VOLUME 74 | NUMBER 2

APRIL–JUNE 2021

International Social Security Review

ISSN 0020-871X

- A shift to libertarian paternalism in old-age income security: Discourses on pension privatization reforms in Lithuania 2016–2018
- Pension coverage extension as social innovation in Zambia: Informal economy workers' perceptions and needs
- The impact of the Lesotho Child Grant Programme in the lives of children and adults with disabilities: Disaggregated analysis of a community randomized controlled trial
- Pension coverage in Latin America: Trends and inequalities
- Minimizing inequality in the financing of Argentina's pension system: Modelling three scenarios

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Publisher: *International Social Security Review* is published by John Wiley & Sons Ltd, 9600 Garsington Road, Oxford OX4 2DQ, UK. Tel: +44 (0) 1865 776868, Fax: +44 (0) 1865 714591.

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VOLUME 74 | NUMBER 2
APRIL–JUNE 2021

International Social Security Review

Information for subscribers. *International Social Security Review* is published in 4 issues per year. Institutional subscription prices for 2021 are: Print & Online: US$627 (US), US$730 (Rest of World), €478 (Europe), £377 (UK). Prices are exclusive of tax. Asia-Pacific GST, Canadian GST/HST and European VAT will be applied at the appropriate rates. For more information on current tax rates, please go to https://onlinelibrary.wiley.com/library-info/products/price-lists/payment. The price includes online access to the current and all online backfiles to January 1st 2017, where available. For other pricing options, including access information and terms and conditions, please visit https://onlinelibrary.wiley.com/library-info/products/price-lists.
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Printed in Singapore by C.O.S. Printers Pte Ltd.

INTERNATIONAL SOCIAL SECURITY REVIEW, (Print ISSN: 0020-871X; Online ISSN: 1468-246X), is published quarterly. Periodical postage paid at Rahway, NJ. Postmaster: Send all address changes to *International Social Security Review*, Wiley Periodicals LLC, C/O The Sheridan Press, PO Box 465, Hanover, PA 17331 USA.

A shift to libertarian paternalism in old-age income security: Discourses on pension privatization reforms in Lithuania 2016–2018

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Abstract This study uses news media discourse analysis to investigate the highly contentious process of pension privatization retrenchment in Lithuania. In 2016, Lithuania began debating reforms on restructuring its poorly performing "second pillar" pension scheme – statutory funded individually defined contribution plans managed by the private sector. Pension reform is here conceptualized as a process of discursive contestation of the orthodox neoliberal consensus that prevailed in designing and introducing a private pension system in the early 2000s. By 2018, when a new Law on Pensions institutionalized a subsidized "nudge-type" private retirement saving scheme, this process was legitimized by a newly prominent libertarian paternalistic ideology. Impacts of the discursive framing of pension reforms on their outcomes are discussed.

Keywords pension scheme, social security reform, privatization, social policy, press, consumer behaviour, Lithuania

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The author thanks Romas Lazutka for extensive comments and suggestions on an earlier draft, as well as Jekaterina Navicke and two anonymous reviewers for observations and comments that permitted to improve the article.

Introduction

In the early 2000s, a number of Eastern European countries, including Lithuania, undertook reforms to privatize their pension systems by creating “second pillar” schemes; namely, statutory, fully or partly funded individual defined contribution plans managed by the private sector. However, in the aftermath of the 2008–09 global economic crisis, privatization was halted and began to be reversed, primarily because of the dramatic weakening of public finances as well as the excessive costs and poor performance of private retirement saving accounts. A number of reversal strategies were undertaken to reform the “privatized” pillars of pension systems. This resulted in a temporary reduction in contribution levels in Estonia (Krzyzak, 2019) and Romania (Adascalitei, 2017), a reduction in contribution levels in Latvia and Lithuania (Aidukaite, 2019), a permanent reduction in contribution levels and a partial reversal of the privatizing reform in Poland (Kobylinski, and Zbyszynski, 2019; Polakowski and Hagemejer, 2018), and a permanent reversal of the privatizing reform (i.e. renationalization) in Hungary (Bielawska et al., 2015; Datz and Dancsi, 2013; Fultz, 2012).

These reversal strategies led to a shift in social security and social welfare studies as well – from an earlier focus on the analysis of global trend towards privatization (Orenstein, 2008; Müller, 2003; Adascalitei and Domonkos, 2018), to a study of the drivers that accounted for divergent paths of retrenchment reforms across the region. While analysis emphasized the importance of economic and institutional factors (see for example, Fong and Leibrecht, 2019; Fultz and Hirose, 2019; Altiparmakov, 2018; World Bank, 2013), the impact of ideational factors that framed debates on changes in pensions systems, while discussed, remains less investigated (Kohli and Arza, 2011).

Ideational factors, or the “power of ideas”, are very important in legitimizing change, i.e. they permit to make claims concerning the moral appropriateness of reforms without which no controversial changes in a welfare state could succeed (Schmidt, 2000). This article focuses its analysis on one type of ideational factor that accompanied privatization retrenchment. Specifically, it analyses the news media discourses that were prevalent in the most recent round of pension reforms in Lithuania, which began in late 2016, when the newly elected government announced its plans to restructure the second pillar, up until the passage of the new Law on Pensions in June 2018. For this purpose, content analysis is used to examine 349 news media articles on pension reform published from December 2016 to June 2018 by the three most popular national news media portals in Lithuania – *delfi.lt*, *15min.lt*, and *lrytas.lt*.

This study conceptualizes news discourse as “a mass process of public persuasion … [by] … individuals and groups involved in the presentation, deliberation and legitimation of political ideas to the general public. …

[D]iscourse serves not only to express one set of actors' strategic interests or normative values, but also to persuade others of the necessity and/or appropriateness of a given course of actions" (Schmidt, 2008, pp. 310–312). The goal of content analysis is not only to identify who are speaking on pension reform, who are the "loudest" in the debate, and what specifically they are saying, but also whose discourses are dominating and whose views are minority opinions. Equally important is to ascertain how the discursive framing of reforms in Lithuania came to be reflected in their eventual outcomes – did those who spoke the loudest and who dominated in news media debates succeed in shaping the re-writing of the pension laws?

A second goal is to make an analytical distinction between the political process of pension privatization that led to changes in pension laws and the discursive contestation of the reforms in the news media per se. Discursive contestation, the dynamics of which are specific to news media, is but one constitutive element of the wider political process. The wider political process is shaped also by numerous broader historical, socioeconomic, institutional and cultural factors, only some of which are specific to Lithuania, while others may be shared with other countries in the region.

Given that pension privatization retrenchment is conceptualized as occurring along two interrelated dimensions – political and discursive –, each of which has its own specific dynamic, this article is structured to reflect this analytical duality. First, we outline the socio-historical context and political dynamics that led to the pension privatization retrenchment reforms in Lithuania. Specifically, we describe how, in a process of negotiation and contestation, a compromise was reached that resulted in the passage of the 2018 Law on Pensions. On the one hand, the financing of the PAYG (pay-as-you-go) State Social Insurance Fund Board of Lithuania (SODRA) was made more secure. On the other hand, while state contributions to the individual retirement saving accounts were also reduced, pension privatization policies were neither reversed nor abandoned. Public subsidies – at a reduced level – remained in place to serve as incentives for employees to continue to contribute to their retirement saving accounts, with the expectation that individual contributions would increase over time. Furthermore, the second pillar's mandate was altered to become a "nudge-type" investment scheme that, among other measures, introduced automatic enrolment in retirement savings accounts for all employees aged 40 or younger.

Here, the discursive dimension of pension reform analysis is conceptualized as a process of the discursive contestation of the orthodox neoliberal consensus that prevailed in designing and introducing a private pension system in 2004. Neoliberal orthodoxy is based on an assumption of the rational nature of economic decision-making; all that was required was to free individuals to pursue their own economic interests, which would "naturally" lead them to engage in forms of pension provision that were more effective than that provided by the State. In the late 1990s, Lithuania eagerly embraced – as did other countries in the region – pension privatization. This shift was based on claims that markets are always more efficient, and a market-oriented pension system would be more reliable and provide higher returns than benefits from the PAYG social security systems currently in place. It was based also on claims that fully or partly funded second pillar private contributory plans would stimulate the economy and strengthen individual responsibility for personal welfare in old age (Müller, 2003; Fultz, 2006; Lazutka, 2007).

By the mid-2010s, the discursive framing of the pension privatization reforms had shifted as the dominance of neoliberal orthodoxy in the news media began to decline. Instead, in the course of reform debates, libertarian paternalist or "soft paternalism" discourses on pension privatization became prominent. Both types of governing philosophy – neoliberalism and libertarian paternalism – conceptualize pension reform as a shift from the traditional social security pension system (characterized in Lithuania by the PAYG SODRA) to the provision of old-age income security via state and/or private investments in financial markets. However, they differ as regards their assumptions concerning what governs the economic behaviour of individuals.

Specifically, libertarian paternalist approaches are derived from the rapidly developing fields of behavioural economy and behavioural psychology. In contrast with neoliberal orthodoxy, libertarian paternalism is based on the assumption of the fundamental irrationality of economic behaviour. Important in this regard is the belief that everyday life economic decisions are not only bound by limits of time, cognitive ability and information available, but are also impacted by conscious and subconscious psychological, emotional, instinctual drives and influences. On this basis, advocates of libertarian paternalism argue that decision-making environments should be designed so as to guide individuals by means of "nudging" or subtle targeting, with the aim to "influence people's behaviour in order to make their lives longer, healthier and better" (Thaler and Sunstein, 2008, p. 5). Nudges are defined as strategies that "[a]lter people's behaviour in predictable ways without forbidding any option or significantly changing their economic incentives … Putting the fruit at eye level counts as a nudge. Banning junk food does not" (Thaler and Sunstein, 2008, p. 6, as cited in Jones, Pykett and Whitehead, 2010b, p. 484).

In the second part of this article, content analysis will be used to identify major themes and categories that constitute agents of neoliberal or libertarian paternalistic, as well as other, discourses. In turn, comparisons of the frequency and distribution of themes and actors in news coverage will be used to demonstrate the decline of orthodox neoliberalism and the rise to prominence of libertarian paternalism. As regards Lithuania, we discuss how a libertarian paternalist media discourse chose to identify the irrational, misguided, and uninformed behaviour of the country's citizens as the reason for private pension system failure. The excessive costs and poor performance of private retirement savings accounts were attributed to the failings of account owners in not having deferred short-term gratification – to have not saved or to have saved too little, or for having postponed saving for old age for too long – thus contributing to their poverty in retirement. Therefore, the ultimate goal of pension reform, according to the libertarian paternalistic interpretation, is to design and employ paternalistic state policies that would rationalize, re-direct, and incentivize individuals to save more for retirement. The article will conclude with a discussion of the impacts that the shift in discursive framing, from neoliberal orthodoxy to libertarian paternalism, has had on pension reform outcomes.

Politics of pension reform in Lithuania

Lithuania is a small East European country (pop. 2.8 million) that, after regaining its independence from the Soviet Union in 1991, zealously embraced neoliberal doctrines in the creation of a new market economy, with low controls on capital, open markets and reduced provisions for social protection (von Hirschhausen, 1998; Kolodko, 2002; Bohle and Greskovits, 2007). By the mid-2000s, such socioeconomic policies generated a significant level of economic growth to earn Lithuania (together with the two other Baltic states of Latvia and Estonia) the nickname of "Baltic Tiger". However, this growth was based on suppressing wages, keeping taxes on capital low, exporting cheap labour to the core European Union (EU) countries, and through a substantial reduction in the universal and extensive social security provisions inherited from the socialist period. As a result, Lithuania has been characterized as having one of the lowest levels of social expenditure and the highest levels of poverty and inequality among EU Member States (Atas, 2018; Lazutka, Juska and Navicke, 2018a).

The push to privatize pensions in Lithuania in the mid-2000s was characteristic in this respect, as it was based on "an extraordinary high degree of cross-party consensus" on pension privatization orthodoxy and the need to create private retirement saving accounts supported by public subsidies (Müller, 2006, p. 416). Some have suggested that the introduction of the private pension pillar in Lithuania, and the other Baltic states, was an attempt at "out-liberalizing" the EU (Orenstein, 2008), or an expression of the "triumph of neoliberalism" and an application of "avant-garde neoliberal policy ideas" (Appel and Orenstein, 2018, p. 3).

However, by the mid-2010s, neoliberal orthodoxy in Lithuania was increasingly questioned as the second pillar privatized pension system proved to be inefficient, very costly, and, in the long run, fiscally unsustainable. As a result of the severe recession in 2008–09 and a growing SODRA deficit (reaching 3.7 billion euros (EUR) by the end of 2017), SODRA transfers to individual retirement saving accounts were significantly cut. The transfers fell from a figure equivalent to 5.5 per cent of individual social security contributions collected to 1.5 per cent in 2012, albeit then raised to 2.5 per cent in 2013 (Aidukaite, 2019, p. 48; LRFM, 2018). Despite the post-crisis market rebound, private pension funds in Lithuania performed poorly. Thus, from 2004 until 2018, private pension funds accumulated EUR 2.9 billion in assets and earned 19.6 per cent, or EUR 571.2 million, in dividends. However, inflation across the same period was 55.9 per cent, significantly higher than the rate of growth of earnings (see also OECD, 2018b; LŽTA, 2018). Finally, the subsidies provided to retirement saving accounts began to generate discontent, especially among pensioners who were among the poorest voting constituencies in Lithuania. In 2016, the average pension of the around 908,200 retirees (about a third of the population in Lithuania) was EUR 255.30 per month, significantly lower than the official poverty measure at EUR 307 per month (NSMOT, 2018, p. 7). Moreover, in 2017, SODRA had transferred about EUR 189 million to retirement saving accounts (Kukuraitis, 2018b). In other words, instead of increasing pensions to alleviate current old-age poverty, SODRA was transferring its revenue to subsidize private saving accounts for the currently employed.

