Senior Tax Benefits and Tax Burden: Evidence from Honduras.*

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Abstract

This study examines the impact of senior tax benefits on the tax burden by analyzing two policies that provide tax relief through additional deductions for senior taxpayers aged 60 and 65 or older. Using a regression discontinuity design (RDD) to estimate causal effects at policy cutoffs, we find that the increased deductions lead to a direct reduction in the tax burden. Additionally, we observe a behavioral response, with beneficiaries reporting higher "profits" even before utilizing the deduction, primarily driven by taxpayers reporting income from independent professional activities and services. These findings, derived from the complete dataset of Personal Income Tax (PIT) records in Honduras, are particularly significant in the context of global population aging and the pressing need for effective tax collection strategies.

Keywords: Deductions, income taxes, administrative data, Honduras.
JEL codes: H21, H24, H31.

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1 Introduction

The global population is aging at a fast rate. According to the World Health Organization (WHO), in 2020, the number of people aged 60 years and older surpassed that of children under five, and this demographic shift is expected to accelerate. By 2050, the global population aged 60 years and older is projected to double, reaching 2.1 billion, while the number of individuals aged 80 years and older is anticipated to triple, rising to 426 million[1]. This trend underscores the growing importance of policies that support the well-being of senior citizens, particularly in areas such as taxation, healthcare, financial stability, housing, and social engagement.

Among these, taxation policies aimed at alleviating the financial burden on seniors are particularly significant. These measures typically focus on reducing the tax liability of older adults, acknowledging the unique financial challenges they face, such as living on fixed incomes. Common strategies include income tax exemptions, property tax relief, capital gains tax breaks, healthcare-related tax deductions, and tax credits.

Even though taxation policies play a crucial role in reducing the financial pressures faced by senior citizens, understanding their broader implications remains an important area of inquiry. This research seeks to address the question: What is the impact of senior tax benefit policies on this segment of the population? Various studies have examined similar policies in different contexts. For example (Brewer et al., 2023) analyze the effects of state income tax provisions for the elderly on economic growth, concluding that these tax breaks primarily benefit upper-income seniors and have limited impact on state economic growth. (Camp & Lockhart, 2013) highlight the financial relief these policies provide to seniors while discussing the potential fiscal challenges they pose for state budgets. (McNichol, 2019) calls for means-testing tax benefits to ensure they target those most in need, thereby optimizing resource allocation. Additionally, (Felix & Watkins, 2013) suggest that as retirees earn and spend less, the aging population will likely lead to a decline in income and sales tax revenue for governments.

Building on this body of literature, this study examines the impact of senior tax benefits on

[1]World Health Organization, October 1, 2024: Ageing and Health - WHO Fact Sheet.

tax burdens and behavioral responses using a unique dataset from Honduras. A Regression Discontinuity Design (RDD) approach is employed to analyze policy cutoffs using personal income tax (PIT) records for the period 2003-2022. The analysis focuses on two specific policies designed to provide tax relief for senior taxpayers: an additional tax deduction introduced in 2002 for individuals aged 65 or older, which became automatic and added an extra deduction in 2020, and an automatic additional medical tax deduction introduced in 2007 for individuals aged 60 or older.

While RDD has been widely applied to evaluate various tax policies, its use in studying senior tax relief policies remains limited. This paper contributes to the literature by addressing this gap and providing causal evidence on the effects of senior tax benefits in the Honduran context.

The findings reveal that the additional tax deductions result in a corresponding reduction in the tax burden for eligible taxpayers. Furthermore, a behavioral response is observed, with beneficiaries reporting an increase in "profit" even before utilizing the deductions. Analyzing taxpayers by income source, we find that this response is primarily driven by those reporting income as independent professionals and services.

These insights suggest that tax benefits not only alleviate financial burdens but may also influence taxpayer behavior. Studies, like (Slemrod, 1982) and (Feldstein, 1995) have examined how exemptions and non-standard deductions influence taxable income through tax planning activities in PIT.

Behavioral responses similar to those observed in this study could partially account for the differences in PIT collection between a developing country like Honduras and a developed one. In the context of Latin America and the Caribbean (LAC), taxation structures present unique challenges. According to the Organization for Economic Cooperation and Development (OECD)[2], LAC countries rely heavily on taxes on goods and services, which accounted for 50.3% of total tax revenues in 2018, compared to 32.7% in OECD countries. Conversely, personal income taxes represented only 9.2% of total tax revenues in LAC, significantly lower than the OECD average of 23.5%. This disparity highlights the potential to increase tax collection through better enforce-

[2]OECD: Revenue Statistics 2024 and Revenue Statistics in Latin America and the Caribbean 2024

ment of personal income tax systems.

Given the accelerating pace of global population aging, and the tax collection challenges in LAC countries, these results provide valuable evidence for designing policies to address the financial challenges faced by senior citizens and to strengthen tax collection through PIT. By filling a gap in the literature on the use of RDD to evaluate senior tax relief policies, this study contributes to the broader understanding of how targeted tax benefits impact economic outcomes for aging populations.

This paper is structured as follows: Section 2 provides an overview of the institutional background of the Honduran PIT system, along with a detailed description of the dataset used and an explanation of the two policies analyzed. Section 3 discusses the empirical framework, including the identification strategy and estimation approach employed to evaluate the causal impact of senior tax benefits. The results of the analysis are also presented and interpreted in this section. Finally, Section 4 concludes by summarizing the key findings, discussing their broader implications for policy design in developing countries, and suggesting potential directions for future research.

2 Institutional context and Data

2.1 Honduran PIT system

As is common in developing countries, tax collection in Honduras relies significantly on indirect taxation, which has historically accounted for more than 60% of total tax revenue. According to the OECD, Personal Income Tax (PIT) in Honduras accounted for 11% of total tax revenue and 2.3% of GDP in 2022, compared to 24% and 8.2%, respectively, in OECD countries.

The Honduran PIT system is based on a dual income taxation framework, separating taxes on labor income from those on capital income. Labor income, including earnings from employment and income generated by individuals engaged in independent economic activities (such as professional services or self-employment), is taxed under the PIT system. Capital income—such

as dividends, rental income, interest, and capital gains—is taxed separately at a definitive rate of 10%.

Individuals income from independent economic activities is subject to the PIT system. The tax framework distinguishes between the legal forms of taxpayers—corporate entities versus individuals—despite the similar economic nature of their activities, such as business operations. Furthermore, the Honduran tax system is strictly individual-based, with no provision for joint filing. Taxable income is subject to a progressive marginal tax rate structure of 0%, 15%, 20%, and 25%. The 0% rate applies to a tax-exempt threshold (exemption base), which is adjusted annually to reflect inflation—a policy in place since 2016 to maintain alignment with economic conditions. Individuals earning below the tax-exempt threshold are not required to file tax returns. Similarly, wage earners are generally exempt from filing unless their tax liability is not fully withheld by their employer or they have additional sources of income.

2.2 Data

We utilize a granular administrative dataset for our analysis, comprising the complete universe of PIT records for the period 2003–2022, provided by the Tax Administration of Honduras. This dataset includes detailed information on various income components, standard deductions, itemized deductions, profits, tax bases, credits, tax liabilities, balance sheets, and more. After excluding taxpayers whose ages fall outside the scope of analysis, the dataset consists of 445,988 observations representing 85,930 unique taxpayer identifiers.

The dataset captures various sources of income, allowing us to distinguish taxpayers based on categories such as business activities, services, wages, independent professional income, leases, non-banking interest, and other income sources.

Although the dataset represents an unbalanced panel, we conduct the RDD analysis separately for each year and report the results on a yearly basis. This approach eliminates the need to control for time-dependent unobserved factors (e.g., individual heterogeneity) that may affect the data distribution independently across time.

This paper examines two policies designed to provide tax relief to senior taxpayers. The first policy, introduced in 2002 with a major revision in 2020 (referred to as "Policy 1"), is analyzed for the period 2019–2022. The second policy, introduced in 2007 (referred to as "Policy 2"), is examined for the period 2005–2009.

