

# Assessing pension-related tax expenditures in South Africa

Evidence from the 2016 retirement reform

Agustin Redonda and Christopher Axelson

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The collaboration is between the United Nations University World Institute for Development Economics Research (UNU-WIDER), the National Treasury of South Africa, the International Food Policy Research Institute (IFPRI), the Department of Monitoring, Planning, and Evaluation, the Department of Trade and Industry, South African Revenue Services, Trade and Industrial Policy Strategies, and other universities and institutes. It is funded by the National Treasury of South Africa, the Department of Trade and Industry of South Africa, the Delegation of the European Union to South Africa, IFPRI, and UNU-WIDER through the Institute's contributions from Finland, Sweden, and the United Kingdom to its research programme.

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## **Assessing pension-related tax expenditures in South Africa**

Evidence from the 2016 retirement reform

Agustin Redonda<sup>1</sup> and Christopher Axelson<sup>2</sup>

March 2021

**Abstract:** In 2016, the South African government introduced a comprehensive reform to simplify and harmonize the pension system in order to incentivize pension savings and increase the fairness of the retirement system. Using administrative tax micro-data, we assess the impact of the 2016 reform and find that it triggered a positive impact on the extensive margin (the number of people contributing to pension funds) and a less sharp yet positive effect on the intensive margin (the average value of contributions). The reform was not effective at mitigating the regressive impact of the retirement system because the number of individuals contributing to retirement funds increased relatively more for top earners, and it has also exacerbated the gap between low- and high-income individuals on the intensive margin side. In addition, more resources were allocated to pension-related tax expenditures, which have been proven to be highly concentrated among rich earners, both before and after the reform, hence exacerbating inequality.

**Key words:** pension savings, tax incentives, inequality, tax expenditures, retirement

**JEL classification:** H2, H3, H55, D31

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## 1 Introduction

Population aging has significant socio-economic implications, such as a decline in the size of the labour force, an increase in the age-dependency ratio, and a redistribution of income and wealth. This phenomenon has been a long-standing issue in several advanced economies and, as indicated in last year's G20 Osaka Leaders' Declaration, is among the most important challenges faced by the G20 (Redonda et al. 2019).<sup>1</sup> At the same time, the aging of societies has recently been spreading in several low- and middle-income economies. Aging in East Asia and the Pacific, for instance, has been faster—and on a larger scale—than any other region in history (World Bank 2016). Even in Africa, the youngest continent in the world, people are living longer than ever before. According to the World Health Organization (WHO), the population of elderly people in sub-Saharan Africa is projected to reach 67 million by 2025 and 163 million by 2050 from only 43 million in 2010.<sup>2</sup>

Therefore, guaranteeing adequate retirement income is vital to ensure that the benefits of economic growth are equitably distributed across societies worldwide. In this context, the coverage of older persons by social protection systems is explicitly measured by Sustainable Development Goals (SDGs) Indicator 1.3.1.<sup>3</sup>

In many countries, public spending on pensions account for a large share of budget deficits. Brazil is a case in point. Spending on social security is among the highest in the world, accounting for roughly 45 per cent of the federal government's budget. In 2018, the social security deficit amounted to 5.5 per cent of gross domestic product (GDP) (IMF 2019).

Hence, governments across the world have been trying to shift the burden of providing retirement income out of the public sector by boosting private savings for pensions (e.g., shifting from 'pay-as-you-go' to funded systems). Whereas the former finances pensions to retired workers through current contributions of active workers (usually via payroll taxes), in funded systems, contributions are accumulated in individual accounts (along with earnings on these assets), and the total amount of contributions at retirement is generally annuitized. Yet, moving into funded systems is no *panacea* and, in most of these cases, there is still concern that people are myopic and thus do not save enough for retirement (Poterba 2014). This may be particularly relevant for young people because they are likely to face other commitments (e.g., raising a family, saving for education, buying a house) and postpone saving until later in life. This, in turn, is crucial because income-replacement ratios (i.e. the percentage of pre-retirement income that a retiree would need to receive to have a post-retirement standard of living equivalent to the pre-retirement one) are directly affected by, among other factors, the age at which individuals start saving.

Against this backdrop, increasing household savings rates to ensure a stable and decent level of income for retirees, as well as to safeguard the sustainability of pension systems, has become a priority in many countries. Thus, besides some regulatory measures, including cutting pension benefits and raising retirement ages, governments worldwide often implement a myriad of tax incentives or pension-related tax expenditures (PTEs) seeking to boost pension savings.

According to the Organisation for Economic Co-Operation and Development (OECD), the preferential tax treatment of retirement savings quantifies the tax advantage or 'amount that an individual would save in taxes paid by contributing to a private pension plan [over her lifetime cycle] instead of putting the same

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<sup>1</sup> Last year's declaration was the first to recognize the 'importance of promoting a healthy and active ageing society' ([www.un.org/development/desa/ageing/news/2019/07/g20/](http://www.un.org/development/desa/ageing/news/2019/07/g20/)).

<sup>2</sup> For more details, see: [www.afro.who.int/health-topics/ageing](http://www.afro.who.int/health-topics/ageing).

<sup>3</sup> A detailed description of Indicator 1.3.1, as well as of the rest of the indicators, is available at: <https://sustainabledevelopment.un.org/?menu=1300>.

amount into an alternative, benchmark saving vehicle' (OECD 2016). In general, the stated policy goal of PTEs is that pension savings grow until retirement and are annuitized in order to provide the elderly with stable income upon retirement (South African National Treasury 2012). Yet, whereas ensuring a decent level of income for retirees and reducing its volatility are certainly goals worth pursuing, the fiscal cost of PTEs is often significant and their effectiveness usually falls below expectations. In addition, as is the case with other tax benefits (particularly—but not only—those granted as deductions), PTEs are likely to be 'upside-down' subsidies that disproportionately benefit the rich and thus exacerbate inequality (Hümbelin and Farys 2018).<sup>4</sup>

The OECD (2016) shows that average earners in all OECD countries receive a tax advantage when investing in private pension funds instead of regular saving accounts—an advantage that can be as high as 37 per cent in Australia, 46 per cent in Hungary, 51 per cent in Israel, and 281 per cent in Mexico.<sup>5</sup> In the United States, tax benefits, due to the exclusion of pension contributions and earnings of retirement plans from personal income taxes (PITs), amounted to close to US\$190 billion (roughly 13 per cent of total tax benefits) in 2018 (US Department of the Treasury 2018). The Canadian government estimated the net cost resulting from non-taxation of income paid into registered pension and retirement plans, as well as non-taxation of the investment income from such plans, to amount to close to CAD45 billion in 2018 (Department of Finance of Canada 2019). The latest estimates for superannuation tax concessions in Australia indicate an overall fiscal cost of more than AUD37 billion in 2018, which accounts for more than 9 per cent of total tax revenue (Australian Treasury 2018).

When it comes to the effectiveness of these provisions, Attanasio et al. (2004) assess the impact of PTEs in the UK and the United States showing that most of the provisions are redundant (i.e. the investment would have been undertaken even without these provisions in place). The authors conclude that only a small fraction of these funds can be considered to be 'new' savings and find some dead-weight loss caused by the 'reshuffling' of existing savings. Likewise, Carnot (2013) argues that there is a substitution effect explaining why PTEs are likely to change the composition of savings rather than increase their overall level. Using data for Denmark, Chetty et al. (2014) moves one step further and disentangles the effect of active and passive retirement savings policies on wealth accumulation. Policies relying upon individuals to take an action to raise savings mainly induce individuals to shift assets from taxable accounts to retirement accounts. Hence, the elasticity of total savings to active PTEs is low: a dollar spent through those provisions increases savings by only one cent. As expected, passive PTEs (i.e. policies that raise retirement contributions even if individuals take no action), such as automatic employer contributions to retirement accounts, have a larger impact on wealth accumulation.

Finally, besides their fiscal cost and lack of effectiveness in boosting pension savings, prior studies highlight significant issues regarding the distributive impact of these provisions. The OECD (2016) states that the preferential tax treatment of retirement savings can be highly regressive (i.e. in 20 OECD economies, at least one type of pension plan offers a tax advantage that increases with income). In the United States, '... roughly 70 percent of the tax benefits for employer-based retirement savings and 65 percent of subsidies for individual retirement accounts (IRAs) accrue to the top income quintile, with the fourth quintile picking up much of the rest' (Harris et al. 2014). Duflo et al. (2006) argue that the approach applied in the United States by the implementation of tax deductions for contributions and tax deferral on account earnings has not encouraged low- and middle-income households to increase their contributions to retirement accounts, in part because the value of tax preferences is modest for families with low marginal income tax rates. On the other hand, the authors show that the size of matching rates

