WIDER Working Paper 2024/72

Donations and tax incentives

Evidence from South Africa

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December 2024

United Nations University World Institute for Development Economics Research

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Abstract: This study examines the impact of tax incentives on charitable donations within South Africa, with a focus on donations declared on individuals' tax returns. Leveraging the universe of South African tax administrative data spanning over a decade (2011–21), we apply the bunching approach to assess how individual taxpayers respond to donation tax incentives. South Africa's tax policy allows individuals to deduct up to 10% of their taxable income for contributions made to approved public benefit organizations, with the option to carry forward any excess donations for potential deductions in future years. Our findings indicate significant bunching at the cap, demonstrating a considerable tax price elasticity of giving at the intensive margin, which suggests a high responsiveness of charitable donors to tax incentives. Variation in bunching patterns has been observed across different demographics, such as gender, age, and income percentiles. We also estimate the heterogeneous implied tax price elasticity of donations. The findings show that the implied tax price elasticity of donations was higher for females than for males. The study also finds that working-age individuals and the less wealthy showed higher responsiveness to the tax incentive. Although only a small proportion of taxpayers report donations and we are not able to determine whether additional donations are made but not reported, our results suggest that tax deduction incentives could increase charitable donations.

Key words: charity donations, tax incentive policy, South Africa

JEL classification: H21, H24, H32

Acknowledgements: We are grateful to Southern Africa—Towards Inclusive Economic Development (SA-TIED) for support. All errors and views expressed in this paper are those of the authors. They do not necessarily represent the views of UNU-WIDER or the University of Pretoria.

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This study has been prepared within the UNU-WIDER project Southern Africa—Towards Inclusive Economic Development (SA-TIED).

Information and requests: publications@wider.unu.edu

ISSN 1798-7237 ISBN 978-92-9267-535-6

https://doi.org/10.35188/UNU-WIDER/2024/535-6

Typescript prepared by Gary Smith.

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The Institute is funded through income from an endowment fund with additional contributions to its work programme from Finland and Sweden, as well as earmarked contributions for specific projects from a variety of donors.

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1 Introduction

Many countries have adopted tax incentives to encourage charitable giving, recognizing the role that private donations play in supporting public benefit organizations (Pickering et al. 2014; Standley and Roodman 2006). These incentives are typically structured as tax credits or deductions from taxable income. Given the widespread implementation of such policies, understanding their effectiveness is crucial for informing governmental decision-making. Initial studies on the income and price elasticity of donations were predominantly conducted in the United States, with foundational research by Feldstein and Taylor (1976) and Feenberg (1987) finding a relatively high price elasticity of around -1.5. However, other research utilizing panel data to control for individual donor heterogeneity has identified much lower price elasticities (Broman 1989). Notably, Bakija and Heim (2008) examined a long panel of US taxpayers, focusing on high-income individuals, and uncovered evidence of variability in charitable giving in response to tax incentives. Their work highlighted that the elasticity of giving in relation to tax price changes differs across income groups.

In this paper, we investigate the effects of one such policy in South Africa: tax incentives aimed at encouraging charitable donations by offering deductions on taxable income. Over the past few decades, these incentives have become a popular tool for promoting philanthropy (Auten et al. 2002; Reece 1979), and many countries, including the United States, the United Kingdom, and South Africa, have implemented various forms of tax-related strategies to stimulate charitable giving. While the specifics of these tax incentives vary across regions, they typically involve reductions in tax liabilities for individuals or corporations based on the value of their donations. Despite the widespread adoption of these policies, relatively little is known about their actual impact on donor behaviour, particularly how different demographic and income groups respond to such incentives and whether the policies effectively increase overall donations to public benefit organizations.

Research has shown that charitable giving is sensitive to tax incentives. For example, Bakija and Heim (2011) found that the elasticity of giving with respect to the tax price is generally high, suggesting that tax policy changes can have significant impacts on the amount donated. Additionally, Randolph (1995) demonstrated that the long-run elasticity of charitable giving is significantly greater than the short-run elasticity, emphasizing the lasting impact of sustained tax incentives on donation behaviour.

Our analysis provides new insights into the effects of tax incentives on charitable giving. The donation tax incentive in South Africa allows individuals that donate to approved public benefit organizations (PBOs) to deduct contributions up to a maximum of 10% of their taxable income before any other deductions. Using anonymized individual income tax records from the South African Revenue Service (SARS), we first examine the impact of tax incentives on donation behaviour, particularly focusing on bunching patterns around the 10% donation deduction cap. We then consider how demographic factors such as gender, age, and income percentiles affect the bunching and we calculate price elasticity of giving for the whole sample and each group.

Our results show that tax incentives for charitable donations were effective in promoting giving, particularly around the 10% donation deduction cap on taxable income. We find significant bunching behaviour, with over 5% of donors clustering just below the cap, and a sharp drop in donations beyond this point. The tax price elasticity of individual giving was estimated to be around -2, indicating a high sensitivity to tax incentives. The elasticity of this high magnitude suggests that policies aimed at reducing the effective cost of giving, such as increasing tax deductions for charitable donations, could significantly boost the amount of money individuals donate to charities. Compared to tax incentive policies studied in developed countries, such as the United States and Germany (e.g., Bakija and Heim 2011; Bönke and Werdt 2015), our results suggest that donation incentives in South Africa are equally, if not more, effective in influencing donor behaviour. However, the high bunching near the cap suggests potential over-reporting of donations just below the threshold, a challenge observed in other studies.[1]

Our findings also reveal that women exhibit a higher tax price elasticity of giving compared to men. Across various demographic groups, including age and income percentiles, the responsiveness to tax incentives varied, but the overall effect represents a significant bunching in donations around the cap. As donations vary across demographic groups, we use quantile regression to explore this variation. Gender and age both had a significant effect on donations, with women and older individuals (aged 65+) contributing less across all donation quantiles. High-income individuals (top 5 percentile) donate significantly more, and this effect becomes particularly pronounced in the higher quantiles of donations. Deductible donations have a negative relationship with donation amounts, but the effect becomes slightly less severe for larger donors. Quantile regression estimates suggest that gender, income, and age all play important roles in shaping donation behaviours, with high-income individuals donating the largest amounts, and women and older individuals donating less in absolute terms.

This paper makes a number of contributions to the literature on the role of tax incentives in charitable giving and the broader determinants of philanthropic behaviour. Our analysis of tax-deductible donation incentives in South Africa provides novel evidence on how tax policies affect donor behaviour, particularly around the 10% cap on donation deductions. We contribute to the limited literature on the role of donation tax incentives for individual philanthropy in a developing country environment.[2] Most related research has been done in developed countries, such as Germany (Adena 2021; Bönke and Werdt 2015), the United States (Barrett et al. 1997; Broman 1989; Feldstein and Taylor 1976), and France (Fack and Landais 2010). Research on tax price elasticities of donations in other countries is relatively scarce, although tax deductions for charitable donations are widely utilized. The tax price elasticity of charitable donations in developing countries such as South Africa may differ from that in the United States and other developed countries due to various factors. The economic conditions, characterized by greater income inequality and a substantial informal sector, influence both the capacity and willingness to donate (Dasgupta and Kanbur 2011). Cultural norms and community expectations often prioritize community obligations and religious practices over tax benefits as motivations for giving (Bekkers and Wiepking 2011). Additionally, the less extensive role of government in providing public goods in developing nations may increase individuals' sense of personal duty to contribute to community services, thereby affecting their response to tax incentives. Furthermore, the effectiveness of tax incentives is likely diminished by less developed tax systems and lower compliance rates (Bird and Zolt 2008). Collectively, these elements imply that the responsiveness of donations to tax incentives in South Africa and similar economies could be less pronounced or follow distinct trends compared to developed countries.

In addition, we expand the analysis to consider demographic heterogeneity, examining differences in responsiveness across gender, age, and income groups. This approach allows for a deeper understanding of how specific subgroups respond to tax incentives, contributing to the limited research on the varied effects of tax incentives in developing countries. We also make use of the bunching methodology pioneered by Saez (2010) and Chetty et al. (2011), applying it to the study of charitable donations, which offers a fresh perspective on how tax policies can shape donor behaviour in a developing country setting. Finally, our findings contribute to the policy discussion on fostering philanthropy through tax incentives, offering insights relevant to countries with similar socio-economic challenges. These results

[1] The data does not allow us to measure all donations, since the taxpayer decides whether or not to report a donation. Therefore, it is possible that taxpayers only report donations up to 10% of taxable income, knowing that there is no tax benefit to reporting further donations. We compared reported donations from our dataset to the SARS tax statistics reports, and found that these align well. However, the same reporting issue might apply (albeit to a lesser extent) to the SARS reports.

[2] See Asatryan and Joulfaian (2022) for some general reviews of the literature on the role of tax incentives in business donations in developing countries.

have implications for policy-makers seeking to design tax incentives that encourage charitable giving while addressing issues of income inequality and domestic resource mobilization.[3]

The rest of the paper is structured as follows. Section 2 highlights the relevant South African tax system features. Section 3 describes the data used for our empirical estimations of bunching and tax price elasticity of donations. Section 4 shows the theoretical model of charitable giving and the bunching estimator. Section 5 discusses the results and robustness checks. We conclude in Section 6.

2 Policy and context

A charitable giving tax incentive has existed in South Africa since 1998, but significant changes have been made over time. Since 1 September 1998, the Non-Profit Organisations Act 71 of 1997 has been in effect. The purpose of the Act is to create an environment where non-profit organizations (NPOs) can thrive and to establish an administrative and regulatory framework for their operations.[4] SARS emphasizes the significance of this framework in its Basic Guide to Income Tax for Public Benefit Organisations (SARS 2021). Based on the Katz Commission's recommendations, the minister of finance introduced extensive amendments to the laws governing the income tax exemption for NPOs during his 2000 National Budget Speech.[5] The aim of this new legislation was to group similar types of entities for consistent treatment and to offer clearer guidelines for both taxpayers and the Commissioner regarding the eligibility criteria for tax-exempt entities (SARS 2023).

The Taxation Laws Amendment Act 30 of 2000, effective from 15 July 2001, introduced the concepts of 'public benefit organization' and 'public benefit activity'. In accordance with the Income Tax Act 58 of 1962 (ITA), the minister announced a list of qualifying public benefit activities, which can be updated periodically via notice in the *Government Gazette*. The new regulations were more detailed and comprehensive than previous ones, providing greater consistency and certainty. Additionally, specific regulations were implemented to address cases in which a PBO misuses its tax-exempt status or fails to comply with ITA provisions.