Even though the dataset contains outliers and missing values in some cells, there is no need to exclude observations for the main results because the primary method of analysis is non-parametric. For behavioral responses, however, we restricted the sample to include only positive values for certain variables of interest.

Table 6 provides general descriptive statistics for the population of personal income taxpayers included in the analysis.

2.3 Reforms

Policy 1: *L350,000 deduction became automatic + L40,000 automatic medical/educational deduction for taxpayers aged 65 or older.*

Introduced in 2002 through Decree 194-2002, taxpayers aged 65 or older with a gross income of up to L. 350,000 ($14.2K), who had paid taxes in accordance with the PIT law for five consecutive fiscal periods, became exempt from paying this tax starting from the enactment of the Decree. However, the application of the benefit required an authorizing administrative procedure.

Acknowledging the challenges posed by the complex process, Decree 59-2020 was enacted in 2020, making the benefit automatic for taxpayers aged 65 or older. This reform also introduced an additional medical and educational deduction of L. 40,000 ($1.6k) for individuals aged 65 or older, bringing the total medical and educational deduction for this segment of taxpayers to L. 110,000.

Figure 1 illustrates the gap between eligible individuals and beneficiaries over each year in the period. Before 2020, only a small proportion of eligible taxpayers received the benefit, and this proportion declined over time, dropping from approximately 25% in 2010 to less than 10% by 2019. Even in 2020, when the benefit became automatic, some eligible individuals still did not receive

it. By 2021 and 2022, however, only a small number of eligible taxpayers (9 and 7, respectively) remained without the benefit. These 9 and 7 observations were excluded in 2021 and 2022 to run a sharp design for those years. The non-negligible imperfect compliance observed in 2020 reflects a period of adaptation for the tax administration to implement the policy change. Additionally, since 2013, no taxpayers under the age of 65 have received the benefit (though a few did each year before 2013).

In Honduras, a deduction for health care and education is allowed, treated as a non-itemized deduction with a standard amount of L. 40,000 (L20,000 before 2009) for all individuals. An additional deduction of L. 30,000 is granted to taxpayers aged 60 or older. This latter provision is part of Policy 2, discussed below.

Policy 2: *L30,000 automatic additional medical deduction for taxpayers aged 60 or older.*

Introduced in 2007 through Decree 199-2006, taxpayers aged 60 or older have an automatic additional deduction of L30,000 ($1.58) for medical purposes. Totaling L. 50,000 for taxpayers 60 years old or older before 2009, and L70,000 after it.

Table 1 presents the timeline of the various deductions analyzed in this paper. The first column lists the year, the second column provides the deductions available for all ages, the third column specifies additional deductions for individuals aged 60 and above, the fourth column indicates additional deductions for individuals aged 65 and above, the fifth column details the deduction of L350,000 for individuals aged 65 and above, and the final column specifies the application type for the L350,000 deduction, either by request or automatically applied.

3 Empirical Analysis

To estimate the size of the treatment effect of each policy on tax burden, our empirical model is based on a standard RDD:

A sharp design when treatment assignment is based on deterministic function/decision rule, being the cutoff $\bar{S}$ strictly enforced

$$Y_i = \beta + \alpha D_i + g(S_i) + \varepsilon_i \tag{1}$$

where Y is the outcome variable tax burden, D is an binary indicator that the taxpayer is classified as aged 60/65 or older, or not, α is the parameter for the treatment effect, and $g(S_i)$ is some continuous function of S_i with $g(0) = 0$, also known as control function.

And a Fuzzy design when the treatment assignment is based on stochastic function/decision rule, the cutoff $\bar{S}$ is not strictly enforced

$$Y_i = \beta + \alpha E(D_i \mid S_i) + g(S_i) + \varepsilon_i \tag{2}$$

where $E(D_i \mid S_i)$ is the expected treatment status ($E(D_i \mid S_i) = \mathtt{Prob}(D_i = 1 \mid S_i)$). Based on propensity score $\mathtt{Prob}(D_i = 1 \mid S_i)$.

Our outcome variable, tax burden, is measured by the effective tax rate (ETR), which is defined as:

$$\text{ETR} = \frac{\text{Tax Base}}{\text{Total Income}} \times 100 \tag{3}$$

Leveraging the richness of our dataset, we employ non-parametric estimation methods, which allow for greater flexibility in modeling relationships without imposing strict functional form assumptions.

Nonetheless, for comparison purposes and to provide robustness checks, we also conduct parametric estimations including controls. The parametric approach offers the advantage of interpretability and simplicity, enabling us to examine the results under specific model assumptions and compare them to the findings from the non-parametric analysis.

For section 3.3. on behavioral responses, the outcome variable is Net Income Margin (NIM), defined as:

$$\text{NIM} = \frac{\text{Taxable Income}}{\text{Total Income}} \times 100 \tag{4}$$

Figure 13 illustrates the structure of the PIT form and identifies the locations of the variables used to calculate the ETR and NIM, respectively.

3.1 Tax burden

We define an individual's ETR as the ratio of the tax base to total income. Various types of ETRs exist for both corporations and individuals; for further details, refer to (Bachas et al., 2022) and (Abramovsky et al., 2020). We employ a straightforward definition that effectively captures the essence of the tax burden concept.

Policy 1: L350,000 + L40,000.

Figure 2 provides an initial informal visual inspection of the average ETR for the period 2018–2022, covering two years before and after the policy change in 2020. A clear shift in the ETR is observed at the cut-off point starting in 2020. Since no jump at the cutoff is observed in the years prior to 2020 (a similar pattern is observed before 2018, not shown), this visual representation serves as a type of balance test.

We conduct a more formal analysis using local averages with the Nadaraya-Watson approach that provide a visual representation of the design without relying on parametric assumptions regarding the underlying regression functions, while also capturing the local behavior of the data, comparing weighted averages (means) just above and below the cutoff. There is no need to specify the functional form of the running variable, age. Since we have access to detailed birthday information, including year, month, and day, our running variable, age, is continuous and centered at 65. The bandwidth is set to ±10 years around the cutoff, and we use the Epanechnikov kernel function for the analysis. Figure 3 presents the results, showing a clear jump at the 65-year-old cutoff for 2020–2022, but no change for 2019.

We present the results of the local polynomial regressions for the years 2020–2022 in Table 2, fitting the polynomial model with orders ranging from 1 to 4. Estimates do not change significantly with an increase in polynomial order. As expected, the standard error and bandwidth increase with higher orders. Gelman and Imbens (2019) argue that controlling for high-order

polynomials of the forcing variable is a flawed approach due to three major issues: noisy estimates, sensitivity to the degree of the polynomial, and poor coverage of confidence intervals. Based on the compliance levels for each year, the 2020 regression follows a fuzzy design, while the regressions for 2021 and 2022 follow sharp designs. Figure 14 shows the compliance level for 2019-2022. In 2020, a significant number of eligible taxpayers did not receive the benefit, whereas in 2021 and 2022, only a few (9 and 7, respectively) were in this situation. We excluded these 9 and 7 observations to perform a sharp design analysis for 2021 and 2022.

In Figure 4, we present the effect of treatment of the additional deduction of L350,000 + L40,000 for the years 2020–2022, estimated using a linear local regression (p = 1). The tax benefit leads to a reduction in the tax burden of -23.5, -21.18, and -22.32, respectively. For all years and across every order of polynomial, these reductions are statistically significant at the 1% level. A slightly diminishing impact is observed over time.

Table 3 presents the results of the parametric estimation for different orders of polynomials. For the years 2021 and 2022, for Sharp designs, we run Ordinary Least Squares (OLS) with the specification outlined in Equation (1). In the case of imperfect compliance for 2020, the Instrumental Variable (IV) / Two-Stage Least Squares (2SLS) method is used to estimate the effects in a Fuzzy design as follows:

First Stage estimate the propensity score function with a probit model:

$$D_i = \lambda + \gamma Z_i + g_D(S_i - \bar{S}) + \nu_i \tag{5}$$

Obtain $\hat{D}_i$, which is an estimate for $\mathbb{E}(D_i \mid S_i) = \text{Prob}(D_i = 1 \mid S_i)$, and

Second Stage replace $\mathbb{E}(D_i \mid S_i)$ with the first stage estimate $\hat{D}_i$, and estimate

$$Y_i = \beta + \alpha \hat{D}_i + g(S_i - \bar{S}) + \varepsilon_i \tag{6}$$

Based on the results of the nonparametric estimation, for 2020 we restrict the data to a small window using Calonico optimal bandwidth +/- 2.722 from cutoff.