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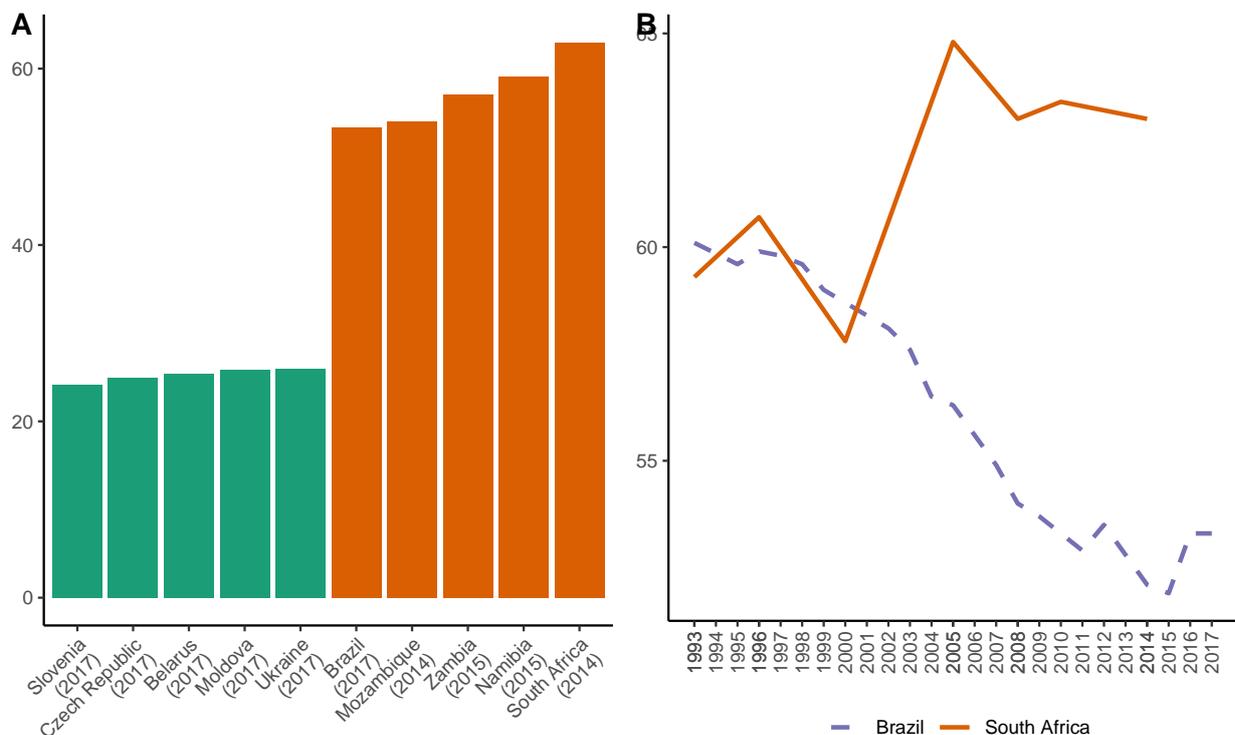
<sup>4</sup> As shown by Doerrenberg et al. (2017), under certain circumstances related to deductions (i.e. if deductions generate externalities and if deductions are responsive to tax-rate changes), the elasticity of taxable income is not sufficient to calculate the welfare cost of taxation. Although a comprehensive welfare analysis of the South African pension tax system is beyond the scope of this paper, this result highlights the importance of tax deductions as a key component of any tax system.

<sup>5</sup> This is for contributions to 'solidarity savings' that are only available to Mexico's public sector workers.

provided by employers, which are provided independently of an individual’s marginal income tax rate, has an impact on the willingness of low- and middle-income families to contribute, proxied by take-up and contribution levels. The Resolution Foundation estimates the revenue foregone through the pension tax relief in the UK to amount to GBP48 billion and reports that ‘... while low earners should be the state’s priority in boosting the adequacy of savings, the benefits of pension tax incentives flow primarily to higher earners. In 2013–14, higher and additional rate taxpayers made up around 8 per cent of the 16+ population, accounted for 30 per cent of pension savers, made 45 per cent of employee pension contributions yet received 63 per cent of tax relief’ (Corlett and Whittaker 2016).<sup>6</sup> Australia is another case in point. Tax benefits granted in the context of the superannuation scheme are poorly targeted and, hence, leak to those that need them the least. According to the Financial System Inquiry, only AUD1 in every AUD200 of the cost of super-tax concessions goes to the bottom 20 per cent of income earners, whereas more than 50 per cent is captured by the top 20 per cent (Australian Treasury 2015).

The latter is a particularly relevant topic because inequality is a major challenge in South Africa. South Africa has one of the highest levels of inequality worldwide. Panel A in Figure 1 shows the five countries with the lowest and highest GINI indexes (more equal and unequal countries, respectively), based on the latest available year published by the World Bank.<sup>7</sup>

Figure 1: GINI index, across countries and over time



Source: authors’ elaboration based on National Treasury and UNU-WIDER (2019).

South Africa shows the highest GINI index among all available countries. Moreover, as observed in Panel B, the strikingly high level of inequality has been a long-standing issue in South Africa. The time evolution of the GINI indexes for South Africa and Brazil (another of the top-five most unequal

<sup>6</sup> As clarified by the authors, the overall cost estimate of GBP48 billion includes GBP13.8 billion of National Insurance contribution (NIC) relief on employer contributions and does not deduct GBP13 billion received through the taxation of current pension benefits. Accounting for these two figures would result in a lower-bound estimate of GBP21 billion.

<sup>7</sup> The GINI index captures the deviation from perfect income equality using a scale of 0 to 100 (i.e. a GINI index of 0 indicates perfect income equality, and an index of 100 implies complete income disparity).

countries) has been significantly different.<sup>8</sup> Whereas the levels of inequality were similar during the 1990s, countries have been diverging considerably since the early 2000s. On one hand, Brazil has significantly reduced inequality during the last 15–20 years, with a GINI index that dropped from 60.1 in 1993 to 51.3 in 2015 with a relatively small upturn in the last two years.<sup>9</sup> South Africa shows a very different picture. Whereas inequality was reduced for four consecutive years between 1996 and 2000, when the GINI index reached its minimum (57.8), it has significantly increased since that year until reaching a peak of 64.8 in 2005. Since then, the index has been pretty stable between 63 and 64.

Assessing the distributive impact of any policy implemented by the government is critical—in general and much more when it comes to tax expenditures (TEs) granted as deductions because these tend to be highly regressive (De la Feria and Redonda 2020). Against this backdrop, this paper aims to shed light on the effectiveness and distributive impact of PTEs in South Africa by exploiting a comprehensive retirement reform that was implemented in 2016.

The remainder of the paper is structured as follows. Section 2 discusses the South African pension system by focusing on the PTEs granted by the government and on the 2016 retirement reform. Section 3 describes the data set used throughout the paper and provides descriptive details on the available data. Section 4 analyses the distributional impact of PTEs in South Africa, and finally, Section 5 provides concluding remarks and discusses potential policy implications.

## 2 The South African pension system and the 2016 retirement reform

South Africans are allowed to contribute to their own retirement funds in order to increase their pension income and reduce their vulnerability in old age. At the same time, employers can make contributions for the benefit of employees to an employer-affiliated retirement fund.

There are three different types of retirement funds in the country: pension funds (PFs), provident funds (PrFs), and retirement annuity funds (RAFs). PFs and PrFs are called 'workplace funds' (i.e. if an employer offers one of these funds, and the employee is eligible to join, they usually join this fund). The main difference between PFs and PrFs regards the way benefits are paid out once the fund member retires. Whereas PF members get one-third of the total benefit as a cash lump sum and the other two-thirds are annuitized, PrF members can get the full benefit paid as a cash lump sum. In addition, compulsory annuitization applies to two-thirds of fund balances over a certain threshold in PFs but not in PrFs. RAFs instead are meant for self-employed persons or for employees whose employer does not offer a workplace fund. Compulsory annuitization applies in a similar fashion to PFs.

As in most countries, the South African government has been trying to encourage individuals to save for their retirement through the implementation of several PTEs. The government provides tax deductions on fund contributions, a tax deferral on growth in the fund, and a preferential tax treatment when exiting the fund. Whereas the tax treatment of the three stages (contributions, returns on investment, and benefits) in the saving process is important, this paper focuses on the former—the tax deduction for fund contributions, allowing: i) employers to deduct a certain share of contributions to their employee's fund

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<sup>8</sup> Unlike Brazil, data for South Africa are missing for some years. To ensure comparability, we assumed that the change from one year to the next available has been linear (i.e. when no data exist for a specific year, we assumed that the overall change before the last and next years for which data exist is equally divided across that time period).

<sup>9</sup> The inequality-reducing process was even more impressive in Brazil because the peak of the GINI index was actually higher (i.e. 63.3 in 1989). Yet, because there are no available data before 1993 for South Africa, we did not include previous years in our analysis.

as a business expense, and ii) employees to deduct a certain share of their own contributions to reduce their own tax liability.

As discussed in Section 1, PTEs worldwide are often costly. This is also the case in South Africa. According to the latest TE statement published by the Treasury, in 2016, TEs in South Africa were estimated at ZAR209,007 million (18.3 per cent of tax revenue and 4.8 per cent of GDP), with the largest three provisions—deductions of pension contributions, zero-rated supplies in the context of value added tax (VAT), and medical tax credits—accounting for roughly 75 per cent of the total. PTEs are the largest TE in South Africa amounting to ZAR72,991 million. To put this figure in context, PTEs alone accounted for 35 per cent of total TEs and 68 per cent of total TEs granted through PITs in 2016.<sup>10</sup>

Despite their magnitude, PTEs have been at the heart of an intense debate within the South African government that has been trying to deal with a policy-design trade-off between providing generous PTEs to boost individuals' savings and the risk of hindering the equity of the tax system by the excessive use of these provisions, particularly by those at the top end of the income distribution. The regressive impact of PTEs in countries with small tax bases, such as in South Africa, is likely to be exacerbated because informal workers (estimated at 34 per cent in South Africa and very likely among the worst off) cannot be targeted by such provisions (ILO 2018).<sup>11</sup> As acknowledged in a Technical Discussion Paper published by the Treasury in 2012:

The barriers to a more effective tax incentive regime are the complexity of the current regime (three different tax dispensations apply), as well as the fact that the regime is open to abuse through excessive contributions by employers and high-income earning individuals...the tax exemption has no nominal monetary cap in the case of higher-income employees, allowing them to make tax-exempt contributions way in excess of the amount required to maintain a reasonable standard of living in retirement (South African National Treasury 2012).

