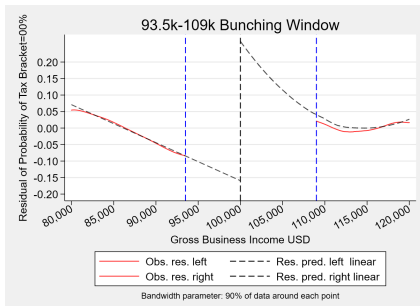
(e) Bunching Window 5



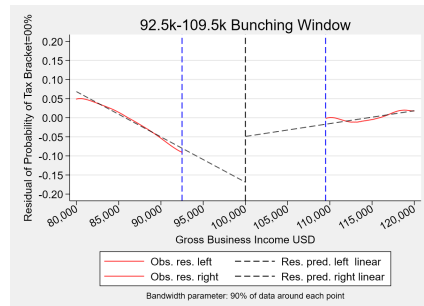
(f) Bunching Window 6



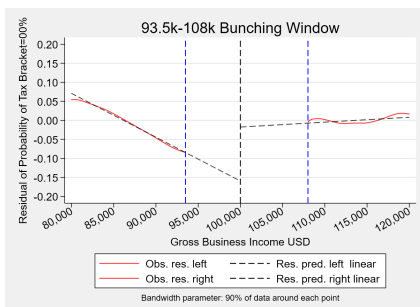
(g) Bunching Window 7



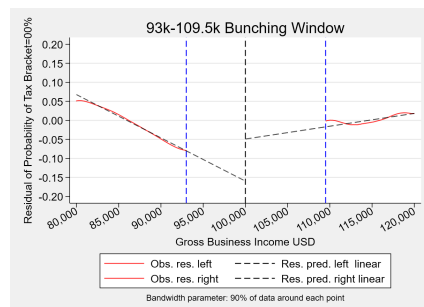
(h) Bunching Window 8



(i) Bunching Window 9



(j) Bunching Window 10



Note: The sub-figures include all the bunching windows estimated in Table 4. Given that the outcome of being in a predefined tax bracket is a binary variable, residual estimation scatter points will tend to cluster around zero. Therefore, we decided to plot the observed data as a locally weighted regression using the lowess procedure in Stata. The use of a scatter at either the left or right of each bunching window would result in dot accumulation around zero in each sub-figure. The lowess procedure correctly captures the mean probability behavior alongside the Gross Business Income distribution.

performance in completing the tax forms and tax authority enforcement capacities in those labor supply decisions? In a framework where, as in our case, a tax authority delineates two tax regimes that differ in their complexity and are divided by an income threshold, labor supply choices of self-employed taxpayers are driven by the incentive to maximize their utility Kleven (2016); Alosa (2023); Bastani and Selin (2014); Saez (2010). This utility is shaped by the net income retained after taxes and the personal cost of complying with tax obligations. Taxpayers with incomes below the threshold can file taxes independently under a relatively straightforward system, whereas those above are compelled to engage with a more complex system that mandates hiring an accountant.

In our analysis, an unconventional element of uncertainty in the labor supply decision of self-employed individuals could arise when they deliberate on jointly selecting the OKAB regime and investing in professional accounting services. This investment is driven by the expected utility derived from the accountant's efforts, which inherently carries a degree of unpredictability. For a given fee to the accountant, taxpayers must conjecture on the potential returns from these services, which will subsequently inform their choice of tax regime. The higher the expected benefit, the more likely they are to opt for a regime that—though possibly more complex—promises greater deductions or lower tax liabilities. However, the precise valuation of these services is obfuscated by the intricacies and nuances of tax legislation, rendering the decision-making process for taxpayers especially subject to uncertainty.

Another element to consider in the choice of labor supply for self-employed individuals is the strictness of tax enforcement, for it can critically condition taxpayer behavior regarding income declaration. Enhanced enforcement mechanisms dissuade the reporting of wrong income figures by increasing the probability of detection and subsequent penalization. This risk of noncompliance influences taxpayers' decisions not only on their income reporting but also on the selection of their tax regime. In our setting, the level of enforcement is not only particularly pivotal at income thresholds that delineate different tax brackets but also near the threshold for the OKAB regime. Choices to accurately report effort, labor supply, and income are underscored by the potential for substantial impacts on tax liability resulting from the regime choices.

In essence, the architecture of the tax system—including its brackets and regimes—shapes how the self-employed report their income and allocate their labor. They adjust their work and report earnings strategically to select the most favorable tax conditions. A straightforward and predictable tax system generally simplifies these decisions, leading to more consistent reporting of incomes at levels that are tax-efficient. Exploring how uncertainty and enforcement influence labor supply and tax regime choice within the context of a labor supply model remains a complex task. We delve into this topic in a companion paper, which complements the current analysis.

7. Conclusions

In this paper, we inquired about how the behavior of self-employed taxpayers in Ecuador changes in response to transitions across different tax regimes as their business income increases, particularly with respect to bunching at income thresholds to avoid increased tax obligations, and what is the causal impact of transitioning to a more complex tax regime on the amount of taxes paid by these individuals.

We explored the relationship between tax brackets and tax regimes in the context of personal income tax for self-employed taxpayers in Ecuador. Across the globe, tax authorities aim to make personal income taxes more progressive by implementing tax rates fixed within income brackets that increase progressively along the income distribution. Taxpayers often respond to these rising tax rates by employing a strategy known as “bunching.” Bunching involves taxpayers clustering their reported incomes at the upper end of a lower tax bracket (Chetty et al., 2011; Saez, 2001), a rational response when they possess complete information and aim to maximize their welfare under given enforcement and transaction cost conditions.

Here we develop the idea that, interacting with tax brackets, the “tax regime” is also an important feature of the tax system. Those tax regimes represent different levels of enforcement, oversight, and regulatory obligations that increase with income levels, even though they are not defined by levels of taxable income. Tax regimes define the rules of engagement between taxpayers and governments and are a crucial component of tax systems. Our research focused on first documenting whether taxpayers engage in bunching behavior around income thresholds that trigger transitions between tax regimes and then examining what implications the change in regime had for tax collections in the presence of that kind of strategic behavior.

An essential aspect of our research centers on the difficulty taxpayers face in assessing the net benefit of choosing a particular tax regime due to the complex nature of tax forms, deductions, and exemptions. When transaction costs associated with these assessments are high, taxpayers may choose to bunch to address the uncertainty, even if this results in higher tax payments.

Our study analyzes the behavior of a subset of self-employed taxpayers in Ecuador between 2011 and 2014, a period during which the tax code classified these individuals into different tax regimes based on whether their income exceeded a USD 100,000 threshold. Leveraging individual-level longitudinal data from the Ecuadorian tax authority, we found evidence that individuals often declared incomes just below this threshold, indicative of bunching behavior.

Examining the differences in tax paid between those who self-selected into the Simple regime and those in the OKAB (complex) regime around the USD 100,000 threshold, we find that, on average, individuals who opt for the Simple regime pay higher taxes than those who choose the complex one. This surprising result challenges the assumption that bunching always leads to the paying of a lower amount of tax.

We investigate the mechanisms behind this phenomenon and discover that taxpayers who bunch and opt for the Simple tax regime may be encountering higher uncertainty. Despite the complexity of the form they must file, non-bunchers have more opportunities to request exemptions and deductions, thus paying a lower amount of tax. The availability of accountants emerges as a key mechanism for reducing that uncertainty.

Overall, our research uncovers that taxpayers may engage in bunching behavior to mitigate uncertainty, even if it results in higher tax payments. This finding challenges conventional wisdom and emphasizes the importance of understanding the behavioral responses of taxpayers to complex tax systems, tax regimes, and transaction costs. It has broader implications for tax policy design, enforcement mechanisms, and the balance between efficiency and equity in tax systems. Ultimately, our research contributes to the ongoing discourse on

optimal tax theory and offers valuable insights for policymakers seeking to refine tax systems and enhance revenue collection.