We observe that the parameters of interest (treatment effect) do not change significantly with respect to the nonparametric estimation.

The results of the MacCrary test for manipulation are shown in Figure 5. There is no evidence of bunching of observations immediately above or below the cutoff point for each year from 2020 to 2022, suggesting no manipulation. These findings are expected, as taxpayers are required to submit a copy of the birth certificate at the time of registration with the tax administration.

Policy 2: L30,000.

Since policies are similar in the form of application (but policy 2 is much smaller in magnitude) we follow a similar approach.

Figure 10 presents a visual assessment of the mean ETR for the 2005–2009 period, encompassing two years before and after the 2007 policy introduction. A slight change in the mean ETR can be noticed in 2007 at the 60 y/o cutoff, and a more visible jump in 2008 and 2009. No shift is observed at the cutoff in the years preceding 2007, so this visual representation acts as a form of balance test. These results are confirmed by the formal analysis using local averages presented in Figure 11: no clear shift at the 60-year-old cutoff in 2007, but a clear jump in 2008–2009.

The absence of a jump in 2007, the year the policy was introduced, is attributed to noncompliance. Figure 15 illustrates the compliance levels for 2006–2009. In 2007, both eligible taxpayers not receiving the benefit and noneligible taxpayers receiving the benefit are observed, whereas 2008 and 2009 exhibit perfect compliance. Based on this, we applied a fuzzy design for 2007 and a sharp design for 2008 and 2009.

Table 4 presents the results of the polynomial regression for different orders. The effect of treatment is not significant for any order in 2007. However, it is significant for orders 1 to 3 in 2008, with a reduction in the tax burden ranging from -8.8 to -9.2. In 2009, the effect of the treatment is significant for all polynomial orders, showing considerable variation among them, with a reduction in the tax burden ranging from -9 to -12.3.

In Table 5 , we present the parametric results of the 2SLS estimation for 2007, using a fuzzy design restricted to the optimal bandwidth determined by Calonico's non-parametric analysis.

For 2008 and 2009, the results reflect a standard sharp design. The treatment effect (parameters of interest) differs from the nonparametric estimation.

Figure 12 displays the results of the MacCrary test for manipulation. For the period 2007 to 2009, there is no indication of manipulation.

3.2 Behavioral response

In this section, we analyze potential behavioral responses. Our outcome variable is the Net Income Margin (NIM), defined as the ratio of Taxable Income to Total Income. This definition is chosen to capture an individual's "profitability" response without the direct influence or mechanical effect of the tax benefit, which is deducted after this measure (see Figure 13). A behavioral response, indicated by a shift in NIM at the cutoff, would suggest tax planning activities. This is because taxpayers who increase their taxable income are aware that they can use the tax benefit to adjust or maintain their tax burden. The only adjustment made to the dataset was the removal of observations for taxpayers with declared income lower than the exempt base, as they are not required to submit the tax form.

We begin by examining whether there is any discontinuity at the cutoff. Figure 6 displays the median NIM in 0.25 bins for the years 2019–2022. The results indicate a shift at the cutoff starting in 2020, aligning with the implementation of the policy change, while no such shift is evident before 2020. These results can be interpreted as evidence of tax planning, as there is no economic or financial justification for the observed jump. Figure 7 and Figure 8 show that total income is the primary driver of the observed discontinuity in NIM.

Based on the evidence presented, we are interested in determining which types of reported income are more responsive to the change. We adopt the graphical approach used in (Scot et al., 2024), which examines misreporting and evasion through cost adjustments in the context of a minimum income tax in Honduras. In our case, the key policy question is which factors or types of taxpayers are driving such a jump.

To address this, we utilized the detailed income composition reported in the tax form to create

eight income categories: wages, independent professional, services, commercial activities, non-banking interest, lease income, Article 20 income, and other income sources. We calculate the ratio of each income category to the exempt base of the year, which serves as a common reference point. Figure 9 presents the results of the median for 0.250 bins across each of the eight categories. The figures suggest that taxpayers reporting incomes as independent professionals and services are the most responsive at the cutoff age of 65 years. In the case of independent professionals, the ratio nearly doubles for many bins. Significant shifts are not observable in other categories.

4 Conclusions

The findings of this analysis highlight the significant causal impact of the senior tax benefit on reducing the tax burden for eligible taxpayers. The observed behavioral responses, particularly among independent professionals and service providers, underscore the importance of understanding how such policies shape taxpayer behavior. These responses reveal that the benefit not only alleviates financial pressures for seniors in the context of a rapidly aging population but also poses challenges for tax administrations to ensure proper enforcement and compliance in tax collection.

The magnitude of the tax burden reduction emphasize its role as a key policy tool in supporting aging populations. However, the results also point to the need for robust administrative mechanisms to minimize noncompliance and optimize the impact of such policies.

Future iterations of this analysis will account for the magnitude of tax revenue forgone by the government and its relative significance to taxpayers, as well as explore heterogeneous effects to assess how these benefits vary across different taxpayer groups. Additionally, incorporating control variables (size, economic activity, geographic location, etc.) in the regression models will provide a more nuanced understanding of the policy's impacts. Future versions will also include analyses by tax brackets and the advance payment system in Honduras.

References

Abramovsky, L., Smurra, A., & Warwick, R. (2020). Analysis of effective tax rates for cit and pit in myanmar. Tech. rep., International Growth Centre (IGC). 8

Bachas, P., Brockmeyer, A., Dom, R., & Semelet, C. (2022). Effective tax rates and firm size. Tech. rep., World Bank. 8

Brewer, B., Conway, K., & Rork, J. (2023). Are income tax breaks for seniors good for state economic growth? *Public Finance Review*, *51*(1), 53–82. 1

Camp, J. L., & Lockhart, S. E. (2013). The pros and cons of state tax breaks for senior citizens. *Journal of State Taxation*, *31*(5), 23–30. 1

Feldstein, M. (1995). The effect of marginal tax rates on taxable income: A panel study of the 1986 tax reform act. *Journal of Political Economy*, *103*(3), 551–572. 2

Felix, A., & Watkins, K. (2013). The impact of an aging population on state tax revenues. *Federal Reserve Bank of Kansas City Economic Review*, *98*(1), 95–127. 1

McNichol, E. C. (2019). States should target senior tax breaks only to those who need them, free up funds for investments. *Center on Budget and Policy Priorities*. 1

Scot, T., Lobel, F., & Zúñiga, P. (2024). Corporate taxation and evasion responses: Evidence from a minimum tax in honduras. *American Economic Journal: Economic Policy*, *16*(1), 482–517. 11

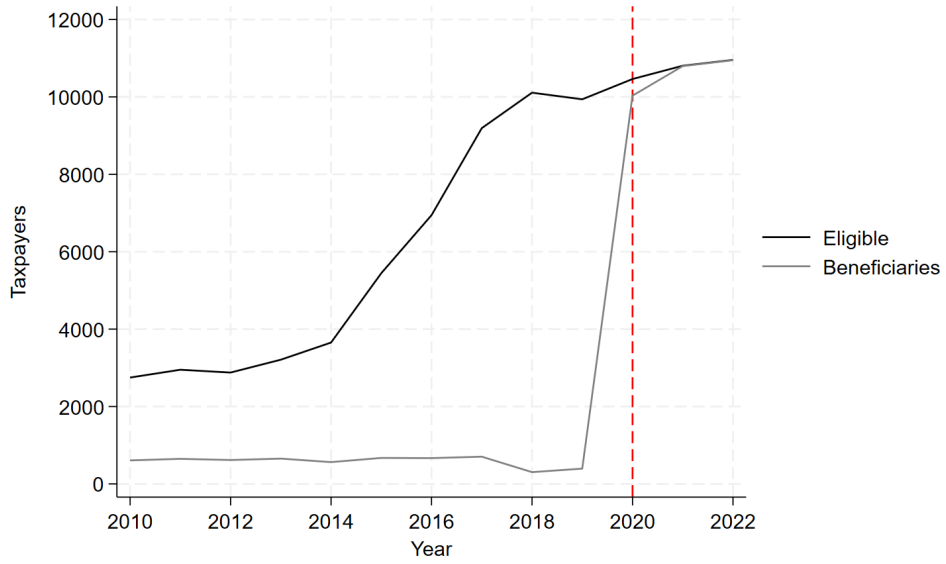
Slemrod, J. (1982). Taxation and inequality: A direct test of the 'ability to pay' hypothesis. *Journal of Public Economics*, *17*(3), 363–372. 2

5 Tables and Figures

Table 1: Tax benefits timeline (L).