Against this backdrop, in March 2016 a comprehensive reform (hereafter the Reform) was implemented to the retirement fund system in order to simplify and harmonize the system in the hope that this would, in turn, incentivize savings further as well as increase the fairness of the whole system. Among other modifications including, for example, changes regarding whether funds must be taken as a lump sum or annuitized at retirement, the Reform significantly affected PTEs. For instance, the Reform harmonized the definition of the income base to which the percentage and monetary thresholds of the different PTEs were applied, which, before 2016, varied considerably among the three different types of funds. Table 1 summarizes the main changes introduced by the Reform that are relevant for this paper.

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<sup>10</sup> In theory, the impact of the South African pension system that exempts contributions and fund income but taxes the pension in payment—Exempt-Exempt-Tax (EET)—is similar to a Tax-Exempt-Exempt (TEE) system, where contributions are made out of taxed incomes, but benefits can be withdrawn tax-free. Yet, the overall cost estimate of ZAR73 billion does not deduct the amount received through the taxation of current pension benefits nor the forecast of the revenue that the government will collect when the current contributions are retired as taxed income. Hence, such a figure is likely to be overestimating the long-term impact of these provisions.

<sup>11</sup> For more details regarding the links between informality and inequality, see, for instance, Chong and Gradstein (2007) and Caruso Bloeck et al. (2019).

Table 1: The 2016 retirement reform—changes related to PTEs

	Pension Funds (PFs)		Provident Funds (PrFs)		Retirement Annuity Funds (RAFs)	
	Before 2016	After 2016	Before 2016	After 2016	Before 2016	After 2016
Employers' contributions	Employers were allowed to deduct contributions between 10% and 20% of the employee's <i>approved remuneration</i> . More concretely, the minimum deduction allowed is 10% of the employee's approved remuneration and, only where the employer's contribution exceeds 10%, may the deduction be restricted to what the commissioner regards as reasonable. In practise, the commissioner usually allows a 20% cumulative percentage covering contributions to both PFs and PrFs as well as medical schemes. These deductions were not considered as a fringe benefit for the employee and hence not part of their taxable income.	The 20% threshold was eliminated. Yet, contributions are now considered as a fringe benefit for the employee and taxed according to the employee's tax bracket.	Employers were allowed to deduct contributions between 10% and 20% of the employee's approved remuneration. These deductions were not considered as a fringe benefit for the employee and hence not part of their taxable income.	The 20% threshold was eliminated. Yet, contributions are now considered as a fringe benefit for the employee and taxed according to their tax bracket.	Unlimited contributions on behalf of their employees were allowed but taxed as a fringe benefit for the employee, based on their tax bracket.	No change.
Employees' contributions	Employees were allowed to deduct contributions up to 7.5% of their retirement-funding employment income.	Employees are allowed to deduct their total contributions to any of the three funds up to 27.5% of the higher between their taxable income and gross remuneration. Moreover, the overall tax deductible is capped at ZAR350,000. Contributions over these limits may be rolled over to following years.	Deductions were not allowed.	Employees are allowed to deduct their total contributions to any of the three funds up to 27.5% of the higher between their taxable income and gross remuneration. Moreover, the overall tax deductible is capped at ZAR350,000. Contributions over these limits may be rolled over to following years.	Employees were allowed to deduct contributions up to 15% of their non-retirement-funding employment income.	Employees are allowed to deduct their total contributions to any of the three funds up to 27.5% of the higher between their taxable income and gross remuneration. Moreover, the overall tax deductible is capped at ZAR350,000. Contributions over these limits may be rolled over to following years.

Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

In a nutshell, before the Reform, employers were allowed to deduct contributions to PFs or PrFs between 10 per cent and 20 per cent of the *approved remuneration* of employees as a business expense against tax, and these contributions were not included as part of the *taxable income* of employees.<sup>12</sup> When it comes to RAFs, employers' contributions on behalf of their employees were unlimited, but employees were taxed on the amount contributed as a fringe benefit, and employers were allowed to deduct the amount from their *taxable income*. Employees were allowed to claim a deduction on contributions up to a maximum of 7.5 per cent of *retirement-funding employment income* on contributions to a PF and a deduction of up to 15 per cent of *non-retirement-funding employment income* to a RAF. No deduction was allowed against employee contributions made to a PrF.

After the introduction of the Reform, the bases and thresholds against which the deductions are computed were harmonized for the three funds. Specifically, the 20 per cent threshold for employers' contributions to PFs and PrFs was eliminated, hence allowing for unlimited contributions as was the case already with contributions to RAFs. Moreover, contributions made by employers are now considered a fringe benefit for the employee and thus taxed accordingly (i.e. depending on the bracket in which the employee falls). Because employer contributions can now be deducted by the employee, the tax liability drops by an equivalent amount, offsetting the tax impact of this measure.<sup>13</sup> Employees' contributions were also harmonized among the three funds; employees can now deduct their total contributions to any of the three funds up to 27.5 per cent of the higher of their *taxable income* or *gross remuneration*. Finally, on top of the changes regarding the bases and thresholds against which the deductions are computed, a ZAR350,000 cap was introduced to mitigate the regressive impact of PTEs. After 2016, the overall tax deductible of employees' contributions to any of the three funds is capped at ZAR350,000, including the cost of any risk cover attached to the fund—contributions over that limit can be rolled over to following years.<sup>14</sup>

### 3 Data and descriptives

Our main source of information is the individual panel (IP) that was created using administrative tax micro-data in the context of the South Africa-Towards Inclusive Development (SA-TIED) programme (National Treasury and UNU-WIDER 2019).<sup>15</sup> The IP provides anonymized data from the combination of payroll or employee tax certificates [IRP5/IT3(a) (henceforth IRP5)] and personal income tax returns (ITR12) in South Africa. As discussed by Ebrahim and Axelson (2019: 2):

...using only the ITR12 data systematically ignores workers not required to file individual taxes. By combining the ITR12 and IRP5/IT3(a) tax records we believe we have a more complete version of the income distribution of formal sector workers in South Africa, alongside detailed income information from retirees who receive income from a retirement fund and individuals who are self-employed and only submit ITR12 returns.<sup>16</sup>

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<sup>12</sup> The distinction between the different income concepts (taxable income, gross remuneration, approved remuneration, retirement-funding employment income, and non-retirement-funding employment income) used within the South African pension system is crucial. A detailed description of the different concepts is provided in Appendix A (Table A.1).

<sup>13</sup> According to the South African Revenue Service (SARS), *employees' tax* refers to the tax required to be deducted by an employer from an employee's remuneration paid or payable. The process of deducting or withholding tax from remuneration as it is earned by an employee is commonly referred to as pay-as-you-earn (PAYE).

<sup>14</sup> The higher between the ZAR350,000 cap and the 27.5 per cent threshold described before applied.

<sup>15</sup> The data, which can only be accessed at the Secure Data Facility (National Treasury), were first accessed in May 2019 and the latest access was in March 2020. The version of the data set that was used is 2019\_1.

<sup>16</sup> The working paper by Ebrahim and Axelson (2019) explains the individual panel.

In a nutshell, the IP is made up by linking four data sets: i) an ID Panel containing the original anonymized identification variables for each IRP5 and ITR12 return; ii) an Employment Panel where each row represents a formal period of employment, a lump sum payment, or a payment from a retirement fund; iii) a Source of Income Panel providing information on the amounts of each type of income per person per tax year; and iv) an Income Panel showing the final income position of the individual each year, after including all the information from the IRP5 certificates and ITR12 returns.<sup>17</sup> The IP provides information on the taxable income and tax liability of taxpayers as well as other derived variables including gross income, exempt income, and lump sums. Whereas the most important component of the IP for our paper is the Income Panel, the Source of Income Panel deserves further clarification. The latter provides detailed information regarding the different types of income by source code contained in each IRP5 and ITR12 return by taxpayer by year.<sup>18</sup>

It is worth highlighting that the individual panel is flexible enough so that it can be updated on a regular basis as new years of tax data are received by the Treasury. This is crucial not only to increase the number of observations over time but also to adapt the panel to changes in tax policy and reporting requirements. The 2016 retirement reform is a case in point. As discussed by Ebrahim and Axelson (2019), although the Reform did not trigger any changes to the source code for pension fund contributions (which remained as 4001), since 2017 the amount reported under this line item did change to indicate both employer and employee contributions instead of only employee contributions to pension funds, as was the case before the Reform. As mentioned before, after the Reform, contributions to PrFs (4003) became deductible for the first time. As will be discussed later, all these changes considerably affected the amounts and interpretation of source codes that are relevant for our paper and were adjusted accordingly.

Besides the potential of the IP as a source of information, working with tax return data does not come without limitations, which also apply to our data set. First, the main input of the IP is individual income tax returns. Hence, the panel does not take into account those workers operating in the informal sector (estimated at more than 17 per cent of total employees). In addition, our data are also likely to be affected by tax evasion and avoidance issues, which can be particularly relevant when it comes to high-income earners (Alstadsæter et al. 2019). Although we have limited room to tackle these issues, we do consider them when it comes to the interpretation of our results.

Whereas Section 2 describes the structure of the tax system as it relates to retirement fund deductions before and after the Reform, this section provides details on the available data associated with each regime. Table 2 describes the available source codes from both the ITR12 and IRP5 returns that were provided to the SARS in the years before 2016, and Table 3 shows the source codes available after the Reform. Importantly, no information was provided to SARS on employer contributions to pension or provident funds before the 2016 tax year because it was not deemed a fringe benefit and not part of the individual tax calculation.