References

- Adam, S., & Miller, H. (2021). *Taxing work and investment across legal forms: Pathways to well-designed taxes* (No. R184). IFS Report.
- Akcigit, U., Philippe, A., Lequien, M., Gravouelle, M., & Stantcheva, S. (2022). Tax simplicity or simplicity of evasion? evidence from self-employment taxes in france. *Working Paper*.
- Alosa, F. (2023). Estimating the elasticity of turnover from bunching: Preferential tax regimes for solo self-employed in italy. *Working Paper*(1).
- Bastani, S., & Selin, H. (2014). Bunching and non-bunching at kink points of the swedish tax schedule. *Journal of Public Economics*, 109, 36–49.
- Best, M. C., Brockmeyer, A., Kleven, H. J., Spinnewijn, J., & Waseem, M. (2015). Production versus revenue efficiency with limited tax capacity: theory and evidence from pakistan. *Journal of political Economy*, 123(6), 1311–1355.
- Boeri, T., Giupponi, G., Krueger, A. B., & Machin, S. (2020). Solo self-employment and alternative work arrangements: A cross-country perspective on the changing composition of jobs. *Journal of Economic Perspectives*, 34(1), 170–195.
- Bosch, N., Dekker, V., & Strohmaier, K. (2020). A data-driven procedure to determine the bunching window: An application to the netherlands. *International Tax and Public Finance*, 27(1), 951–979.
- Carrillo, P., Pomeranz, D., & Singhal, M. (2017, April). Dodging the taxman: Firm misreporting and limits to tax enforcement. *American Economic Journal: Applied Economics*, 9(2), 144–64. Retrieved from <https://www.aeaweb.org/articles?id=10.1257/app.20140495> doi: 10.1257/app.20140495
- Chetty, R., Friedman, J., Olsen, T., & Pistaferri, L. (2011). Adjustment costs, firm responses, and micro vs. macro labor supply elasticities: Evidence from danish tax records. *The Quarterly Journal of Economics*, 126(2), 749–804.
- Deza, M. C., Carrillo-Maldonado, P., & Ruiz-Arranz, M. (2021, dic.). Imposición efectiva a las empresas en ecuador. *X-pedientes Económicos*, 4(9), 6–30. Retrieved from https://ojs.supercias.gob.ec/index.php/X-pedientes_Economicos/article/view/47
- Dowd, C. (2020). Donuts and distant late's: Derivative bounds for rd extrapolation. *Available at SSRN 3641913*.
- Harju, J., Matikka, T., & Rauhanen, T. (2019). Compliance costs vs. tax incentives: Why do entrepreneurs respond to size-based regulations? *Journal of Public Economics*, 173, 139–164.
- Kleven, H. J. (2016). Bunching. *Annual Review of Economics*, 8, 435–464.
- Kleven, H. J., & Mazhar, W. (2012). Using notches to uncover optimization frictions and structural elasticities: Theory and evidence from pakistan. *The Quarterly Journal of Economics*, 128, 669–723.
- Liu, L., Lockwood, B., Almunia, M., & Tam, E. H. (2021). Vat notches, voluntary registration, and bunching: Theory and uk evidence. *Review of Economics and Statistics*, 103(1), 151–164.
- Mirrlees, J. A. (1971). An exploration in the theory of optimum income taxation. *The Review of Economic Studies*, 38(2), 175–208. doi: 10.2307/2296779
- Saez, E. (2001). Using elasticities to derive optimal income tax rates. *The Review of Economic Studies*, 68(1), 205–229. doi: 10.1111/1467-937X.00166

- Saez, E. (2010). Do taxpayers bunch at kink points? *American Economic Journal: Economic Policy*, 2(3), 180–212.
- Servicio de Rentas Internas, SRI. (2024). *Autorización para llevar contabilidad*. Retrieved from <https://www.gob.ec/sri/tramites/autorizacion-dejar-llevar-contabilidad> (Accessed: 2024-04-04)
- Smith, K., & Miller, H. (2021). Capital taxation and entrepreneurship. *Job Market Paper*.

Appendix

A. Bunching Window Set Estimation Procedure

Consider c_j as the number of observations (i.e., taxpayers) with an income level (or bin) z_j . Define $z_L \in \{z_{L1}, z_{L2}, \dots\}$ and $z_U \in \{z_{U1}, z_{U2}, \dots\}$ as the bunching window lower and upper bounds.

1. Estimate a local polynomial model of degree $p \in \{1, 2, \dots, 5\}$ following equation (9), excluding the current bunching window interval (z_{Ln}, z_{Un}) :

$$c_j = \sum_{i=0}^p \beta_i z_j^i + \epsilon_i, \quad \forall z_j \notin (z_{Ln}, z_{Un}) \quad (9)$$

2. Fit the model for all income levels, including the out-of-sample interval (z_{Ln}, z_{Un}) , and obtain the counterfactual \hat{c}_j frequencies. See equation 10:

$$\hat{c}_j = \sum_{i=0}^p \hat{\beta}_i z_j^i \quad \forall z_j. \quad (10)$$

3. Calculate the excess mass below and above the threshold (i.e., to the left and right) as the difference in the observed number of observations and the predicted values.

$$\hat{\mathbf{M}}_{b, z_{Ln}} = \sum_{j=z_{Ln}}^{z^*-1} (c_j - \hat{c}_j)$$

$$\hat{\mathbf{M}}_{a, z_{Un}} = \sum_{j=z^*}^{z_{Un}} (c_j - \hat{c}_j)$$

Under the current application, $\hat{\mathbf{M}}_{b, z_{Ln}}$ is positive, because the bunching observations produce excess mass below z^* . On the other hand, $\hat{\mathbf{M}}_{a, z_{Un}}$ is negative because the observations that commit into bunching behavior leave missing mass above z^* . Recall that for notches, this is a common characteristic, but it is uncommon for kinks.

4. Compute the difference in the total excess mass from the current bunching window (z_{Ln}, z_{Un}) as the difference between excess mass below and above. Recall that $\hat{\mathbf{M}}_{a, z_{Un}}$ carries a negative sign since there is a hole above the threshold.

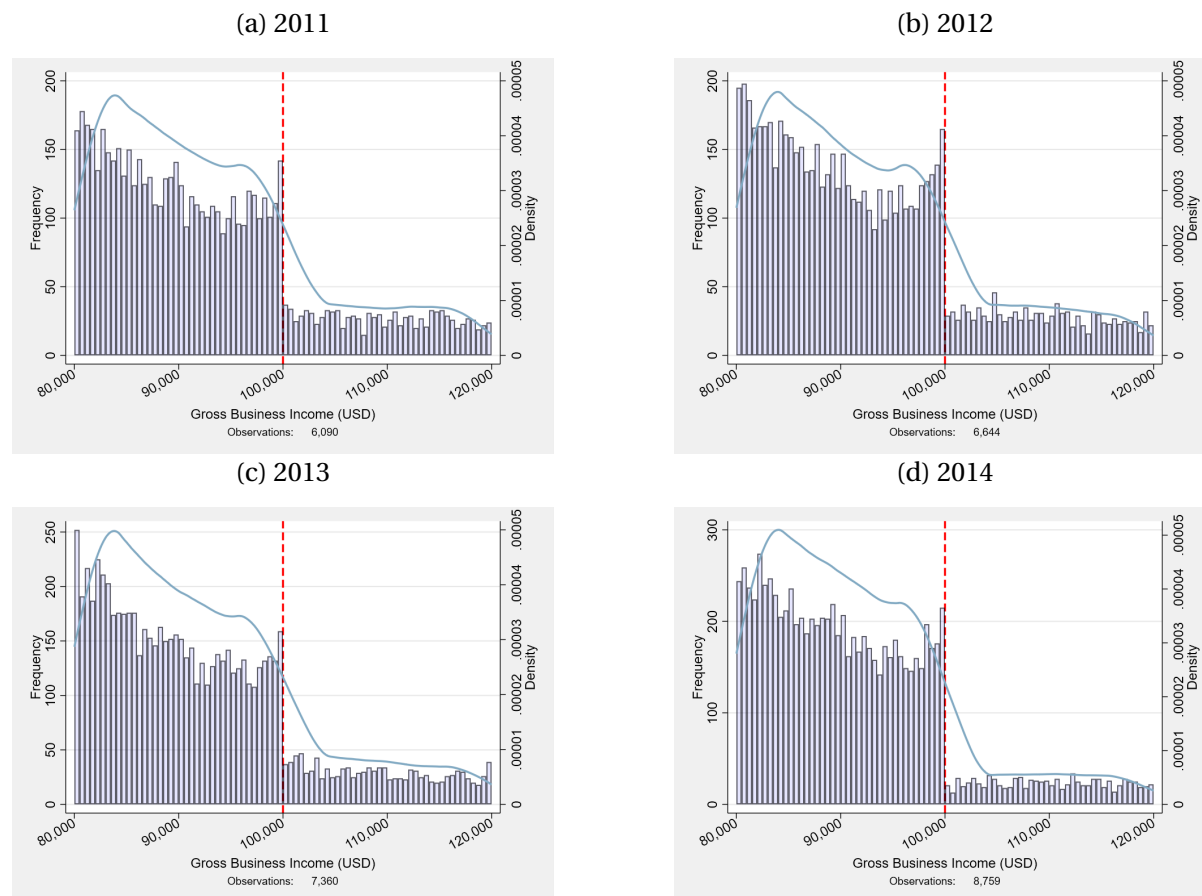
$$\hat{\mathbf{M}}_{z_{Ln}, z_{Un}} = \hat{\mathbf{M}}_{b, z_{Ln}} + \hat{\mathbf{M}}_{a, z_{Un}} \quad (11)$$

5. Repeat steps 1–4 for all the combinations of z_L and z_U .

The procedure's output is a bunching window set in which all the bunching window combinations can be ranked under the excess mass criteria.