Legislation. A PBO is defined in section 30 of the ITA in South Africa. A PBO must have as its sole or principal objective the carrying out of one or more public benefit activities. These activities should be conducted in a non-profit manner and with a philanthropic intent. The Ninth Schedule to the ITA outlines the specific public benefit activities that qualify and must benefit the general public at large. These activities cover areas such as welfare, health care, education, culture, conservation, research, and support services for other PBOs. If a PBO meets the requirements outlined in section 30 (including obtaining approval from the Commissioner of SARS), it can qualify for tax-exempt status under section 10(1)(cN). According to section 10(1)(cN), the receipts and accruals of an approved PBO are exempt from normal tax, provided they are not derived from any business undertaking or trading activity. Additionally, the PBO may issue section 18A tax deduction certificates to its donors. Below we elaborate on this section 18A deduction and the amendments that were implemented.

[3] The policy aims at prioritizing charities that provide public goods over those that confer private benefits to ensure that tax incentives for charitable donations yield maximum social welfare and economic efficiency, otherwise this might be a strong assumption (Bertrand et al. 2020).

[4] Section 2 of the Nonprofit Organisations Act outlines the objectives of the Act. The Act aims to encourage and support NPOs in their contributions to meeting the diverse needs of the population in the Republic of South Africa. Specifically, the Act promotes cooperation and shared responsibility among government entities, donors, and other interested parties when interacting with NPOs.

[5] The minister of finance established the Katz Commission on 22 June 1994. Its task was to produce several reports on tax reform in South Africa. The ninth report focused on fiscal matters concerning NPOs (Katz 1994).

Section 18A permits taxpayers to deduct bona fide donations (whether in cash or in kind) made to PBOs. However, it is important to note that not all tax-exempt PBOs are authorized to issue tax deduction certificates to donors. Additionally, section 18(2A) mandates that the donation must be used exclusively for activities specified in Part II of the Ninth Schedule. To be eligible for the deduction, the donation must be actually paid or transferred during the assessment year. Currently, for individual taxpayers the deductible amount cannot exceed 10% of the taxpayer's taxable income before the deductions under section 18A. Since section 18A(1) references the taxpayer's 'taxable income', a taxpayer with no taxable income or an assessed loss cannot claim the deduction. Furthermore, any excess donation (i.e. an amount exceeding the 10% limit) cannot be carried forward to reduce future taxable income. The 2013 legislative amendment relaxed this rule.

Amendment. The 2013 Taxation Laws Amendment Act 31 of 2013 (TLAA) introduced a much-needed relief by allowing excess donations to be carried forward as deductible donations in the following assessment year, still subject to the 10% limit.[6] If any excess remains, it can be rolled over again. This amendment applies to donations paid or transferred during assessment years beginning on or after 1 March 2014. This relief is included in an additional proviso to section 18A(1)(B), which states:

> Provided that any amount of a donation made as contemplated in this subsection and which has been disallowed solely by reason of the fact that it exceeds the amount of the deduction allowable in respect of the year of assessment shall be carried forward and shall, for the purposes of this section, be deemed to be a donation actually paid or transferred in the next succeeding year of assessment.

The Explanatory Memorandum on the Taxation Laws Amendment Bill of 2013 clarifies in paragraph 1.3 that, although the government is committed to the 10% limit, it is concerned that this limit is harsh on large donations. To mitigate this issue, taxpayers are now allowed to distribute large donations over several years. Table A1 in Appendix A illustrates the amendment following a donation made by an individual to a PBO. Prior to the TLAA, donations could not be carried forward to reduce future taxable income, thereby preventing donors from maximizing the benefits of large donations. While the amendment allows for one-off large donations to be split over more than one year for tax purposes, it does not allow for a sustained increase in donations beyond the 10% limit. We therefore group the years before and after this amendment together in our analysis.

3 Data source and descriptive statistics

We use the Individual Panel data from the South Africa administration tax micro data (National Treasury and UNU-WIDER 2023). Tax data encompasses the entire population of taxpayers, and exhibits multi-dimensional characteristics. Administrative tax records are appealing to researchers due to their presumed accuracy in capturing income information for individuals. However, these records often lack demographic details about the individual compared to survey data. We use the anonymized Individual Panel, which is created by combining payroll and personal income tax records. These two datasets allow us to create a comprehensive overview of the income distribution for individual taxpayers in South Africa.

Payroll tax records (IRP5 certificates). The IRP5 certificate, also known as the Employee Tax Certificate, is provided to SARS by employers who are registered for pay-as-you-earn (PAYE). This certificate pertains to each employee who has received remuneration from the employer. The IRP5 certificate con-

[6] The 10% limit is calculated based on taxable income, excluding any retirement fund lump sum benefits and withdrawal benefits, and now also severance benefits.

tains essential information for calculating an individual's tax liability, especially if it represents their sole income source. Employers withhold the tax liability (known as PAYE) and pay it to SARS on the individual's behalf. The certificate includes details such as income, deductions, donations, allowances, fringe benefits, medical scheme contributions, and age—all of which contribute to determining the PAYE tax amount. This withheld PAYE tax serves as a provisional estimate of the individual's overall tax liability.

Personal income tax records (ITR12 returns). The ITR12 return, also referred to as the personal income tax return, is filed by individuals or their tax practitioners. It encompasses all the necessary details to calculate the final tax liability for a given assessment year. Typically, the return autofills income and deductions related to employment (as stated in the IRP5 certificate), but individuals must manually declare additional income from self-employment, investments, or other sources, as well as any extra deductions. It is crucial to recognize that the PAYE tax amount indicated in the IRP5 is provisional, while the tax liability calculated in the ITR12 is definitive. Consequently, this could result in either tax refunds or additional tax being due upon assessment, contingent on whether the provisional PAYE tax surpasses or is less than the final tax liability. Not every taxpayer is obligated to file an ITR12. Generally, individuals are exempt if they only have one source of employment income, their investment income is below the exemption limit, they do not claim extra deductions, and their total income is under the mandatory filing threshold. This threshold has increased over time: it was ZAR120,000 from the 2007–08 tax year, ZAR250,000 from the 2012–13 tax year, and ZAR350,000 from the 2014–15 tax year onwards.

Data cleaning. Our analysis utilized two sub-panels from the Individual Panel: the Source Code Panel and the Income Panel. The Source Code Panel presents the types of individual income per person for each tax year, while the Income Panel compiles annual data on taxable income, tax liability, and other income types per individual. These sub-panels also include demographic details such as date of birth, used for age calculation, and gender. To ascertain donation amounts, we examined 'deductions' under Source Codes 4011 and 4030. Deductions under 4011 represent contributions to PBOs made by individuals on their ITR12 returns, whereas 4030 deductions denote contributions made by employers to PBOs on behalf of employees, as recorded on their IRP5 certificates. Total donations were calculated by adding personal donations to those made by employers on behalf of their employees. Donors were defined as individuals whose total donations exceeded zero, with all others classified as non-donors. Taxable income was determined based on total earnings prior to any deductions.

Table 1 presents a comprehensive summary of taxpayer statistics from 2011 to 2021, focusing on key variables such as the total number of taxpayers, donors, average donation amounts, gender distribution, age, and taxable income (mean and median) for both donors and non-donors. The number of total taxpayers increases steadily over the period, from 12.8 million in 2011 to 14.3 million in 2021. The number of donors also rises, with the percentage of donors relative to total taxpayers growing from 0.55% in 2011 to 0.90% in 2021. Donors are also shown to have consistently higher taxable incomes compared to non-donors, with this gap widening substantially over time. For example, in 2011, donors earned an average taxable income of ZAR4 million (with a median of ZAR2 million), compared to ZAR0.9 million for non-donors (with a median of ZAR0.4 million), whereas by 2021 donors' average taxable income had risen to ZAR6.3 million (with a median of ZAR3.3 million), while non-donors earned ZAR2.8 million on average (with a median of ZAR0.6 million). The gender breakdown shows that female participation in donations increases slightly, while the percentage of female non-donors remains relatively stable. Additionally, donors tend to be slightly older than non-donors, with the mean age of donors fluctuating between 49 and 53 years throughout the period.

Table 1: Summary statistics by tax year

Year	Total taxpayers	Donors		Donations	% Female		Age (mean)		Taxable income (mean)		Taxable income (median)	
	Count	Count	%	Mean	Donors	Non-donors	Donors	Non-donors	Donors	Non-donors	Donors	Non-donors
2011	12,807,007	70,810	0.55	44,788	41.70	43.76	53	41	4,029,325	918,674	2,025,844	411,561
2012	13,255,517	85,602	0.65	47,355	43.99	44.34	52	41	4,136,539	974,356	2,086,862	425,079
2013	13,481,634	95,536	0.71	50,172	44.90	44.26	51	41	4,565,362	1,048,167	2,266,606	456,202
2014	13,705,712	109,628	0.80	58,942	42.75	44.64	50	41	4,629,586	1,303,245	2,159,756	482,235
2015	14,076,313	113,648	0.81	64,506	45.43	45.25	50	41	5,352,034	1,510,133	2,381,401	498,187
2016	14,077,486	98,941	0.70	55,161	47.57	45.45	51	41	6,032,085	1,301,260	2,832,184	540,211
2017	14,287,639	112,619	0.79	60,541	48.85	46.10	51	41	6,536,940	1,489,867	3,219,227	574,090
2018	14,337,113	121,294	0.85	65,633	49.21	46.21	50	42	6,415,982	1,299,738	3,257,707	609,140
2019	14,520,290	130,226	0.90	69,399	49.03	46.73	49	42	6,408,721	1,601,578	3,307,151	633,053
2020	14,719,033	126,983	0.86	82,061	48.07	47.45	49	42	6,521,800	1,903,698	3,257,753	648,499
2021	14,262,270	129,001	0.90	80,499	47.66	47.77	49	42	6,348,941	2,845,403	3,275,542	638,855

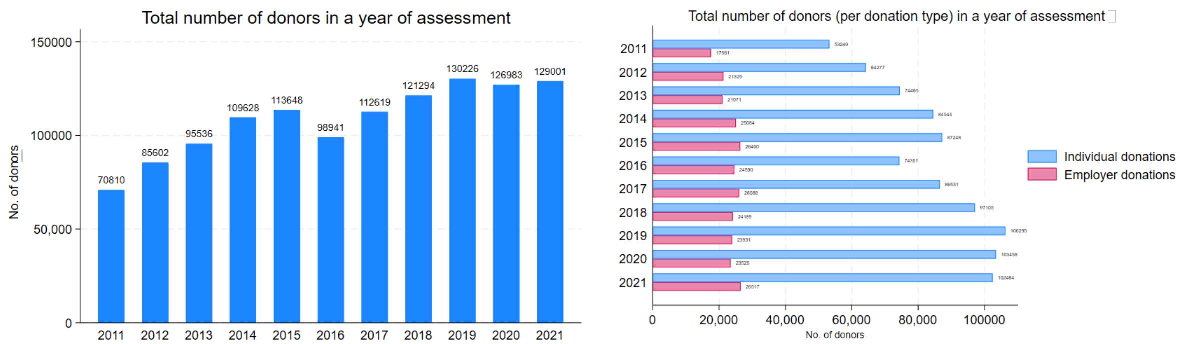
Note: this table provides a summary of taxpayer statistics from tax years 2011–2021. 'Donors count' indicates the total number of donors each year. 'Donors %' shows the percentage of donors in relation to the total number of taxpayers. 'Donations' refers to the average donation amount. The table also breaks down demographic information (gender, age, and taxable income) for both donors and non-donors. '% Female' denotes the proportion of female donors and non-donors, while 'Age' indicates the average age of both groups. Both taxable income and donations are presented in real terms, adjusted to 2020 prices, and expressed in South African rand.