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<sup>17</sup> A more detailed discussion about the income source codes is provided by the Business Requirements Specification (BRS) document that is available on the SARS website at <https://www.sars.gov.za/TaxTypes/PAYE/Pages/PAYE-Annual-Reconciliations.aspx>.

<sup>18</sup> Tables A2 and A3 in the Appendix show two examples taken from Ebrahim and Axelson (2019) that nicely illustrate the content of the Source of Income and the Income Panels, respectively.

Table 2: Retirement source codes for tax years before 2016–17

Code	Description
4001	Pension fund contributions by employees (deductible but limited to 7.5% of retirement funding income)
4002	Arrears pension fund contributions (limited to ZAR1,800)
4003	Provident fund contributions by employees (not deductible, no limit)
4006	Retirement fund annuity contributions (deductible but limited to 15% of non-retirement funding income)
4007	Arrears retirement funding income (limited to ZAR1,800)

Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

As Table 3 illustrates, the underlying information associated with each source code changed after the Reform. For example, source code 4001 represented employee contributions to PFs before the Reform but represents both employee *and* employer contributions to PFs after the Reform. Although additional information is provided to SARS after the Reform, some variables need to be computed to be comparable with previous years. For example, source code 4006 (RAF contributions) is no longer included in the data for the years after 2016–17 if the individual files an ITR12 but can be calculated from the other variables (4029, 4001, 4003).

Table 3: Retirement source codes for tax years after 2016–17

Code	Description
3817–3819	PF employer contributions (for defined contribution, defined benefit and hybrid components)
3825–3827	PrF employer contributions (for defined contribution, defined benefit and hybrid components)
3828	RAF employer contributions
4001	PF contributions by employees <b>and</b> employers (deductible but limited to 27.5% of the higher of taxable income or gross remuneration)
4003	PrF contributions by employees <b>and</b> employers (deductible but limited to 27.5% of the higher of taxable income or gross remuneration)
4006	RAF contributions (deductible but limited to 27.5% of the higher of taxable income or gross remuneration)—only included in IRP5
4029	Total contributions to retirement funds (includes all employee and employer contributions to PFs, PrFs, and RAFs)—only included in ITR12

Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

### 3.1 Descriptive statistics

Table 4 illustrates the total number of individuals per year who have had an employee contribution to a PF or PrF, a contribution to a RAF before 2016–17, or any type of contribution to a retirement fund after 2017. The number of individuals steadily increased from 4.88 million in 2010–11 to 5.56 million in 2016–17 (at an inter-annual average growth rate of 2.65 per cent) and jumped to 6.88 million in 2016–17 after the changes to the retirement system (i.e. the 23.76 per cent growth rate observed between 2016 and 2017 was almost 10 times larger than the average for previous years).

Table 4 also shows the number of individuals who have declared contributions to each type of retirement fund. Employer contributions for pension and provident funds were included from 2017, with around 2.8 million individuals stating employer contributions to their PF and around 3.3 million individuals with contributions to their PrF. The number of individuals with any type of contribution to a PF remained flat at around 3 million after the tax change. The largest difference is for PrF contributions, which shifted upwards substantially from 1.9 million to 3.46 million persons after employer PrF contributions were included. This may indicate that there were a lot of individuals that only had PrF employer contributions before the amendments, which resulted in an artificial increase in the number of people contributing from 2017 onwards.

RAF contributions appear to show a substantial decrease after 2016; however, this is a result of the source code not being available for individuals who only filled out an ITR12 return. Similarly, the total contributions code (4029) is not available for individuals who only have an IRP5 return. The ‘arrears’ contributions were discontinued after 2016.

Table 4: Individuals with retirement fund contributions

Tax year	Total	Pension: employee	Pension: employer	Provident: employee	Provident: employer	Retirement annuity
2011	4,882,693	2,858,053	0	1,405,231	0	1,485,455
2012	4,974,950	2,907,731	0	1,424,492	0	1,548,314
2013	5,181,628	2,947,824	0	1,564,589	0	1,619,897
2014	5,344,076	2,974,068	0	1,704,501	0	1,648,594
2015	5,480,548	3,001,332	0	1,836,035	0	1,635,156
2016	5,562,945	3,024,830	0	1,930,519	0	1,577,381
2017	6,884,845	2,941,065	2,850,786	2,777,879	3,321,877	2,278,073
2018	6,751,578	2,935,220	2,834,200	2,771,154	3,354,107	1,746,229

Source: authors’ elaboration based on National Treasury and UNU-WIDER (2019).

The total amounts included under each source code for each year are shown in Table 5. Employer contributions to PFs were close to ZAR100 billion in 2017–18, while just over half that amount (around ZAR55 billion) was contributed by employees to PrFs.

Table 5: Contributions to retirement funds (ZAR million)

Tax year	Total	Pension: employee	Pension: employer	Provident: employee	Provident: employer	Retirement annuity
2011	49,786	31,243	0	4,982	0	13,560
2012	52,731	34,135	0	3,523	0	15,074
2013	58,491	37,157	0	4,255	0	17,079
2014	64,063	40,158	0	5,343	0	18,562
2015	69,449	43,194	0	6,199	0	20,056
2016	74,085	45,957	0	7,526	0	20,602
2017	240,822	49,853	91,647	17,413	41,704	40,206
2018	246,051	53,509	98,184	18,816	43,780	31,762

Source: authors’ elaboration based on National Treasury and UNU-WIDER (2019).

## 4 Assessing the impact of the 2016 Reform

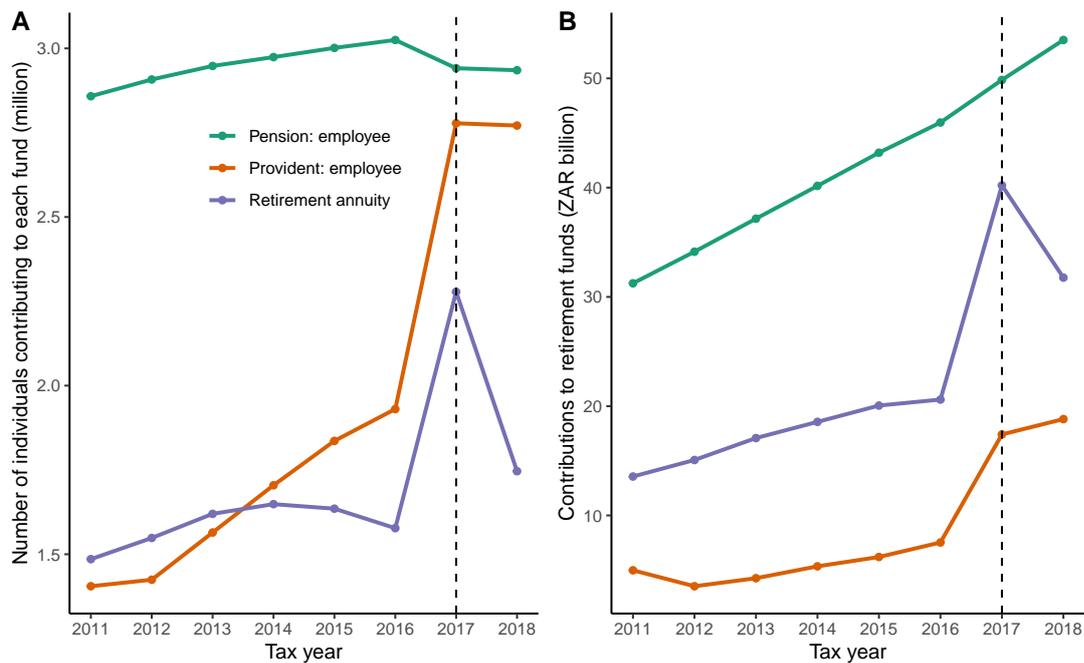
### 4.1 Contributions to retirement funds

A simple first check to assess whether the Reform has had an impact on retirement savings behaviour is to analyse the change in the total level of contributions to retirement funds. Yet, a change in contributions could be triggered by a change in the number of filers or by the same group of individuals contributing higher (or lower) amounts—or both. We hence follow Borenstein and Davis (2016) by looking at the share of filers making contributions (the extensive margin) and the average amount contributed (the intensive margin). The results must be interpreted cautiously because of the lack of data on employer contributions to PFs and PrFs, which shows a steep increase in total contributions when they are included from 2016–17 onwards (as shown in Table 5). However, it is possible to track employee contributions to PFs and PrFs and all RAF contributions for the period throughout the Reform to get a sense of the behavioural change.

Figure 2 shows that the number of people contributing to PrFs and RAFs (Panel A) saw a sharp increase after the Reform, with an additional 800,000 individuals contributing to a PrF (a 29 per cent increase) and an additional 830,000 individuals contributing to a RAF (a 52 per cent increase). The number of people contributing to a PrF overtook those who contribute to a PF after the Reform.

Panel B shows that the total value of contributions to RAFs also rose steeply after the Reform, with a ZAR22 billion (or 107 per cent) increase compared to the previous year. There was a substantial increase in employee contributions to PrFs, which rose by ZAR11 billion (a 66 per cent increase).<sup>19</sup> The increase in employee contributions to PFs appeared to stay on trend. Compared to PFs, PrFs and RAFs experienced a far larger increase in the level of contributions that could receive a deduction. Employee contributions went from not being deductible at all to the 27.5 per cent (or ZAR350,000) limit, while the RAF limit increased from 15 per cent of non-retirement-funding income. PFs were already able to contribute up to 27.5 per cent of retirement funding income (20 per cent from the employer and 7.5 per from employees). Contributions to RAFs are also not directly linked to formal employment, and additional contributions can be made at any time, making it easier to contribute more in a short time frame.