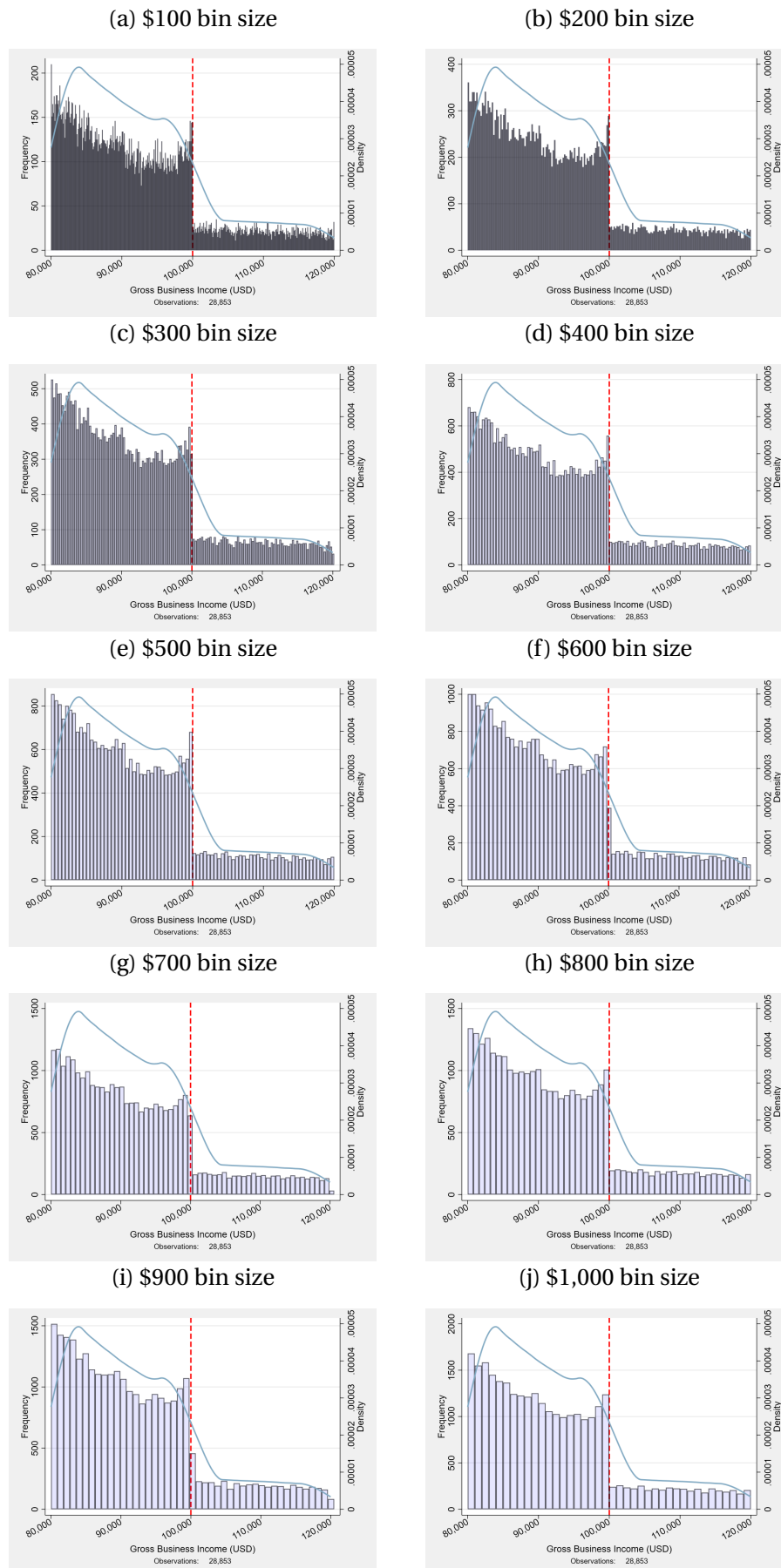
B. Figures

Figure 11: Density Distribution under a USD 20,000 Bandwidth around the Regime Threshold, 2011–2014



Note: The histograms use a width parameter of USD 500 for the histogram plot and a bandwidth parameter of USD 2,000 for the density plot (See Stata `kdensity` documentation for further details).

Figure 12: Density Distributions under a USD 20,000 Bandwidth around the Regime Threshold by Bin Size, 2011–2014



Note: The years 2015 and 2016 are not included.

C. Left and Right regressions for Outcome residuals

Table 7: Impact of Gross Business Income on Tax Paid Unconditional Net of covariates - Optimal Polynomial Models Left and Right of the Bunching Window

Variables	(1)		(2)		(3)		(4)		(5)	
	Bunching Window 94.5K-107.0K		Bunching Window 95.5K-106.0K		Bunching Window 94.5K-107.5K		Bunching Window 94.5K-103.0K		Bunching Window 94.0K-107.5K	
	Left	Right	Right	Right	Left	Right	Left	Right	Left	Right
Gross Business Income USD	0.0105*** (0.00270)	0.0112 (0.00711)	0.0107*** (0.00245)	0.00251 (0.00646)	0.0105*** (0.00270)	0.0124* (0.00750)	0.0105*** (0.00270)	0.00614 (0.00478)	0.00980*** (0.00283)	0.0124* (0.00750)
Constant	-909.6*** (233.6)	-1270.1 (804.7)	-933.8*** (213.5)	-282.5 (727.8)	-909.6*** (233.6)	-1403.5* (850.6)	-909.6*** (233.6)	-681.3 (530.8)	-846.0*** (244.4)	-1403.5* (850.6)
RMSE	1,451.8538	1,154.3145	1,454.7634	1,175.6606	1,451.8538	1,153.1386	1,451.8538	1,182.0880	1,450.4657	1,153.1386
Observations	16,781	2,551	17,710	2,030	16,781	2,551	16,781	2,551	16,336	1,790
Variables	(6)		(7)		(8)		(9)		(10)	
	Bunching Window 92.6K-109.5K		Bunching Window 93.5K-109.0K		Bunching Window 92.5K-109.5K		Bunching Window 93.5K-108.0K		Bunching Window 93.0K-109.5K	
	Left	Right	Right	Right	Left	Right	Left	Right	Left	Right
Gross Business Income USD	0.0102*** (0.00351)	0.0153 (0.0101)	0.00689** (0.00296)	0.0187** (0.00913)	0.00950*** (0.00330)	0.0153 (0.0101)	0.00689** (0.00296)	0.0113 (0.00797)	0.00834*** (0.00313)	0.0153 (0.0101)
Constant	-870.3*** (300.2)	-1758.5 (1158.9)	-593.4** (255.4)	-2134.2** (1043.8)	-814.4*** (283.1)	-1758.5 (1158.9)	-593.4** (255.4)	-1287.8 (905.8)	-717.2*** (268.9)	-1758.5 (1158.9)
RMSE	1,461.7045	1,179.0522	1,443.9890	1,157.1717	1,456.3711	1,179.0522	1,443.9890	1,164.5854	1,450.3981	1,179.0522
Observations	14,531	1,451	15,883	1,722	15,020	1,451	15,883	1,722	15,450	1,451

Notes: Significance levels are * ($p < .10$), ** ($p < .05$), *** ($p < .01$).

Table 8: Impact of Gross Business Income on Tax Paid Conditional Net of covariates - Optimal Polynomial Models Left and Right of the Bunching Window

Variables	(1)		(2)		(3)		(4)		(5)	
	Bunching Window 94.5K-107.0K		Bunching Window 95.5K-106.0K		Bunching Window 94.5K-107.5K		Bunching Window 94.5K-103.0K		Bunching Window 94.0K-107.5K	
	Left	Right	Right	Right	Left	Right	Left	Right	Left	Right
Gross Business Income USD	13.95** (6.349)	0.0282** (0.0119)	12.42** (5.117)	-1.415** (0.663)	13.95** (6.349)	0.0310** (0.0125)	13.95** (6.349)	0.0165** (0.00801)	14.48** (7.123)	0.0310** (0.0125)
Gross Business Income ² USD	-0.000159** (0.0000729)		-0.000141** (0.0000584)	0.0000633** (0.0000294)	-0.000159** (0.0000729)		-0.000159** (0.0000729)		-0.000165** (0.0000820)	
Gross Business Income ³ USD	6.05e-10** (2.79e-10)		5.36e-10** (2.22e-10)		6.05e-10** (2.79e-10)		6.05e-10** (2.79e-10)		6.28e-10** (3.15e-10)	
Constant	-406790.5** (184062.9)	-3189.6** (1348.7)	-362731.8** (149129.2)	78984.8** (37341.6)	-406790.5** (184062.9)	-3516.7** (1421.8)	-406790.5** (184062.9)	-1832.6** (889.2)	-421886.9** (205916.2)	-3516.7** (1421.8)
RMSE	1,674.6883	1,357.9525	1,673.5980	1,381.2944	1,674.6883	1,352.9120	1,674.6883	1,406.7844	1,675.9281	1,352.9120
Observations	10,560	1,295	11,214	1,032	10,560	1,295	10,560	1,295	10,235	904
Variables	(6)		(7)		(8)		(9)		(10)	
	Bunching Window 92.6K-109.5K		Bunching Window 93.5K-109.0K		Bunching Window 92.5K-109.5K		Bunching Window 93.5K-108.0K		Bunching Window 93.0K-109.5K	
	Left	Right	Right	Right	Left	Right	Left	Right	Left	Right
Gross Business Income USD	0.520* (0.290)	0.0416** (0.0168)	0.550** (0.216)	0.0440*** (0.0154)	0.534** (0.259)	0.0416** (0.0168)	0.550** (0.216)	0.0302** (0.0134)	0.482** (0.238)	0.0416** (0.0168)
Gross Business Income ² USD	-0.0000304* (0.00000169)		-0.0000322*** (0.00000125)		-0.0000312** (0.00000151)		-0.0000322*** (0.00000125)		-0.0000281** (0.00000138)	
Constant	-22211.8* (12421.3)	-4768.7** (1930.0)	-23487.6** (9347.2)	-5031.5*** (1756.9)	-22791.8** (11163.8)	-4768.7** (1930.0)	-23487.6** (9347.2)	-3436.4** (1518.5)	-20591.8** (10248.0)	-4768.7** (1930.0)
RMSE	1,701.4827	1,376.9689	1,671.3258	1,355.8293	1,691.0806	1,376.9689	1,671.3258	1,367.4868	1,681.3645	1,376.9689
Observations	8,949	737	9,895	869	9,303	737	9,895	869	9,591	737

Notes: Significance levels are * ($p < .10$), ** ($p < .05$), *** ($p < .01$).