Source: authors' calculations based on Individual Panel data from National Treasury and UNU-WIDER (2023).

Figure 1 illustrates the total number of donors for each tax year and further segregates donors according to the source of their donations. Notably, the count of total donors has risen to over 100,000 since 2014. Upon dis-aggregating the data, it is observed that a majority of donors have contributed themselves, with the number of donors through the employer not showing significant variation over time.

Figure 1: Donor distribution

(a) Total donors (b) Self-donors vs via-employer donors

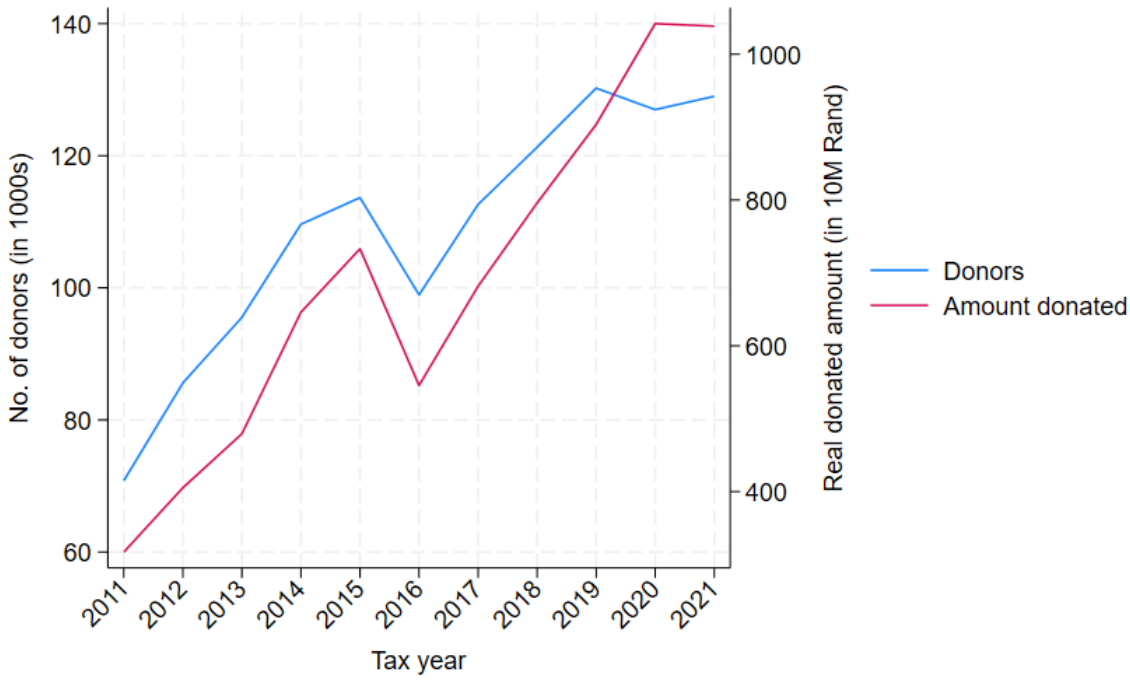


Note: the total number of donors for each tax year is determined by counting individuals who have made positive contributions to PBOs. These donations have been made either directly by the individuals or via their employers.

Source: authors' calculations.

Figure 2 illustrates the cumulative real value of charitable contributions and the count of donors in South Africa from 2011 to 2021, showing an overall increase in both the number of donors and the amount donated. The number of donors rises from around 70,000 in 2011 to over 120,000 by 2021, while the real donated amount grows consistently, with the amount donated to PBOs tripling during the same period. There is a slight rise after 2014, suggesting that the option to carry donations over to the next tax year provoked some increase in donations. Despite the dip in 2016, both donors and donation amounts generally exhibit sustained growth throughout the decade.

Figure 2: Individual donations in South Africa

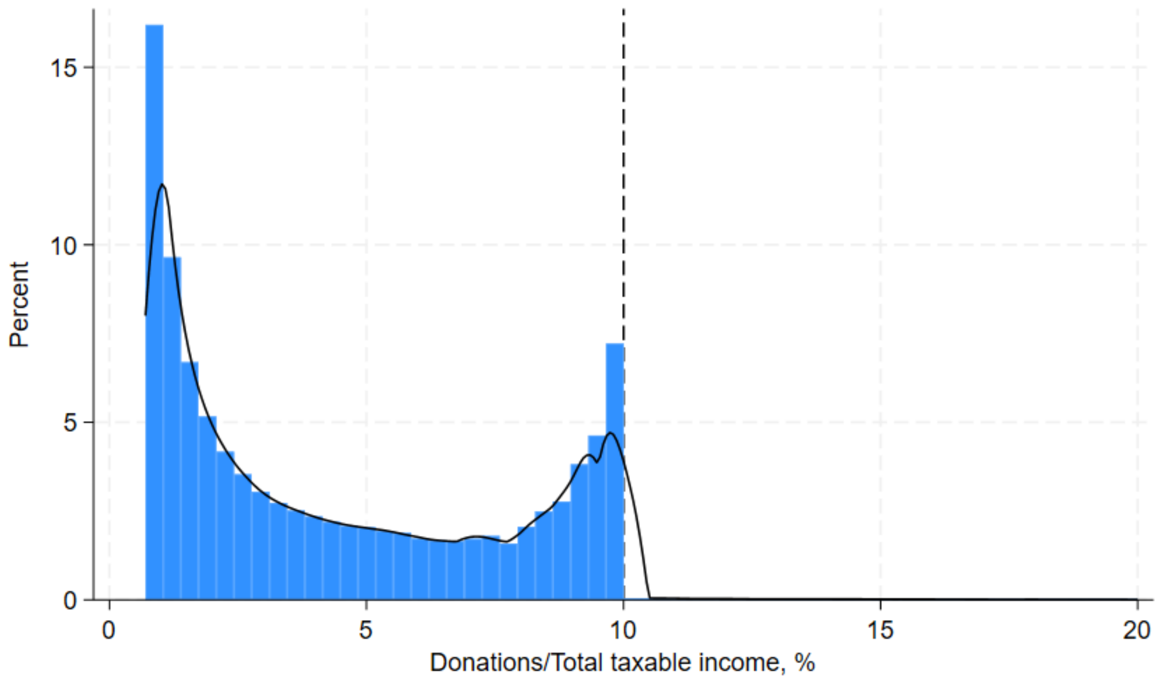


Note: calculated based on the combined annual personal income and payroll tax records for individuals with positive donations, with the donated amounts adjusted using 2020 prices.

Source: authors' calculations.

Figure 3 suggests strong evidence of bunching at the point above which donations are no longer incentivized by the tax system (10% of taxable income). This shows that more than 5% of donors are situated just below the kink point, with a sharp decline in the frequency of donors beyond this point. This pattern is consistently observed across all the tax years and taxable income percentiles, as depicted in Figures A1 and A2 in Appendix A.

Figure 3: The kink point around charitable donations to taxable income ratio

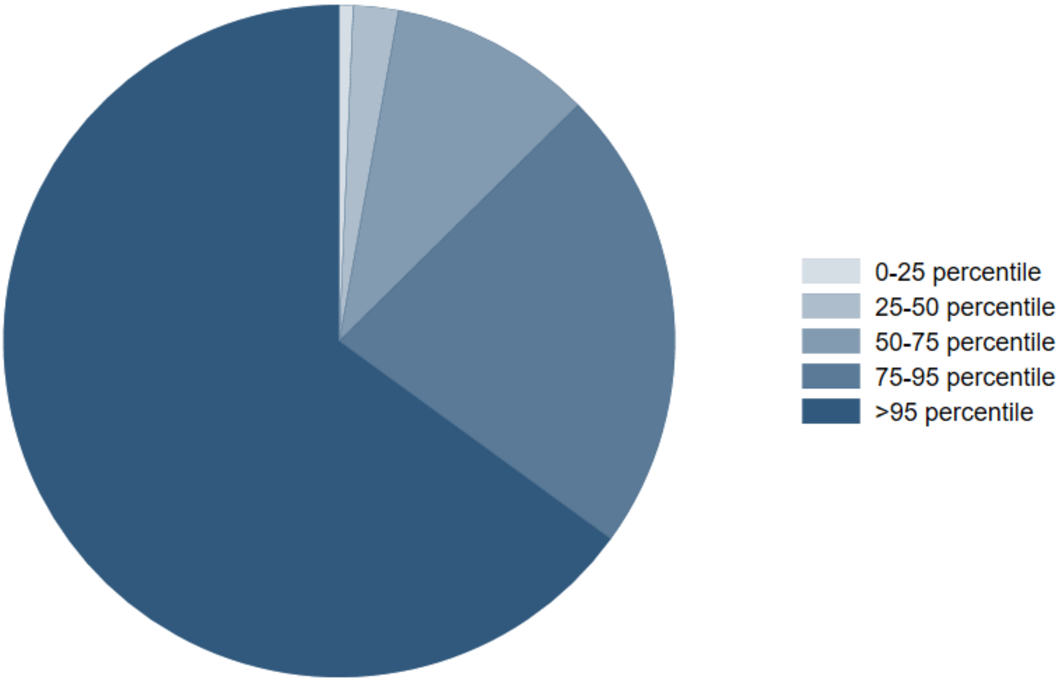


Note: annual tax returns for individuals were pooled for the years 2011–21. The point at 10% represents the kink point of the ratio of donations to taxable income.

Source: authors' calculations.

Figure 4 illustrates the proportion of taxpayers making any donation across different income percentiles. The figure demonstrates that the share of donors increases progressively with higher income percentiles. Specifically, individuals in the highest taxable income category (>95th percentile) account for the largest proportion of donors, indicating a strong correlation between higher income levels and the likelihood of making donations. Unsurprisingly, the lower income percentiles (0–25, 25–50) contribute the smallest shares of donors.