In the 2016 October elections to *Seimas* (parliament), the Lithuanian Farmers and Greens Union (LFGU) used discontent over SODRA's subsidies to appeal to impoverished retirees for their political support, promising to discontinue these transfers and to restructure the second pillar. Upon coming to power, the LFGU leadership began drafting plans to restructure the national pension system, generating public controversy that mobilized a number of powerful and vocal constituencies such as the banking, life insurance, private pension fund industries, as well as business lobbying groups that had high stakes in pension reform. Later, these were joined by various political parties in Seimas, as well as by civic groups, experts, lawyers and others.

The Lithuanian government, and especially officials and experts at the Ministry of Social Security and Labour, were keenly aware of the "nudge" type strategies used in designing public policies in other countries (Jakilaitis, 2017). These were applied not only in pension saving schemes (DWP, 2006; see also Leggett, 2014), but also in healthcare, nutrition, and the architecture of everyday life in general (Jones, Pykett and Whitehead, 2010a). Nudging allowed the government to avoid authoritarian, top-down decisions that have a higher likelihood of generating public backlash and, in the case of pension reform, undermining the support of retirees who constituted a major, although poorly organized, voting constituency.

As a result, by 2018, the pension system had been restructured in such a way that those aged 40 or younger were by default enrolled into retirement saving accounts, initiating defined contributions based on their wages. Those who did not wish to participate were obliged to opt out. Affiliates' savings were allocated to an investment fund chosen for them, based on a "life cycle" strategy – higher risk (and therefore potentially higher returns) for younger individuals, and lower risk for the older cohorts, while annuities were to be calculated and paid out by SODRA.

The reform restructured the pension system via a series of "nudged" individual choices set preferentially to favour private pension savings. These nudges were expected to guide individual's private investment behaviour, as well as pacify citizens, i.e. to diffuse their discontent over low (current and projected) pensions by offering individuals the ability to make different investment choices. However, despite partial privatization retrenchment in 2018, the pension system in Lithuania remains, especially in the long term, vulnerable to fiscal and other crises and challenges. First, the reform did not resolve the systemic contradiction inherent in its design (i.e. the high transition costs of the reforms and conflict over public subsidies to private savings accounts). Second, it is uncertain to what extent the accumulated amounts held in individual private retirement accounts will be able in the near future to compensate (or fail to compensate) for the underfunding of PAYG pension system.

Before we address how content analysis enables us to investigate to what degree pension system restructuring was legitimized, and by whom, the next section offers a brief outline of the major changes to the pension system introduced by the 2018 Law on Pensions. This is followed by a description of the methods that were used to collect and analyse the content of the news media publications, which in turn is followed by the presentation of the most important discourses that prevailed in pension reform news coverage.

The 2018 Law on Pensions

In 2004 when the voluntary second pillar pension scheme was introduced in Lithuania, the contribution to SODRA was set at 2.5 per cent of the insured worker's monthly wage and 23.4 per cent of the monthly payroll from the employer (SSA and ISSA, 2004). Initially, the transfer of 80 per cent of an individual's contribution to SODRA (or 2 per cent out of 2.5 per cent) financed their private retirement savings account (the so-called "2 per cent mode"). In 2014, it became possible to make additional voluntary contributions with a matching state subsidy when the so-called "2 per cent +2 per cent +2 per cent mode" was created, to be financed on the basis of 2 per cent of SODRA contributions, 2 per cent of state subsidies, and 2 per cent paid by individual participants.

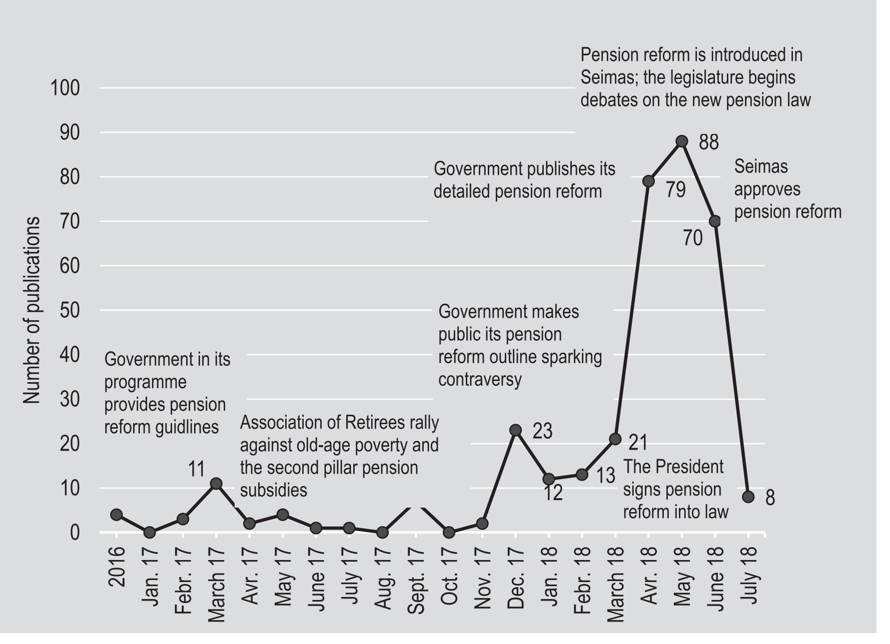
By late 2016 when the newly elected government announced its plans to reform the pension system, about 1.23 million or 90 per cent of all SODRA insured employees were participating in the statutory funded second pillar scheme. Of these, about one third were enrolled in the "2 per cent mode", and a further third were in the "2 per cent +2 per cent +2 per cent mode". The remaining third of private retirement savings accounts were inactive, for instance due to individuals being unemployed or having emigrated. Eighty per cent of the annual contributions to private retirement saving accounts were provided by public sources (SODRA and the state budget), while the remaining 20 per cent came from individual participants (Lazutka, Poviliunas and Zalimiene, 2018b).

Following the 2018 pension reform, SODRA was to be financed directly from the state budget, instead of being reliant on social insurance contributions. Transfers from SODRA to the second pillar retirement savings accounts were eliminated, while the government was to allocate funds from the state budget (up to 1.5 per cent of the national average monthly wage) to those who had opted to contribute to a private retirement savings account. However, in return for these budgetary contributions to the retirement saving accounts, the pensions paid by SODRA to insured persons upon retirement were expected to be 10–15 per cent lower than they might have been if the insured person had chosen to forgo private saving.

Among other major changes, the Law also modified the saving formulas so that individuals would be "nudged" to double their contributions to private retirement savings accounts, from 2 per cent of wages to rise incrementally to 4 per cent of wages. At the same time, the government would scale down its total contributions to private retirement savings accounts from 4 per cent (i.e. 2 per cent from SODRA and 2 per cent from the budget) to 2 per cent from the budget only. The new formula "4 per cent + 2 per cent" was set as the default to which all those currently contributing to private retirement savings accounts would automatically adhere to. If individual affiliates were not willing to participate in the new "4 per cent +2 per cent" scheme, they would be automatically enrolled in a private retirement savings account for a minimum period of three years only, but with the choice to opt out. Those who chose to opt out at the end of the third consecutive year could either leave the savings in the account or transfer their total accumulated savings to SODRA. Furthermore, they would also lose the state subsidy provided to private accounts, but would not be subject to the SODRA pension reduction.

Overall, the changes introduced by the 2018 reform reoriented the Lithuanian pension system, in a relative sense, away from a defined benefit approach and towards a defined contribution approach, thus shifting greater responsibility for old-age income security onto individuals.

Figure 1. *News media publications on pension reform in Lithuania, 2016–2018 (N=349)*



Source: Author.

Methodology

The discourse analysis began by compiling a list of news reports and articles on pension reform published from October 2016 to July 2018. For this purpose, the three most popular news portals in Lithuania were selected: *Delfi.lt* (on average 1.06 million visitors per month), *15 min.lt* (645,000 visitors per month) and *Lrytas.lt* (533,000 visitors per month). These top three sites together accounted for 53 per cent of the consumption (so-called, time share) of Internet news media sites in Lithuania. Analysis was limited to three top portals because the fourth most often visited news site, TV3 broadcaster (*TV3.lt*), had only half the number of *Lrytas.lt* visitors – on average 270,000 per month or about 4 per cent of time share-Internet in the country.[1] Therefore, while no claims can be made about the comprehensiveness of the list of news publications used in this study, it is argued that it is sufficient to allow for a representative analysis of the discourses on pension reform in Lithuania's news media.

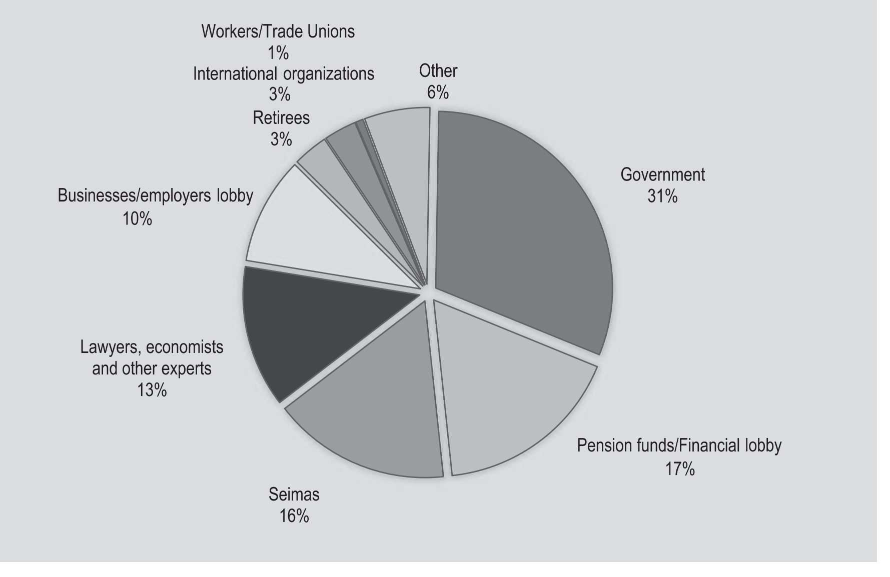
1. See data on number of visitors and time share-Internet for 2017–2018 news portals in Lithuania here.

The three most popular news portals placed articles published on pension reform in special sections called "Pension reform". For October 2016 to July 2018, *Delfi.lt* listed 111 articles, *15 min.lt* 172 articles, and *lrytas.lt* 51 articles on "Pension reform", making 349 articles in total. As illustrated in Figure 1, the publication cycle was driven by coverage of legislative activities undertaken by the government and Seimas.

Articles retrieved from news portals varied in length. Some were a single paragraph, for example, a summary report of which items of the proposed pension reform the Seimas was debating. Others were more extensive articles, authored by professional journalists, experts and lawyers, government officials, and representatives of civic groups. Bibliographic data on each article (title, author, source and date of publication) were entered into the EndNote bibliographic reference management programme.

In order to answer the question "who is speaking?", publications were coded beginning with the list of 18 social actors that later were consolidated into nine categories (Figure 2). Close to 33 per cent of news publications covered government policies and statements, including those by the Prime Minister and cabinet ministers, high ranking government and ministerial officials, and advisors to the government. "Pension Funds/Financial Lobby" accounted for

Figure 2. *Social actors in Lithuanian news media on pension reform (N=349, October 2016–July 2018)*



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17 per cent of publications, which included statements and commentaries by representatives of the Lithuanian Association of Investment and Pension Funds, the Lithuanian Life Insurance Companies Association, the Lithuanian Private Equity and Venture Capital Association, the Lithuanian Financial Brokers Association, and representatives of the Lithuanian Central and other banks, and other investment experts. The Seimas was covered in 16 per cent of publications. Lawyers, economists, and other experts authored 13 per cent of articles on pension reform. Business and the employers' lobby accounted for 10 per cent of articles published by representatives of the Lithuanian Free Market Institute, the Lithuanian Business Confederation, the Investors' Forum and other business associations. Under "International organizations" were coded 3 per cent of articles referring to or discussing policy papers and recommendations of the International Monetary Fund (IMF), World Bank and EU.

It is striking how few publications were attributed to civic groups. Only 3 per cent of articles were either authored or featured retirees and their organizations, and only 1 per cent was by workers and trade unions. It was the government together with business and the financial lobby, lawyers, economists and other experts, that overwhelmingly dominated pension reform coverage in the Lithuanian news media.