Table 9: Impact of Gross Business Income on the Probability of Paying Taxes Net of covariates - Optimal Polynomial Models Left and Right of the Bunching Window

Variables	(1) Bunching Window 94.5K-107.0K		(2) Bunching Window 95.5K-106.0K		(3) Bunching Window 94.5K-107.5K		(4) Bunching Window 94.5K-103.0K		(5) Bunching Window 94.0K-107.5K	
	Left	Right	Right	Right	Left	Right	Left	Right	Left	Right
	Gross Business Income USD	0.0000122*** (0.000000858)	-0.000000743 (0.00000295)	0.0000116*** (0.000000776)	-0.00000139 (0.00000263)	0.0000122*** (0.000000858)	-0.000000978 (0.00000312)	0.0000122*** (0.000000858)	-8.64e-08 (0.00000194)	0.0000120*** (0.000000902)
Constant	-1.060*** (0.0744)	0.0841 (0.335)	-1.005*** (0.0677)	0.157 (0.296)	-1.060*** (0.0744)	0.111 (0.354)	-1.060*** (0.0744)	0.00959 (0.215)	-1.036*** (0.0780)	0.111 (0.354)
RMSE	0.4621	0.4799	0.4610	0.4781	0.4621	0.4794	0.4621	0.4787	0.4628	0.4794
Observations	16,781	2,551	17,710	2,030	16,781	2,551	16,781	2,551	16,336	1,790

Variables	(6) Bunching Window 92.6K-109.5K		(7) Bunching Window 93.5K-109.0K		(8) Bunching Window 92.5K-109.5K		(9) Bunching Window 93.5K-108.0K		(10) Bunching Window 93.0K-109.5K	
	Left	Right	Right	Right	Left	Right	Left	Right	Left	Right
	Gross Business Income USD	0.0000116*** (0.00000112)	-0.00000151 (0.00000411)	0.0000115*** (0.000000952)	-9.25e-08 (0.00000377)	0.0000120*** (0.00000105)	-0.00000151 (0.00000411)	0.0000115*** (0.000000952)	-0.000000504 (0.00000328)	0.0000115*** (0.00000100)
Constant	-0.993*** (0.0955)	0.173 (0.471)	-0.988*** (0.0821)	0.0106 (0.431)	-1.033*** (0.0903)	0.173 (0.471)	-0.988*** (0.0821)	0.0573 (0.373)	-0.987*** (0.0861)	0.173 (0.471)
RMSE	0.4651	0.4787	0.4641	0.4782	0.4646	0.4787	0.4641	0.4798	0.4646	0.4787
Observations	14,531	1,451	15,883	1,722	15,020	1,451	15,883	1,722	15,450	1,451

Notes: Significance levels are *($p < .10$), **($p < .05$), ***($p < .01$).

Table 10: Impact of Gross Business Income on the Probability of being in Bracket = 00% Net of covariates - Optimal Polynomial Models Left and Right of the Bunching Window

Variables	(1) Bunching Window 94.5K-107.0K		(2) Bunching Window 95.5K-106.0K		(3) Bunching Window 94.5K-107.5K		(4) Bunching Window 94.5K-103.0K		(5) Bunching Window 94.0K-107.5K	
	Left	Right	Right	Right	Left	Right	Left	Right	Left	Right
	Gross Business Income USD	-0.0000123*** (0.000000851)	0.00000136 (0.00000295)	-0.0000115*** (0.000000771)	0.00000183 (0.00000263)	-0.0000123*** (0.000000851)	0.00000150 (0.00000312)	-0.0000123*** (0.000000851)	0.000000322 (0.00000193)	-0.0000120*** (0.000000896)
Constant	1.062*** (0.0738)	-0.154 (0.335)	1.000*** (0.0671)	-0.206 (0.296)	1.062*** (0.0738)	-0.170 (0.354)	1.062*** (0.0738)	-0.0357 (0.215)	1.040*** (0.0774)	-0.170 (0.354)
RMSE	0.4586	0.4800	0.4576	0.4785	0.4586	0.4796	0.4586	0.4784	0.4594	0.4796
Observations	16,781	2,551	17,710	2,030	16,781	2,551	16,781	2,551	16,336	1,790

Variables	(6) Bunching Window 92.6K-109.5K		(7) Bunching Window 93.5K-109.0K		(8) Bunching Window 92.5K-109.5K		(9) Bunching Window 93.5K-108.0K		(10) Bunching Window 93.0K-109.5K	
	Left	Right	Right	Right	Left	Right	Left	Right	Left	Right
	Gross Business Income USD	-0.0000115*** (0.00000111)	0.00000337 (0.00000411)	-0.0000115*** (0.000000945)	0.00000158 (0.00000378)	-0.0000119*** (0.00000105)	0.00000337 (0.00000411)	-0.0000115*** (0.000000945)	0.00000129 (0.00000328)	-0.0000114*** (0.000000995)
Constant	0.985*** (0.0949)	-0.386 (0.471)	0.992*** (0.0815)	-0.181 (0.432)	1.017*** (0.0897)	-0.386 (0.471)	0.992*** (0.0815)	-0.146 (0.373)	0.977*** (0.0856)	-0.386 (0.471)
RMSE	0.4621	0.4787	0.4608	0.4786	0.4617	0.4787	0.4608	0.4800	0.4616	0.4787
Observations	14,531	1,451	15,883	1,722	15,020	1,451	15,883	1,722	15,450	1,451

Notes: Significance levels are *($p < .10$), **($p < .05$), ***($p < .01$).

D. Tables

Table 11: Number of Personal Taxpayers by Tax Bracket, All Regimes

Bracket	2011–2014	2011–2016	2011	2012	2013	2014	2015	2016
00%	8,808	18,842	1,603	1,959	2,309	2,937	4,867	5,167
05%	3,112	6,285	616	710	848	938	1,560	1,613
10%	2,477	4,845	507	534	649	787	1,138	1,230
12%	2,688	4,863	482	593	726	887	1,104	1,071
15%	6,766	12,116	1,533	1,625	1,678	1,930	2,805	2,545
20%	867	1,672	165	215	239	248	393	412
25%	326	590	63	86	95	82	131	133
30%	0	0	0	0	0	0	0	0
35%	144	144	144	0	0	0	0	0
Observations	25,188	49,357	5,113	5,722	6,544	7,809	11,998	12,171

Note: The observations reported are only those whose Gross Business Income is within USD 20,000 above and below the threshold in 2011–2014, from USD 80,000 to USD 162,500 in 2015, and from USD 80,000 to USD 167,500 in 2016.