Figure 4: Share of donors by taxable income percentiles



Note: the ratio of donors to total taxpayers increases with the taxable income percentiles, with the ratio of donors to total taxpayers in the >95th percentile being the highest.

Source: authors' calculations.

4 Methods

4.1 Modelling charitable giving

The optimal design and theoretical rationale of subsidies for charitable donations differ according to the philanthropy model used. Charitable giving models typically assume that individuals not only derive utility from the aggregate provision of public goods, but also from the personal benefits of contributing, a phenomenon known as the 'warm glow' effect of giving. This means that individuals also obtain satisfaction from their personal donations. If individuals were solely altruistic, one would observe crowding out of charitable donations by government expenditure. However, the presence of the warm glow motivation means that crowding out is not perfect, potentially warranting the implementation of tax incentives.[7] The optimal taxation treatment of charitable contributions under the influence of the warm glow effect has been explored by Saez (2004) and Diamond (2006).

In this analysis, we utilize the theoretical framework established by Saez (2004) to assess the effectiveness of tax incentives. This framework defines the optimal tax subsidies using parameters that can be empirically estimated. Saez's (2004) model considers that an individual's utility is derived from private consumption (c), earnings (z)—which negatively affect utility to represent the cost of labour supply—personal charitable contributions (g)—reflecting the warm glow motive—and the aggregate amount of charitable contributions (G). Thus, individuals aim to maximize

$$\max U(c, g, z, G) \tag{1}$$

subject to

$$c + g(1 - t) \leq z(1 - \tau) + R \tag{2}$$

[7] For an analysis of models that incorporate the warm glow effect, refer to Andreoni's work (1990).

where $(1-t)$ represents the donation tax deduction when donations are completely deductible and τ denotes the tax rate on earnings, which finances the subsidy on g and a lump-sum transfer R to all individuals. Given that the population is sufficiently large, individuals perceive G as constant when maximizing their utility.

The impacts of crowding out effects are also incorporated into the model by permitting the government to directly contribute to the same public good by a specified amount, G_0. The amount of total public goods will then be $G = G_P + G_0$, such that the total private contributions (G_P) is directly influenced by G_0, since G is a component of the Marshallian demand function of every individual, $g_i(1-\tau, 1-t, R, G_0)$. The crowding out effect can be depicted as a function of the average private contribution, taking into account the tax parameters and a specified G_0, denoted by $G^* = G^*(1-\tau, 1-t, R, G_0)$. The crowding out effect of increasing G_0 is $\frac{\partial G^*}{\partial G_0}$, denoted by $G^*_{G_0}$, and is assumed to vary between 0 and -1 (complete crowding out). To formulate quantitative tax policy recommendations, Saez (2004) demonstrates that it is beneficial to adopt three critical assumptions in this framework: (1) individual earnings are not influenced by income effects; (2) the amount of contributions and the subsidy rate on charitable contributions have no impact on earnings; and (3) the compensated supply of contributions is independent of the tax rate on earnings.

These assumptions are often implied within the empirical research on charitable contributions, and Saez's model (2004) can link these findings to a broader theoretical context. With these assumptions, the criterion to evaluate the optimality of the subsidy rate, t, is formulated as a function of ε_{1-t}, which represents the elasticity of charitable contributions relative to their price, $1-t$:[8]

$$\varepsilon_{1-t} = -(1 + G^*_{G_0}) \tag{3}$$

Equation 3 suggests that if there is no crowding out effect between charitable contributions and government spending ($G^*_{G_0} = 0$), then subsidies for charitable contributions should be raised when the elasticity exceeds 1 in absolute value, and lowered when it is less than 1 in absolute value.

4.2 Bunching estimator

The theoretical framework discussed develops from the usual conventions associated with the deductibility of individual donations. Typically, deductions are capped, and in South Africa they are limited to 10% of total taxable income. This cap creates discontinuities, as deductions beyond this 10% threshold are not permitted. The introduction of such discontinuities, or 'kinks', is likely to alter the impact of tax incentives on giving. Our approach draws on the empirical methods developed by Saez (2010) andChetty et al. (2011) to calculate elasticities from the clustering of taxpayers at these kink points in the budget set. The key concept of a bunching estimator is that it allows for the empirical estimation of elasticity based on the observed concentration of taxpayers at the kink, compared to a counterfactual distribution without the kink. More recent bunching estimators, such as Bertanha et al. (2022), are generally used to estimate bunching behaviour around a single, well-defined kink or threshold in the data, where the kink or threshold is fixed at a specific value for all observations. For this bunching command to work effectively, it needs a consistent threshold at which bunching behaviour occurs, such as a fixed income level for all individuals. This is not the case for our data structure, where the 10% donation threshold depends on income such that the actual income level at which the threshold applies varies across individuals. For that reason, the traditional approach by Saez (2010) and Chetty et al. (2011) seems more appropriate for this dataset.

In our counterfactual scenario, donations are completely tax-deductible as in Equation 2. Introducing a kink, we define g^* above which donations are deductible at a rate t_1, which is zero in our scenario. In

[8] In his model, Saez (2004) incorporates a social weight to show the government's distributive preferences; however, for simplicity we disregarded this additional objective.

South Africa, this kink is determined by the ratio of donations to taxable income, so we represent the donation amount as $G_p = gZ$, where Z denotes an individual's annual taxable income and g represents the proportion of giving. The method established by Chetty et al. (2011)[9] involves fitting a flexible polynomial to the observed income distribution while excluding observations within a certain range around the kink. Specifically, individuals are categorized into donations/income bins denoted by j, and the following regression is computed:

$$c_j = \sum_{i=0}^{p} \alpha_i (g_j < g^*)^i + \sum_{i=0}^{p} \beta_i (g_j > g^*)^i + \sum_{i=-E}^{E} \gamma_i [g_j = i] + \eta_j \tag{4}$$

Here, c_j represents the number of individuals in the share of donations bin j. Relative to the kink in bin j, $g_j < g^*$ indicates that the share of giving is less than the kink, while $g_j > g^*$ indicates that the share of giving is above the kink. The term $[-E, E]$ denotes the range of data excluded around the kink g^*, and p represents the order of the polynomial. Both g_j and E are measured in units of the bin width, d.

Similar to workers in prior bunching studies who select between pre-tax and post-tax income levels, the kink suggests that marginal bunchers within the region $[g^*, g^* + dg^*]$ above the kink move to the kink point g^* to optimize their utility. This movement causes the noticeable bunching at the kink point g^* in the density distribution of charitable contributions, as shown in Figure 3. The degree of excess bunching is calculated by comparing the observed bin counts with the predicted bin counts within the excluded range $[-E, E]$, normalized by the average height of the counterfactual distribution in that range:

$$\hat{b} = \frac{\sum_{j=-E}^{E} C_j - \hat{C}_j}{\sum_{j=-E}^{E} \hat{C}_j / (2E+1)} \tag{5}$$

Where $[2E+1]$ represents the number of bins in the excluded range, $[-E, E]$. Assuming that the distribution of individual heterogeneity is uniform around the kink, the local tax price elasticity at the kink point g^*, denoted as $\tilde{e}(g^*)$, can be linked to the estimate of excess bunching using the following formula:

$$\tilde{e}(g^*) = \frac{b}{K \times \log\left(\frac{1-t_0}{1-t_1}\right)} \tag{6}$$

where b captures the concentration of donors around the kink point in the distribution of contributions, indicating how many people are contributing just at or around the kink. K denotes the kink point g^* at the 50th bin (the kink point is defined as the threshold at which the ratio of donations to taxable income equals 10%, beyond which any additional donations are not deductible). t_0 is the marginal tax rate before the kink, representing the tax rate applicable to contributions before the kink point. t_1 is the marginal tax rate after the kink.

5 Results and discussions

We begin with Wilcoxon rank-sum tests to assess the differences in average donations as a percentage of income based on the type of donation, gender, age, and taxable income percentiles. We then visually present the excess bunching of individuals around the kink point. To estimate elasticity, we adopt the methodologies of Saez (2010) and Chetty et al. (2011), constructing histograms to illustrate the bunching at the kink point. We then calculate the excess mass of individuals and standard errors[10] by comparing

[9] I follow the estimation procedure developed by Chetty et al. (2011) and utilize the Stata command 'bunch_count' created by the authors.

[10] We adopt the parametric bootstrap procedure outlined by Chetty et al. (2011) to calculate the standard errors for the estimated bunching parameter. This involves estimating the difference between the actual and the counterfactual number of individuals

the observed mass at this kink point to the hypothetical mass in the absence of a kink,[11] using the code provided by Chetty et al. (2011).[12] Our analysis starts with the baseline bunching estimate (estimates for the whole sample), followed by a discussion on the sensitivity of this baseline to the chosen assumptions. Subsequently, we conduct a heterogeneity analysis, estimating the excess bunching mass across various demographics, including gender, age, and taxable income percentiles. Finally, we perform robustness checks to affirm that the baseline estimate is consistent with the choice of polynomial degree and the exclusion of bins around the kink point in estimating the counterfactual density and some quantile regression analysis.

5.1 Main results

Table 2 shows the results for a two-sample Wilcoxon rank-sum test to compare average donations across different demographic groups. The results reveal significant differences in average donations as a percentage of income based on the type of donor, gender, age, and taxable income percentiles. Self-donors contribute a higher percentage of their income (2.3%) compared to those donating via employers (0.7%), and males (2.2%) donate more than females (1.6%). The difference in average taxable income between males and females results in a corresponding gap in their ability to donate. Males, having higher incomes, are both capable and possibly incentivized to donate larger amounts, while females, with lower incomes, donate less on average. This is primarily driven by the income effect, tax incentives, and proportional giving behaviour, all of which favour higher-income individuals—males in this case. Individuals aged 64 and under give a larger share (2.4%) of their income compared to older individuals (1.6%), and those in the lower income percentiles (0–50) donate a higher percentage (3.0%) than higher earners in the 50–99 percentiles (0.9%). All comparisons are statistically significant, as indicated by the Wilcoxon z-values. All figures are adjusted for inflation to reflect 2020 values and are denominated in South African rand.

Figure 5 provides strong evidence of bunching in the baseline scenario (all taxpayers). The empirical distribution of the share of giving around the kink point is plotted as a dotted blue line, while the smooth red line illustrates the counterfactual estimated by applying the seventh-order fitted polynomial, excluding observations within a small window around the kink point. The bin sizes were fixed at 0.2% of donations to taxable income ratio, and to estimate the counterfactual we excluded four bins to the left and two bins to the right of the kink.[13] The decision is based on the visual analysis of Figure 5, which distinctly and sharply shows the beginning and end of the distribution interval for individuals impacted by the kink. The excess mass for this chosen specification is calculated at 97.39. In order to calculate the change in the net of tax rate we used the marginal tax rate from taxable income brackets from the SARS website[14] and then calculated the price change. The price increase was determined by the formula: $price\_increase = mtr/(1-mtr)$, where mtr refers to the average marginal tax rate. Subsequently, the logarithm of the price change was calculated as: $log\_price\_change = \log(1 - price\_increase)$. Upon

per bin, excluding the window around the kink. We then create a new distribution of individual counts from these errors and estimate the corresponding bunching mass. The standard deviation of this bunching mass provides the estimated standard error.