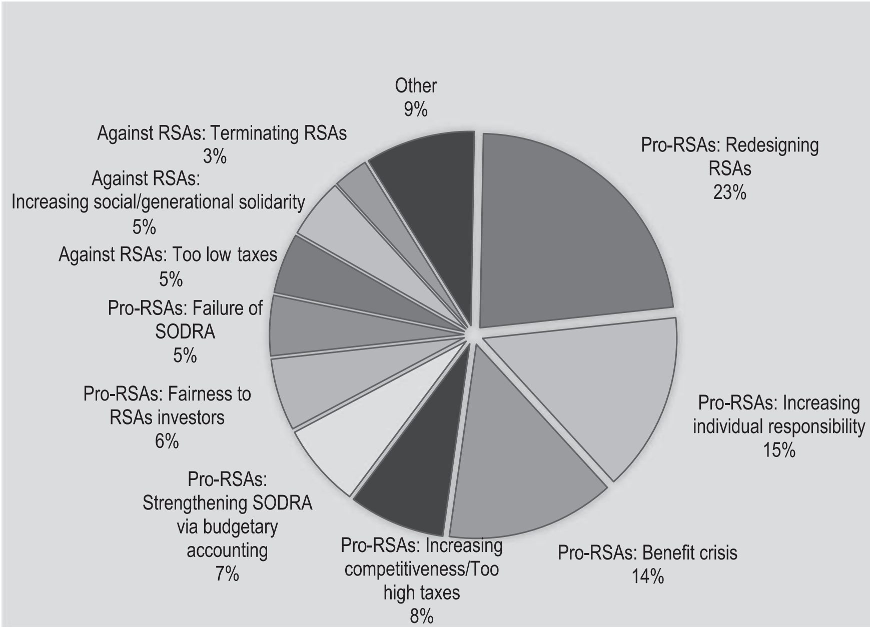
In order to answer the question "what were social actors saying?", articles were coded beginning with a list of approximately 20 themes or keywords. Keywords were constituted by the issues that were discussed in the media, such as retirement benefit crisis, descriptions of new retirement funding schemes, calls for more individual responsibility, demands for fairness for those who invested in retirement savings accounts, claims of increasing or decreasing business competitiveness as a result of proposed changes in pension financing, and so on. One or more categories of themes or keywords could be used to identify the content of a single report.

The empirical clustering of keywords in coded articles was then grouped into broader categories to differentiate the distinct ways in which the new Law on Pensions was defined and described in the news media. As a result, ten discourses or strategic narratives were identified (Figure 3). Sets of keywords that constitute each discourse are described in detail below.

Seven discourses were supportive of retaining second pillar retirement savings accounts (RSAs), albeit redesigned and restructured, accounting for 78 per cent of all publications. Specifically, these identified discourses addressed i) redesigning and restructuring private RSAs, ii) increasing individual responsibility, iii) pension benefits crisis, iv) increasing competitiveness, v) strengthening SODRA, vi) fairness to RSA investors, and vii) failure of SODRA.

Three discourses – on taxes being too low, increasing social solidarity, and terminating RSAs – accounted for 13 per cent of all publications. These were

Figure 3. *Discourses on pro- and against Retirement Saving Accounts (RSAs) in Lithuanian news media (N=349, October 2016–July 2018)*



Source: Author.

critical of public subsidies to RSAs and argued for discontinuing subsidies and privatizing RSAs, i.e. converting them into a voluntary personal pension saving scheme.

Pro-RSA discourses

The discourse on “redesigning retirement savings” (RRS) was the most significant in pension reform debates, accounting for 23 per cent of all publications. Such predominance of RRS indicates the intent of its proponents to limit pension reform to the restructuring of the second pillar pension system only. In other words, to frame it as a legislative initiative to make private RSAs more rational and efficient, while eschewing and concealing political, social and ethical dilemmas associated with having publicly subsidized private pension funds in the first place.

More specifically, RRS relied heavily on an assumption that individuals with RSAs require paternalistic guidance and supervision by the State. Surveys of individuals with savings in private RSAs in Lithuania have shown that an overwhelming majority of participants were unable to make or incapable of informed investment decisions. For example, a survey conducted by the Lithuanian

Central Bank found that participants were mostly "passive investors", remaining with the first fund that they started to invest in; only 3.28 per cent of investors had changed funds since they started contributing to private funds. About 70 per cent of contributors were unable to choose the optimal level of risk suitable for their age: younger individuals chose strategies that were overly conservative, while older individuals chose more risky strategies, leading to underperforming investments and losses. Only half of those surveyed checked the performance of their RSAs at least once a year, and those who did so tended to engage in erratic behaviour, such as investing in stocks at their peak price (see also OECD, 2016; Vasiliauskas, 2017). Therefore, in the last 15 years, upon retirement only 450 individuals out of about 80,000 (0.6 per cent) who had invested in RSAs had accumulated more than EUR 10,000 and received an annuity. All other retirees received a lump-sum payment of about EUR 2,000, making them worse off because their private savings did not compensate for the expected reduction in SODRA pensions of 10–15 per cent (Naprys, 2018a).

In order to remedy the situation, the Minister of Social Affairs and Labour, Linas Kukuraitis, the government spokesperson for the pension reform, declared that the goal of the government was to "design the best private saving strategies for those who can do it profitably" (Balčiūnaitė, 2017). This announcement initiated an extensive technocratic debate in the media on multiple types of "nudges" that could be used to incentivize and guide people's behaviour so that "in the near future, there will remain no one who does not save individually" (Balčiūnaitė, 2017). Thus, the RRS discourse focused on a number of technical questions. These included possible additional tax cuts for the employed; measures to reduce private fund management fees; additional incentives to encourage saving directed at those with higher earnings; choosing between opt-in enrolment or enrolment by default (opt-out) in private saving schemes; fund and investment strategy choices; and the option to receive annuities.

Increasing individual responsibility discourse

If the RRS discourse represented a paternalistic aspect of "libertarian-paternalistic ideology", then the "increasing individual responsibility" (IIR) discourse constituted its libertarian part. It was the second most prevalent discourse in debates on pension reform, accounting for 15 per cent of publications. IIR was used to legitimize the libertarian character of the reforms; i.e. of further transfer of the responsibility for old-age income security from the State to the individual. Critics argued that even if the second pillar pensions were referred to as "private", these were financed mostly by the State. For example, Minister Kukuraitis has pointed out that 678,000 out of 1.23 million RSAs were financed by SODRA's 2 per cent contributions only. This was, in his opinion, certainly insufficient. Therefore, the current RSAs were in need of being restructured into "real" private ones, where individuals would take control and be the main contributors providing up to 4 per cent of monthly declared wages in contributions, while the State's role would be gradually reduced to that of providing incentives – additional contributions up to 2 per cent – for savers (Kukuraitis, 2018a).

Moreover, the shift from societal to individual responsibility would also entail behavioural change among the country's citizens, as it required them to become more conscientious and responsible for providing income for their retirement and thus engaging in long-term planning, the deferment of immediate gratification, greater prudency and self-sufficiency. For example, the whole slew of financial industry-sponsored articles depicted saving for pensions as a moral stance, equating persons with high pension savings as having greater moral fortitude and demonstrating personal responsibility, which would permit them to enjoy greater income security in old age. Such "deserving" senior citizens typically were portrayed in the media using photographs showing them happily enjoying Mediterranean beaches or lounging near swimming pools. In comparison, low pensions were portrayed as being indicative of individual moral failure, imprudence, and an inability on their part to defer gratification, plan and save (Lapienytė, 2018).

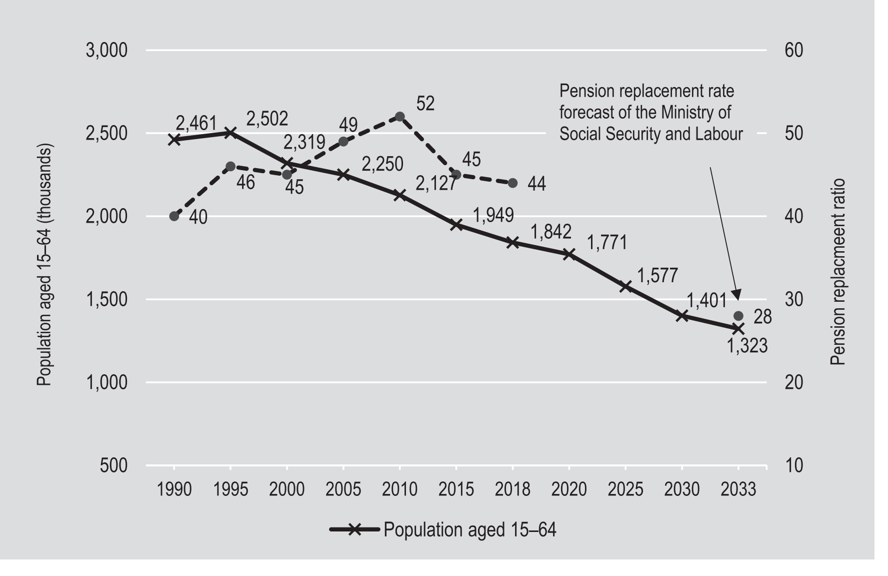
Benefit crisis discourse

The "benefit crisis" discourse accounts for 14 per cent of all publications and argues that the PAYG financing mechanism that underpins SODRA is rapidly becoming unsustainable due to the demographic crisis produced by three interacting and self-reinforcing trends: rapid ageing, a decline in the birth rate, and high levels of emigration from the country. Therefore, according to this discourse, the solution to the rapidly advancing PAYG benefit crisis is to restructure and strengthen the second pension pillar. The discourse lists a number of demographic trends, such as a worsening old-age dependency ratio, as undermining SODRA's sustainability. For instance, "if [in 2018] there was one pensioner for 3.5 employed, by 2050 […] this ratio will decrease to one pensioner per 1.75 employed" (15 min.lt, 2018; author's translation). Similarly, according to estimates by the Ministry of Social Affairs and Labour, in the next 50 years the pension replacement rate will decline from 44 per cent in 2018 to only 20 per cent of wages (Žilionis, 2018).

Therefore, unless the private second pillar pensions are restructured, the only alternatives to reform would be to "invite 600,000 immigrants into a country with a population of 2.8 million; the pension age should increase from age 65 to age 72; or increase social security contributions by 12 per cent" (Naprys, 2018b; author's translation). These proposed alternatives were highly unpopular, overwhelmingly opposed by the majority of the country's population.

Of course, published research has established that PAYG schemes are no more vulnerable to demographic pressures than are funded pension schemes (Barr, 2002; Orszag and Stiglitz, 1999; Singh, 1996). Lithuania is not different in this regard. As is illustrated in Figure 4, since 1990 the country's working-age population aged 15–64 declined by about 600,000. However, while the pension replacement rate in the last 28 years has remained at about 45 per cent, it was dependent not on the size of working-age population, but on the economic cycle, i.e. the budget deficit accumulated by SODRA during the 2008–09 economic crisis was replaced by a budget surplus during a period of strong economic recovery. Publications by the Ministry of Social Security and Labour (MSSL) forecast a significant future decline in the pension replacement ratio (European Commission, 2017; SADM, 2018). However, the MSSL has given no explanation as to why this did not happen in the last three decades or what might be done to avoid it in the future.

Figure 4. *Pension replacement rate and size of population aged 15–64 in Lithuania (1990–2033)*



Note: The pension replacement rate is calculated as the ratio of the average pension to the average net wage after taxes.
Source: Based on Lazutka (2018a).

Increasing competitiveness/too high taxes discourse

The "competitiveness" discourse accounted for 8 per cent of publications on pension reform. This discourse is rooted in neoliberal orthodoxy, i.e. specifically, the claims of supply-side economics that lower taxes boost economic growth, which thus enables not only to compensate for, but also to increase, revenue lost to the tax cuts. Despite being disproven by decades of economic experience (Krugman, 2009; Bartlett, 2009), these views remain ardently supported by businesses and financial interests in Lithuania, who claim that high social insurance contributions are weakening the competitiveness of Lithuania and are a disincentive to attracting foreign direct investment.

Prime Minister Skvernelis' government embraced this pro-business doctrine by proposing to reduce social security contributions by 2 per cent. The Prime Minister claimed that a decrease in SODRA contributions would help promote economic growth by shrinking the informal economy, stimulating foreign direct investment and thus paying for itself via increasing revenue. As argued by Finance Minister Šapoka, a 2 per cent decrease in SODRA contributions by employers would be "an investment in the future, so that the Lithuanian economy would grow much faster" (Kuodis, 2018; author's translation) and help the country "to become the most competitive in terms of labour taxes in the region" (Plikūnė, 2018; author's translation). Furthermore, cuts in SODRA contributions would enable "one million employees in 3 years to earn an additional EUR 1 billion" (Savickas, 2018; author's translation).

Protecting SODRA via budgetary accounting discourse

The "protecting SODRA" discourse accounted for 7 per cent of publications. In order to appeal to retirees, key items on the Lithuanian Farmers and Greens Union coalition's electoral programme were promises to "protect" SODRA's budget as well as to increase pensions. In keeping with its electoral promises, the newly elected government moved SODRA, and its arrears of EUR 3.7 billion that had accumulated since the 2008–09 economic crisis, into the state budget. In addition, the government declared that it would change the source of subsidies for private RSAs. The transfers from SODRA would be discontinued and replaced by direct budgetary transfers.

Critics asserted that such measures to "protect" SODRA revenue were mostly an accounting gimmick, as public subsidies were re-directed to be withdrawn from a different budgetary line instead of being used to alleviate old-age poverty (Ilkevičiūtė, 2015; Lazutka, 2018a). Nevertheless, protecting SODRA's budget via accounting procedures proved to be a very effective political strategy. The government trumpeted its changes in budgetary accounting as a matter of the restoration of social justice. Discursively it allowed SODRA protection debates to focus on the question "from which budgetary lines funding for SODRA and retirement saving accounts should come?", while excluding the question "whether to provide or not subsidies?" Such discursive framing of SODRA's budgeting combined with a modest increase in pensions implemented by the government was instrumental in undermining criticism and resistance to the pension reform from retirees and the broader public.