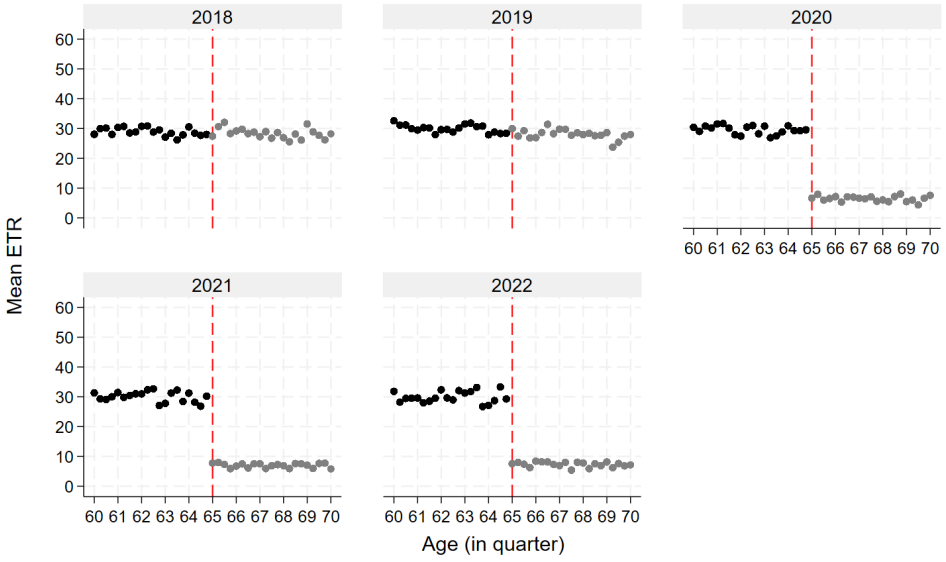
Year	All ages	>=60 (additional)	>=65 (additional)	>=65	Application (L350K)
2003	20,000	-	-	350,000	Request
2004	20,000	-	-	350,000	Request
2005	20,000	-	-	350,000	Request
2006	20,000	-	-	350,000	Request
2007	20,000	30,000	-	350,000	Request
2008	20,000	30,000	-	350,000	Request
2009	40,000	30,000	-	350,000	Request
2010	40,000	30,000	-	350,000	Request
2011	40,000	30,000	-	350,000	Request
2012	40,000	30,000	-	350,000	Request
2013	40,000	30,000	-	350,000	Request
2014	40,000	30,000	-	350,000	Request
2015	40,000	30,000	-	350,000	Request
2016	40,000	30,000	-	350,000	Request
2017	40,000	30,000	-	350,000	Request
2018	40,000	30,000	-	350,000	Request
2019	40,000	30,000	-	350,000	Request
2020	40,000	30,000	40,000	350,000	Automatic
2021	40,000	30,000	40,000	350,000	Automatic
2022	40,000	30,000	40,000	350,000	Automatic

Figure 1: Gap eligible vs beneficiaries: Benefit L350,000.



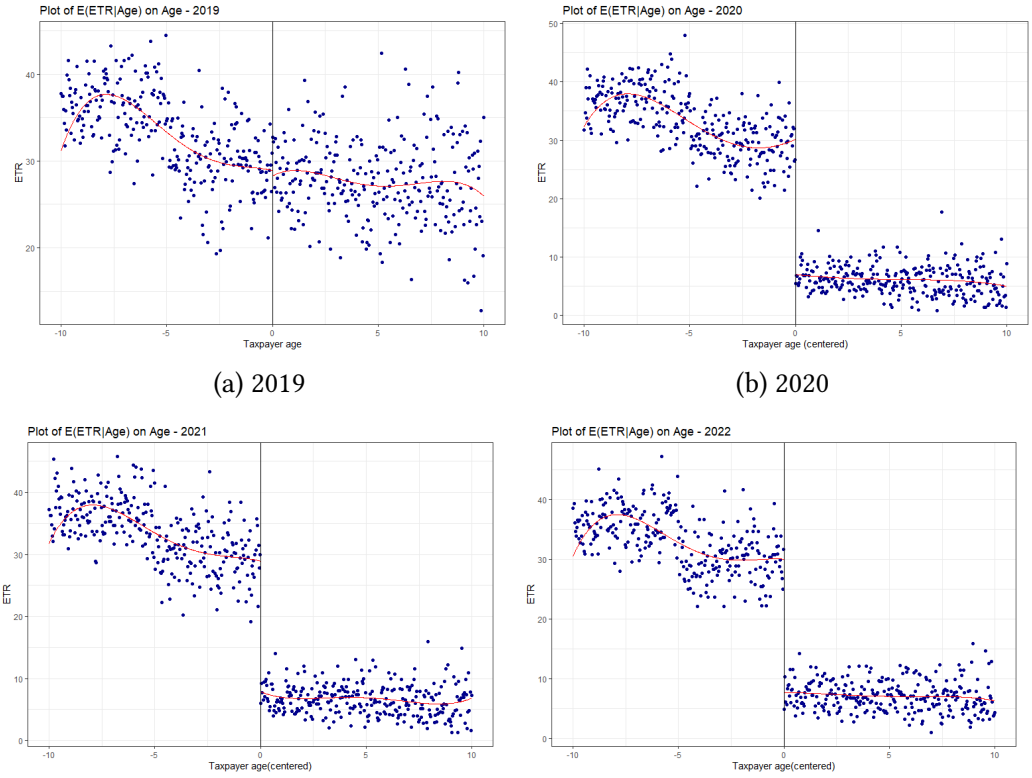
Note: This figure reports a gap by comparing eligible taxpayers to beneficiaries and includes taxpayers up to 75 years old. L350,000 benefit became automatic in 2020.

Figure 2: Mean ETR 2018-2022: Balance test.



Note: This figure shows the average ETR by bin before and after the 65-year-old cutoff. The ETR, is defined as the ratio of the Tax Base to Total Income. The bins are 0.25 wide and bandwidth +/- 5 years.

Figure 3: Local Averages 2019-2022.



(a) 2019 (b) 2020

(c) 2021 (d) 2022

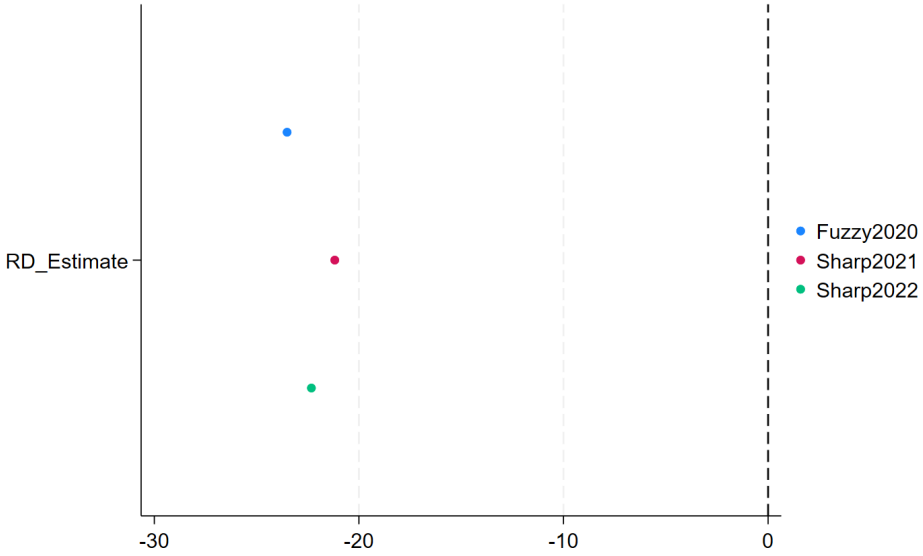
Note: This figures report Local Averages with order of polynomial = 4 and kernel = epanechnikov.