[11] Chetty et al. (2011) permit the relaxation of the constant baseline distribution assumption within the bunching segment, opting instead to estimate a polynomial across the actual earnings distribution to represent the counterfactual mass. Moreover, it may be necessary to omit a region around the kink due to frictions that prevent individuals from relocating precisely to the kink.

[12] Much of the literature on bunching notes significant bunching patterns at round numbers, often incorporating round number dummies to account for potential biases (see Hungerman and Ottoni-Wilhelm 2021; Kleven and Waseem 2013). However, this phenomenon does not appear in our data, possibly because the kink is characterized as a ratio of donations to taxable income, rather than an absolute number.

[13] This means that we are omitting the density range from 9.2% to 10.4% in the fraction of charitable donations to taxable income.

[14] https://www.sars.gov.za/tax-rates/income-tax/rates-of-tax-for-individuals/.

incorporating this bunching and the price change parameters into Equation 6, we deduce a baseline tax price elasticity of donation of -1.910.

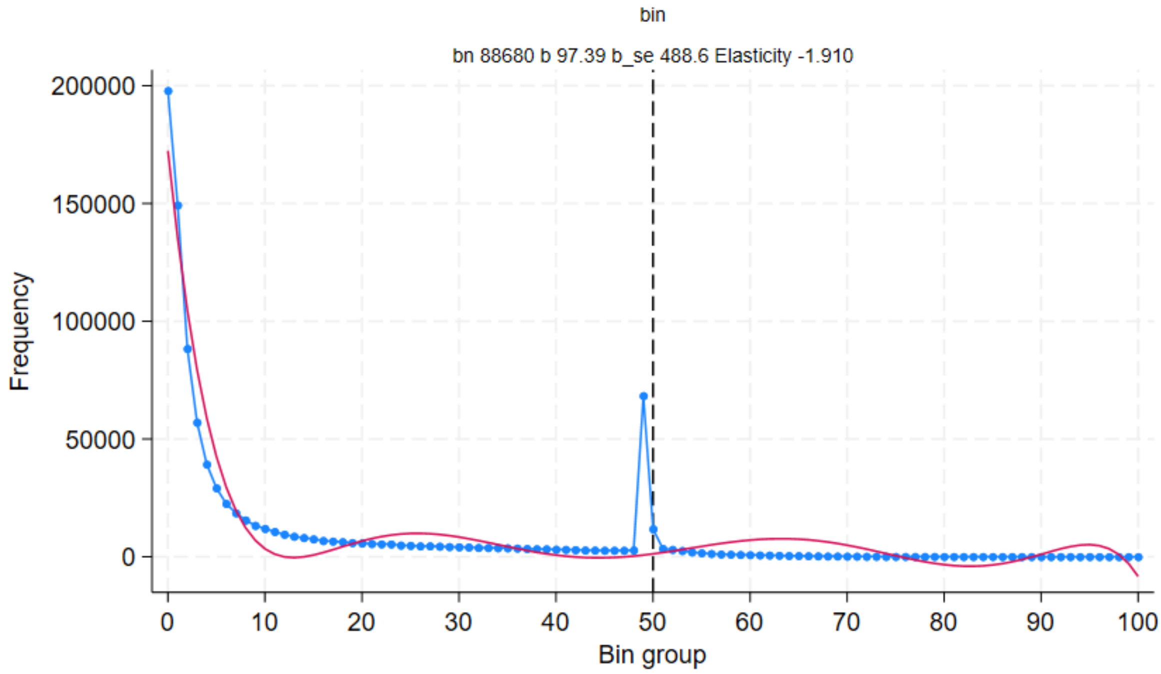
Table 2: Two-sample Wilcoxon rank-sum test of donations as a percentage of income

N	Mean (s.d.)	*N*	Mean (s.d.)	Wilcoxon z
		Type of donor		
Self-donors		Via-employer donors		
920,524	2.3 (3.11)	254,397	0.7 (3.52)	481.1***
		Gender		
Male		Female		
579,491	2.2 (3.52)	513,079	1.6 (2.87)	76.5***
		Age		
Middle aged (15–64 years)		Old-aged (65+ years)		
735,580	2.4 (3.23)	184,210	1.6 (2.45)	60.5***
		Taxable income percentiles		
0–50		50–99		
589,356	3.0 (4.02)	585,565	0.9 (1.69)	326.0***

Note: the table presents a two-sample Wilcoxon rank-sum test comparing donations as a percentage of income across different groups, including type of donor, gender, age, and taxable income percentiles. ***, **, and * indicates significance level at 1%, 5%, and 10%, respectively.

Source: authors' calculations.

Figure 5: Charitable giving bunching analysis (*Baseline*)



Note: this figure utilizes the methodology of Chetty et al. (2011) to estimate counterfactual density and calculate the excess mass for all individuals who donate in our sample. Further details can be found in Section 4.2. The bins on the *x*-axis correspond to 0.2% of the ratio of charitable giving to taxable income. Therefore, the 50th bin, marked by a black dashed vertical line, signifies the kink point at 10% of taxable income. For the counterfactual estimation, we omit four bins to the left and two bins to the right of the kink point and apply a seventh-degree polynomial. Table 3 presents a sensitivity analysis for these parameters. The calculated excess mass is 97.39, which, according to the elasticity formula in Equation 6, results in a tax price elasticity of giving of –1.910.

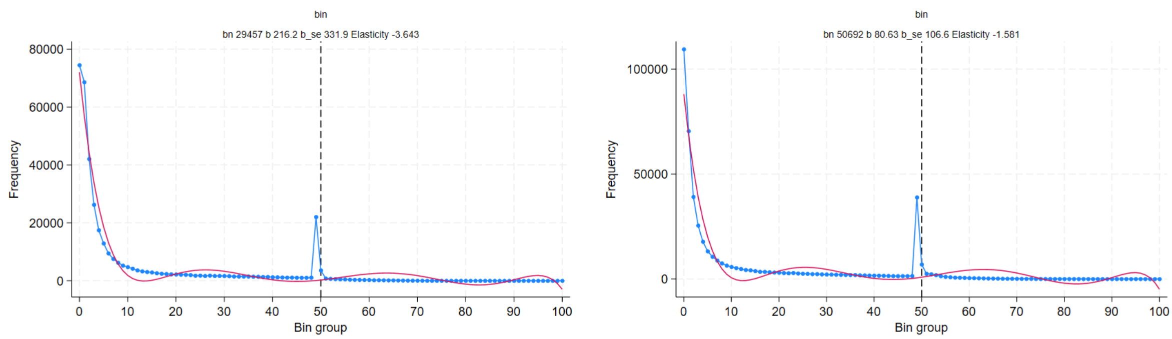
Source: authors' calculations.

5.2 Heterogeneity analysis

We calculate elasticities differentiated by gender, age (15–64 years category and 65+ years category), and taxable income percentiles. Figure 6 demonstrates significant bunching for both females and males. Notably, the excess bunching mass is higher for females (216.2) compared to males (80.63). Applying the same method for calculating *price_increase* as used in the baseline estimation, but now exclusively for females or males and including bunching estimates in Equation 6, we find that the tax price elasticity of donations is negative for both females (-3.643) and males (-1.581), indicating that both genders increase their donations when the cost of giving (the tax price) decreases, but females are much more responsive to tax incentives than males. This finding is consistent with the findings from Auten et al. (2002). Since females have a lower average marginal tax rate than males, smaller changes to the 'cost' of giving would be expected to have bigger increases on giving, resulting in higher elasticity. The greater negative elasticity observed in females suggests that they are more responsive to changes in the tax price of giving than males. A reduction in the tax price results in a notably larger increase in donations from women. This could be attributed to women potentially being more price conscious due to a lower average income, or women may adjust their giving more significantly based on external factors, including financial incentives such as tax deductions, in comparison to men (Andreoni and Vesterlund 2001; Mesch et al. 2006). Consequently, they tend to alter their donation amounts more substantially in reaction to tax incentives.

Figure 6: Charitable donations bunching analysis for gender

(a) Females (b) Males



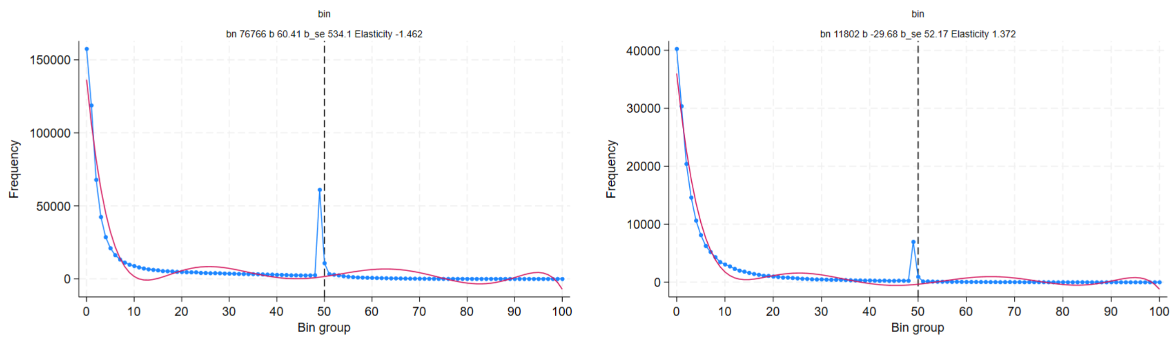
Note: this figure reproduces the baseline estimate presented in Figure 5 and shows bunching analysis by segmenting the sample into female and male observations. Part (a) pertains to females and indicates an elasticity of –3.643, while (b) pertains to males and indicates an elasticity of –1.581. The robustness exercise was also replicated for these female and male groups in Table 3.

Source: authors' calculations.