Fairness to RSA investors discourse

This "fairness to investors" discourse accounts for 6 per cent of publications and, similar to the increasing competitiveness discourse described above, is based on claims derived from neoliberal orthodoxy. It is underpinned by such clichés as "everyone wants to be a master of his/her fate", or "people planning for retirement have a right to save money in any way they would like" (Slušnys, 2017; author's translation), and therefore interference with private savings accounts represents a violation of constitutional guarantees of private property protection (Sutkus, 2017). This discourse was directed against what its proponents considered to be an overbearing and capricious government intent on acting underhandedly, via the complicated accounting of pension benefits, to appropriate all or part of individuals' private retirement savings. Numerous publications of the Lithuanian Free Market Institute, an influential think tank and a public lobby organization financed by domestic and international corporate donors, were especially representative of this discourse (Vainienė, 2018a; Šilėnas, 2018).

Failure of the SODRA discourse

The "failure of SODRA" discourse accounted for 5 per cent of publications and was used as an argument in favour of strengthening and expanding private retirement savings. The discourse can be considered as an expression of broader public dissatisfaction with the agency. In some surveys only 42 per cent of respondents had a positive view of SODRA (Vainienė, 2018b). The opinion that social security contributions represent a penalty imposed by the government, instead of being an investment for old-age security, was and is widespread. A number of criticisms of SODRA – justifiable or not – go decades back. Specifically, SODRA has been blamed for meagre pensions, old-age poverty, and for increases in the retirement age and in the number of years of contribution required to earn the full pension. The agency has no control over these policies. A major point of criticism was the lack of connection between the contributions paid to SODRA and the benefits received. On the one hand, the so-called “floor” for payments means that workers earning less than the minimum wage were paying contributions assessed for the minimum wage. On the other hand, there was no contribution “ceiling”, the maximum amount for social security contributions (Dubnikovas, 2018).

Discourses against RSAs

There were three additional discourses, which accounted for 13 per cent of all publications. These were discourses on taxation being too low, on the need to increase social solidarity, and to terminate RSAs. Some of these publications expressed the opinions of retirees as well as employees. However, the overwhelming majority of the publications in this category belong to a relatively small, but publicly prominent, group of intellectuals and politicians who were critical of the near-theological hold of neoliberalism as a governing philosophy in Lithuania.

This group of intellectuals and politicians criticized as misplaced the parametric focus of pension debates, i.e. concerned mostly with differences in the reshuffling of budgetary lines and in the percentages of the subsidies to be provided to RSAs. Instead, they argued for reconsideration and reform of the very neoliberal model upon which development of Lithuania had been based since regaining independence in 1991. The three anti-RSAs discourses were representative of their critique.

First, the “taxes are too low” discourse emphasized that pensions in Lithuania are low, in part, because the country has one of the most poorly funded PAYG systems in the EU, accounting for only a half of the then “EU28” average spending on social security: 6.5 per cent of GDP as opposed to 12.3 per cent of GDP (Eurostat, 2019). This is despite the fact that on a number of GDP and other economic indicators, Lithuania is on par with the most advanced countries in Central Eastern Europe, such as Slovenia and Czechia (Lazutka, Juska and Navicke, 2018a). Second, while wages are taxed, no taxes are applied, overall, to income or property. As a result, “taxes on profits and property taxes currently account for only 1 per cent of the state budget” (Dagys, 2018; author’s translation). Finally, and somewhat ironically, the “taxes are too low” discourse pointed out that all international economic organizations of importance to Lithuania – the European Union, the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund – were advising Lithuania to reform its tax system, and to increase social spending (Lazutka, 2018b; IMF, 2017; OECD, 2018a).

Second, the "increasing social solidarity" discourse emphasized that the privatization of the social security system undermines social cohesion and generational solidarity in society, increases insecurity and precariousness, divides people into winners and losers, and contributes to dissatisfaction, reduced well-being, and increased emigration from the country. Therefore, old-age income security was too important to be a measure of how successful one was investing in private retirement accounts.

Finally, the "terminating RSAs" discourse argued for the privatization of the second pension pillar, i.e. its restructuring into a voluntary personal pension scheme with tax benefits for employees who wish to make voluntary contributions to enhance their pension benefits. If implemented, this would transform the second pillar pension into a so-called third pillar, or a voluntary private pension savings scheme with tax benefits. Alternatively, employers and employees could finance second-pillar retirement savings jointly as long-term investment accounts, such as is done for 401(k) plans in the United States (Jakeliūnas, 2017).

Conclusions

This article has shown that the most recent round of pension system restructuring in Lithuania can be explained, at least in part, by the manner in which dominant actors were able via discursive framing to legitimize such a course of action for the reform. More specifically, the overwhelming dominance of discourses favouring redesigning retirement savings, or using Gramscian terms, their hegemony, defined incentivization and rationalization of private retirement savings to be the ultimate goal of the pension reform. This was to be achieved by paternalistically governing the population to influence individual behaviour, so that Lithuanians would become conscious of, and active in, fulfilling responsibilities for the provision of their old-age income security.

Discursively, this libertarian paternalistic project was expressed through morality plays. On the one hand, the general public were admonished for their lack of thrift, with the aim to increase individual responsibility for old-age income security. On the other hand, a multitude of technocratic prescriptions and nudges were designed to guide and provide saving incentives. The latter were accompanied by savings strategies, estimates of private pension fund returns, access to benefit calculation formulas, and other technical information.

However, an overwhelming majority of the participants in private RSAs had little if any financial literacy to make informed investment decisions. The predominance of a discourse for the technocratic redesign of retirement savings as part of pension reform created even more disorientation and confusion among the public.[2] As a result, the debates over policy alternatives presented in the news media, the very essence of national politics, were marginalized. Only 13 per cent of publications advocated for the strengthening of the social security system, rather than weakening it and subsidizing private investment schemes.

Methodologically this study complements as well as contributes to the literature on blame avoidance, obfuscation and other reform strategies (Weaver, 1986; Pierson, 1996), by introducing an approach that allows to quantifiably describe the discursive framing of pension reforms. Furthermore, if extended to similar news media content analysis in other countries, it could enable cross-country comparisons. This would be especially so in describing how differences/similarities in discursive framing (i.e. in who spoke, what they said, and what discourses were predominant and by what degree) affected the outcome of pension reform reversals across the region – whether it was a partial or temporary reduction in contributions, or a permanent reversal of pension privatization (i.e. renationalization), or some combination of these outcomes.

Probably, the biggest shortcoming of the reform in Lithuania was its failure to address the issue of public subsidies to private RSAs. This is an issue that will certainly continue to fester politically, since such subsidies are contributing to the poverty of retirees by reducing SODRA revenue and is a matter of intergenerational justice. Second, changes in the pension system's second pillar failed to enhance old-age income security, as this has been made more dependent on private investment results. This will contribute to increases in old-age inequality, potentially adding to social tensions and conflict. So far, the investment performance results of the private pension funds have been very disappointing, and while, following the reform, reliance on private pension investment will increase, the State does not provide any legally binding guarantees regarding the RSAs' future investment performance. This is despite state subsidies and the government directing people to invest in private pension funds. Furthermore, it remains to be seen to what degree the current global economic crisis due to the COVID-19 pandemic will affect the contributions paid into, as well as the near-term investment performance of, RSA pension funds, regardless of any possible improvements in their management and performance. With retirees already among the most vulnerable population groups in Lithuanian society, the risk of current as well as future retirees facing greater financial insecurity is a major concern.

2. For example, in a question posed to its readers by *15 min.lt* portal "Do you understand how the system of pension accounts works?", only 7 per cent of 4,232 respondents answered in the affirmative, while 79 per cent answered that they did not (15 min.Lt. 2017). This was not a representative survey, but reviews of readers' posts in response to published articles on pension reform confirm overwhelming confusion and frustration experienced while trying to navigate the complex pension system.

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Pension coverage extension as social innovation in Zambia: Informal economy workers' perceptions and needs

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Abstract With the enactment of Statutory Instrument No. 72 (2019), Zambia is extending pension coverage to workers in the informal economy. We present evidence on the experiences and perspectives of domestic workers and bus and taxi drivers regarding pension scheme coverage in Zambia. We use data generated through interviews and focus group discussions. The analysis shows that pension schemes, as conventionally designed for formal economy employees, are not compatible with the values, beliefs and needs of informal economy workers, and pension coverage was not a priority for them. As a form of social innovation, extending access to pension coverage had a lower relative advantage and lacked incentives to attract informal economy workers. We propose a member-centred framework for initiating the extension of social security coverage to informal economy workers.

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Keywords informal economy, pension scheme, social security schemes, social protection, domestic worker, taxi driver, Zambia

Introduction

Globally, social protection policy development is witnessing enhanced effort towards extending contributory social security coverage for informal economy workers (RNSF, 2017). Extending contributory social security coverage to the informal economy is considered a social "innovation". An innovation is defined as an idea, practice, or object that is perceived as new by an individual or another unit of adoption (Rogers, 1983). The social innovation of extending social security coverage to informal economy workers is based on the conception that this category of worker is one of wage workers who are characteristically hired without social protection coverage (Chen, 2016; Giles, Wang and Park, 2013; Phe Goursat and Pellerano, 2016). The objective of such an innovation is to seek to reduce vulnerability among people currently engaged in informal employment and, in turn, alleviate the future risk of old-age poverty.

Informal economy workers do not have access to comprehensive social security systems that include the full range of benefits, from child and family benefits to old-age pensions (ILO, 2017). Furthermore, globally, a large proportion of the elderly depend on social assistance and are heavily reliant on family support arrangements (ILO, 2017). Therefore, many older people remain vulnerable to social and economic risks. This situation justifies the need for a policy response to address their income security needs in old age as well as improve livelihoods. Any policy response to extend pension coverage to informal economy workers requires an understanding of informal workers' perceptions of these schemes, which will inform the design of benefit packages that are relevant and acceptable.

Informal economy workers constitute a large proportion of the global working population (Patankar and Patwardhan, 2016). They can be categorized into two broad groups: i) informal self-employment and ii) informal wage employment, each with sub-categories. Informal self-employment includes employers in informal enterprises, own account workers in informal enterprises, contributing family workers (in informal and formal enterprises), and members of informal producers' cooperatives (Chen, 2016). Informal wage employment includes employees hired without social protection coverage by formal or informal enterprises or as paid domestic workers by households, casual or day labourers, temporary or part-time workers, contract workers, unregistered or undeclared workers, and industrial outworkers (Chen, 2016).

In Zambia, the Central Statistics Office defines informal employment as being characterized by a lack of entitlement to annual paid leave and the absence of social security coverage, and such employment is found in formal and informal economy production units alike (Central Statistical Office Zambia, 2017). The definition includes members of informal producers' cooperatives as well as persons engaged in the own-account production of goods exclusively for final use by their household, such as subsistence farming.

This article examines the perceptions of domestic workers and bus and taxi drivers in Lusaka, Zambia, about pension schemes. This population was chosen because domestic workers and bus and taxi drivers constitute a significant population of informal employees. Zambia is a worthy case for examining the extension of pension scheme coverage because it has i) recently achieved lower-middle income country status; ii) has a dominant informal labour force; and iii) with the enactment of Statutory Instrument No. 72 (2019) (Government of Zambia, 2019), is actively seeking to extend pension scheme coverage beyond the formal economy, as a pioneer among low- and middle-income countries. This article generates evidence that can inform theory and practice on the design of a relevant pension scheme for informal economy workers. To broaden the theoretical generalizability of our study, we use social innovation as a lens to examine this issue.

Pension scheme coverage extension: Rationale, design and institutional framework

Pension coverage in Zambia is part of the broader social protection system that also includes health insurance, social assistance, and livelihood and empowerment programmes (Ministry of Community Development and Social Services, 2014).[1] In Zambia, social assistance programmes and social cash transfer and livelihood and empowerment programmes, for instance the Farmer Input Support Programme, are dominant. Among people in the informal economy, only small-scale farmers have access to the Farmer Input Support Programme, which serves approximately one million farmers. Many informal economy workers are excluded from accessing social cash transfers, including the Public Welfare Assistance Schemes (PWAS) that target poor and incapacitated households (Ministry of Community Development and Social Services, 2014). Eligibility rules exclude informal economy workers from accessing PWAS because they have a capacity to work.

1. Zambia's Social Cash Transfer (SCT) programme is "one of the cash transfers in the subregion with the largest coverage and greatest government ownership" (Arruda and Dubois, 2018, p. 7).

Informal economy workers are normally excluded from mandatory coverage under pension schemes[2] because these schemes conventionally are designed to address the social protection needs of the working population with a formal employment relationship, established through a written contract and providing for regular and predictable income (Phe Goursat and Pellerano, 2016).

There are no references to self-employment in the various pieces of legislation concerning social security or in the Employment Act, and temporary workers were explicitly excluded from the definition of an employee in the Employment Act (Phe Goursat and Pellerano, 2016). Thus, self-employed bus and taxi drivers were systemically excluded, while domestic workers and bus and taxi drivers who have employer-employee relations suffered from a lack of coverage due to institutional factors concerning the definition of an employer and the mandate of social security institutions. For example, domestic workers are usually not covered by the pension scheme, not only because the pension scheme is designed to target employees in the formal economy but also because the legislation does not recognize households as an employer (Phe Goursat and Pellerano, 2016).