Figure 2: Number of individuals contributing and amount contributed to retirement funds



Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

Overall, the figure indicates a very large behavioural response to the Reform both on the extensive and intensive margins. Yet, there is one implicit assumption being made when making these statements on the impact of the Reform, namely that there is not an offsetting change in the level of employment contributions to PFs and PrFs. However, it would be unlikely that employees would restructure their remuneration packages to shift the allocation of employer contributions to PFs or PrFs (which are deductible) to contributions to an RAF or an employee contribution to a PrF (which is also deductible). There would be no tax benefit from structuring contributions in this manner. Given this reasonable assumption, it appears that the large increase in the number of people contributing to PrFs and RAFs and increase in the employee contributions to PrFs and in all contributions to RAFs are because of the relaxation of the deductible limits after the Reform (especially if contributions to PFs, which had a small increase in the deductible limit, are viewed as a proxy control group). This may be an indication that the Reform has been effective in increasing retirement savings, which aligns with the original objectives of the Reform. However, although these data should provide a close-to-complete view of retirement sav-

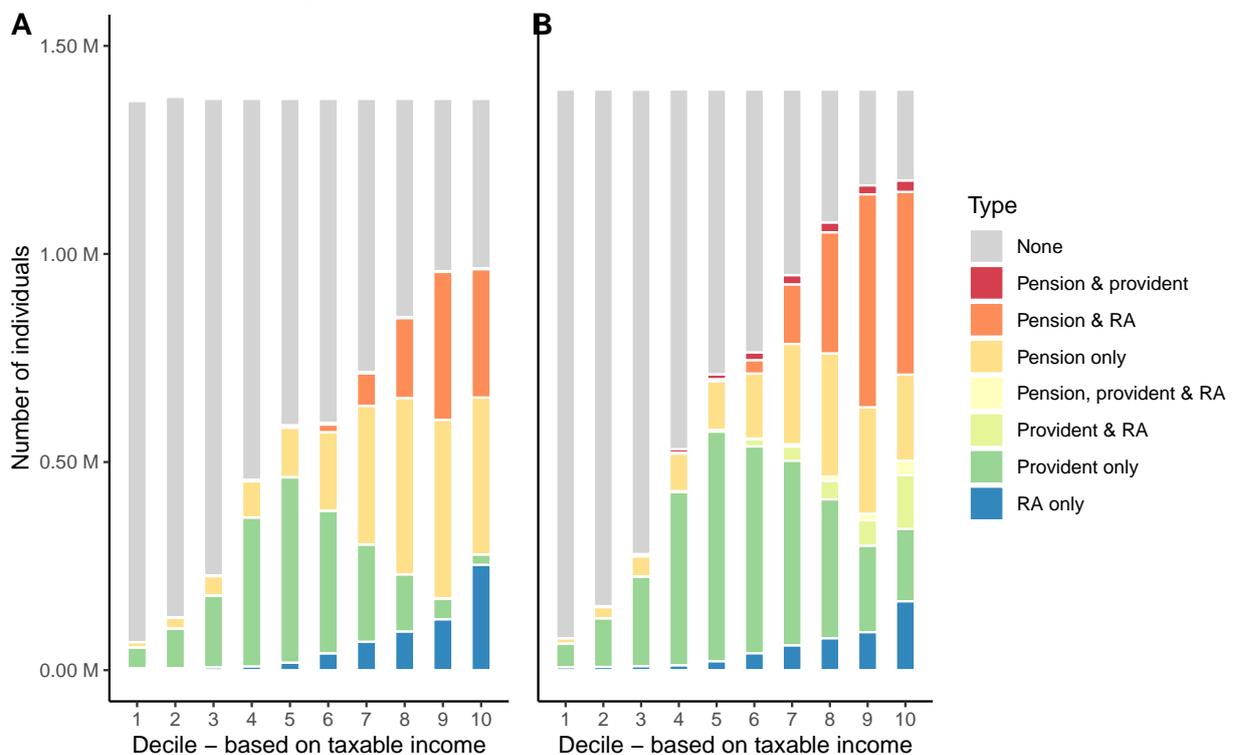
<sup>19</sup> The drop in the RAF contribution in the second year after the Reform may be because of incomplete returns for that year. The IP should contain most of the IRP5 returns from employers to give a good overall picture of contributions to PFs and PrFs, but the RAF contributions are dependent on the ITR12 returns that are sent to SARS up to seven months later, and not all of those returns may be included in the current version of the panel.

ings, they do not provide a picture of total overall savings. Any increases in retirement savings may be offset by other types of savings, as taxpayers move to structure their portfolios in the most tax-efficient manner. It would be even more difficult to assess whether the Reform helped to increase overall savings, but if the sole focus is on retirement savings (which requires taxpayers from PFs and RAFs to purchase an annuity with a portion of those savings at retirement), then the initial evidence appears to be positive.

### Contributions by decile

Investigating contributions by decile provides some insight into the distributional characteristics of retirement fund deductions and the impact of the retirement reform. Deciles are calculated according to all the individuals in the micro-data in each year (which is around 15 million persons). This would not be directly comparable to other more regularly referenced statistics on the income distribution for South Africa as it only includes those who have income tax returns. For the 2016–17 year, the median taxable income was around ZAR81,000, while the top 10 per cent had taxable incomes greater than ZAR556,000. Figure 3 shows the number of individuals who contributed to a retirement fund per decile, broken down according to the type of fund, or funds, that received a contribution.

Figure 3: Individuals contributing to a retirement fund, per taxable income decile



Note: RA refers to retirement annuities.

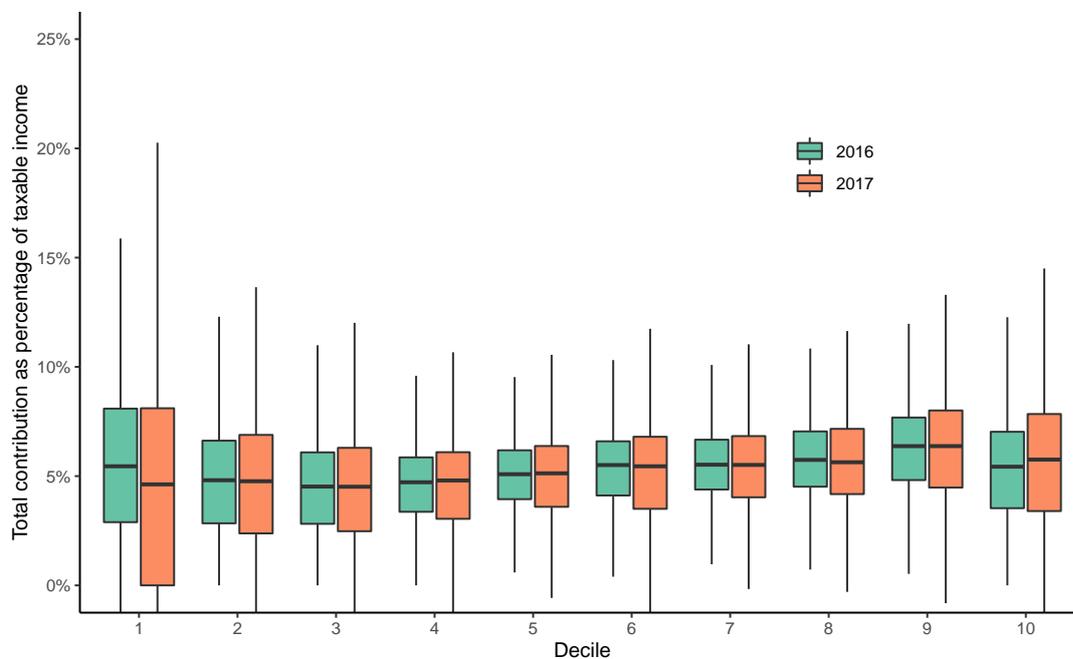
Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

The figure clearly shows that both before (Panel A) and after the Reform (Panel B), a greater proportion of individuals contributed to a retirement fund as taxable income increased. The Reform has amplified this feature since the number of individuals contributing to retirement funds increased more for top earners after the Reform, with the share of individuals in the top decile using these funds to save for retirement jumping from 70 per cent in 2016 to more than 84 per cent in 2017, although this increase may be overstated if there were a large number of individuals in the top decile who only had an employer contribution in 2016.

When it comes to the use of different funds before the Reform, most lower-income individuals contributed to a PrF, with a higher proportion of people contributing to a PF and/or RAF in the upper deciles. The top decile had a relatively even spread across all the different types of contributions. After the Reform, the savings portfolio of individuals in the four lowest deciles remained relatively unchanged. On the other hand, the share of individuals in the top four deciles contributing to RAFs and PFs only decreased, but the share of top earners contributing to PrFs only increased considerably. Likewise, many individuals seemed to have started to diversify their portfolio as the share of earners in these deciles contributing to two different types of funds at the same time (and even to the three available funds) increased as well.

While Figure 3 shows how many individuals contributed at each decile (the extensive margin), Figure 4 provides box plots of the amount contributed as a proportion of taxable income per decile in 2016 and 2017, hence shedding light on the impact of the Reform on the intensive margin. In general, not only do more people contribute in the higher deciles, but they also contribute a larger amount on average, with the median contribution amount increasing as income increases (although the median reduces for the top decile).