Table 2: Local Polynomial Regressions 2020-2022.

Order	2020	2021	2022
p=1	-23.509***	-21.179***	-22.32***
	(1.087)	(1.076)	(1.268)
p=2	-23.748***	-20.601***	-22.497***
	(1.476)	(1.478)	(1.52)
p=3	-23.653***	-20.386***	-23.271***
	(1.665)	(1.755)	(1.761)
p=4	-23.938***	-20.397***	-23.97***
	(1.814)	(1.972)	(2.07)
N=	29963	30485	30426
BW (p=1)	2.722	2.473	1.922
BW (p=2)	3.222	2.865	2.904
BW (p=3)	4.392	3.517	3.763
BW (p=4)	5.686	4.238	4.097

Kernel = epanechnikov. *** p<0.01, ** p<0.05, * p<0.1

Figure 4: Coefficient plot 2020-2022.



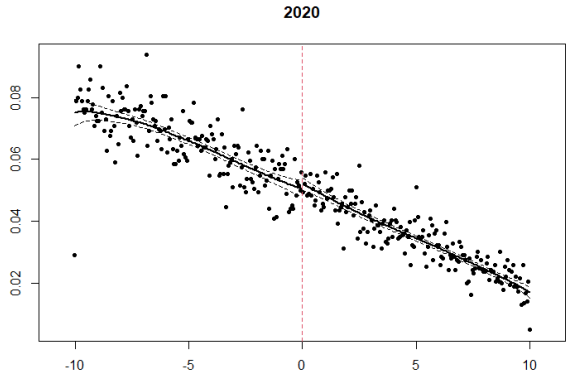
Note: This figure shows the treatment effect parameters from the local polynomial regression for 2020-2022.

Table 3: Parametric Regressions 2020-2022.

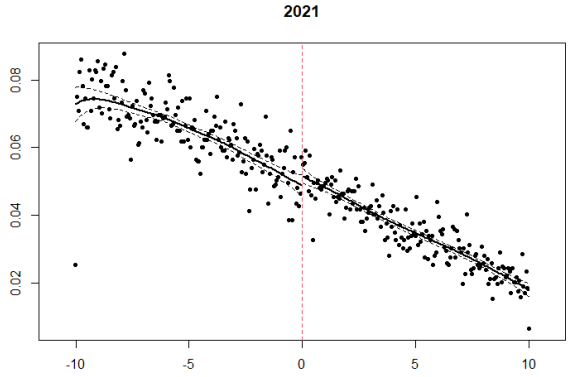
Order	2020	2021	2022
p=1	-23.096***	-20.951***	-21.042***
	(1.053)	(0.596)	(0.592)
p=2	-	-20.086***	-20.667***
		(0.875)	(0.873)
p=3	-	-20.395***	-21.575***
		(1.054)	(1.055)
p=4	-	-21.105***	-23.017***
		(1.27)	(1.274)

*** p<0.01, ** p<0.05, * p<0.1

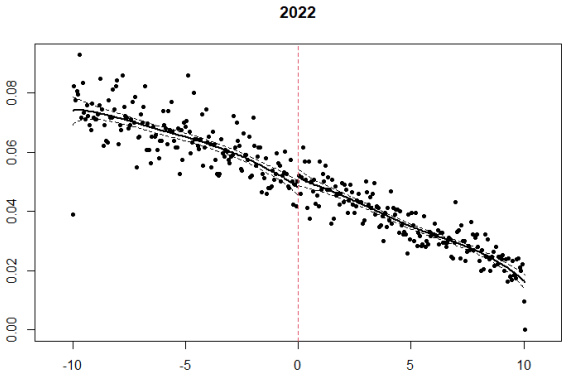
Figure 5: Manipulation test 2020-2022.



(a) 2020



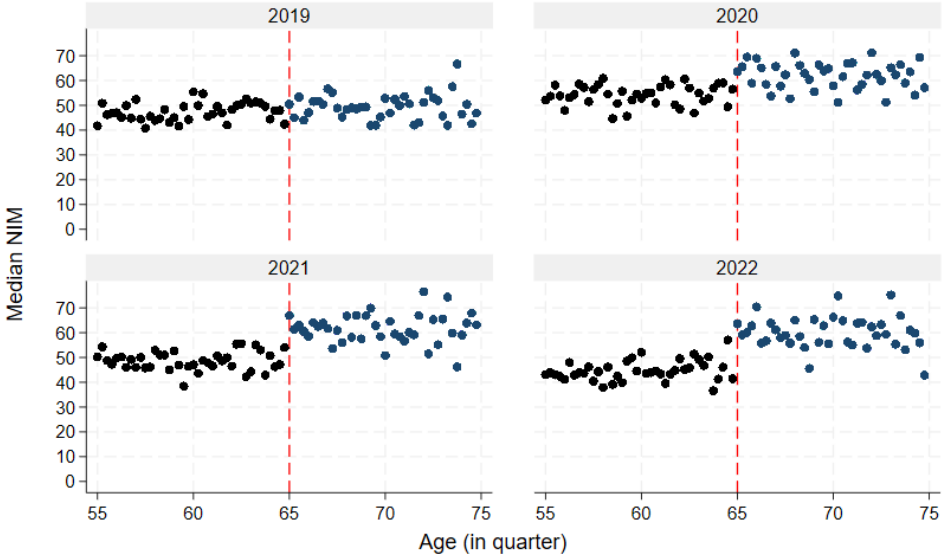
(b) 2021



(c) 2022

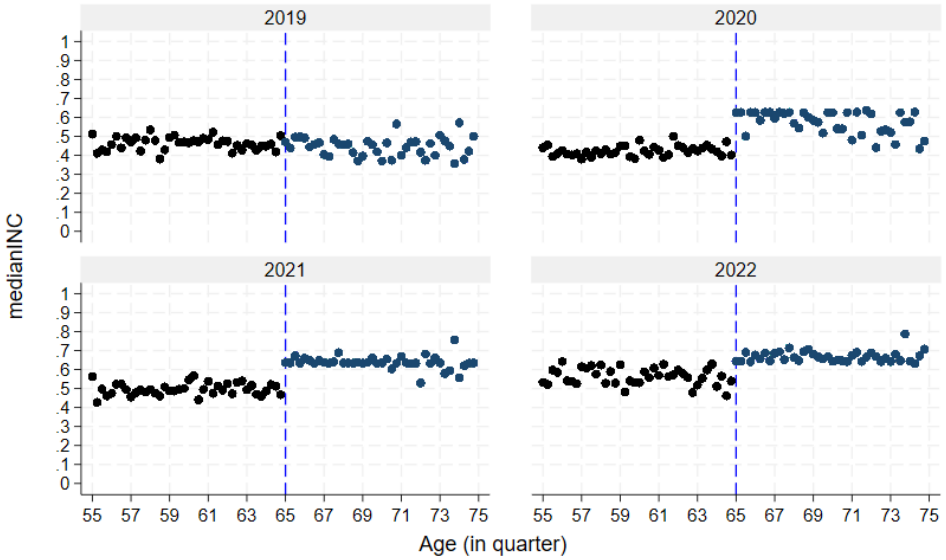
Note: This figures report McCrary test for manipulation.