In developing a pension scheme for informal workers, the government decided that its design should be different from the scheme for formal workers in terms of the benefit package, eligibility rules and vesting period. The current scheme for formal economy employees has a 15-year vesting period and the retirement benefit can be accessed at age 60 (NAPSA, 2019). The benefits for formal workers include coverage for the contingencies of old age, disability and survivorship. These benefit programmes do not fully correspond with the needs of people in the informal economy. A scheme that addresses these lacunas is necessary to help reduce the risks of poverty and vulnerability among informal economy workers (Ministry of Community Development and Social Services, 2014). With this in mind, the Government enacted the Statutory Instrument No. 72 (2019) (Government of Zambia, 2019) to facilitate the legal requirement for the extension of social security to informal economy workers, such as small-scale farmers, bus and taxi drivers, domestic workers, saw mill workers, and marketeers working under different conditions. To take into account the needs of informal economy workers, the Statutory Instrument No. 72 reduces the vesting period for informal economy workers by five years, to 10 years.

The National Pension Scheme Authority (NAPSA) has the responsibility for the extension of coverage to informal economy workers. NAPSA is a statutory body established in 2000 to provide income security against the risks arising from

2. According to SSA and ISSA (2019), until recently, Zambia's National Pension Scheme Authority (NAPSA) only provided voluntary coverage for certain categories of informal economy workers who previously had mandatory coverage for at least 60 months.

retirement (old age), death and disability (Perkiö, Miti and Malkamäki, 2019).[3] It is thus responsible for member registration and the processing of benefits, as well as addressing grievances when they arise in relation to its core mandate. As part of fulfilling its mandate to extend pension coverage, NAPSA recognizes the importance of working with informal economy workers' associations, such as the Bus and Taxi Drivers Association of Zambia (BTDAZ). To facilitate extending coverage, the role of BTDAZ is to sensitize its members about social security, as well as to offer a platform where NAPSA can engage with bus and taxi drivers. Moreover, there is an expectation that BTDAZ can be engaged to enrol and collect contributions from employers and workers (Phe Goursat and Pellerano, 2016).

Informal economy workers in the social security framework

The informal economy is growing rapidly in most developing countries (Giles, Wang and Park, 2013; Hu and Stewart, 2009; Kannan, 2010; Smit and Mpedi, 2015; Patankar and Patwardhan, 2016). Evidence shows that in Latin America and the Caribbean, the share of informal employment in non-agricultural activities ranges from 39.8 per cent in Uruguay to 75.1 per cent in Bolivia. Non-agriculture informal employment in most African countries exceeds 50 per cent, reaching 76.2 per cent in the United Republic of Tanzania and 81.8 per cent in Mali. Most people in this employment bracket are exposed to social and economic risks because of a lack of access to social protection in the form of formal social security mechanisms (ILO, 2017; Patankar and Patwardhan, 2016).

Extending coverage to informal economy workers has gained momentum in recent years. This is supported by global policies including the International Labour Organization's (ILO) Social Protection Floors Recommendation, 2012 (No. 202), which envisages the progressive extension of social security, the ILO's Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204), (ILO, 2017), and the United Nations Sustainable Development Goals (SDGs), and especially SDG targets 1.3, 3.8 and 8.b. This momentum seems to have been influenced by the failure of growing economies to reduce informal employment, as was earlier hoped (Chen, 2016; Phe Goursat and Pellerano, 2016; Williams and Bezeredi, 2018). Instead of a decline, there has been an increase in people working informally and, therefore, an increase in the proportion of people vulnerable to economic shocks. In low- and middle-income countries, the plight of informal economy workers is made worse by poor

3. The NAPSA provides social insurance benefits and was implemented to replace the Zambia National Provident Fund that had operated since 1966.

working conditions, economic stagnation and the weakening of traditional systems of social security such as those provided by the family, kinship ties, mutual aid and the community (Galera Shaba, 2013; Vincent, 2018). The extension of social security coverage is therefore a key issue for people working in the informal economy (Chen, 2016; Phe Goursat and Pellerano, 2016). Such an innovation holds the potential to reduce social and economic risks and guarantee better livelihoods for people.

Many low- and middle-income countries (LMICs) have embarked on initiatives towards enhancing pension coverage for informal economy workers. Examples of voluntary pension schemes for low-income and informal workers can be found in Kenya, (Kwena and Turner, 2013), Tunisia (World Bank, 2016) and China (Jiang, Qian and Wen, 2018). These programmes are not without challenges. In Tunisia, despite the introduction of voluntary pension schemes, access remained low: "[o]nly 37 per cent of Tunisia's population of 11 million" were contributing to pension payments in 2016 (World Bank, 2016). China's social insurance schemes were decentralized at the same time as new social programmes, including social and health insurances, were introduced. These reforms resulted in variations in the levels of protection, degree of fund pooling, and management quality between social insurance schemes, and across provinces (Giles, Wang and Park, 2013).

Inadequate legal coverage has also been observed in other contexts (Kongtip et al., 2015). For example, in Turkey, the legal framework favours a male gender bias in coverage (Elveren, 2013). In addition to specific challenges, other, more general, challenges obstruct the extension of coverage in developing countries. These include a lack of incentives to join alongside high contribution rates, low levels of knowledge about social programmes, poor compliance levels, and inadequate mechanisms for the enforcement of contribution payments (Hu and Stewart, 2009; Naagarajan, 2010; Phe Goursat and Pellerano, 2016; Sane and Thomas, 2015). Taken together, the studies suggest that while there are endeavours to extend social security coverage, there is insufficient focus on tailoring pension schemes to make these attractive to informal economy workers.

Theoretical framework

This article is nested in the theory of the diffusion of innovation (Rogers, 1983). The theory helps to understand the adoption or non-adoption of an intervention, here referred to as an innovation. Rogers propagates five attributes of an innovation, which together could influence people in adopting the innovation, namely: relative advantage, compatibility, complexity, trialability, and observability. According to Rogers (1983):

- **Relative advantage** is the degree to which an innovation is perceived as being better than the idea it supersedes.
- **Compatibility** is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters.
- **Complexity** refers to the degree to which an innovation is perceived as relatively difficult to understand and use.
- **Trialability** is the degree to which an innovation may be experimented with on a limited basis.
- **Observability** is the degree to which the results of an innovation are visible to others.

In addition to these five attributes, this article incorporates “knowledge” of the decision-making process propagated by the theory. Knowledge is considered as exposure of the decision-making unit to the innovation’s existence and an understanding of how the innovation functions (Rogers, 1983). Dearing (2009) conceptualizes the diffusion theory of social innovation in a way that corresponds with the critical attributes in the process of Zambia’s social security coverage extension initiative that is the focus of this study. Dearing focuses on seven concepts “intervention attributes, intervention clusters, demonstration projects, societal sectors, reinforcing contextual conditions, opinion leadership, and intervention adaptation”. These concepts will be utilized in discussing the results of the study.

Research on social innovation in interventions, such as in healthcare and water and sanitation, has provided evidence that knowledge and perceived advantages determine the adoption of the intervention (Banerjee and Duflo, 2013; Rogers, 1983). Similar evidence is present in social security interventions, such as for health insurance and pension schemes, where people do not readily come forth to enrol (Ahmed et al., 2016; World Bank, 2016).

The theory helps in understanding that a social innovation, such as the extension of social security coverage, should present a relative advantage; be compatible with the social norms, values and aspirations of people; be less complex; and be tested and observable in the short term. These attributes are relevant because contributing to a pension programme is a long-term commitment, and to ensure that people are be willing to do so, particularly in a low-income context where immediate consumption needs are typically the priority, is a substantial challenge for policy-makers. Therefore, this study responds to an urgent need among pension scheme institutions and policy stakeholders to understand the perceptions about pension schemes held by informal economy workers, who are, as a target population for social innovation, potential contributors as well as benefit recipients. The theory of the diffusion of innovation leads to an understanding of the socioeconomic and cultural milieu in which decisions are made, and can influence the adoption of pension scheme coverage extension as an innovation.

Therefore, the theory also helps to build the member-centred framework proposed in this study through its focus on the relative advantages, compatibility and observability of the results of an innovation (Rogers, 1983). These attributes resonate with the call made in this article for the provision also of short-term benefits with pension schemes as well as the need to make the scheme responsive to the social norms and values of its members.

Critiques of the theory of the diffusion of innovation argue that the decision not to adopt an innovation is cast as a matter of "individual blame", and fails to adopt a more nuanced understanding of the influence of social structures (Botha and Atkins, 2005). This criticism arises from an awareness that the diffusion of innovation approach classifies later adopters of an innovation as "laggards" (Rogers, 1983). The term laggard is a value-laden classification that exhibits a pro-innovation bias (Kelly, 2012), which assumes that the adoption of an innovation is desirable and a priority. In the context of Zambia's policy landscape, this study understands the absence of pension scheme affiliation by workers as a function of the individual, the society, and the organization of services. The theory, as used here, enhances our understanding of individual experiences, aspirations and perspectives in the light of the broader social and economic structures in which informal economy workers live.

Methods

Study design and setting

This is an exploratory qualitative study based on interviews and focus group discussions (FGDs) (Creswell, 2014). The qualitative design is well suited to research on a previously unknown phenomenon (Alasuutari, 1995). It is preferred in this study because it offers an opportunity for participants to express themselves and use their own words in discussing the pension schemes in Zambia. The design also gave researchers flexibility to explore in more depth the topic with participants. Using this design made it possible to gain a fuller understanding of the issues surrounding informal economy workers' pension schemes. With the expanded conceptual understanding from this approach, and using other qualitative studies on social protection for the informal economy in Zambia, this permits a well-informed basis upon which to conduct surveys and verify key aspects on the issue up to scale.

The study was conducted in Lusaka, the capital city of Zambia with 3.5 million inhabitants. Domestic workers and bus and taxi drivers constitute a significant population of employees. Reports show that there were 192,921 domestic workers in Zambia in 2017, of whom 97 per cent were employed in the informal economy

(Central Statistical Office Zambia, 2017), and 67 per cent were employed in urban areas. Drivers and the storage sector have 112,100 employed persons, out of which approximately 70 per cent are informally employed (Central Statistical Office Zambia, 2017). The transport sector in Lusaka grew rapidly due to the liberalization policy of the 1990s. Consequently, bus and taxi drivers are an integral part of everyday life in Lusaka. As is similarly the case for domestic workers and other employees in the informal economy, social security programmes inadequately cover these workers.

Participants

The study had 28 participants (10 domestic workers; 16 drivers; 1 NAPSA representative and 1 BTDAZ representative). Table 1 presents the participants' characteristics.

We selected study participants using non-probability sampling techniques, specifically purposive and snowball sampling techniques (Gentles et al., 2015; Tongco, 2007). We used purposive sampling because we wished to recruit information-rich cases for the study (Suri, 2008; Tongco, 2007). The snowball technique was used to recruit participants who were hard to reach, as the researcher relied on social networks of purposively identified cases to reach others in their category of employment (Knapik, 2017). We were interested in recruiting participants who had worked as a domestic worker or bus or taxi driver in the six months preceding the study. Members and non-members of the pension scheme were eligible for participation.

Table 1. *Demographic distribution of participants*

Data collection method	Participant category	Age range	Gender		Highest level of education				
			Male	Female	None	Primary	Secondary	College (enrolled)	Graduate
Interviews	Domestic workers	22–54	3	7	1	4	3	2	0
	Drivers	26–50	8	0	0	3	5	0	0
	NAPSA official	Undisclosed	1	0	0	0	0	0	1
	BTDAZ official	Undisclosed	1	0	0	0	0	Undisclosed	0
Focus group discussions	FGD 1	26–48	3	0	0	1	2	0	0
	FGD 2	28–45	5	0	0	2	3	0	
	Total		21	7	1	10	13	2	1

Source: Authors.

Following contact made with NAPSA, which maintains a register of enrolled members, domestic worker participants were identified and approached. NAPSA provided the contact details for prospective participants. This did not influence the research because it was found that not all members who actually participated in the study were contributing to the pension scheme, despite some of them being registered with NAPSA.

Prospective participants were contacted to arrange initial meetings. Of these, four accepted to participate in the study, while others could not participate because they were either unreachable or “out of town”, expressed lack of interest, had a busy schedule or permission was denied by their employers. Using the snowballing technique, the four participants identified other domestic workers for potential participation, of whom six agreed to participate. The final number of domestic workers was ten, of which four were registered with NAPSA.

Bus and taxi drivers were contacted through the Bus and Taxi Drivers Association (BTDAZ). However, members who already contributed to the pension scheme did not participate; it was reported that employers did not permit their involvement in the study. None of the drivers who participated in the study was at the time registered with NAPSA. Nine drivers contacted through BTDAZ declined to participate due to busy schedules and lack of interest, while four agreed. To seek their perspectives, bus and taxi drivers were approached through personal invitations presented at bus stations. However many were busy and meeting after working hours was often not possible. Therefore, only 12 of those approached at bus stations accepted to participate through interviews and FGDs. In addition, we selected key informants based on their role in extending social security coverage. We interviewed two drivers, with representation from NAPSA and BTDAZ.

The purpose of the study as well as matters to do with participants’ voluntary participation and freedom of expression were explained. There was neither conflict of interest nor the potential for harm to the researcher or the participants. Participants gave verbal consent for their engagement in the study. The interviews did not touch upon issues of personal health or other sensitive personal issues.