Table 12: Donut Estimation

Outcome Variables	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)	
	Bandwidth	Hole	Bandwidth	Hole	Bandwidth	Hole	Bandwidth	Hole	Bandwidth	Hole	Bandwidth	Hole	Bandwidth	Hole	Bandwidth	Hole	Bandwidth	Hole	Bandwidth	Hole	Bandwidth	Hole
Prob. of Taxes > 0	-0.2295*** (0.0096)	NO	-0.2232*** (0.0098)	NO	-0.2219*** (0.0101)	NO	-0.2214*** (0.0104)	NO	-0.2199*** (0.0106)	NO	-0.2155*** (0.0110)	NO	-0.2082*** (0.0114)	NO	-0.2020*** (0.0118)	NO	-0.1974*** (0.0123)	NO	-0.1952*** (0.0128)	NO	-0.1870*** (0.0136)	NO
Covariates																						
Prob. of Taxes > 0	-0.1932*** (0.0096)	YES	-0.1867*** (0.0098)	YES	-0.1849*** (0.0101)	YES	-0.1851*** (0.0103)	YES	-0.1840*** (0.0106)	YES	-0.1805*** (0.0110)	YES	-0.1724*** (0.0113)	YES	-0.1671*** (0.0117)	YES	-0.1620*** (0.0122)	YES	-0.1589*** (0.0127)	YES	-0.1519*** (0.0135)	YES
Covariates																						
Observations	25,186		23,895		22,683		21,601		20,557		19,432		18,366		17,315		16,253		15,113		13,900	
Taxes Paid Among Those Who Pay ¹ , USD	-100.8344** (47.1463)	NO	-102.9024** (48.1481)	NO	-90.0498* (50.5034)	NO	-66.2276 (52.8619)	NO	-39.4167 (55.3677)	NO	-46.2598 (56.7540)	NO	-46.2033 (58.0608)	NO	-67.1491 (59.7663)	NO	-66.1781 (63.2929)	NO	-94.3284 (65.4530)	NO	-64.2728 (69.3687)	NO
Covariates																						
Taxes Paid Among Those Who Pay ¹ , USD	-83.1827* (45.7235)	YES	-80.8691* (46.6959)	YES	-66.1930 (48.9884)	YES	-48.4705 (51.1262)	YES	-25.7391 (53.5016)	YES	-31.1515 (54.9573)	YES	-28.2891 (56.0277)	YES	-38.0412 (57.7397)	YES	-37.3280 (60.9536)	YES	-58.7730 (63.6489)	YES	-46.4137 (67.6151)	YES
Covariates																						
Observations	16,048		15,107		14,228		13,475		12,753		11,980		11,267		10,532		9,818		9,055		8,271	
Taxes Paid ² , USD	-343.2542*** (24.6151)	NO	-336.6450*** (25.1995)	NO	-328.4362*** (26.1509)	NO	-316.5265*** (27.1593)	NO	-302.2555*** (28.2726)	NO	-298.9224*** (28.9691)	NO	-289.1337*** (29.8323)	NO	-290.3687*** (30.6370)	NO	-285.8152*** (32.2911)	NO	-295.6258*** (33.1538)	NO	-273.1634*** (35.3912)	NO
Covariates																						
Taxes Paid ² , USD	-268.3078*** (24.0998)	YES	-258.4906*** (24.6461)	YES	-248.8390*** (25.6023)	YES	-237.4346*** (26.4968)	YES	-224.1807*** (27.5383)	YES	-219.4420*** (28.1942)	YES	-206.5698*** (28.9338)	YES	-204.2875*** (29.7690)	YES	-199.2451*** (31.3037)	YES	-207.4497*** (32.3513)	YES	-195.3983*** (34.5656)	YES
Covariates																						
Observations	25,186		23,895		22,683		21,601		20,557		19,432		18,366		17,315		16,253		15,113		13,900	
Prob. of Tax Bracket=00%	0.2376*** (0.0096)	NO	0.2314*** (0.0098)	NO	0.2301*** (0.0101)	NO	0.2292*** (0.0104)	NO	0.2277*** (0.0107)	NO	0.2229*** (0.0110)	NO	0.2168*** (0.0114)	NO	0.2109*** (0.0118)	NO	0.2065*** (0.0123)	NO	0.2039*** (0.0128)	NO	0.1973*** (0.0136)	NO
Covariates																						
Prob. of Tax Bracket=00%	0.1988*** (0.0096)	YES	0.1926*** (0.0098)	YES	0.1906*** (0.0101)	YES	0.1904*** (0.0103)	YES	0.1893*** (0.0106)	YES	0.1856*** (0.0110)	YES	0.1789*** (0.0113)	YES	0.1736*** (0.0117)	YES	0.1685*** (0.0122)	YES	0.1651*** (0.0127)	YES	0.1596*** (0.0135)	YES
Covariates																						
Observations	25,186		23,895		22,683		21,601		20,557		19,432		18,366		17,315		16,253		15,113		13,900	

Note: This table shows the estimates of the OKAB regime's effect for various outcome variables. All models are estimates of the δ_1 coefficient in equation (1). The covariates included for models labelled *Covariates = YES* are sex, age, years in the tax system, married, single, work at manufacture, trade or professional, province of residence, education and year fixed effects.
¹ Taxes Paid Among Those Who Pay comprises the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax. All the taxpayers with a lower personal income tax outcome are excluded from the estimation.

² Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0.

Table 13: Differences in means at the Bunching Windows USD 1,500 margins

Variables	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)	
	lb: 94.5K	up: 107.0K	lb: 95.5K	up: 106.0K	lb: 94.5K	up: 107.5K	lb: 94.0K	up: 107.5K	lb: 92.0K	up: 109.5K	lb: 93.5K	up: 109.0K	lb: 92.5K	up: 109.5K	lb: 93.5K	up: 108.0K	lb: 92.5K	up: 109.5K	lb: 93.0K	up: 109.5K
Age	0.791 (0.868)	-0.624 (0.909)	0.378 (0.870)	0.506 (0.891)	-0.055 (0.869)	0.783 (0.895)	0.632 (0.874)	0.536 (0.890)	-0.323 (0.849)	0.669 (0.885)										
Years in the tax system	1.852*** (0.580)	0.916 (0.603)	1.478** (0.580)	2.121*** (0.599)	1.421** (0.573)	1.339** (0.603)	1.107* (0.579)	1.150* (0.593)	0.843 (0.561)	1.224** (0.590)										
Single	-0.077* (0.043)	0.006 (0.044)	-0.104** (0.043)	-0.051 (0.044)	-0.106** (0.043)	-0.009 (0.042)	-0.013 (0.042)	0.015 (0.042)	-0.049 (0.041)	-0.000 (0.042)										
Married	0.066 (0.044)	-0.030 (0.045)	0.078* (0.044)	0.028 (0.046)	0.079* (0.044)	0.017 (0.044)	0.031 (0.044)	-0.005 (0.043)	0.043 (0.042)	0.006 (0.044)										
Other Marital Status	0.011 (0.021)	0.025 (0.022)	0.026 (0.021)	0.022 (0.021)	0.028 (0.021)	-0.008 (0.021)	-0.018 (0.020)	-0.010 (0.020)	0.006 (0.020)	-0.006 (0.020)										
Female	0.031 (0.043)	-0.057 (0.043)	0.048 (0.043)	-0.053 (0.044)	0.054 (0.043)	-0.100** (0.042)	-0.069 (0.042)	-0.085** (0.042)	0.027 (0.041)	-0.077* (0.042)										
Sierra	0.039 (0.045)	0.080* (0.046)	0.014 (0.045)	0.062 (0.046)	0.039 (0.045)	-0.020 (0.044)	0.019 (0.044)	-0.021 (0.044)	0.055 (0.043)	-0.002 (0.044)										
Costa	-0.025 (0.045)	-0.066 (0.046)	-0.028 (0.045)	-0.057 (0.046)	-0.053 (0.045)	0.030 (0.044)	0.002 (0.045)	0.038 (0.044)	-0.059 (0.043)	0.018 (0.045)										
Amazon and Galapagos	-0.015 (0.020)	-0.013 (0.022)	0.015 (0.020)	-0.005 (0.020)	0.014 (0.020)	-0.010 (0.018)	-0.021 (0.020)	-0.017 (0.020)	0.003 (0.020)	-0.015 (0.019)										
Manufacture	-0.004 (0.005)	-0.002 (0.003)	-0.004 (0.005)	-0.004 (0.006)	-0.004 (0.005)	-0.003 (0.005)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.003 (0.005)										
Trade	-0.019 (0.017)	-0.011 (0.018)	-0.026 (0.017)	-0.018 (0.018)	-0.029 (0.018)	-0.010 (0.013)	-0.018 (0.017)	-0.010 (0.013)	-0.019 (0.016)	-0.012 (0.014)										
Professional	-0.003 (0.009)	0.008 (0.008)	-0.010 (0.008)	-0.010 (0.009)	-0.014 (0.010)	-0.007 (0.010)	-0.013 (0.009)	-0.004 (0.009)	-0.013 (0.009)	-0.008 (0.011)										
Others	-0.120*** (0.043)	-0.059 (0.044)	-0.155*** (0.043)	-0.090** (0.044)	-0.181*** (0.043)	-0.115*** (0.043)	-0.123*** (0.043)	-0.110** (0.043)	-0.173*** (0.041)	-0.105** (0.043)										
Gross Business Income, USD	14,026,970*** (38,722)	12,032,500*** (39,610)	14,515,593*** (38,810)	9,957,575*** (40,000)	15,015,293*** (39,671)	19,010,233*** (37,705)	16,971,108*** (39,000)	18,517,920*** (39,172)	16,035,633*** (37,842)	18,018,990*** (37,967)										
% With Income Tax>0	-0.295*** (0.039)	-0.266*** (0.041)	-0.299*** (0.039)	-0.328*** (0.040)	-0.286*** (0.040)	-0.248*** (0.041)	-0.302*** (0.040)	-0.272*** (0.040)	-0.324*** (0.039)	-0.267*** (0.040)										
Taxes Paid, USD	-376.079*** (137,211)	-169.538 (146,015)	-449.581*** (136,301)	-534.073*** (138,382)	-408.997*** (129,621)	-330.256** (128,825)	-409.242*** (114,018)	-357.573*** (129,207)	-394.649*** (111,128)	-345.922*** (126,760)										
Taxes Paid ATWP, USD	-19,073 (213,959)	365.351 (228,995)	-166.287 (213,571)	-288.449 (223,900)	-134.133 (203,554)	-72.500 (210,128)	-175.453 (186,302)	-70.163 (208,191)	-89.991 (186,342)	-63.171 (204,279)										
% in Tax Bracket 00%	0.300*** (0.039)	0.270*** (0.041)	0.304*** (0.039)	0.332*** (0.040)	0.289*** (0.039)	0.254*** (0.041)	0.306*** (0.040)	0.277*** (0.040)	0.328*** (0.038)	0.271*** (0.040)										

Note: The bunching windows margins are defined as the space below USD 1,500 from the bunching window lower bound and USD 1,500 above the bunching window upper bound. For example, the bunching window 2 margin is defined as the space between USD 95,500 and 106,000 in Gross Business Income. This case considers all taxpayers who lie inside the intervals [94,000;95,500] and [106,000;107,500] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. The margins are defined for all the bunching windows defined in Table 4.