Figure 6: Median NIM 2019-2022.



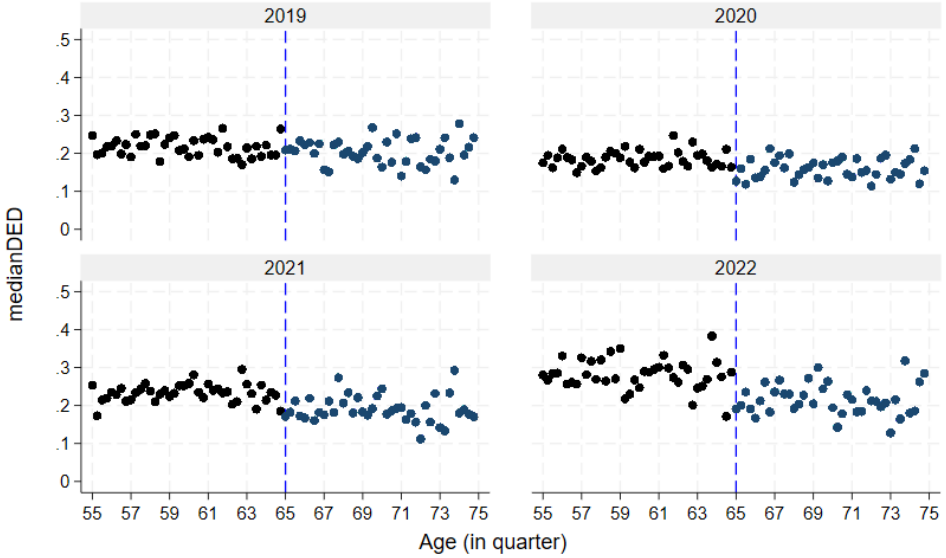
Note: This figure shows the median NIM. The bins are 0.25 wide and bandwidth +/- 10 years.

Figure 7: Median Total Income Reported 2019-2022.



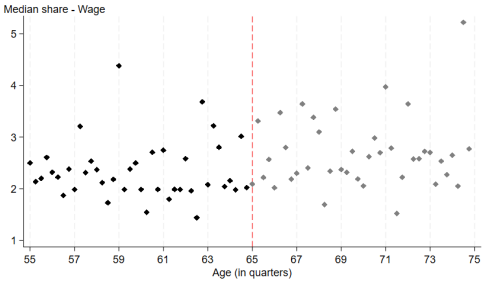
Note: This figure shows the median Total Income reported by bin. The bins are 0.25 wide and bandwidth +/- 10 years.

Figure 8: Median Total Standard Deduction 2019-2022.

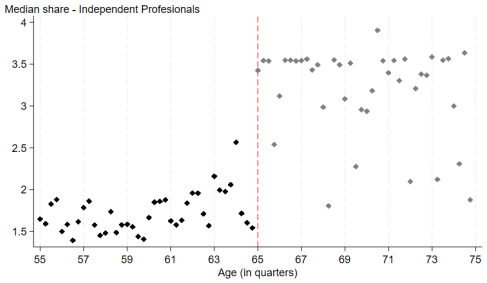


Note: This figure shows the median total standard deduction reported by bin. The bins are 0.25 wide and bandwidth +/- 10 years.

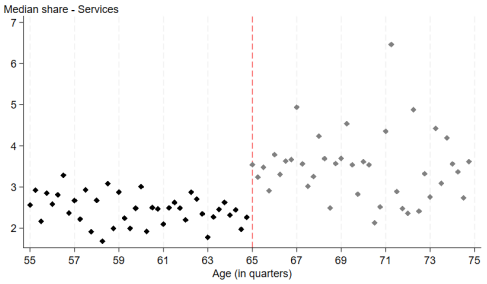
Figure 9: Median Income Share - 2022.



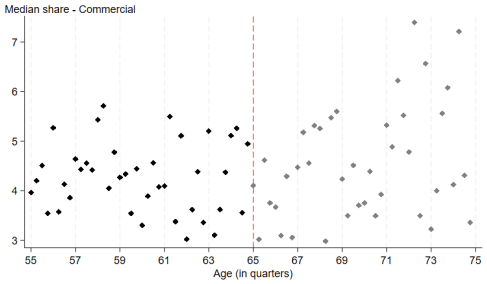
(a) Wage



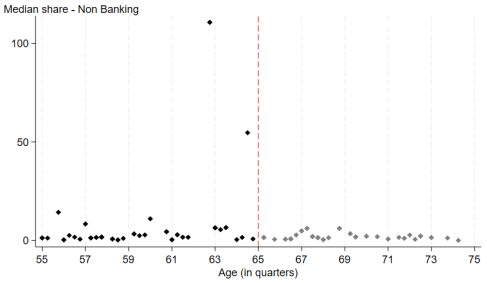
(b) Independent Professional



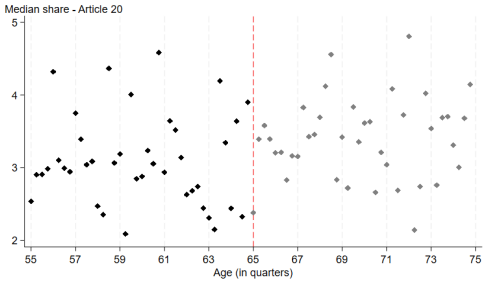
(c) Services



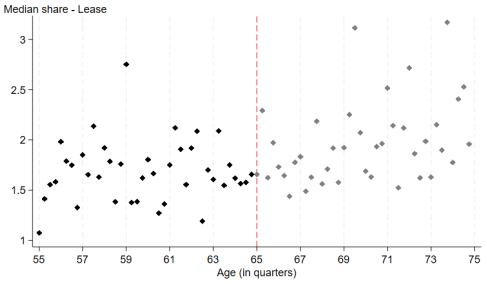
(d) Commercial Activities



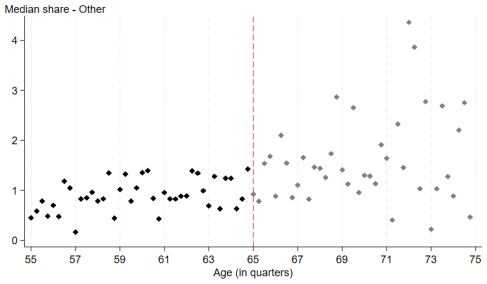
(e) Non-Banking



(f) Article 20



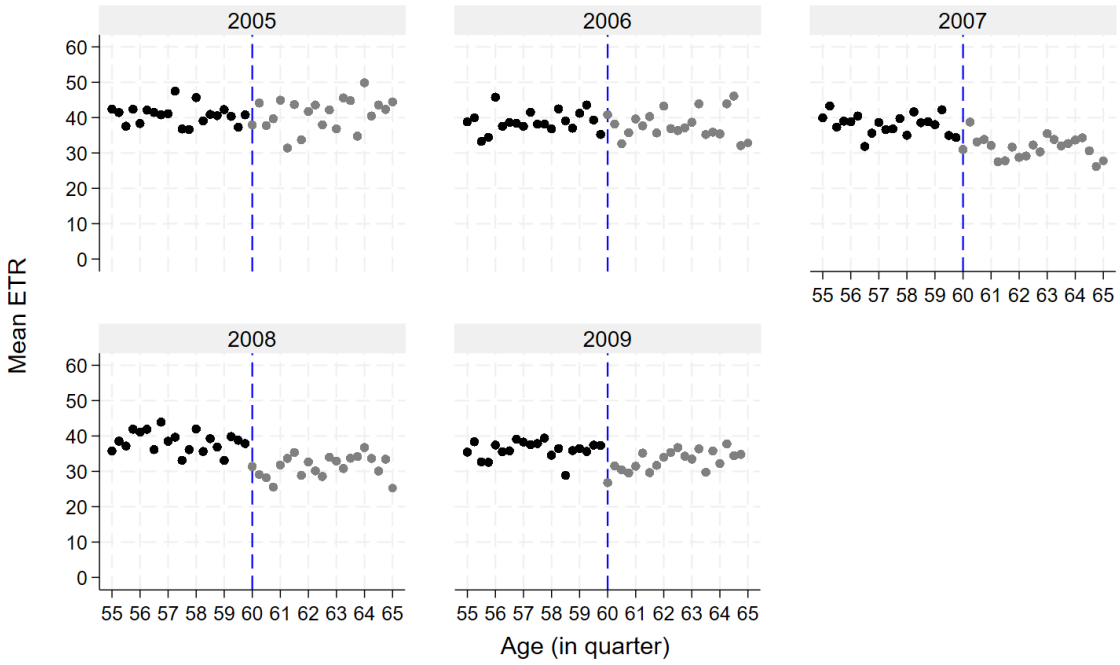
(g) Lease



(h) Other

Note: This figures present median income source items as share of of exempt base in each bin for the year 2022. Bins are 0.250 wide.