Data collection

Semi-structured interviews and FGDs were used to collect data (Creswell, 2014): individual and key informant interviews were used to explore individual perspectives about pension coverage extension, while FGDs were used to explore group norms (Bojlén and Lunde, 1995; Knapik, 2017). The interviews allowed participants to speak in their own voice and express their own thoughts and feelings (Alshenqeeti, 2014), while the FGDs helped to understand and obtain group norms and elicit views and opinions on the subject (Bojlén and Lunde, 1995; Creswell, 2014). This approach allowed for triangulation, where representative FGD statements were matched with associated interview data, thereby enriching the overall findings. FGDs were conducted with bus or taxi drivers only. Arranging a common time to meet with domestic workers proved to be a practical challenge. Thus, domestic workers were consulted only through individual interviews.

All interviews and FGDs were conducted in Lusaka, using the ChiNyanja language. The interviews and FGDs followed a semi-structured interview schedule that was used to understand the participants' experiences of and perspectives on pension schemes. The interviews with those representing NAPSA and BTDAZ focused on institutional perspectives, while the interviews with employees focused on their perception of the scheme. Interviews and FGDs were conducted at workplaces, homes and public places such as local church premises. Proceedings were recorded, transcribed and translated, where necessary, for analysis. The study stopped collecting data upon reaching saturation (Creswell, 2014).

Analysis

Data were translated, transcribed, and analysed inductively using the thematic analysis approach (Willig and Rogers, 2018). Transcripts were read and re-read and coded, following which categories and themes were established. These categories and themes formed the basis for the article. The analysis was strengthened through an interdisciplinary team (including members from the fields of social work, social policy and psychology/health sciences), offering different experiences on social security and the Zambian context. In the results section, we code using numbers and letters (F=female participants; M=male participants). "Member" refers to participants registered in the pension scheme and "Not a member" refers to participants who are not registered in the pension scheme. "KI" refers to key informant. Given participants' tight schedules, findings were not discussed with them despite the research plan having envisaged a validation meeting. However, some preliminary results were discussed with officials from NAPSA.

Results: Enablers and barriers

This study of the experiences and perspectives of informal economy workers in Zambia as regards the extension of pension coverage – a social innovation –

establishes evidence upon which further studies can be conducted. The results consist of three enabling conditions and five barriers for either registration with, or paying contributions to, the pension scheme.

Knowledge about pension schemes is socially transferred

All informal economy participants were aware of pension schemes in Zambia. However, participants differed in their level of awareness about pension schemes. In one case, the participant said:

> "What I know is that those who work in offices are the ones who get money when they stop working" (M13, Not a member).

Other responses to this question revealed a similar theme, as in the citation below:

> "Yes, I know that pension is money you get after retirement. I came to know through asking because one day my boss just said I should bring my National Registration Card to register for pension. So, I went and asked at home" (F1, Member).

Most participants attributed having access to pension coverage only for those in formal employment, or for people who retire from formal employment. They also thought pensions were mainly for government employees. Some participants were neither aware of their right to a pension nor the legal requirement concerning contributions. Most participants depended on social networks as their source of information about pensions.

Guaranteed income after retirement fosters willingness to enrol in the scheme

Awareness that enrolling in the scheme guaranteed income after retirement was a factor that made most participants indicate a willingness to register for the pension scheme. Generally, participants were of the view that the economic situation in the country was challenging and their salaries were "hand-to-mouth", which would make them vulnerable once they retire. Therefore, a guaranteed income, such as a pension, would be of help to them and their families.

A domestic worker said:

> "Contributing to pension is good because NAPSA is saving our money for the future. When we retire and we have no strength we can depend on that money" (F5, Member).

This view was corroborated by the bus and taxi drivers. Interviews with the BTDAZ informant revealed a similar outlook, one that stemmed from the risk of road traffic accidents, which rendered some drivers unable to work. This is also a reason for the Association's stated collaboration with NAPSA:

> "We also realized as an industry that most of the time that we buried one of our members; it was evident that we buried the entire family because there was no one to take responsibility of the role of the breadwinner after the death of such a member. The employer backed their investments and looked for people to work with. We realized also that we were denied one of the fundamental rights under which we as a sector should have been accorded" (KI2).

The fear of destitution and concern for family was also echoed by one domestic worker who said:

> "That money they get can assist my child or me in future just in case of death because these days it is difficulty for people to take care of your child after your death" (F7, Not a member).

Although there were similar views of appreciation for the roles of the pension scheme, there was also consensus that the scheme would need to be compatible with informal economy workers' aspirations. Such aspirations included access to credit in order to invest in and expand business ventures and to meet basic expenditure needs, as well as to meet emergency expenditures such as for healthcare.

Engagement with informal economy associations can foster registration

The extension of pension coverage is an innovation in Zambia. To this end, there are efforts to test the acceptability of the NAPSA scheme through building partnerships with informal economy workers' associations. This came to light in the interviews:

> "NAPSA is desirous to market the social security … we as a sector are desirous to be covered for any eventuality that social security is tailored for" (KI2).

This mutual interest creates greater opportunities for NAPSA to collaborate with stakeholders. However, the key informant felt that NAPSA was slow in its approach to reach out to stakeholders.

Collaboration with informal economy associations was relevant because NAPSA acknowledged the challenges it faced in engaging with informal economy workers.

Some of these challenges arose because the efforts to extend pension coverage were still in their infancy. NAPSA only augmented these efforts in 2017. The NAPSA official said:

> "… establishment of the project was the desire of NAPSA to ensure that we cover the uncovered" (KI1).

In spite of this, the unit remained understaffed to the extent that they were not dealing adequately with the diversity of informal economy and varied demands.

Lack of income and competing priorities reduce willingness to contribute

All participants had inadequate income to enable them to meet current needs, make savings, and contribute to the pension scheme in its existing form. Among domestic workers, the monthly salary ranged from 550 Zambian kwacha (ZMK) (or 42 US dollars (USD)) to ZMK 1,000 (USD 77), and among drivers ranged from ZMK 500 (USD 38) to ZMK 1,500 (USD 115). FGDs and interviews with drivers yielded concerns about low salaries, which suggested income was a constraint to registration with a pension scheme. The priority for drivers and domestic workers was expenditure on subsistence needs, such as food and groceries, rental payments, water, clothing, electricity and other forms of fuel. Alluding to this, a participant said:

> "When I get paid or when my husband has the money, he brings it home and gives it to me because I am the one who knows what to do. The priority is to buy food and pay rent and other things when necessary" (F2, Not a member).

Drivers, who were usually men, also shared this focus in the two FGDs. Their priority was ensuring that their families had food. They also prioritized meeting the cost of rent for housing and paying school fees. The rationale for investing in children's education was two-fold. First, to help the child to find a decent job in the future and become financially secure. Second, there was an aspiration that children would support their parents in old age.

Employment arrangements reduce willingness to contribute

The nature of employment arrangements was a matter of concern, as most participants felt that they had no job security. They did not consider their employment to be permanent, which affected their views about their entitlement to be covered by the pension scheme. In the FGDs, participants considered their work to be “piecework”, which could be terminated at any time. An extract from FGD illustrates:

> “Work is not permanent, and it is different with those in companies who are entitled to NAPSA. You can be surprised that tomorrow you go to get the bus; the owner just says I want to take the car for servicing. However, it is just a way to say I have fired you” (FGD M2, Not a member).

Termination from employment was common among drivers who never met the “cash in” target, or who missed work. Job security was similarly not guaranteed for domestic workers. They worked in an environment that is largely private and were vulnerable to abuse. For example, one female participant described her employer as being “good”, but sometimes would talk in a manner purposely to offend her feelings.

There were also indications that the participants felt their employment insecurity combined with a lack of access to social security coverage was aggravated by the lack of strong trade unions, which could advocate for and ensure better employment arrangements.

Complex registration process reduces willingness to register

Participants who were registered and those who attempted to register highlighted the complex registration process as a difficulty. Of the ten interviewed domestic workers, four were enrolled in the pension scheme. In contrast, none of the drivers in the study were enrolled. The process of registration, particularly the online system involving different fields to be completed, was explained to be problematic. Generally, the inefficient internet platform was detrimental to a smooth registration process. A participant indicated that:

> “I can say that registration was a trouble; the online system was not good at all and I think it is still difficult because government things to be effective take time” (M4, Member).

Similar problems were identified at the institutional level:

> “There are complaints such as cumbersomeness of paying if you have no access to Internet, or expecting the trader to leave their desk. Cumbersome nature of process and online system requires you to submit a return and other things and

> these are too heavy for domestic workers and marketeers, even employers. Coming to the office to pay is tricky and can be hectic, as they have to be in queues" (KI1).

Some interviewees also mentioned that the distance to the registration offices may be a hindrance to registration. The process thus imposes hidden costs, such as for transportation. They preferred the introduction of different registration and pay points, such as booths[4] and mobile money solutions.

Other challenges included poor customer relations, with customer care agents being described as impolite, impatient and unclear.

Lack of short-term benefits hinder the willingness for registration and contribution payment

Domestic workers and drivers were concerned with the lack of short-term benefits in the pension scheme. They viewed the scheme as lacking incentives, as well as it being tailored only for those in formal employment. The following summarizes the major concerns and aspirations expressed by the first FGD:

> "I would like them to give loans so that members with economic pressure can obtain something before they retire. Another issue is benefit to the children before the parent retires. NAPSA at times should pay for school fees as privileges for members so that children can benefit" (FGD 1 M, Not a member).

This suggests that participants would prefer a benefit scheme that responds to some of their immediate needs, while retaining the long-term pension scheme objectives.

Lack of trust in social insurance institutions hinder registration

Domestic workers and drivers expressed misgivings towards state-managed pension schemes because of their historically poor reputation as well as observed delays in the payment of retirement benefits. Alluding to this, a participant said:

> "These days, people just die without getting their money. I think you cannot trust government now. People just contribute without knowing if they will ever get

4. A small-box structured commercial space, commonly used by agents for mobile network operators who are also involved in mobile money transfers, found in most markets and streets of Lusaka.

their money. I know somebody who retired about four years ago, but they have not yet received their money" (M13, Not a member).

Some participants also perceived pension schemes as a form of taxation. Others expressed views that pension scheme funds are used to make investments that have no direct benefit for contributors:

"Why is there no interest? If I put money in the bank, there is a type of interest, but nothing in NAPSA, even when they are using that money in other investments. We know they have shopping malls, but retirees are not paid" (FGD M2, Not a member).

This lack of trust is also a product of a lack of communication, with members registered with NAPSA stating that they received no periodic information about their contributions.

Discussion and policy recommendations

The perspectives and experiences of domestic workers and bus and taxi drivers, as well as those of key informants, defined the scope of this study. The data used in this study are considered trustworthy with regard to the important issues of transferability, credibility, confirmability and dependability (Given, 2008).

A limitation was the small size of the sample of domestic workers and drivers, which was constrained by a lack of cooperation and by demands made by domestic worker associations, as well as by employer resistance. Despite these challenges, the sample includes several drivers and domestic workers, among whom a small number contribute to the pension scheme. The perceptions of multiple respondents with different backgrounds allow for a diversity of voices on the subject matter, making the research process rigorous.

In analysing the experiences and perceptions of domestic workers and drivers regarding pension coverage in Zambia, the results show that informal economy workers had low levels of awareness about their social security rights. At the same time, there are indications of their willingness to enrol in the scheme. However, joining and contributing to the pension scheme was not a primary priority. These workers prioritized immediate household consumption needs and their children's education.

The findings show that most participants were not aware of their social security entitlements. Awareness about an innovation is important, as this permits people to decide whether to adopt the innovation, or not (Rogers, 1983). Other studies have also established similar findings on the importance of awareness of an innovation as a step towards decision-making (Hu and Stewart, 2009; Naagarajan, 2010; Phe Goursat and Pellerano, 2016). In India, for instance, 80 per cent of informal economy workers were not aware of pension schemes (Hu and Stewart, 2009). Such lack of awareness hinders demand for social security registration (ILO, 2016; Phe Goursat and Pellerano, 2016). Given this situation, enhanced awareness among informal economy workers concerning the role of pension schemes, and about social risk more generally, is important to create a possibility for claiming a pension scheme as a right. It is necessary to inform potential beneficiaries of an innovation, indicating how proposed changes will promote their interests (Rogers, 1983). As this study has identified with regard to pension coverage extension in Zambia, such change should involve the inclusion of short-term benefits.

The findings further show that the relative advantage of social security was its perceived ability to guarantee income after retirement. This view fostered greater willingness among informal economy workers to enrol for pension schemes. This may not always be the case, however. In Moldova, for instance, the relative advantage for farmers to be gained from contributing to the pension scheme was perceived to be low by farmers due to a huge discrepancy between the desired pension amount and the actual pension (ILO, 2016). The case of Moldova shows that farmers had misgivings about the relative advantages of the pension scheme because it did not meet some of their perceived important needs. The Moldovan example acts to underline the more general need to design a scheme that can meet the aspirations of informal economy workers. The lesson for Zambia is that a pension scheme for informal economy workers should have long-term benefits that allow members to have access to greater income security upon reaching retirement as well as offering them incentives in the form of short-term benefits that enable them to meet immediate needs. This is important because greater satisfaction and perceived relative advantage would lead to more rapid rates of adoption (Rogers, 1983). At the level of compatibility, however, the results of this study show that pension scheme enrolment was not a priority for domestic workers and drivers. There was a perception that pension contributions would divert money away from more important life priorities, such as meeting day-to-day needs for food, housing and education, as well as from other forms of saving and business enhancement in the immediate term. This perception is one that is widely shared by informal economy workers (Hu and Stewart, 2009; Phe Goursat and Pellerano, 2016). In our study, children’s education was understood as important for household livelihoods and traditional “social security”. In African tradition and culture, children have a moral obligation to provide income security to their parents (Ruparanganda, Ruparanganda and Mupfanochiya, 2017). Therefore, any proposed social innovation should be compatible with the values and beliefs of the target population (Rogers, 1983). For informal economy workers, children’s education presents such a value. This suggests that pension schemes can be made more attractive if they incentivize participation through, for example, supporting the education of children of affiliated members, as identified in this study.