Online Appendix

A. Balance tables at Bunching Windows Margins

A.1 Bunching Window 1, USD USD 94,500 – 107,000

Table 14: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 94,500 – 107,000				
Margins: USD 93,000 – 94,500 and USD 107,000 – 108,500				
Variables	(1)	(2)	(3)	Observations
	Simple lb:93.0K up:94.5K	OKAB lb: 107.0K up: 108.5K	Diff. (2-1)	
Age	41.709 (9.690)	42.500 (9.479)	0.791 (0.868)	1,369
Years in the tax system ¹	9.018 (6.438)	10.870 (6.669)	1.852*** (0.580)	1,369
Single	0.366 (0.482)	0.290 (0.455)	-0.077* (0.043)	1,369
Married	0.579 (0.494)	0.645 (0.480)	0.066 (0.044)	1,369
Other Marital Status ²	0.054 (0.227)	0.065 (0.248)	0.011 (0.021)	1,369
Female	0.361 (0.480)	0.391 (0.490)	0.031 (0.043)	1,369
Region: Sierra ³	0.453 (0.498)	0.493 (0.502)	0.039 (0.045)	1,369
Region: Costa ⁴	0.496 (0.500)	0.471 (0.501)	-0.025 (0.045)	1,369
Region: Amazon and Galapagos ⁵	0.051 (0.220)	0.036 (0.188)	-0.015 (0.020)	1,369
Sector: Manufacture	0.004 (0.064)	0.000 (0.000)	-0.004 (0.005)	1,369
Sector: Trade	0.041 (0.197)	0.022 (0.146)	-0.019 (0.017)	1,369
Sector: Professional	0.010 (0.098)	0.007 (0.085)	-0.003 (0.009)	1,369
Sector: Others	0.359 (0.480)	0.239 (0.428)	-0.120*** (0.043)	1,369
Gross Business Income, USD	93,757 (431)	107,784 (436)	14,027*** (39)	1,369
% With Income Tax>0	0.766 (0.424)	0.471 (0.501)	-0.295*** (0.039)	1,369
Taxes Paid ⁶ , USD	953 (1,549)	577 (1,327)	-376*** (137)	1,369
Taxes Paid Among Those Who Pay ⁷ , USD	1,244 (1,665)	1,225 (1,721)	-19 (214)	1,008
% in Tax Bracket 00%	0.229 (0.420)	0.529 (0.501)	0.300*** (0.039)	1,369
Observations	1,231	138	1,369	.

Note: Bunching Window 1 is defined as the space between USD 94,500 and 107,000 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [93,000;94,500) and (107,000;108,500] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

A.2 Bunching Window 2, USD 95,500 – 106,000

Table 15: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 95,500 – 106,000					
Margins: USD 94,000 – 95,500 and USD 106,000 – 107,500					
Variables	(1)	(2)	(3)	Diff. (2-1)	Observations
	Simple lb: 94.0K up: 95.5k	OKAB lb: 106.0K up: 107.5K			
Age	41.508 (9.967)	40.884 (8.475)	-0.624 (0.909)		1,414
Years in the tax system ¹	8.984 (6.628)	9.899 (5.494)	0.916 (0.603)		1,414
Single	0.343 (0.475)	0.349 (0.478)	0.006 (0.044)		1,414
Married	0.596 (0.491)	0.566 (0.498)	-0.030 (0.045)		1,414
Other Marital Status ²	0.061 (0.239)	0.085 (0.280)	0.025 (0.022)		1,414
Female	0.328 (0.470)	0.271 (0.446)	-0.057 (0.043)		1,414
Region: Sierra ³	0.455 (0.498)	0.535 (0.501)	0.080* (0.046)		1,414
Region: Costa ⁴	0.485 (0.500)	0.419 (0.495)	-0.066 (0.046)		1,414
Region: Amazon and Galapagos ⁵	0.060 (0.237)	0.047 (0.211)	-0.013 (0.022)		1,414
Sector: Manufacture	0.002 (0.039)	0.000 (0.000)	-0.002 (0.003)		1,414
Sector: Trade	0.042 (0.201)	0.031 (0.174)	-0.011 (0.018)		1,414
Sector: Professional	0.008 (0.088)	0.016 (0.124)	0.008 (0.008)		1,414
Sector: Others	0.346 (0.476)	0.287 (0.454)	-0.059 (0.044)		1,414
Gross Business Income, USD	94,751 (427)	106,783 (452)	12,033*** (40)		1,414
% With Income Tax>0	0.739 (0.439)	0.473 (0.501)	-0.266*** (0.041)		1,414
Taxes Paid ⁶ , USD	950 (1,585)	780 (1,541)	-170 (146)		1,414
Taxes Paid Among Those Who Pay ⁷ , USD	1,285 (1,723)	1,650 (1,900)	365 (229)		1,011
% in Tax Bracket 00%	0.257 (0.437)	0.527 (0.501)	0.270*** (0.041)		1,414
Observations	1,285	129	1,414		.

Note: Bunching Window 2 is defined as the space between USD 95,500 and 106,000 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [94,000;95,500) and (106,000;107,500] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

A.3 Bunching Window 3: USD 94,500 – 107,500

Table 16: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 94,500 – 107,500				
Margins: USD 93,000 – 94,500 and USD 107,500 – 109,000				
Variables	(1)	(2)	(3)	Observations
	Simple lb: 93.0K up: 94.5K	OKAB lb: 107.5K up: 109.0K	Diff. (2-1)	
Age	41.709 (9.690)	42.088 (9.330)	0.378 (0.870)	1,368
Years in the tax system ¹	9.018 (6.438)	10.496 (6.483)	1.478** (0.580)	1,368
Single	0.366 (0.482)	0.263 (0.442)	-0.104** (0.043)	1,368
Married	0.579 (0.494)	0.657 (0.476)	0.078* (0.044)	1,368
Other Marital Status ²	0.054 (0.227)	0.080 (0.273)	0.026 (0.021)	1,368
Female	0.361 (0.480)	0.409 (0.493)	0.048 (0.043)	1,368
Region: Sierra ³	0.453 (0.498)	0.467 (0.501)	0.014 (0.045)	1,368
Region: Costa ⁴	0.496 (0.500)	0.467 (0.501)	-0.028 (0.045)	1,368
Region: Amazon and Galapagos ⁵	0.051 (0.220)	0.066 (0.249)	0.015 (0.020)	1,368
Sector: Manufacture	0.004 (0.064)	0.000 (0.000)	-0.004 (0.005)	1,368
Sector: Trade	0.041 (0.197)	0.015 (0.120)	-0.026 (0.017)	1,368
Sector: Professional	0.010 (0.098)	0.000 (0.000)	-0.010 (0.008)	1,368
Sector: Others	0.359 (0.480)	0.204 (0.405)	-0.155*** (0.043)	1,368
Gross Business Income, USD	93,757 (431)	108,273 (431)	14,516*** (39)	1,368
% With Income Tax>0	0.766 (0.424)	0.467 (0.501)	-0.299*** (0.039)	1,368
Taxes Paid ⁶ , USD	953 (1,549)	504 (1,138)	-450*** (136)	1,368
Taxes Paid Among Those Who Pay ⁷ , USD	1,244 (1,665)	1,078 (1,471)	-166 (214)	1,007
% in Tax Bracket 00%	0.229 (0.420)	0.533 (0.501)	0.304*** (0.039)	1,368
Observations	1,231	137	1,368	.