Figure 7 shows bunching estimates across individuals aged 15–64 versus those aged 65 and above. The differences in tax price elasticity of donations between younger individuals (-1.462) and older individuals (1.372) reflect distinct behavioural patterns in how these age groups respond to tax incentives for charitable giving. The negative elasticity observed in the younger demographic group suggests a high responsiveness to tax incentives, with a decline in the tax price of donations leading to a notable increase in their charitable contributions. This indicates a heightened price sensitivity among this group towards charitable giving, likely viewing tax incentives as a financial benefit that renders donating more feasible, prompting them to adjust their contributions accordingly. Conversely, the older group shows less bunching at the cut-off. Given that many in this group are retirees on fixed incomes, tax incentives may not significantly alter their established donation habits or financial priorities. Their philanthropic actions are probably more influenced by personal convictions or enduring commitments than by tax benefits. Studies by Andreoni (2006) on philanthropic behaviour corroborate that older individuals often have more consistent giving patterns, motivated by long-standing allegiances to specific causes or institutions rather than immediate tax advantages. This aligns with the observed positive tax elasticity, suggesting a lesser sensitivity to tax incentives among the elderly. Meer's (2013) research supports the notion that tax incentives more effectively encourage donations from those still employed, namely the middle-aged, as opposed to retirees who may place less emphasis on yearly tax deductions. Andreoni and Payne's (2011) findings also suggest that younger and middle-aged donors are typically more tactical in their giving, adjusting their donations in response to tax policies, whereas older donors may be less influenced by tax changes, focusing instead on legacy planning or bequest intentions. This is in line with the negative elasticity seen in the middle-aged sector, where a decrease in tax price prompts an increase in donations.

Figure 7: Charitable donations bunching analysis for age

(a) Middle-aged (b) Old-aged



Note: this figure segments the sample into middle-aged (15–64) and old-aged observations (65+). Part (a) pertains to the working-age population and indicates an elasticity of –1.462, while (b) pertains to the retired population and indicates an elasticity of 1.372.

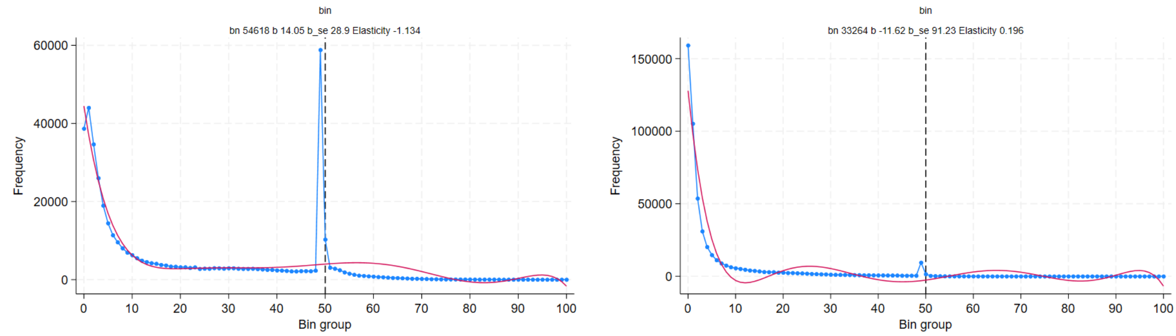
Source: authors' calculations.

Lastly, the heterogeneity analysis includes bunching analysis estimates for two broad groups of taxable income percentiles: the 0–50th percentile and the 50–99th percentile. We observe more pronounced bunching at the lower percentiles than at the higher percentiles, as depicted in Figure 8. The differences in tax price elasticity of donations between lower-income individuals (0–50th percentile) and higher-income individuals (50–99th percentile) reflect distinct behavioural responses to tax incentives. Lower-income individuals show a more negative elasticity (-1.134), indicating that they are highly responsive to tax price changes; when the cost of giving decreases (due to tax deductions), they significantly increase their donations. This suggests that tax incentives play a crucial role for these individuals, as they face tighter financial constraints and may be motivated to donate in part because of the financial relief tax deductions provide. Research by Clotfelter (2007) and Auten et al. (2002) supports this finding, showing that lower-income households tend to adjust their charitable giving more in response to tax incentives than wealthier individuals.

Conversely, higher-income individuals in the 50–99th percentile show a marginal positive elasticity (0.196), suggesting that tax price changes do not significantly influence their charitable giving, also illustrated by less bunching at the cut-off, as seen in Figure 8. This group is less sensitive to tax incentives, likely because their giving behaviour is driven by other factors, such as long-term philanthropic commitments, social pressures, or personal values. Studies by Randolph (1995) and Bakija and Heim (2011) corroborate this, finding that higher-income individuals are generally less responsive to tax incentives as they have greater financial flexibility and tend to donate regardless of the tax benefits. In Figure A2 in Appendix A we further dissect these income percentiles into narrower bands. Our analysis indicates a consistent decline in both bunching and elasticity with an increase in income percentiles.

Figure 8: Charitable donations bunching analysis for taxable income percentiles

(a) 0–50th percentile (b) 50–99th percentile



Note: our analysis included bunching at different taxable income percentiles. Part (a) represents the 0–50th percentile of taxable income, revealing an excess mass of 14.05 and a tax price elasticity of –1.134. Conversely, (b) represents the 50–99th percentile, with an excess mass of –11.62 and a tax price elasticity of 0.196.

Source: authors' calculations.

5.3 Robustness checks

Table 3 provides evidence that the baseline, female, and male estimates remain robust when varying the degree of the polynomial and when excluding bins around the kink point in estimating the counterfactual density. Specifically, we experimented with excluding up to six bins to the left and four bins to the right of the kink, in two-bin intervals. Additionally, we varied the polynomial degree for estimating the counterfactual from four to seven, based on the data from the non-excluded bins. The resulting elasticity estimates ranged from −2.298 to −0.768 for the baseline, −3.643 to −1.092 for females, and −1.949 to −0.461 for males.[15]

Table 3: Elasticity estimates: robustness to selection of bunching parameters

Polynomial	Excluded bins					
	Baseline		Females		Males	
	(–4;2)	**(–6;4)**	**(–4;2)**	**(–6;4)**	**(–4;2)**	**(–6;4)**
7th (reference)	–1.910	–2.480	–3.643	–3.472	–1.581	–1.831
4th	–2.298	–1.713	–2.665	–2.045	–1.949	–1.385
5th	–1.343	–0.768	–1.704	–1,092	–1.018	–0.461
6th	–2.121	–2.019	–3.568	–3.041	–1.052	–1.425

Note: the table displays robustness tests for baseline estimates, as well as for female and male individuals. Specifically, it examines the robustness in estimating the counterfactual density by altering the excluded bins around the kink point in the columns, and by changing the polynomial function's degree in the rows. Each bin represents 0.2% of the ratio of charitable giving to taxable income.

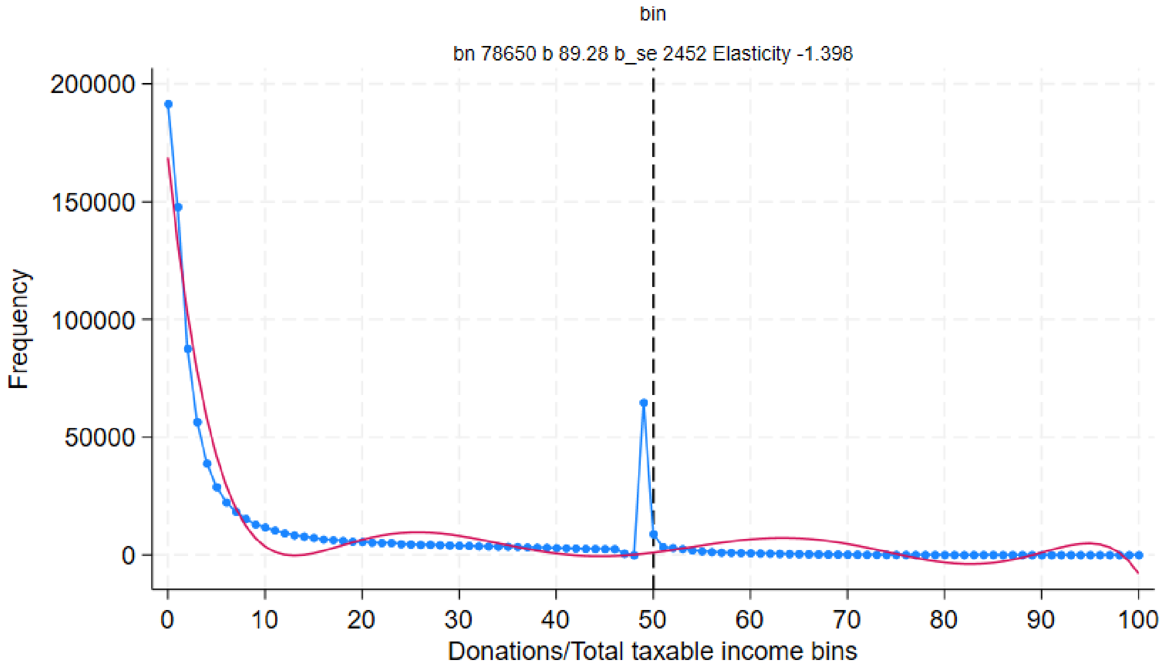
Source: authors' calculations.

Concerns arise regarding whether reporting behaviour influences the estimated high elasticity. This could emanate from individuals under-reporting their donations beyond the kink point, as there is no tax advantage to reporting these additional amounts. To investigate this, we examine the robustness of our baseline bunching analysis in Figure 9 by omitting taxpayers who cluster significantly at the kink point. If there are no tax incentives for reporting donations above the deductible limit, it is likely that some individuals will report exactly at the kink point and omit any contributions beyond it. Therefore, we remove all individuals situated at the kink to consider this potential under-reporting. As a result, we eliminate 12,394 observations at the bin involving the kink, specifically individual–year observations that report donations in the range of [9%, 10%] of taxable income. This adjustment causes bunching

[15] We also calculated these parameters using winsorized trimmed data at the lower 1st percentile and the higher 99th percentile. The findings in Table A2 in Appendix A indicate that, generally, elasticity diminishes as we exclude extreme values from the data.

estimate to decrease in absolute value but still reflect a considerable magnitude tax price elasticity of giving, with an estimate of -1.398.

Figure 9: Donations and bunching analysis: excluding sharp bunchers



Note: this figure duplicates the baseline analysis from Figure 5 by excluding 12,394 observations situated in the bin at the kink point, specifically all taxpayers with donations ranging from 9.5% to 10% of taxable income. The calculated elasticity is –1.398. Source: authors' calculations.