Conditions of widespread informal employment, inadequate earnings and a lack of strong trade unions characterize the working lives of domestic workers and bus and taxi drivers. In Zambia, pension schemes in their current form are not compatible with the lived realities of domestic workers and bus and taxi drivers. Low income inhibits pension scheme enrolment because of various more pressing demands at the domestic level. This is confirmed in other studies, such as from the Philippines where low income negatively affects the uptake of contributory social security (Conchada and Tiongco, 2015). In Zambia, monthly income for domestic workers and drivers ranged from ZMK 500 (USD 50) to ZMK 1,500 (USD 150), which is lower than average monthly household consumption expenditure of ZMK 1,588 (Central Statistical Office Zambia, 2015). The situation is made worse by high household dependency ratios, as most families rely on one person to provide for the family's basic needs. With the average household size of 4.7 in Lusaka (Central Statistical Office Zambia, 2017), informal economy workers and their families remain vulnerable.

The interview data indicated that registration with the pension scheme was complex. This complexity is the result of low knowledge levels on how to use the online system. At the same time, difficulties in having reliable Internet access and having to wait in long queues at registration centres discouraged participation. For many, all such delays in completing the process were considered a loss of productive working time and an opportunity cost. This finding is consistent with other studies that demonstrate that registering informal economy workers to pension schemes is a challenge, partly due to logistical and administrative difficulties (Hu and Stewart, 2009; Maes, 2003). The personal experience of having been confronted with such challenges can result in a person not promoting the innovation in their social groups. As an innovation, the pension scheme process should be easy to understand and use (Rogers, 1983), and it should create a positive user experience. For Dearing (2009), positive opinions are crucial for the successful diffusion of the social innovation.

Only four participants in the study were enrolled in the scheme. This justifies the need to foster the adoption of the social innovation using a trial or pilot that would produce information as regards the social reality in which potential members live (Perkiö, Miti and Malkamäki, 2019). Dearing (2009) refers to this as "demonstration", meaning putting the intervention project into real-world conditions. Such an activity would require enhanced institutional capacity for effective implementation given that, in Zambia, the staffing available for extending pension coverage was low.

Registering more informal economy workers to affiliate to the pension scheme would be important for increasing the observability of the innovation. Observability is an essential element, especially for innovations that target new categories of beneficiaries. For pension schemes, it is logical that informal economy workers should prioritize short-term benefits and prefer to see evidence of an immediate benefit from the innovation rather than having to wait for some uncertain future eventuality. Observing the benefits accessed by new and current members can help transfer the innovation to others (Rogers, 1983).

A finding was that weak institutional reputation and poor communication negatively affect people's perceptions of pension schemes. In Zambia, this is indicative of a lack of trust in government institutions. While in Zambia the reputation of pension schemes may be positive as well as negative, the latter viewpoint dominates due to delays in the payment of retirement benefits. Such delays are perceived to stem from inefficiency, ineffectiveness and, indeed, the perceived corruption found in such institutions. NAPSA continues to pay benefits on behalf of the, now defunct, Zambia National Provident Fund – ZNPF (NAPSA, 2019).[5] At the time of this study, some affiliates who had previously been members of the ZNPF were yet to receive their benefits. The problem of lack of trust in the state-run social security system is not specific to Zambia (Kotoh, Aryeetey and Van der Geest, 2017; Pellissery and Walker, 2007). Mistrust disincentivizes participation and is a cause for delinquency in the payment of contributions (ILO, 2016). To help engender the effective extension of social security coverage, there is a need, both, to build trust and strengthen system capacity.

The relative advantage, as indicated by a willingness to join the scheme, shows that there is interest among informal economy workers to use the social security system to assure their future income security. However, the pension scheme's design still presents challenges, given that it is not compatible with the voiced aspirations of informal economy workers, such as meeting their needs for an accessible and affordable pension (relative advantage and complexity), as well as meeting their immediate household consumption needs and the education of children (compatibility). At the same time, benefits were not immediately observable due to delayed payments and long vesting periods. Required is enhanced communication to improve knowledge of the benefit system. These factors should be addressed when promoting pension coverage extension to informal workers. The challenges that hinder extending coverage to informal economy workers can be resolved by developing a member-centred pension

5. According to the NAPSA website, the National Pension Scheme Authority (NAPSA) is a custodian of all the assets and liabilities of the Zambia National Provident Fund (ZNPF), which was closed to new members in 2000 with the creation of NAPSA.

scheme, that is consistent with social innovation theory and which responds to the needs of members. Concerning a responsive product design, Dearing (2009) discusses the notion of an intervention cluster – a group of interventions tailored together – as a decisive factor for the diffusion of a social innovation. Our results indicate a need for such a tailored benefit package, which is holistic in responding to the needs of members while ensuring a well-functioning pension system.

Theoretically, this article advances an understanding of the needs and aspirations of informal economy workers with regard to pension schemes that are designed for these workers. By supporting the need for a member-centred pension scheme, the article calls for an integrated theory to better understand the perceived needs of informal economy workers and their aspirations for social security protection.

As a policy recommendation, this article proposes a member-centred framework for extending pension coverage to informal economy workers. The process of involving members (informal economy workers) begins with identifying their associations or representative groups, through which they share their vision and aspirations for realizing personal well-being. Pension scheme design should be responsive to the needs and aspirations of the informal economy workers in different sectors of the economy. This framework comprises two major pillars of action; namely, i) system strengthening and ii) product development and redesign. The two pillars require specific enhancement interventions on the part of the social security institution in order to respond to the needs and aspirations of informal economy workers. The framework

Table 2. *Framework for member-centred pension scheme*

Intervention pillar	Strategic Intervention	Needs-to-address
System strengthening	NAPSA should enhance: • Human resource capacity • Communication • Registration mechanisms • Grievance mechanisms • Monitoring system	• Registration process • Compliance and complaints • Trust • Potential retention challenges
	• Partnerships/ Collaborations	• Job security • Conditions and employment relations • Awareness raising • Labour movements
Product development and redesign	• Legal framework	• Sustainable payment-benefit ratio • Short-term benefits • Other incentives
		• Vesting period
		• Inclusion basis: Voluntary or mandatory scheme

Source: Authors.

embraces the need to reflect on the potential challenges for retaining active contributors and the need to decide on whether pension schemes should be voluntary or mandatory for this sector of employees. Table 2 describes the framework.

Conclusion

The study has shown that most informal economy workers were not aware of their rights to be covered by the NAPSA pension scheme. As discussed, there are both enablers and barriers in extending a pension scheme to domestic workers and bus and taxi drivers. The results demonstrate that though there were levels of willingness to contribute to the scheme among some study participants, the pension scheme was not their priority. In order to attract and meet the needs of domestic workers and bus and taxi drivers, the evidence generated suggests that a pension scheme for informal economy workers should demonstrate the relative advantage, compatibility, and observability of long-term benefits for these workers, along with the possible provision of tailored short-term benefits. This article proposes a member-centred approach to enhance the design of the pension scheme to meet the expressed needs of informal workers.

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The impact of the Lesotho Child Grant Programme in the lives of children and adults with disabilities: Disaggregated analysis of a community randomized controlled trial

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Abstract Globally, people with disabilities are disproportionally affected by poverty. Social protection policies, including cash transfers, are key strategies to address poverty "in all its forms", but it is currently unclear how such programmes affect people with disabilities. This study examines differences in the impact of the Lesotho Child Grant Programme (CGP) on food security, health, education and livelihoods between people with and without disabilities using data from a community randomized control trial. Overall, this study finds the CGP had significant and differential impacts for people with disabilities across multiple health indicators (e.g. increased health expenditures, self-rated health, likelihood of seeking healthcare). The CGP also had an impact on food security, decreasing the number of months households with and without members with disabilities faced

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extreme food shortages. There was also a modest but significant and differential impact of the CGP on the engagement of people with disabilities in paid work. The CGP only had an impact on school enrolment for children without disabilities, however the difference in impact was non-significant and likely due to underpowered sample sizes. Overall, people with disabilities receiving the CGP still experienced high levels of absolute deprivation, and were generally still worse off compared to people without disabilities, indicating a need for adapted or complementary social protection and other poverty alleviation programmes.

Keywords children, social protection, disability benefit, poverty, social development, Lesotho

Introduction

Globally, approximately 15 per cent of the world's population has a disability (WHO and World Bank, 2011). On average, people with disabilities and their households are poorer than those without disabilities (WHO and World Bank, 2011; Banks, Kuper and Polack, 2017), and this association is likely to be bi-directional. On the one hand, people with disabilities are vulnerable to becoming poor, as they are less likely to be employed, earn less on average when they do work, and often incur costs related to their disability (e.g. accessible transport, healthcare) (Mitra, 2017; Mitra et al., 2017). Further, other household members may reduce their engagement in work, school and other productive activities in order to provide caregiving support (Palmer et al., 2015). On the other hand, people who are poor are more likely to become disabled as they live in risky and unstable environments, and have worse access to healthcare.

Many studies have highlighted the increased risk of poverty and exclusion amongst people with disabilities and their households. For example, 80 per cent of 150 studies in a systematic review found people with disabilities and their households were more likely to be poor across monetary measures of poverty (e.g. income, expenditures, assets) compared to their counterparts without disabilities in low- and middle-income countries (LMICs) (Banks, Kuper and Polack, 2017). Additionally, in an analysis across 22 countries, households with members who are people with disabilities were more likely to be multidimensionally poor (face deprivations in household living standards and in the education and health of household members) compared to households without members with disabilities in all settings (UN, 2018). Still, monetary and multidimensional poverty measurements tend to be measured at the household level, which may mask intra-household differences. This is a particular concern for people with disabilities, who may experience a lower prioritization in the division of household resources or face additional challenges to improving their well-being (e.g. non-inclusive environments) (Banks, 2020). On indicators of individual-level participation and well-being, studies have shown that people with a disability have poorer outcomes in areas such as school attendance (Mizunoya, Mitra and Yamasaki, 2018; Mitra, 2017), work and livelihoods (Mitra, 2017; Mizunoya and Mitra, 2013; Mactaggart et al., 2018a) and health and healthcare spending (Mitra, 2017; Mitra et al., 2017; UN, 2018).

Evidence is lacking on the effectiveness of strategies to reduce poverty and improve participation amongst people with disabilities and their households (Saran, White and Kuper, 2020). Social protection is a key strategy to address poverty and vulnerability, and is highlighted across several Sustainable Development Goals (SDG), particularly in Goal 1 targets.[1] Social protection is defined as "the set of policies and program[me]s aimed at preventing or protecting all people against poverty, vulnerability and social exclusion throughout their lifecycle, with a particular emphasis towards vulnerable groups" (SPIAC-B, 2020). Broadly, social protection instruments include: i) social insurance to mitigate risk (e.g. health insurance), ii) social assistance, such as transfers (in cash or kind) to vulnerable groups, including people with disabilities, and iii) labour market interventions, which aim to promote employment and protect workers (e.g. minimum wage) (ILO, 2017). Cash transfer programmes in particular have high potential to address the increased vulnerability to poverty among people with disabilities, as they are increasingly being scaled-up globally (ILO, 2017). Furthermore, people with disabilities are often either explicitly targeted (e.g. disability allowance), or implicitly targeted, given eligibility criteria that often encompasses large numbers of people with disabilities (e.g. labour constrained or households living in poverty).

Literature examining the impacts of cash transfers have generally found positive impacts on indicators of poverty and well-being for the general population, such as improved school attendance, greater uptake of health services and improved nutrition (Taaffe, Longosz and Wilson, 2017; Bastagli et al., 2019). However, there is a lack of evidence on the impact of cash transfers specifically, or social protection more broadly, for people with disabilities (Banks et al., 2016),

1. Target 1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.

particularly from sub-Saharan Africa.[2] Impacts of cash transfers – particularly individual-level indicators of participation and well-being – may differ for people with disabilities. On the one hand, people with disabilities and their households may experience a greater impact from receiving a cash transfer compared to people without disabilities as they are worse off to start with. On the other hand, recipients with disabilities and their households may experience more modest impacts compared to people without disabilities due to several factors. For example, recipients with disabilities require cash transfers to cover not just a lack of income due to poverty, but also pay for disability-related expenses (e.g. for healthcare, personal assistance) (Mitra et al., 2017). However, cash transfer programmes rarely account for these additional costs by either providing higher cash values or through complementary programmes (e.g. free assistive device provision, health insurance) (Banks et al., 2021; UN, 2018). Additionally, people with disabilities often face other non-financial barriers to participation and improving standards of living, such as the availability and quality of needed goods and services, attitudes towards disability and inaccessible environments (WHO and World Bank, 2011; UN, 2018). As such, people with disabilities may experience fewer gains particularly in individual-level indicators of poverty and well-being from receiving a cash transfer, unless programmes or complementary interventions address both extra costs and the non-financial barriers people with disabilities face to improving their standard of living and well-being (Banks et al., 2021).