Figure 4: Contribution as a percentage of taxable income, per taxable income decile



Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

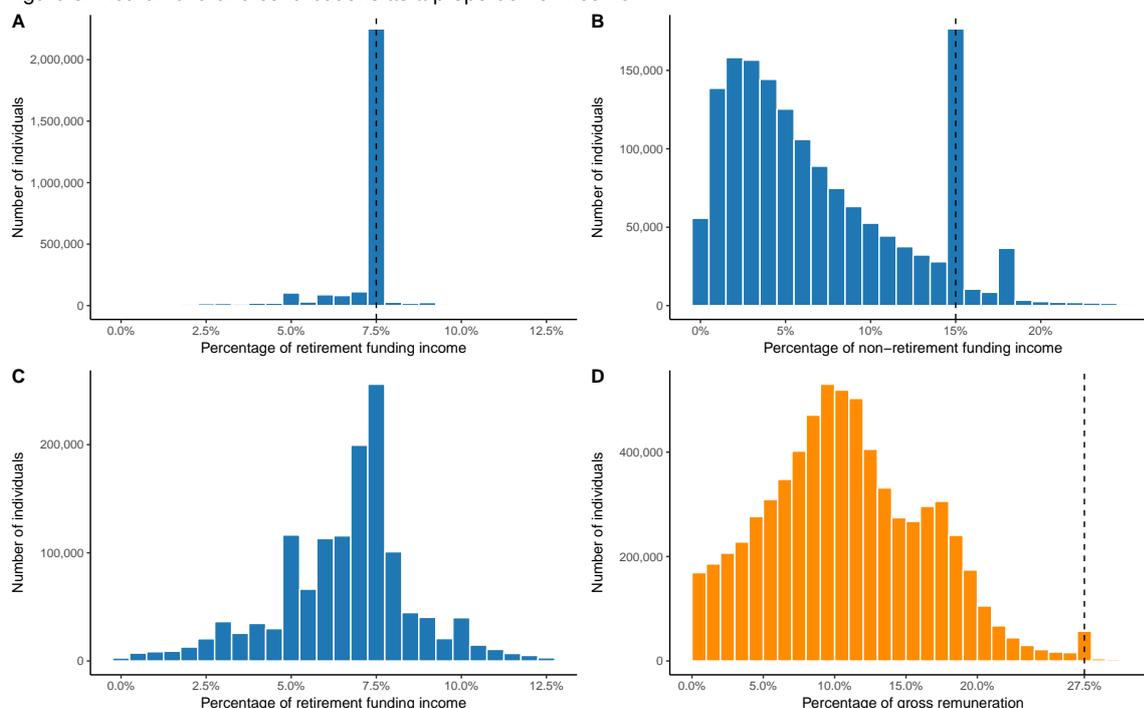
The figure shows that, for the vast majority of individuals, there is hardly any difference before and after the Reform, indicating that most earners did not increase the proportion that they saved for retirement from what we can see using the available data and provided there were not further substantial changes to the calculation of taxable income. Interestingly though, there is some action in both the bottom and top deciles. Whereas the median contribution amount decreased for the bottom decile, the opposite effect is observed for top earners in the top decile, which could be seen as further evidence on the regressive impact of the Reform, even with the inclusion of a cap of ZAR350,000.

In other words, the Reform seems to have had a significant impact on the extensive margin (particularly among higher earners) and a less sharp effect on the intensive margin because contributions as a percentage of taxable income remained relatively unchanged for most deciles except the bottom and top ones.

## Contributions and deduction limits

Section 2 detailed the conditions to be met to be able to claim a deduction for contributions to a retirement fund, including the percentage limits—by type of retirement fund before 2016–17 and in aggregate from 2017–18 onwards. To assess the impact of these criteria on the behaviour of savers, Figure 5 shows the distribution of retirement fund contributions in relation to the applicable limits for different funds before the Reform and in relation to the single limit after the Reform.

Figure 5: Retirement fund contributions as a proportion of income



Note: retirement fund contributions as a proportion of income against which limits apply. A: Pension fund employee contributions in 2015–16. B: Retirement annuity fund contributions in 2015–16. C: Provident fund employee contributions in 2015–16. D: Total retirement fund contributions in 2016–17.

Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

Panel A represents employee contributions to PFs in the 2016 tax year (the year before the amendments). The vast majority of individuals contributing to a PF contributed an amount as a proportion of *retirement funding income* that was at the allowable deduction limit of 7.5 per cent. Panel B includes individuals who contributed to a RAF, and again the largest contribution limit was at the limit of 15 per cent of *non-retirement funding income*. However, there were many individuals contributing lower percentage amounts, with a larger number of individuals contributing between 1 and 3 per cent.

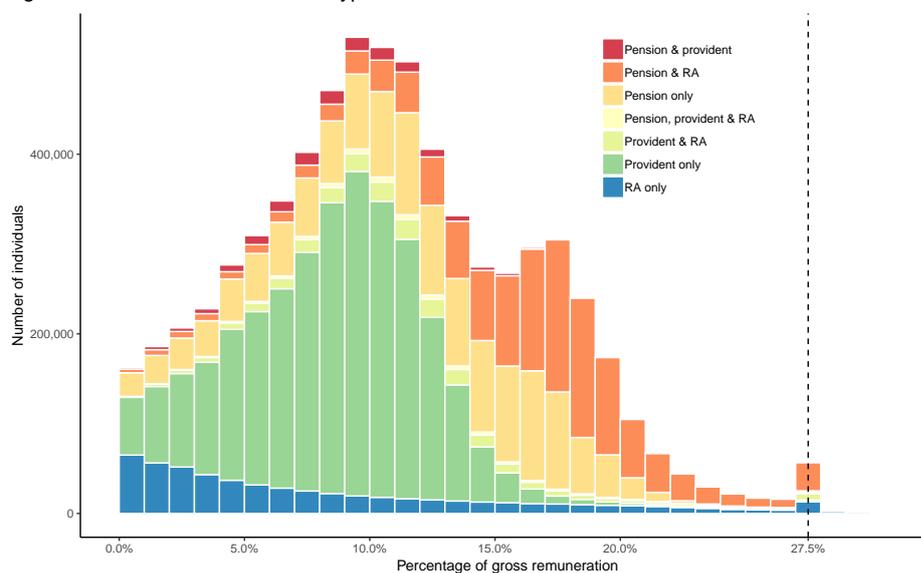
There were no limits for employee contributions to PrFs (as they were not deductible), yet it appears from Panel C that contribution percentages followed the guidance from the limit to pension fund contributions as the distribution peaks at 7.5 per cent of *retirement funding income*, although contributions are more dispersed than pension fund contributions, with spikes at 5 per cent and 10 per cent.

Panel D shows the distribution of both employee and employer contributions after the Reform and in relation to the new limit of 27.5 per cent of the higher of *gross remuneration* or *taxable income*. The most noticeable feature is that the majority of contributions are below the limit (although there is a small spike at 27.5 per cent). The amendments increased the limits for all types of funds, but the large gap between the limit and most of the percentage contributions suggests that individuals did not change their contributions to maximize the available deductions in the first year. However, it is unclear from this distribution whether they did increase contributions compared to the previous year. As mentioned

before, this is particularly difficult as the previous years did not include employer contribution data. The figure does suggest, however, that decisions on contributions to retirement funds before the Reform were heavily influenced by the design of the tax system.

Figure 6 provides a more detailed version of Panel D in Figure 5 by classifying individuals according to the type of retirement fund, or funds, to which they contributed. The figure shows that there are a large number of individuals who only contribute to a provident fund, and these individuals are the main component of the peak at around 10 per cent, after which these individuals drop away quickly. Those with only a retirement annuity (most likely the self-employed) steadily decrease as the percentage increases, with a small jump at the limit of 27.5 per cent. The second peak at around 17.5 per cent is predominantly made up of persons who contributed to both a pension fund and a retirement annuity fund, and there is also bunching at 27.5 per cent. There are only a small number of individuals who contributed to both a pension and a provident fund, to both a provident fund and a retirement annuity fund, or to all three.

Figure 6: Individuals with different types of contributions to retirement funds



Note: RA refers to retirement annuities.

Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

Table 6: Contributions above ZAR350,000

Tax year	N
2011	667
2012	909
2013	1,288
2014	1,661
2015	2,131
2016	2,279
2017	708
2018	2,411

Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

Table 6 includes the number of individuals who made employee contributions to a PF and contributions to RAFs where the total exceeded ZAR350,000 before 2017. A ZAR350,000 cap on allowable deductions for retirement savings was introduced in 2017. After the cap was implemented, the number of people with total contributions (including employer contributions and employee contributions to PrFs) fell markedly from 2,279 in the previous year to 708. Interestingly, the number increased substantially in 2018 to 2,411. This initial result indicates that the ZAR350,000 only had a short-term, temporary effect because the number of individuals contributing amounts above the cap came back to the pre-Reform

trend in 2018. Contributions that are above ZAR350,000 would not receive a tax deduction, but the excess would be rolled over to potentially be deductible in a future tax year.

## 4.2 Pension tax expenditures

The PTEs in this section reflect the benefit from the upfront deduction on a per person basis. This value does not reflect the true TE as it does not include: the tax that would be paid by the individual when they receive income in retirement (which is taxable as normal income); the tax-free growth within the retirement fund; and the preferential tax treatment (or punitive, depending on the type of withdrawal) of the receipt of lump sums at retirement. However, it does give an indication of the quantum of the upfront deduction and how it may impact the current progressivity of the tax system in a particular year. The change in the TE because of the Reform can highlight which groups of taxpayers benefited from the policy in the year of the Reform and, hence, contributes to shedding further light on the debate around the distributive impact of the Reform.

The revenue foregone through PTEs is calculated by taking the difference in the simulated tax liability for each individual without the use of any retirement fund deductions and the simulated tax liability after including the ability to deduct retirement fund contributions.