Note: Bunching Window 3 is defined as the space between USD 94,500 and 107,500 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [93,000;94,500) and (107,500;109,000] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

A.4 Bunching Window 4: USD 94,500 – 103,000

Table 17: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 94,500 – 103,000				
Margins: USD 93,000 – 94,500 and USD 103,000 – 104,500				
Variables	(1)	(2)	(3)	Observations
	Simple lb: 93.0K up: 94.5K	OKAB lb: 103.0K up: 104.5K	Diff. (2-1)	
Age	41.709 (9.690)	42.215 (9.382)	0.506 (0.891)	1,361
Years in the tax system ¹	9.018 (6.438)	11.138 (7.014)	2.121*** (0.599)	1,361
Single	0.366 (0.482)	0.315 (0.466)	-0.051 (0.044)	1,361
Married	0.579 (0.494)	0.608 (0.490)	0.028 (0.046)	1,361
Other Marital Status ²	0.054 (0.227)	0.077 (0.268)	0.022 (0.021)	1,361
Female	0.361 (0.480)	0.308 (0.463)	-0.053 (0.044)	1,361
Region: Sierra ³	0.453 (0.498)	0.515 (0.502)	0.062 (0.046)	1,361
Region: Costa ⁴	0.496 (0.500)	0.438 (0.498)	-0.057 (0.046)	1,361
Region: Amazon and Galapagos ⁵	0.051 (0.220)	0.046 (0.211)	-0.005 (0.020)	1,361
Sector: Manufacture	0.004 (0.064)	0.000 (0.000)	-0.004 (0.006)	1,361
Sector: Trade	0.041 (0.197)	0.023 (0.151)	-0.018 (0.018)	1,361
Sector: Professional	0.010 (0.098)	0.000 (0.000)	-0.010 (0.009)	1,361
Sector: Others	0.359 (0.480)	0.269 (0.445)	-0.090** (0.044)	1,361
Gross Business Income, USD	93,757 (431)	103,715 (460)	9,958*** (40)	1,361
% With Income Tax>0	0.766 (0.424)	0.438 (0.498)	-0.328*** (0.040)	1,361
Taxes Paid ⁶ , USD	953 (1,549)	419 (913)	-534*** (138)	1,361
Taxes Paid Among Those Who Pay ⁷ , USD	1,244 (1,665)	956 (1,182)	-288 (224)	1,000
% in Tax Bracket 00%	0.229 (0.420)	0.562 (0.498)	0.332*** (0.040)	1,361
Observations	1,231	130	1,361	.

Note: Bunching Window 4 is defined as the space between USD 94,500 and 103,500 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [93,000;94,500) and (103,000;104,500] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

A.5 Bunching Window 5: USD 94,000 – 107,500

Table 18: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 94,000 – 107,500				
Margins: USD 92,500 – 94,000 and USD 107,500 – 109,000				
Variables	(1)	(2)	(3)	Observations
	Simple lb: 92.5K up: 94.0K	OKAB lb: 107.5K up: 109.0K	Diff. (2-1)	
Age	42.143 (9.682)	42.088 (9.330)	-0.055 (0.869)	1,351
Years in the tax system ¹	9.075 (6.343)	10.496 (6.483)	1.421** (0.573)	1,351
Single	0.369 (0.483)	0.263 (0.442)	-0.106** (0.043)	1,351
Married	0.578 (0.494)	0.657 (0.476)	0.079* (0.044)	1,351
Other Marital Status ²	0.053 (0.224)	0.080 (0.273)	0.028 (0.021)	1,351
Female	0.355 (0.479)	0.409 (0.493)	0.054 (0.043)	1,351
Region: Sierra ³	0.428 (0.495)	0.467 (0.501)	0.039 (0.045)	1,351
Region: Costa ⁴	0.520 (0.500)	0.467 (0.501)	-0.053 (0.045)	1,351
Region: Amazon and Galapagos ⁵	0.052 (0.222)	0.066 (0.249)	0.014 (0.020)	1,351
Sector: Manufacture	0.004 (0.064)	0.000 (0.000)	-0.004 (0.005)	1,351
Sector: Trade	0.044 (0.204)	0.015 (0.120)	-0.029 (0.018)	1,351
Sector: Professional	0.014 (0.118)	0.000 (0.000)	-0.014 (0.010)	1,351
Sector: Others	0.386 (0.487)	0.204 (0.405)	-0.181*** (0.043)	1,351
Gross Business Income, USD	93,258 (441)	108,273 (431)	15,015*** (40)	1,351
% With Income Tax>0	0.753 (0.432)	0.467 (0.501)	-0.286*** (0.040)	1,351
Taxes Paid ⁶ , USD	913 (1,468)	504 (1,138)	-409*** (130)	1,351
Taxes Paid Among Those Who Pay ⁷ , USD	1,212 (1,581)	1,078 (1,471)	-134 (204)	978
% in Tax Bracket 00%	0.244 (0.430)	0.533 (0.501)	0.289*** (0.039)	1,351
Observations	1,214	137	1,351	.

Note: Bunching Window 5 is defined as the space between USD 94,000 and 107,500 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [92,500;94,000) and (107,500;109,000] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

A.6 Bunching Window 6: USD 92,000 – 109,500

Table 19: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 92,000 – 109,500				
Margins: USD 90,500 – 92,000 and USD 109,500 – 111,000				
Variables	(1)	(2)	(3)	Observations
	Simple lb: 90.5K up: 92.0K	OKAB lb: 109.5 up: 111.0K	Diff. (2-1)	
Age	42.203 (10.115)	42.986 (9.640)	0.783 (0.895)	1,466
Years in the tax system ¹	8.997 (6.828)	10.336 (6.310)	1.339** (0.603)	1,466
Single	0.351 (0.478)	0.343 (0.476)	-0.009 (0.042)	1,466
Married	0.590 (0.492)	0.607 (0.490)	0.017 (0.044)	1,466
Other Marital Status ²	0.058 (0.234)	0.050 (0.219)	-0.008 (0.021)	1,466
Female	0.357 (0.479)	0.257 (0.439)	-0.100** (0.042)	1,466
Region: Sierra ³	0.463 (0.499)	0.443 (0.499)	-0.020 (0.044)	1,466
Region: Costa ⁴	0.492 (0.500)	0.521 (0.501)	0.030 (0.044)	1,466
Region: Amazon and Galapagos ⁵	0.045 (0.208)	0.036 (0.186)	-0.010 (0.018)	1,466
Sector: Manufacture	0.003 (0.055)	0.000 (0.000)	-0.003 (0.005)	1,466
Sector: Trade	0.024 (0.154)	0.014 (0.119)	-0.010 (0.013)	1,466
Sector: Professional	0.014 (0.119)	0.007 (0.085)	-0.007 (0.010)	1,466
Sector: Others	0.379 (0.485)	0.264 (0.443)	-0.115*** (0.043)	1,466
Gross Business Income, USD	91,242 (423)	110,253 (440)	19,010*** (38)	1,466
% With Income Tax>0	0.705 (0.456)	0.457 (0.500)	-0.248*** (0.041)	1,466
Taxes Paid ⁶ , USD	845 (1,482)	515 (1,092)	-330** (129)	1,466
Taxes Paid Among Those Who Pay ⁷ , USD	1,198 (1,641)	1,126 (1,390)	-72 (210)	999
% in Tax Bracket 00%	0.289 (0.453)	0.543 (0.500)	0.254*** (0.041)	1,466
Observations	1,326	140	1,466	.

Note: Bunching Window 6 is defined as the space between USD 92,000 and 109,500 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [90,500;92,000) and (109,500;111,000] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

A.7 Bunching Window 7: USD 93,500 – 109,000

Table 20: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 93,500 – 109,000				
Margins: USD 92,000 – 93,500 and USD 109,000 – 110,500				
Variables	(1)	(2)	(3)	Observations
	Simple lb: 92.0K up: 93.5K	OKAB lb: 109.0K up: 110.5K	Diff. (2-1)	
Age	42.396 (9.796)	43.029 (9.864)	0.632 (0.874)	1,387
Years in the tax system ¹	9.250 (6.522)	10.357 (6.310)	1.107* (0.579)	1,387
Single	0.349 (0.477)	0.336 (0.474)	-0.013 (0.042)	1,387
Married	0.597 (0.491)	0.629 (0.485)	0.031 (0.044)	1,387
Other Marital Status ²	0.054 (0.226)	0.036 (0.186)	-0.018 (0.020)	1,387
Female	0.340 (0.474)	0.271 (0.446)	-0.069 (0.042)	1,387
Region: Sierra ³	0.438 (0.496)	0.457 (0.500)	0.019 (0.044)	1,387
Region: Costa ⁴	0.505 (0.500)	0.507 (0.502)	0.002 (0.045)	1,387
Region: Amazon and Galapagos ⁵	0.057 (0.232)	0.036 (0.186)	-0.021 (0.020)	1,387
Sector: Manufacture	0.002 (0.049)	0.000 (0.000)	-0.002 (0.004)	1,387
Sector: Trade	0.039 (0.194)	0.021 (0.145)	-0.018 (0.017)	1,387
Sector: Professional	0.013 (0.113)	0.000 (0.000)	-0.013 (0.010)	1,387
Sector: Others	0.380 (0.486)	0.257 (0.439)	-0.123*** (0.043)	1,387
Gross Business Income, USD	92,722 (438)	109,693 (434)	16,971*** (39)	1,387
% With Income Tax>0	0.738 (0.440)	0.436 (0.498)	-0.302*** (0.040)	1,387
Taxes Paid ⁶ , USD	813 (1,308)	404 (990)	-409*** (114)	1,387
Taxes Paid Among Those Who Pay ⁷ , USD	1,102 (1,414)	926 (1,333)	-175 (186)	981
% in Tax Bracket 00%	0.258 (0.438)	0.564 (0.498)	0.306*** (0.040)	1,387
Observations	1,247	140	1,387	.