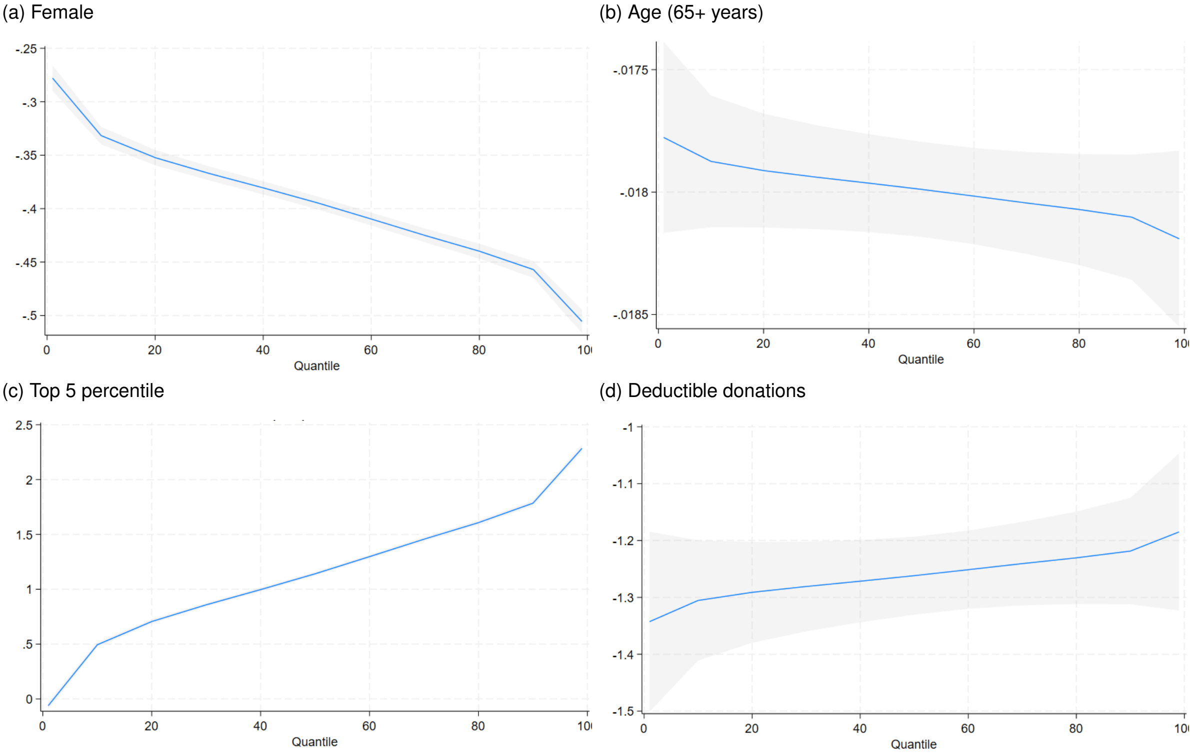
Given that charitable giving can vary significantly by income levels, we use quantile regression to analyse how donations differ across different demographic groups. Figure 10 displays the coefficient estimates of each explanatory variable for the conditional quantiles of the natural logarithm of donations, when controlling for the individual's age, taxable income percentiles, deductible donations and year.[16]

The coefficient plots provide insightful evidence on the determinants of donation behaviour across various quantiles of the donation distribution. First, Figure 10(a) shows a negative coefficient for females, suggesting that women consistently donate less than men across all donation quantiles, with the gender donation gap widening as we move towards higher quantiles. This implies that women not only donate less on average, but that the disparity between male and female donations becomes more pronounced for larger donations. This is expected, as women only have approximately 50% of the average male income. Figure 10(b) shows the coefficient estimates in terms of age. The results show a small but consistent negative effect on donation amounts. Older individuals (aged 65+) tend to donate slightly less than their younger counterparts, though the impact remains relatively uniform across quantiles. The modest slope and narrow confidence interval suggest that the influence of age on donations, while negative, is not highly significant in explaining large variations in donation behaviour. Conversely, the effect of being in the top 5% of the taxable income distribution (Figure 10(c)) is positive and increases substantially with higher donation quantiles. Individuals in this high-income group contribute significantly more, particularly at the upper end of the donation spectrum. This finding aligns with economic theories of donations, which indicates that wealthier individuals have both a greater capacity and propensity to donate larger sums. Finally, Figure 10(d) shows the negative coefficient estimates associated with de-

[16] The corresponding quantile regression table is available in Table A3.

ductible donations (donations that are eligible for deductions—those equal to or below 10% of taxable income). This indicates that individuals donating amounts that are eligible for deduction tend to donate less in absolute terms compared to those making non-deductible donations (donations greater than 10% of taxable income in a given year). However, this effect becomes less pronounced at higher donation levels, suggesting that larger donors are less affected by this constraint. Overall, these results highlight the complex interplay between gender, age, income, and donation behaviours. The significant positive impact of high-income status and the widening gender gap at higher donation levels offers important insights for policy interventions aimed at encouraging charitable giving.

Figure 10: Quantile regressions: factors influencing donations



Note: the quantile regressions were computed using the 'mmqreg' command in Stata, incorporating year fixed effects and robust standard errors. Subsequently, the coefficient estimates derived from these quantile regressions were plotted using the 'qregplot' command in Stata.

Source: authors' computation using SARS tax data (National Treasury and UNU-WIDER 2023).

6 Conclusion

The study examines the tax price elasticity of individual giving while taking into account the individual attributes and demographic variations using the tax return dataset and charitable contributions from South Africa. Our findings highlight that tax incentives play a crucial role in shaping donor behaviour. The substantial bunching of donations at the 10% cap on deduction highlights the sensitivity of givers to tax benefits. This insight is consistent with previous research by Asatryan and Joulfaian (2022) on Armenia. We calculate tax price elasticity of donations at the intensive margin of approximately -2. This high elasticity estimate reveals that enhancing tax deductions could lead to a substantial increase in charitable giving. Despite the low number of donors, this behaviour highlights the potential of tax policy as a tool to encourage charitable giving among those who do donate.

It is worth noting that we are not able to estimate exact donations with certainty, since the dataset only includes donations declared on individuals' tax returns. We corroborated the data on total donations by comparing the tax return data to the SARS donations data. However, both might plausibly suffer from under-reporting bias, where respondents might choose not to request a tax certificate for donations for which they would not receive tax benefits.

We note variability in this estimate for different genders, ages, and income percentiles. Women and lower-income individuals exhibit higher responsiveness to tax incentives compared to men and higher-income groups, emphasizing the varied effects of tax policies across different segments of the population. These demographic variations in response to tax incentives indicate that a one-size-fits-all approach may not be the most effective. Tailored policy designs that consider the specific characteristics and preferences of different donor groups could enhance the overall impact of tax incentives. For example, targeted incentives for younger donors or higher-income individuals might further boost charitable contributions, addressing gaps in current donation patterns.

This research contributes to the broader literature on tax incentives and philanthropy, offering valuable guidance for policy-makers aiming to design effective strategies to foster charitable giving in South Africa. Gradual increases in deduction caps, targeted campaigns to raise awareness about tax benefits for charitable giving, and collaboration with PBOs can further improve social welfare in the country. Enhancing tax incentives could significantly increase charitable donations, potentially offsetting the government's revenue loss through increased social welfare and public goods provision. Policy-makers could consider these findings when designing tax policies to foster a more charitable society. Future research could explore the long-term effects of such incentives and their impact on different types of charitable organizations.

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Appendix A

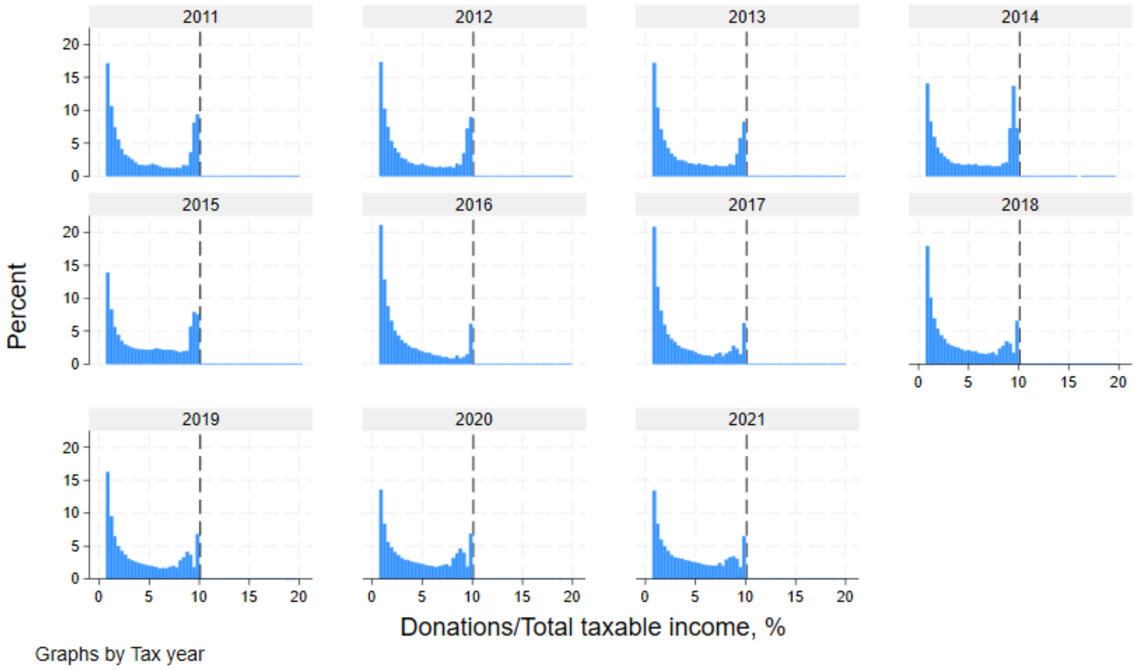
Table A1: Treatment of excess deductible donations

	Year of assessment	
	2015 (rand)	2016 (rand)
Taxable income	200,000	250,000
Maximum potential allowable as deduction (10%)	20,000	25,000
Actual donation	35,000	10,000
Deduction allowed	20,000	25,000*
Amount carried forward	15,000	0

Note: * this is the sum of actual donations in 2016 (10,000) plus the amount carried forward from the previous year 2015 (15,000).

Source: authors' calculations based on the calculation illustrated in SARS (2023: 63).