Table 7: Pension tax expenditure per contribution type (in ZAR billion)

Contribution type	2011	2012	2013	2014	2015	2016	2017	2018
Pension: employee	8.98	9.83	11.00	11.99	13.01	14.36	15.01	17.01
Pension: employer	-	-	-	-	-	-	29.06	31.99
Provident: employee	0	0	0	0	0	0	3.29	3.95
Provident: employer	-	-	-	-	-	-	12.30	13.25
Retirement annuity	4.30	4.81	5.57	6.13	6.73	7.15	13.88	11.18
<b>Total</b>	<b>13.28</b>	<b>14.64</b>	<b>16.56</b>	<b>18.12</b>	<b>19.74</b>	<b>21.51</b>	<b>73.55</b>	<b>77.37</b>

Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

Table 7 shows the PTEs from 2011 to 2018 per type of contribution. No data were collected on employer contributions to a PF or PrF before 2016–17, and no deductions were available for employee contributions to a PrF before 2016–17. The total PTE jumps substantially from around ZAR21.5 billion in 2015–16 to around ZAR73.6 billion in 2016–17. This is mainly because of the inclusion of employer contributions but also represents the new expenditure of ZAR3.3 billion for employee contributions to PrFs and a considerable increase in the TEs for contributions to RAFs (from ZAR7.2 billion in 2015–16 to ZAR13.9 billion in 2016–17). The total PTE of ZAR77.4 billion in 2017–18 is the largest TE in the South African tax system, accounting for roughly 1.7 per cent of GDP.

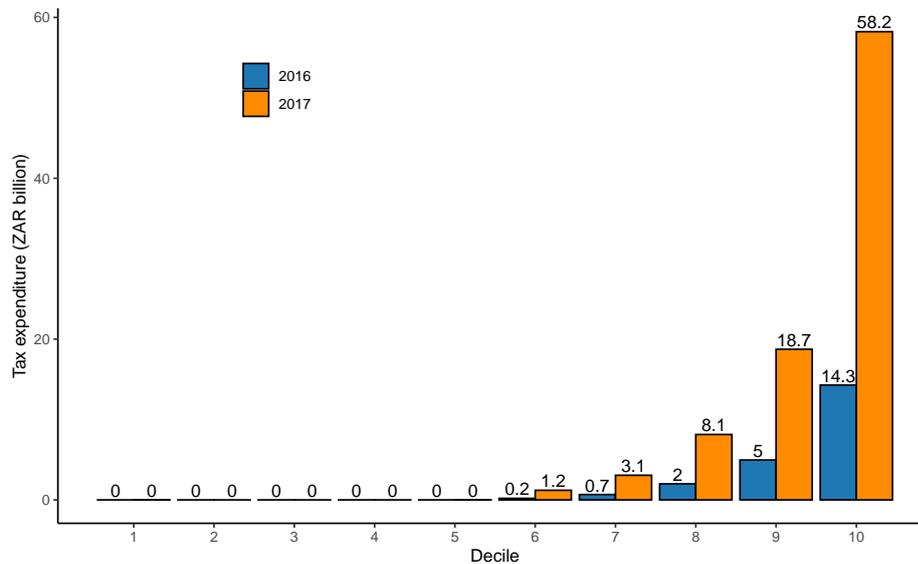
### *The distributive impact of PTEs*

Tax deductions are a particularly regressive type of TE. First, there is no benefit for individuals who do not pay any income tax (e.g., informal workers and individuals with income below the tax-free threshold, which in 2017–18 was ZAR75,750). Second, their value is negligible for individuals with low marginal income tax rates and significantly higher as income and thus marginal tax rates go up (in 2017–18, the top personal tax rate was 45 per cent for taxable incomes above ZAR1.5 million). Whereas a comprehensive assessment of the distributive impact of PTEs should also include the effects of the two further stages of taxation for retirement funds, namely growth within the fund and the tax treatment of the receipt of income in retirement, the upfront deduction can make a material difference in terms of both within-year equality measures and the revenue outcomes for government.

Hence, in Figure 7, we assess the impact of the Reform on the distribution of PTEs across income deciles by breaking up the total PTE across taxable income deciles in 2016 and 2017. The deciles are generated across the 13.4 million individuals with taxable income in 2017, of which 6.75 million of

those contributed to a retirement fund. The median taxable income was around ZAR88,000. As shown in the figure, the distribution of the benefits is strikingly concentrated among the better off. Because the tax-free threshold was ZAR75,750, the bottom four deciles would not receive any benefit from the deduction, implying that the Reform did not have an impact on those lower incomes. It is interesting to observe that there were around 1.2 million individuals in the bottom four deciles who contributed to a retirement fund in 2017, even when no tax benefit could be captured. On the other hand, the top 20 per cent of income earners capture more than 80 per cent of the total benefit from the upfront deduction (this figure is significantly higher than the 50 per cent that was captured by the top 20 per cent in Australia, as referred to in Section 3).<sup>20</sup> The Reform thus did not have the expected impact in mitigating the regressive effect of PTEs. Individuals in the bottom four deciles still do not capture any benefit, and roughly 83 per cent of the benefits are still captured by individuals in the top two deciles, exactly as before the implementation of the Reform.

Figure 7: Total tax expenditure by taxable income decile

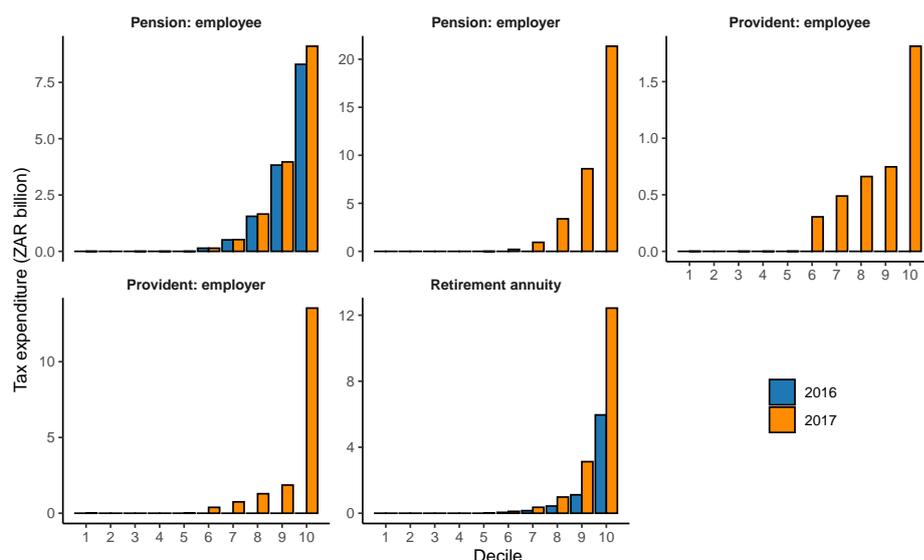


Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

Figure 8 illustrates that the largest portion of revenue foregone is generated through employer contributions to PFs. A similar pattern exists for employee contributions to PFs but at a smaller scale. The highest deciles receive the greatest benefit for employer contributions to PrFs, employee contributions to PrFs, and contributions to RAFs.

<sup>20</sup> Individuals are in the top two deciles if their taxable income is above ZAR322,000, while they are in the top decile with a taxable income above ZAR640,000.

Figure 8: Tax expenditure by type of retirement fund



Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

Another approach to check the distributional impact of PTEs is to compare the GINI before and after the Reform. Table 8 shows that the GINI index on disposable income, including PTEs, increased from 0.2 to 0.8 after the Reform.<sup>21</sup> As discussed throughout the paper, the comparison among the two time periods is not straightforward because data on employer contributions before the Reform are missing. Yet, the impact of the Reform when only looking at the impact on RAFs (which had the largest difference) also shows that the GINI on disposable income increased, in this case from 0.1 to 0.2 (Table 9). Overall, these results confirm the lack of effectiveness of the Reform in mitigating the regressive impact of PTEs.

Table 8: GINI index with and without ALL retirement fund deductions

Year	Disposable income with no deduction	Disposable income	Difference
2016	57.8	58.0	0.2
2017	58.1	58.9	0.8

Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

Table 9: GINI index with and without retirement annuity deductions

Year	Disposable income with no RA deduction	Disposable income	Difference
2016	57.9	58.0	0.1
2017	58.7	58.9	0.2

Source: authors' elaboration based on National Treasury and UNU-WIDER (2019).

## 5 Conclusion and policy implications

South Africa is one of the most unequal countries in the world. Hence, any policy should be evaluated not only regarding its effectiveness in reaching the goals it was designed for but also based on its distributive effects.

<sup>21</sup> We computed the GINI for disposable income because deductions reduce taxable income for those in higher-income deciles, and hence, including deductions mechanically reduces GINI on taxable income.

At the same time, the PIT base in the country is small because the informal sector accounts for a large share of the economy. This feature exacerbates the regressive effect of any policy implemented through the tax system, even if it seeks to target relatively low-income earners.

Against this background, assessing the distributive impact of PTEs (one of the largest TE provisions in the country) is crucial and has been high up in the policy-making agenda. In 2016, the South African government implemented a comprehensive retirement reform to simplify and harmonize the pension system in order to incentivize pension savings and increase the fairness of the retirement system (e.g., by preventing excessive contributions by employers and high-income earners).

Using administrative tax micro-data made available in the context of the SA-TIED programme, this paper assesses the impact of the 2016 Reform. Our main findings indicate that the Reform had a significant impact on both the extensive margin (with an additional 800,000 individuals contributing to a PrF and an additional 830,000 individuals contributing to a RAF) and a less sharp yet positive effect on the intensive margin (i.e. the total value of contributions). Even though we cannot fully rule out some reshuffling effects (i.e. a reallocation of savings across different saving instruments) to maximize tax savings, and hence, we cannot assess the impact of the Reform on overall savings, the evidence confirms that the Reform triggered a significant behavioral effect by increasing retirement savings.