Note: Bunching Window 7 is defined as the space between USD 93,500 and 109,000 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [92,000;93,500) and (109,000;110,500] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

A.8 Bunching Window 8: USD 92,500 – 109,500

Table 21: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 92,500 – 109,500				
Margins: USD 91,000 – 92,500 and USD 109,500 – 111,000				
Variables	(1)	(2)	(3)	Observations
	Simple lb: 91.0K up: 92.5K	OKAB lb: 109.5K up: 111.0K	Diff. (2-1)	
Age	42.450 (10.063)	42.986 (9.640)	0.536 (0.890)	1,496
Years in the tax system ¹	9.186 (6.722)	10.336 (6.310)	1.150* (0.593)	1,496
Single	0.327 (0.469)	0.343 (0.476)	0.015 (0.042)	1,496
Married	0.612 (0.487)	0.607 (0.490)	-0.005 (0.043)	1,496
Other Marital Status ²	0.060 (0.238)	0.050 (0.219)	-0.010 (0.021)	1,496
Female	0.342 (0.475)	0.257 (0.439)	-0.085** (0.042)	1,496
Region: Sierra ³	0.464 (0.499)	0.443 (0.499)	-0.021 (0.044)	1,496
Region: Costa ⁴	0.483 (0.500)	0.521 (0.501)	0.038 (0.044)	1,496
Region: Amazon and Galapagos ⁵	0.053 (0.224)	0.036 (0.186)	-0.017 (0.020)	1,496
Sector: Manufacture	0.002 (0.047)	0.000 (0.000)	-0.002 (0.004)	1,496
Sector: Trade	0.024 (0.154)	0.014 (0.119)	-0.010 (0.013)	1,496
Sector: Professional	0.011 (0.105)	0.007 (0.085)	-0.004 (0.009)	1,496
Sector: Others	0.374 (0.484)	0.264 (0.443)	-0.110** (0.043)	1,496
Gross Business Income, USD	91,735 (441)	110,253 (440)	18,518*** (39)	1,496
% With Income Tax>0	0.729 (0.444)	0.457 (0.500)	-0.272*** (0.040)	1,496
Taxes Paid ⁶ , USD	872 (1,488)	515 (1,092)	-358*** (129)	1,496
Taxes Paid Among Those Who Pay ⁷ , USD	1,196 (1,627)	1,126 (1,390)	-70 (208)	1,053
% in Tax Bracket 00%	0.265 (0.442)	0.543 (0.500)	0.277*** (0.040)	1,496
Observations	1,356	140	1,496	.

Note: Bunching Window 8 is defined as the space between USD 92,500 and 109,500 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [91,000;92,500) and (109,500;111,000] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

A.9 Bunching Window 9: USD 93,500 – 108,000

Table 22: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 93,500 – 108,000				
Margins: USD 92,000 – 93,500 and USD 108,000 – 109,500				
Variables	(1)	(2)	(3)	Observations
	Simple lb: 92.0K up: 93.5K	OKAB lb: 108.0K up: 109.5K	Diff. (2-1)	
Age	42.396 (9.796)	42.073 (10.054)	-0.323 (0.849)	1,397
Years in the tax system ¹	9.250 (6.522)	10.093 (6.243)	0.843 (0.561)	1,397
Single	0.349 (0.477)	0.300 (0.460)	-0.049 (0.041)	1,397
Married	0.597 (0.491)	0.640 (0.482)	0.043 (0.042)	1,397
Other Marital Status ²	0.054 (0.226)	0.060 (0.238)	0.006 (0.020)	1,397
Female	0.340 (0.474)	0.367 (0.484)	0.027 (0.041)	1,397
Region: Sierra ³	0.438 (0.496)	0.493 (0.502)	0.055 (0.043)	1,397
Region: Costa ⁴	0.505 (0.500)	0.447 (0.499)	-0.059 (0.043)	1,397
Region: Amazon and Galapagos ⁵	0.057 (0.232)	0.060 (0.238)	0.003 (0.020)	1,397
Sector: Manufacture	0.002 (0.049)	0.000 (0.000)	-0.002 (0.004)	1,397
Sector: Trade	0.039 (0.194)	0.020 (0.140)	-0.019 (0.016)	1,397
Sector: Professional	0.013 (0.113)	0.000 (0.000)	-0.013 (0.009)	1,397
Sector: Others	0.380 (0.486)	0.207 (0.406)	-0.173*** (0.041)	1,397
Gross Business Income, USD	92,722 (438)	108,758 (437)	16,036*** (38)	1,397
% With Income Tax>0	0.738 (0.440)	0.413 (0.494)	-0.324*** (0.039)	1,397
Taxes Paid ⁶ , USD	813 (1,308)	418 (1,089)	-395*** (111)	1,397
Taxes Paid Among Those Who Pay ⁷ , USD	1,102 (1,414)	1,012 (1,511)	-90 (186)	982
% in Tax Bracket 00%	0.258 (0.438)	0.587 (0.494)	0.328*** (0.038)	1,397
Observations	1,247	150	1,397	.

Note: Bunching Window 9 is defined as the space between USD 93,500 and 108,000 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [92,000;93,500) and (108,000;109,500] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.

A.10 Bunching Window 10: USD 93,000 – 109,500

Table 23: Socio-Demographic Attributes by Tax Regime at USD 1,500 margins from the Bunching Window

Bunching Window: USD 93,000 – 109,500				
Margins: USD 91,500 – 93,000 and USD 109,500 – 111,000				
Variables	(1)	(2)	(3)	Observations
	Simple lb: 91.5K up: 93.0K	OKAB lb: 109.5K up: 111.0K	Diff. (2-1)	
Age	42.317 (9.972)	42.986 (9.640)	0.669 (0.885)	1,411
Years in the tax system ¹	9.112 (6.659)	10.336 (6.310)	1.224** (0.590)	1,411
Single	0.343 (0.475)	0.343 (0.476)	-0.000 (0.042)	1,411
Married	0.601 (0.490)	0.607 (0.490)	0.006 (0.044)	1,411
Other Marital Status ²	0.056 (0.230)	0.050 (0.219)	-0.006 (0.020)	1,411
Female	0.334 (0.472)	0.257 (0.439)	-0.077* (0.042)	1,411
Region: Sierra ³	0.445 (0.497)	0.443 (0.499)	-0.002 (0.044)	1,411
Region: Costa ⁴	0.504 (0.500)	0.521 (0.501)	0.018 (0.045)	1,411
Region: Amazon and Galapagos ⁵	0.051 (0.220)	0.036 (0.186)	-0.015 (0.019)	1,411
Sector: Manufacture	0.003 (0.056)	0.000 (0.000)	-0.003 (0.005)	1,411
Sector: Trade	0.027 (0.161)	0.014 (0.119)	-0.012 (0.014)	1,411
Sector: Professional	0.015 (0.121)	0.007 (0.085)	-0.008 (0.011)	1,411
Sector: Others	0.369 (0.483)	0.264 (0.443)	-0.105** (0.043)	1,411
Gross Business Income, USD	92,234 (425)	110,253 (440)	18,019*** (38)	1,411
% With Income Tax>0	0.724 (0.447)	0.457 (0.500)	-0.267*** (0.040)	1,411
Taxes Paid ⁶ , USD	860 (1,455)	515 (1,092)	-346*** (127)	1,411
Taxes Paid Among Those Who Pay ⁷ , USD	1,189 (1,592)	1,126 (1,390)	-63 (204)	984
% in Tax Bracket 00%	0.271 (0.445)	0.543 (0.500)	0.271*** (0.040)	1,411
Observations	1,271	140	1,411	.

Note: Bunching Window 10 is defined as the space between USD 93,000 and 109,500 in Gross Business Income. This table considers all taxpayers who lie inside the intervals [91,500;93,000) and (109,500;111,000] corresponding to a USD 1,500 margin below and above the bunching window lower and upper bounds. 1. Taxpayer's years in the tax system, which is the difference between the tax form year and the taxpayer's first registered year. 2. Other Marital Status include divorced, widowed, and free union. 3. Sierra includes Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Bolívar, Chimborazo, Cañar, Azuay, and Loja provinces, all of which are located in the highland center of the country. 4. Costa includes Esmeraldas, Manabí, Santo Domingo de los Tsáchilas, Los Ríos, Guayas, Santa Elena, and El Oro provinces. Costa region sites are in the Pacific coast side of the country, west of the highlands. 5. Amazon and Galápagos include Sucumbíos, Napo, Orellana, Pastaza, Morona Santiago, Zamora Chinchipe, and Galápagos provinces, all of which, except for Galápagos, an archipelago in the Pacific Ocean, are located east of the highlands. 6. Taxes Paid refers to tax paid by self-employed individuals, including those who paid USD 0. 7. Taxes Paid Among Those Who Pay comprise the dollar amount of taxes paid among self-employed individuals who pay more than USD 5 in personal income tax.