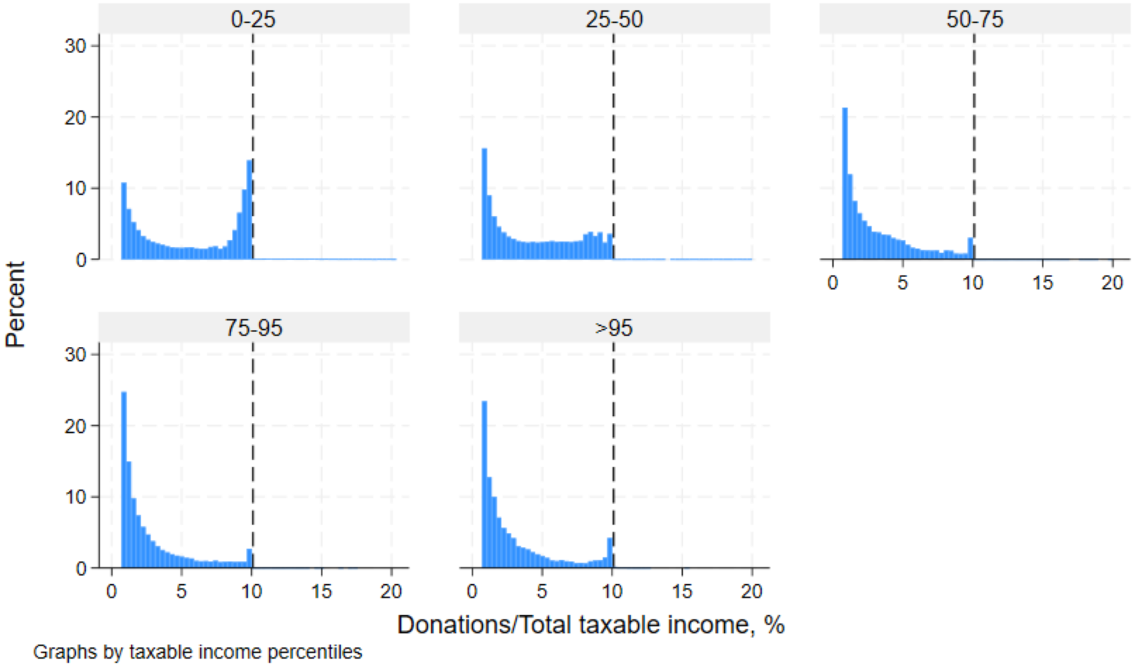
Figure A1: Illustration of charitable giving at kink by tax years



Note: the histograms illustrate the ratio of donations to taxable income among South African individual taxpayers, segmented by tax years. The data reveals a kink point at the 10% mark of the donation-to-taxable-income ratio. There has been a consistent decline in this kink point over time; it hovered around 10% before the 2014 tax year and dropped to around 5% in the tax years post-2014.

Source: authors' calculations.

Figure A2: Illustration of charitable giving at kink over the taxable income percentiles

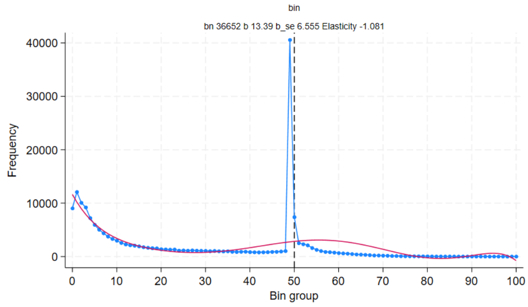


Note: the histograms display the ratio of donations to taxable income among South African individual taxpayers, categorized by taxable income percentiles. The data shows a distinct kink point at the 10% mark in the donation-to-taxable-income ratio. This kink point consistently decreases as the taxable income percentiles increase; beginning at over 10% in the 0–25 percentile and falling to below 5% in the top 5 percentile.

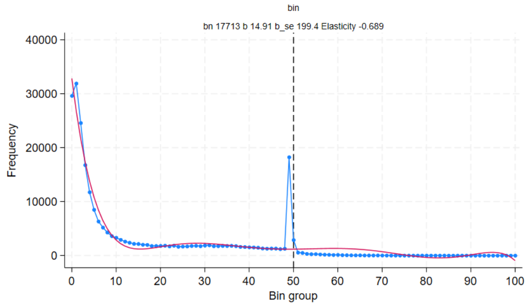
Source: authors' calculations.

Figure A3: Charitable donations bunching analysis for taxable income percentiles: extensions

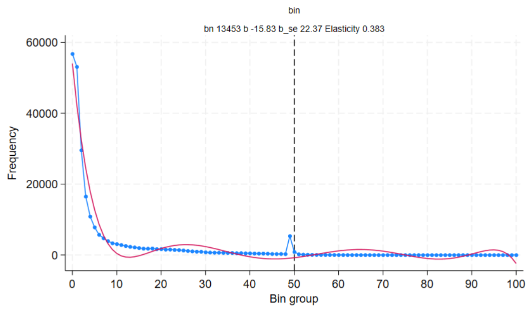
(a) 0–25th percentile]



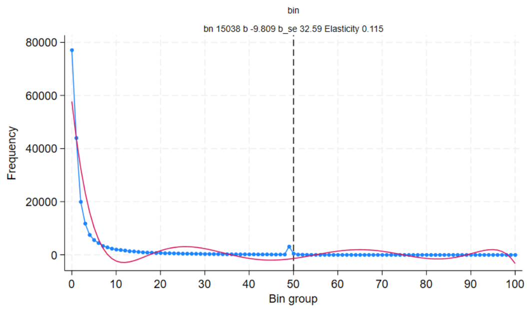
(b) 25–50th percentile



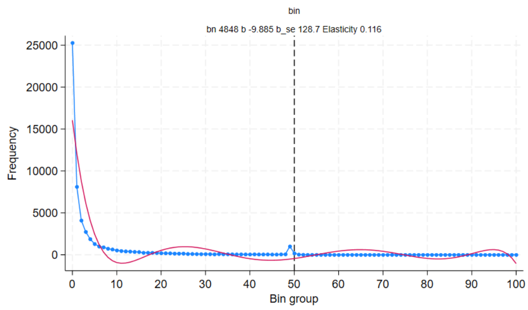
(c) 50–75th percentile



(d) 75–95th percentile



(e) >95th percentile



Note: this figure expands on the analysis of Figure 8, replicating the baseline estimate while further segmenting the taxable income percentiles. The sample is divided into (a) 0–25th percentile, (b) 25–50th percentile, (c) 50–75th percentile, (d) 75–95th percentile, and (e) 95–99th percentile of taxable income. It is observed that both the excess mass and the tax price elasticity of giving decrease in absolute value as we move up the taxable income percentiles.

Source: authors' calculations.

Table A2: Robustness to selection of bunching parameters for winsorized data

Polynomial	Excluded bins					
	Baseline		*Females*		*Males*	
	(–4;2)	**(–6;4)**	**(–4;2)**	**(–6;4)**	**(–4;2)**	**(–6;4)**
7th (reference)	–1,416	–1,814	–2,906	–3,104	–1,195	–1,482
4th	–1,921	–1,539	–2,195	–1,609	–1,899	–1,539
5th	–1,493	–1,433	–1,878	–1,266	–1,192	–1,439
6th	–2,186	–1,786	–2,443	–2,655	–1,172	–1,475

Note: the table displays robustness tests for baseline estimates, as well as for female and male individuals for winsorized taxable income and donations at the 1st percentile and 99th percentile. Specifically, it examines the robustness in estimating the counterfactual density by altering the excluded bins around the kink point in the columns, and by changing the polynomial function's degree in the rows. Each bin represents 0.2% of the ratio of charitable giving to taxable income.

Source: authors' calculations.

Table A3: Quantile estimates: determinants of donations
Dependent variable: natural log of real donations

	Q1	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90	Q99
qtile											
Deductible donations	–1.343***	–1.305***	–1.291***	–1.281***	–1.271***	–1.262***	–1.251***	–1.241***	–1.230***	–1.219***	–1.185***
	(0.081)	(0.054)	(0.045)	(0.040)	(0.037)	(0.035)	(0.035)	(0.037)	(0.041)	(0.048)	(0.070)
Female	–0.278***	–0.332***	–0.352***	–0.367***	–0.381***	–0.395***	–0.410***	–0.425***	–0.440***	–0.457***	–0.506***
	(0.006)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.006)
Age	–0.018***	–0.018***	–0.018***	–0.018***	–0.018***	–0.018***	–0.018***	–0.018***	–0.018***	–0.018***	–0.018***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Top 5 percentile	–0.061***	0.494***	0.706***	0.858***	0.997***	1.141***	1.298***	1.457***	1.608***	1.785***	2.285***
	(0.016)	(0.011)	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)	(0.011)	(0.012)	(0.017)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	853,713	853,713	853,713	853,713	853,713	853,713	853,713	853,713	853,713	853,713	853,713

Note: standard errors clustered at the individual level are shown in parentheses. *Deductible donations* is coded as 1 if total donations are deductible in the current year, and 0 otherwise. *Female* is coded as 1 for female individuals and 0 for others. *Age* represents the individual's age. *Top 5 percentile* is a dummy variable for individuals in the taxable income percentile of 95 and above. *Year* accounts for the year. Significance levels are indicated as: *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Source: authors' calculations based on National Treasury and UNU-WIDER (2023).

Appendix B: Data

This data appendix is created as per UNU-WIDER requirements for users of the National Treasury Secure Data Facility (NT-SDF). It reports on data directly used for the results presented in this paper.

Data access

The data used for this study was accessed from the NT-SDF and is subject to a non-disclosure of private information agreement. Outputs were subject to strict control by qualified staff members assigned to this task to ensure anonymity of firms and individuals. The data used for the paper was the Individual Panel (2023) Extraction 1, Version 5. Period of data access: 15 January 2024 to 20 November 2024.

Software

The empirical analysis was conducted using Stata 18. The estimation results were obtained using the user-written programme bunch_count (Chetty et al., 2011). For robustness analysis we used mmqreg command to estimate quantile regressions.

Cleaning

Our analysis utilized two sub-panels from the Individual Panel dataset: the Source Code Panel and the Income Panel. The Source Code Panel details the types of individual income for each tax year, while the Income Panel compiles annual data on taxable income, tax liability, and other income types, alongside demographic information like age (calculated from date of birth) and gender. The variables from the Income Panel were *Tax_year, id_d_person, best_gender_person, best_dob_person, Gross_income_d, Deductions_d* and the variables from the Source Code Panel were *Tax_year, id_d_person, Source_code* and *Amount.*

To determine donation amounts, we analysed deductions under Source Codes 4011 and 4030. Code 4011 represents personal contributions to public benefit organizations (PBOs) reported in ITR12 returns, while Code 4030 reflects employer contributions to PBOs on behalf of employees, as recorded on IRP5 certificates. Total donations were calculated by summing individual and employer contributions. Donors were defined as those whose total donations exceeded zero, while others were classified as non-donors. Taxable income was calculated as total earnings before deductions. Stata code for creating the individual donations is illustrated below:

```
*** Source code panel
use if Source_code==4011|Source_code==4030 using
"$raw_data\Source_codes_panel_person.dta", clear

bys Tax_year id_d_person: egen total_donations=sum(Amount) if Source_code==
4011 | Source_code==4030 // total donations per person per year
```

Individual-level variables constructed

The following were constructed for use in the analysis. **Age**: Age of an individual was calculated using the '*best_dob_person*' variable. **Gender**: The gender of the individual is derived from the 'best_gender_person' variable. **Taxable income**: Individual taxable income was calculated by using the sum of 'Taxable_income_d' for each year. **Gross income**: Gross income was calculated using the sum of 'Gross_income_d' per year.