Figure 10: Mean ETR 2005-2009: Balance test.



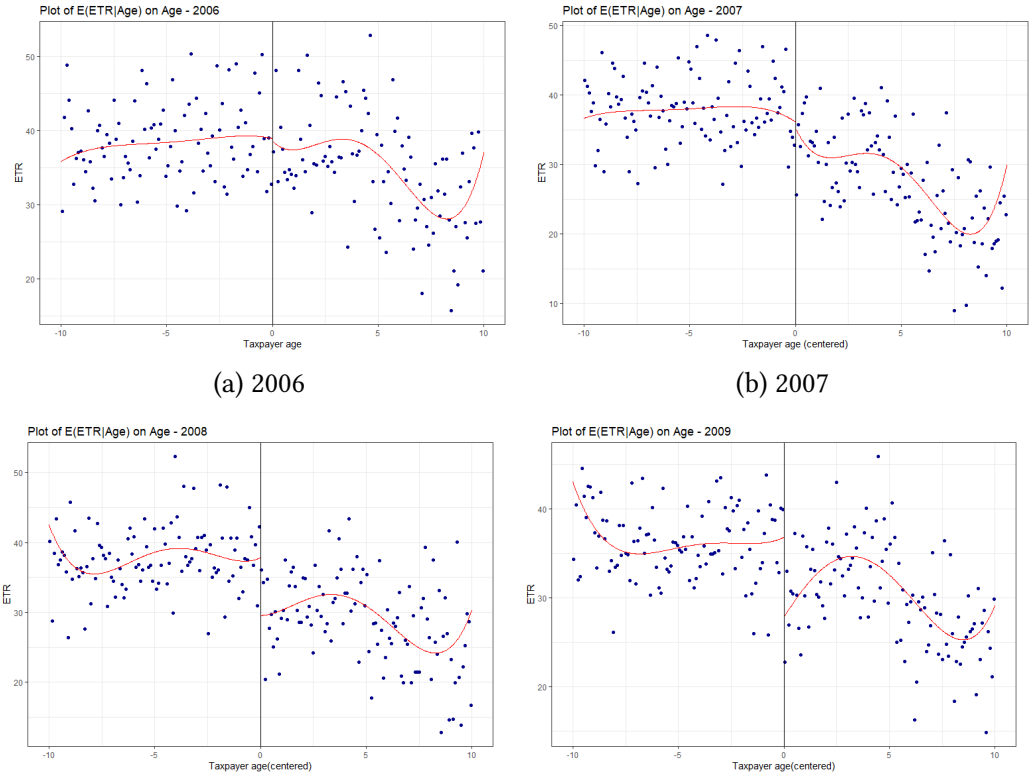
Note: This figure shows the mean ETR by bin before and after the 60-year-old cutoff. The ETR, is defined as the ratio of the Tax Base to Total Income. The bins are 0.25 wide and bandwidth +/- 5 years.

Table 4: Local Polynomial Regressions 2007-2009.

Order	2007	2008	2009
p=1	0.535	-8.828***	-9.011***
	(6.998)	(2.889)	(2.699)
p=2	2.561	-9.175***	-10.211***
	(8.756)	(3.488)	(3.191)
p=3	2.51	-8.996**	-11.82***
	(10.389)	(3.713)	(3.825)
p=4	-4.73	-4.709	-12.397***
	(13.346)	(4.927)	(4.374)
N=	8053	8303	8244
BW (p=1)	1.608	2.266	2.376
BW (p=2)	2.705	3.427	3.708
BW (p=3)	3.871	5.306	4.426
BW (p=4)	4.303	4.439	5.006

Kernel = epanechnikov. *** p<0.01, ** p<0.05, * p<0.1

Figure 11: Local Averages 2006-2009.



(a) 2006 (b) 2007

(c) 2008 (d) 2009

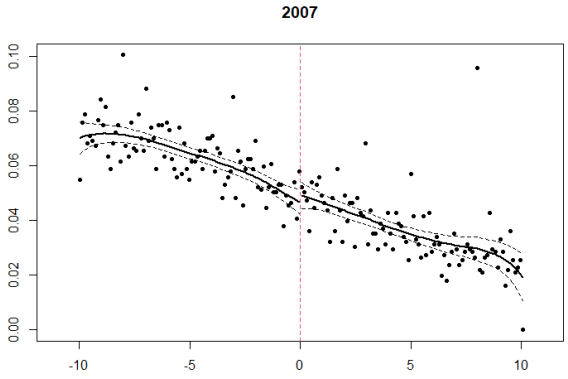
Note: This figures report Local Averages with order of polynomial = 4 and kernel = epanechnikov for years 2006-2009.

Table 5: Parametric Regressions 2007-2009.

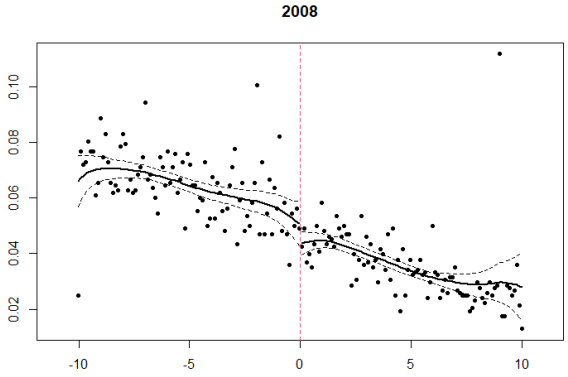
Order	2007	2008	2009
p=1	-2.245	-5.633***	-1.972
	(5.382)	(1.352)	(1.251)
p=2	-	-8.015***	-7.147***
		(2.035)	(1.838)
p=3	-	-7.909***	-9.413***
		(2.747)	(2.399)
p=4	-	-8.275**	-8.476***
		(3.434)	(2.961)

*** p<0.01, ** p<0.05, * p<0.1

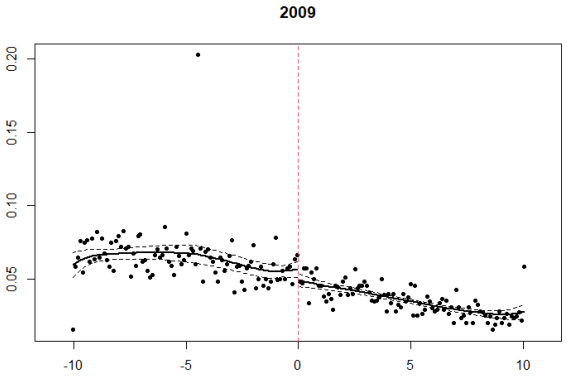
Figure 12: Manipulation test 2007-2009.