When it comes to the second goal of the Reform, i.e. mitigating the regressive impact of the retirement system, our findings are less encouraging. Before the Reform, a greater proportion of rich individuals was already contributing to a retirement fund. Yet, instead of mitigating this effect, the Reform amplified it since the number of individuals contributing to retirement funds increased relatively more for top earners. Likewise, the Reform has exacerbated the gap between low- and high-income earners on the intensive margin side. In other words, not only do more people contribute to retirement funds in the higher deciles of the income distribution, but they also contribute larger amounts on average.

The two main changes introduced by the Reform were the implementation of a ZAR350,000 cap on allowable deductions for retirement savings and the harmonization of the applicable limits for different funds. Regarding the cap, the number of people with total contributions (including employer contributions and employee contributions to PrFs) above ZAR350,000 fell markedly from 2,279 to 708. Interestingly though, the number substantially jumped back in 2018 to 2,411, which indicates that the cap only had a short-term, temporary effect. When it comes to the harmonization of the limits, the large gap between the new common limit introduced with the Reform and most of the percentage contributions suggest that individuals did not change their contributions to maximize the available deductions. Yet, because data before the Reform did not include data on employer contributions, it is unclear to assess whether individuals increased contributions as a result of the introduction of the Reform.

Finally, we look into the distributive impact of PTEs. As expected, the distribution of the tax benefits is strikingly concentrated among the better off. Since the tax-free threshold was set at ZAR75,750, individuals with income below this threshold do not receive any benefit from the deduction and, hence, are not affected by the Reform. On the other hand, the top 20 per cent of income earners (individuals with taxable income above ZAR322,000) captured more than 80 per cent of the total benefit from the upfront deduction both before and after the Reform.

In other words, the Reform was effective in triggering the expected behavioral response since contributions to retirement funds increased both on the extensive and intensive margins. Yet, its impact in reducing the regressive effect of the system was not achieved. Because PTEs became more generous, the overall regressive effect was exacerbated, as indicated by an increase of the GINI index on disposable income after the Reform.

Based on our results, a valid question is whether the government could improve the retirement system so that not only contributions increase but also the benefits of one of the largest TEs in the country are more evenly distributed across the society.

A way to move forward could be to consider replacing deductions with tax credits. Deductions are among the most regressive TEs because benefits increase with marginal tax rates and hence with income. Therefore, switching to a system where benefits are granted as tax credits would be a step in the right direction to mitigate such a regressive effect. Yet, as in the case of the 2012–13 reform that replaced medical expense deductions by tax credits, such a move would probably not be enough to significantly reduce the regressive impact of tax benefits for pension savings (Nhamo and Mudimu 2020).<sup>22</sup> One crucial aspect regards whether the tax credit would be refundable, i.e. passed on to those below the tax-free threshold. As discussed by Elaine Maag in the context of the Child Tax Credit in the United States, making tax credits fully refundable is a powerful retributive measure because low-income formal workers benefit the most.<sup>23</sup> In the context of the retirement system in South Africa, this would imply that individuals in the four lowest deciles of the income distribution could start benefiting as well. Based on the 2018 figures in Table 5, replacing the current scheme with a 30 per cent refundable tax credit would be revenue neutral because the total level of contributions to retirement funds was around ZAR250 billion.

Another measure that could contribute towards mitigating the regressive effect of the system regards the cap. The lack of effectiveness of the ZAR350,000 cap is probably given by a design feature, i.e. the level at which it was set. For example, tax-deductible contributions to one's pension fund are capped at CHF6,768 per year in Switzerland, an amount roughly similar to the median monthly wage in the country, i.e. less than 9 per cent of yearly gross remuneration. Instead, in South Africa, the ZAR350,000 cap represents roughly 400 per cent of yearly taxable income. It would be worth exploring whether lowering the cap would make it binding for more individuals and hence more effective.

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<sup>22</sup> It is worth mentioning that the overall benefit received through deductions for retirement fund contributions is not fully comparable to the tax benefit for medical contributions because there are two further stages of taxation for retirement funds, which are absent when it comes to medical contributions.

<sup>23</sup> [www.forbes.com/sites/elainemaag/2020/05/26/expanding-the-child-tax-credit-full-refundability-and-larger-credit/?sh=3d033f38525d](https://www.forbes.com/sites/elainemaag/2020/05/26/expanding-the-child-tax-credit-full-refundability-and-larger-credit/?sh=3d033f38525d).

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## Appendix

Table A.1: Income concepts

Income concept	Definition	Comments
<i>Gross income</i>	Total amount, in cash or otherwise, received by or accrued to or in favour of a resident; or the total amount, in cash or otherwise, received by or accrued to or in favour of a non-resident from a source within or deemed to be within the Republic.	
<i>Taxable income</i>	The amount remaining after taking into account against gross income, all exclusions and deductions (including assessed losses).	
<i>Approved remuneration</i>	Total remuneration accruing to the employee in respect of his employment as the commissioner considers to be fair and reasonable in respect of services rendered. The examination takes into account the value of the services rendered in relation to the cash and other benefits received in return.	Although there are three distinct calculations, in practise the same value is often attributed to 'approved remuneration' and 'retirement-funding employment' income.
<i>Non-retirement-funding employment income</i>	All the income derived by the taxpayer during the year of assessment after deducting any <i>retirement-funding employment income</i> . Non-retirement funding income also excludes any retirement fund lump sum or retirement fund lump sum withdrawal benefit.	Although there are three distinct calculations, in practise the same value is often attributed to 'approved remuneration' and 'retirement-funding employment' income.
<i>Retirement-funding employment income</i>	'Remuneration' as defined in the Fourth Schedule to the ITA; excluding 50% of any public office allowance or transport allowance, any retirement fund lump sum or retirement fund lump sum withdrawal benefit; including any travel allowance unless it is a travel reimbursement based on actual distance travelled at not more than the gazetted rate.	Although there are three distinct calculations, in practise the same value is often attributed to 'approved remuneration' and 'retirement-funding employment' income.
<i>Pensionable salary</i>	The rules of a retirement fund typically define this concept for the purposes of contributions made by the employer and the employee as well as, where applicable, the value of the benefit payable in the case of fund-provided risk benefits.	Where the retirement fund only has one contributing employer, the rules of the fund may define the actual determination of the 'pensionable salary' (being 'retirement-funding employment' income), for example as only including fixed remuneration (e.g., salary or wages) and excluding variable amounts such as commissions, bonuses, and overtime. In the case of an umbrella fund, the norm is for the rules to allow the contributing employer to determine the components included in 'pensionable salary' and its value.

Source: authors' elaboration based on the Income Tax Act No. 58 of 1962 (ITA) and South African National Treasury (2012).

Table A2: Source of income panel

Tax_year	ID_d	IRP5_ID	Source_code	Amount	Final_d	Category_d	Taxable_d
2013	abcdek	255673340	3601	62,000	0	Normal_income	1
2013	abcdek	256183279	3601	14,300	0	Normal_income	1
2013	abcdek	Assessed	3601	76,300	1	Normal_income	1
2013	abcdek	255673340	3605	3,200	0	Normal_income	1
2013	abcdek	256183279	3605	2,200	0	Normal_income	1
2013	abcdek	Assessed	3605	5,500	1	Normal_income	1
2013	abcdek	256183279	3801	200	0	Fringe_benefit	1
2013	abcdek	Assessed	3801	200	1	Fringe_benefit	1
2013	abcdek	244705789	3920	9,200	0	Lump_sum_retirement	1
2013	abcdek	Assessed	3920	9,200	1	Lump_sum_retirement	1
2013	abcdek	255673340	4001	4,750	0	Deduction	NA
2013	abcdek	Assessed	4001	4,750	1	Deduction	NA
2013	abcdek	Assessed	4102	3,700	1	Withheld_tax_income	NA
2013	abcdek	Assessed	4115	550	1	Withheld_tax_retirement	NA

Source: Ebrahim and Axelson (2019: 6), Table 4.

In 2013, individual 'abcdek' has 'normal taxable income' (3601) and an 'annual payment' or bonus (3605) as indicated in the first (255673340) and second (256183279) IRP5 certificates in Table A2. The second certificate also includes a 'general fringe benefit' (3801). The ITR12 return ('Assessed' in the 'IRP5\_ID' column) aggregates the information per source code from the IRP5 certificates, i.e. 76,300 in the 'Assessed'-'3601' row, and shows the sum of the amounts received as 'normal taxable income' (3601) from the two first certificates. The third certificate shows a pre-retirement withdrawal from a retirement fund (3920). The first certificate included a deduction for a contribution to a pension fund (4001). The panel also includes derived variables to indicate the type of income, whether the value is final, and whether the income is used in the taxable income calculation.

Table A3: Income panel

ID_d	abcdek
Tax_year	2013
ITR12_taxable_income	77250
ITR12_tax_liability	2465
IRP5_PAYE_d	3700
IRP5_lump_sum_tax_d	550
Gross_income_d	91200
Exempt_income_d	0
Income_d	91200
Deductions_d	4750
Lump_sum_retirement_d	9200
Taxable_income_d	77250
Tax_liability_d	2465

Source: Ebrahim and Axelson (2019: 7), Table 5.

Likewise, Table A3 shows an example of the (transposed) outcome provided by the income panel. For individuals who have filed an ITR12 return, the final taxable income amount and tax liability are taken from the ITR12 return directly, but this excludes any retirement lump sum payments. For individuals who did not have an ITR12 return for that year, the taxable income and tax liability amount is the aggregated amount of each value across all the IRP5 certificates. Additional columns indicate the derived values for gross income, exempt income, income after exemptions, deductions, taxable income (income after exemptions and deductions), lump sums, and the tax on lump sums.