(a) 2007



(b) 2008



(c) 2009

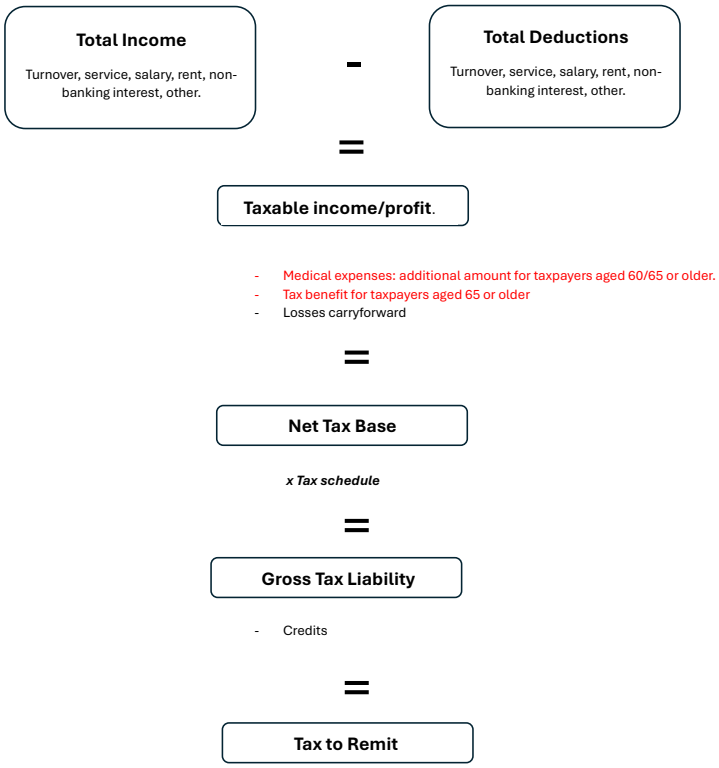
Note: This figures report McCrary test for manipulation.

6 Appendix

Table 6: Descriptive statistics for 2005-2009 and 2018-2022.

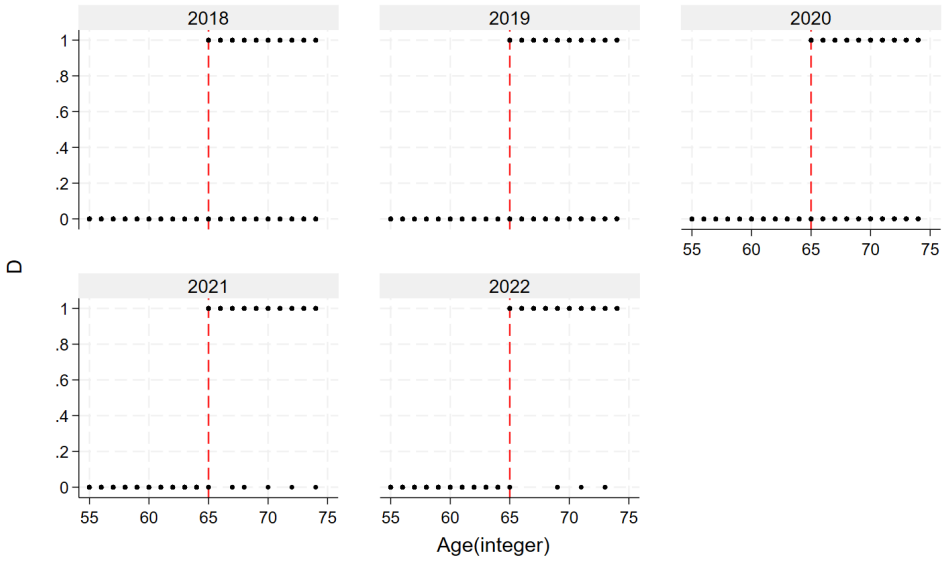
	Years									
Variable	2005	2006	2007	2008	2009	2018	2019	2020	2021	2022
Observations	8,378	8,812	10,135	10,720	11,245	43,586	41,965	43,031	43,888	43,683
Age range										
50 - 54	2,745	2,863	3,217	3,407	3,451	12,974	12,490	12,719	12,984	12,841
55 - 59	2,090	2,308	2,623	2,847	3,135	11,515	10,965	11,015	11,196	10,866
60 - 64	1,534	1,624	1,924	1,968	2,157	8,988	8,572	8,835	8,903	9,020
65 - 70	1,438	1,384	1,643	1,691	1,702	7,294	7,183	7,497	7,622	7,673
71 - 74	571	633	728	807	800	2,815	2,755	2,965	3,183	3,283
Type										
Individual	5,963	6,131	6,812	6,995	7,037	28,672	26,278	26,670	26,711	26,140
Commercial	2,415	2,681	3,323	3,725	4,208	14,913	15,687	16,361	17,177	17,540
Tax variable										
Income (mean L.)	1,543,341	1,651,183	1,784,393	1,939,601	1,848,832	1,359,269	1,494,451	1,303,228	1,768,729	1,981,368
Deduction (mean L.)	913,065	1,228,689	1,572,542	1,800,435	1,782,141	1,104,593	1,220,537	1,045,626	1,468,351	1,661,275
Income source										
Wage	1,804	1,909	2,123	2,177	2,105	5,458	5,286	5,522	5,669	5,580
Independent Prof.	1,213	1,314	1,500	1,572	1,654	9,254	9,373	9,806	10,325	10,517
Services	1,299	1,437	1,617	1,708	1,981	8,065	7,858	7,964	8,110	7,989
Commercial	2,977	3,132	3,753	4,045	4,214	13,341	13,295	13,533	13,814	13,971
Non-banking	143	158	162	170	165	203	231	190	200	205
Article 20	1,013	1,043	1,063	1,046	1,091	7,446	6,254	6,305	5,994	5,771
Lease	1,446	1,434	1,549	1,613	1,642	4,925	4,941	4,877	4,835	4,831
Other	779	791	853	793	804	1,269	1,359	1,439	1,487	1,498

Figure 13: PIT tax form in Honduras.



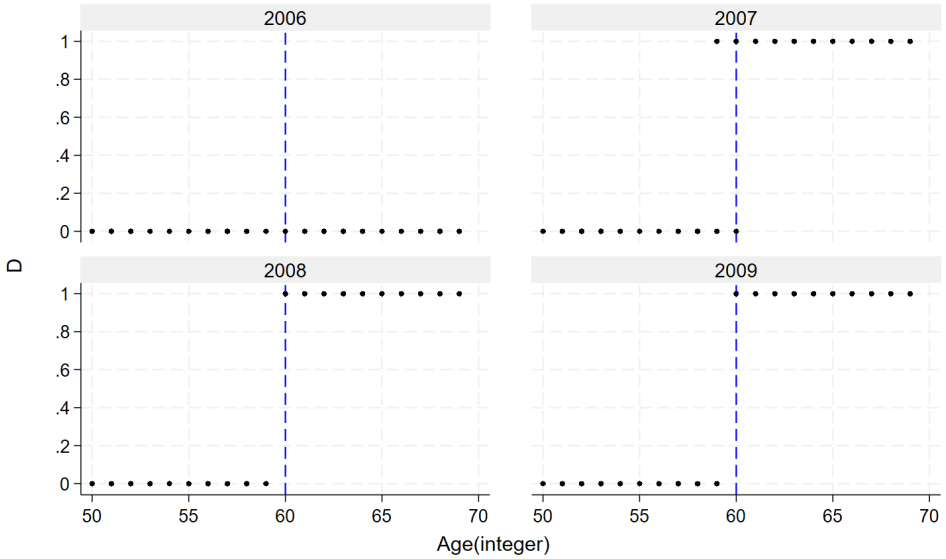
Note: This figure depicts the structure of the PIT form in Honduras. The ETR, as the outcome variable, is defined as the ratio of the Tax Base to Total Income.

Figure 14: Compliance: Benefit L350,000.



Note: This figure reports the compliance level by comparing eligible taxpayers to beneficiaries, using a bandwidth of 10 years. The 2020 reform made the L350,000 benefit automatic and introduced an additional L40,000 deduction for medical and educational expenses. Prior to 2020, a significant portion of eligible taxpayers did not receive the benefit due to administrative burdens. In 2020, the number of eligible taxpayers who did not receive the benefit was 430, decreasing to 9 in 2021 and 7 in 2022. After 2013, no taxpayers under the age of 65 received the benefit, whereas before 2013, a small number did so each year.

Figure 15: Compliance: Benefit L30,000.



Note: This figure reports the compliance level for years 2006-2009.