Several cash transfer programmes in sub-Saharan Africa were introduced in the decade after 1999 in response to the HIV/AIDS pandemic and the subsequent increasing number of orphans and vulnerable children (OVC). These programmes generally targeted caregivers to enable them to support OVC, in recognition of the growing needs among vulnerable households, but also in the belief that cash transfers would encourage the fostering of OVCs in extended families, a situation preferable to institutionalized care. By definition, OVCs are either orphaned (single or double) or are living in households with a chronically ill adult. Thus, households with OVCs frequently include adults with disabilities. In this way, while not specifically targeting people with disabilities, programmes targeting OVCs include a large number of people with disabilities. Examples of these types of programmes include Lesotho's Child Grants Programme (CGP) and Kenya's Cash Transfer Programme for Orphans and Vulnerable Children (CT-OVC).

Lesotho's CGP is an unconditional cash transfer programme with the primary objective to improve the living standards of OVC by reducing malnutrition, improving health status, and increasing school enrolment (Pellerano et al., 2014). The CGP started as a small, donor-funded pilot in 2009, and by 2015 was a government-run and funded social protection programme, reaching

2. See World Bank web portal: Poverty Overview.

25,000 households across the country (Pellerano et al., 2016). The CGP is implemented by the Ministry of Social Development (MSD) of the Government of Lesotho, along with other social protection programmes including the Old Age Pension, school feeding, and tertiary bursaries (Pellerano et al., 2016). The programme targets poor households with at least one child using a proxy means test (PMT) accompanied by a community validation exercise. Eligible households receive a quarterly transfer of 360–750 maloti[3] (LSL) (approximately USD 36–75 in 2013 prices), depending on the number of children in the household.[4] The transfer value constitutes on average 14 per cent of pre-programme consumption levels, which increased to 21 per cent after an adjustment in April 2013.

An impact evaluation of the CGP demonstrated some positive impacts in several domains, for children, other household members and the household overall. The programme had a small positive impact on improving household food security and nutrition, but not on total household expenditure (Tiwari et al., 2016). The CGP was also linked to increased expenditure on child-specific needs, such as education, clothing and footwear (Pace et al., 2019). As a result, the CGP improved schooling outcomes for children, particularly secondary school-aged children and girls (Sebastian et al., 2019). The programme also reduced the occurrence and intensity of multidimensional deprivation among children living in households with low earning capacity that suffered negative economic or demographic shocks (Carraro and Ferrone, 2020). In addition to the impacts on children, the CGP also improved indicators of well-being for the household and other household members. For example, CGP enrolment led to increased farm production (Prifti, Daidone and Davis, 2019) and reduced the engagement of adults in occasional and irregular work (Pellerano et al., 2014).

Data on disability was collected within the CGP impact evaluation, but analyses have not considered the differential impact of the programme for people with disabilities. The current study aims to address the gap in the existing evidence on how cash transfers affect both adults and children with disabilities. Although the primary intended beneficiaries of the CGP are children, the grant is a household rather than individual transfer and carries no conditionality, meaning households can allocate the funds as they see fit. Other evaluations of the CGP have noted impacts for the household and other adult members of the household (Pellerano et al., 2014). Potential impacts on adults are plausible, for example adults with disabilities may be more likely to engage in livelihood activities if their children are in school or if the income from the transfer allows them to

3. The Lesotho currency is the loti (LSL; plural: maloti).
4. 2013 prices are cited because the data set used for this article comes from an impact evaluation completed in 2013 and published in 2014 (Pellerano et al., 2014).

seek needed healthcare that improves their functioning. As such, there is value to exploring the impact of the CGP on both adults and children with disabilities.

Consequently, we examine how programme impacts vary between children and adults with and without disabilities and their households, across a range of indicators within the domains of food security, education, health and livelihoods. This is achieved through a secondary analysis of the cluster-randomized controlled trial evaluating the Lesotho CGP (see Pellerano et al., 2014).

Methods

Intervention description

The CGP is an unconditional cash transfer programme that is targeted to poor households with at least one child younger than age 18. The poverty status of households is measured by a proxy means test (PMT) and community validation. The PMT includes proxy measures of household wealth, such as housing characteristics, household demographics and asset ownership. Based on the PMT score, households are categorized into one of five categories, ranging from one, the lowest category, meaning “ultra-poor”, up to five, meaning “better off”. Households with at least one child younger than age 18 are deemed eligible for the CGP when they fall in one of the two lowest categories of the PMT score and are identified by the community validation exercise as the “poorest of the poor”. The CGP is therefore not directly targeted at households with adults or children with disabilities.

The transfer value for the CGP was originally set at a flat rate of LSL 120 (approx. USD 12) per month per household and was disbursed every quarter. Effective from April 2013, the cash transfer was indexed to the number of children as follows: (1) Households with 1–2 children LSL 360 (USD 36) quarterly; (2) Households with 3–4 children LSL 600 (USD 60) quarterly; and, (3) Households with 5 children or more LSL 750 (USD 75) quarterly.

Study design

The data used in the current study come from an impact evaluation conducted by Oxford Policy Management around the expansion of the CGP, in order to establish the impact, effectiveness, efficiency and sustainability of the programme (Pellerano et al., 2014). The study took place in five Districts: Qacha’s Nek, Maseru, Leribe, Berea and Mafeteng, covering ten Community Councils which were made up of 96 electoral divisions (EDs). The design of the impact evaluation was a community randomized controlled trial (RCT). This approach allowed assessment of the impact of the programme by comparing a representative sample of CGP recipients (treatment group) with a control group – similar households and children who do not benefit from the programme. Half of all EDs were randomly assigned to receive the CGP, and the other half were assigned to the control arm. Randomization took place in public lottery events in each Community Council. In treatment EDs, the CGP implementers undertook the targeting process, selected recipients according to the eligibility criteria and proceeded to enrolment. In control EDs, the programme mimicked this approach so that eligible households were identified for the evaluation control group, but these households were not enrolled until after follow-up was completed. Intervention and control groups were interviewed in 2011 before the CGP transfer began (baseline) and again in 2013, after the CGP had been operating for two years (follow-up). Eligible participants from the control arm were enrolled in the CGP after the follow-up survey had been completed.

Sample

Baseline data were collected between June and August 2011 and comprised around 3,000 households. The follow-up survey fieldwork took place at the same time of the year to avoid seasonality bias – between June and August 2013 – and covered around 2,000 households. One objective of the original evaluation was to identify the spillover effects on households that were not eligible for the CGP (i.e. had no child younger than age 18 or did not meet the poverty criterion). The sample for the impact evaluation therefore included eligible households and non-eligible households in both treatment and control communities. In this article, we focus on the impact of the CGP on individuals in eligible households (in both treatment and control communities) only.

Data collection

The programme was targeted at the household level, and so one main respondent was interviewed during the baseline and endline surveys. Eligible respondents included the head of the household or the most informed household member, and this person reported on indicators for all household members.

The primary independent variable of interest in this study is disability status. Respondents were asked concerning each household member whether the individual has "any physical or mental disability (blind, crippled, etc.)", to which they responded "yes" or "no". People were classified as having a disability if responding "yes" to this question.

Outcome indicators

We investigated the impacts of the CGP in four domains in order to capture household- and individual-level indicators of poverty and well-being: i) food security, ii) education, iii) health and iv) livelihoods. Food security is measured at the household level, while education, health and livelihood outcomes are measured at the individual level.

We used the following indicators, primarily driven by data availability:

Food security. We constructed three food security measures. Food expenditure is the monthly amount of money spent on food items. We summed the expenditures for 58 individual food and drink items. We use two measures of food expenditures: the amount expressed in real maloti, using an inter-survey inflation rate of 18 per cent (Pellerano et al., 2014), and the amount expressed in US dollar purchasing power parity (PPP). The second food security indicator measured the number of months in the year during which the household experienced no food shortages, some food shortage or extreme food shortage. The final food security indicator measured whether any child or adult experienced any of the following food insecurity situations during the three months preceding the survey: eating smaller meals, eating fewer meals or going to sleep at night hungry because of a lack of food. If any of these three situations occurred, we coded the indicator 1 and zero otherwise. The indicator is constructed separately for adults and children in the household.

Education. We constructed two indicators for education among school-aged children (aged 5–19). The first measures whether a child was ever enrolled in school, and the second indicator measures current enrollment.

Health. We included four health-related indicators. The first was a subjective self-assessment of current health, measured on a three-point scale as poor, fair or good. We dichotomize this variable with 1 representing good health, and zero otherwise. The second was the presence of a long-term illness, measured by a positive response to a question if the respondent had been continuously ill for at least three months during the last 12 months. Third, we examined whether the individual had consulted a health provider in the three months before the survey, as a measure of health care access. Finally, we computed the total health expenditures attributed to each household member. Due to the large number of zero reponses and outliers, we also transformed this variable using the inverse hyperbolic sine (IHS). In contrast to a typical log-transformation, the IHS lets us retain the zeros while allowing us to interpret the coefficients as percentage change (Geng et al., 2018).[5]

5. This transformation reduces the potential for bias due to extreme outliers, and addresses the issue of non-normality in the error term when using the original expenditure values.

Health outcomes are available for all household members, and we conducted separate analyses for children and adults.

Livelihoods. For livelihoods, we focused on common economic opportunities for the local working-age population (aged 15 or older): household enterprise, agricultural activity (farming or livestock rearing) or paid work. We constructed dummy indicators equal to 1 if the individual was engaged in the activity in the 12 months prior to the survey, and zero if they were not. We also contructed a dummy indicator for engagement in any of these three livelihood activities as a measure of labour market participation.

Data analysis

We used a difference-in-difference approach to estimate programme impacts of the CGP, exploiting the longitudinal nature of the evaluation. This technique essentially compares the change in the treatment group, between baseline and follow-up, to the change in the control group. Due to the randomized assignment, this approach provides an unbiased estimate of the impact of the CGP on our variables of interest. We employed a triple-difference estimation to estimate differential impacts by disability status. The econometric model being estimated is:

$$Y = \beta_0 + \beta_1 P + \beta_2 T + \beta_3 D + \beta_4 P \cdot T + \beta_5 P \cdot D + \beta_6 T \cdot D + \beta_7 P \cdot T \cdot D + \beta_8 X + \varepsilon \quad (1)$$

Where Y is the outcome of interest. P is a binary variable set to 1 if the household is a recipient of the Lesotho CGP, and to zero if it is not. T is a dummy variable for time of the observation, set to 1 if the observation is from the endline survey, and to zero if it is from the baseline. D is the indicator for disability, with 1 representing people with disabilities and zero for those without disabilities. For household level indicators, D represents a household with a person with a disability. X represents a set of observed individual and household characteristics, including age in years, sex and household size. For household level indicators, we only control for household size. Standard errors for the estimation were clustered at the randomization level (villages) and baseline sampling weights were used.

In this model, β_4 represents the impact on people without disabilities, compared to people without disabilities in the control group. The sum of β_4 andβ_7 represents the impact on people with disabilities, compared to people with disabilities in the control group.[6] β_7 represents the differential impact on people with disabilities, compared to the impact on people without disabilities. A statistically significant

6. The estimate of the sum of β_4 and β_7 and associated standard error is computed using Stata's *lincom* command after running equation 1.

coefficient for β_7 would indicate that the CGP differentially affected individuals with and without a disability. For household level indicators, the interpretation is similar for households with people with disabilities.

We conducted a number of study validity checks. We used the baseline data to regress each outcome on a treatment indicator in order to assess whether the treatment group and control group were balanced at baseline.[7] A significant p-value ($p < 0.05$) would indicate that there was a significant difference between our treatment group and control group for that indicator. We conducted this test for people (households) with disabilities and people (households) without disabilities separately. We also assessed whether attrition affected the internal validity of our results.

Ethics

The data used in this secondary data analysis are anonymized and publicly available and hence Institutional Review Board approval was not required.

Results

At baseline, the sample included 1,486 eligible households (747 treatment households and 739 control households). At endline, 1,353 households were successfully followed-up.[8] The total number of individuals in these households followed-up was 8,146. Table 1 provides the baseline descriptive statistics of people with and without disabilities in our sample. Individuals in our sample were relatively young, with an average age of 22.6 years. This young age distribution reflects the targeting approach of the CGP, aimed at families with children. In our CGP sample, the disability prevalence was 4.3 per cent, and 18.8 per cent of households included at least one member with a disability. People with disabilities were significantly older than people without (35.8 years versus 22.0 years). People with disabilities were less likely to be children (35 per cent) compared to people without disabilities (55 per cent). Furthermore, 22 per cent of people with disabilities were aged 60 or older, compared to only 7 per cent among those without a disability. There were relatively few differences between people with and without disabilities in terms of household characteristics. One exception is household size, as people with disabilities lived in smaller households (5.2 versus 5.9 people). There were no differences with regard to consumption

7. This article is supplemented by an extensive online Appendix prepared by the authors and made available to readers (see Supporting Information). For baseline data, see Appendix 2, Tables A.2.1–A2.4.
8. Please refer to Pellerano et al. (2014), the official endline evaluation report, for more details about the sampling strategy.

Table 1. *Baseline comparison of socio-demographic characteristics between people with and without disabilities**

	Full sample (*n=7,360)*	People with disabilities *(n=321)*	People without disabilities *(n=7,039)*	p-value comparing people with and without disabilities
Individual characteristics				
Age (in years)	22.6	35.8	22.0	<0.001
Female	53%	50%	53%	0.41
Child < 18 years	54%	35%	55%	<0.001
Adult 18 – 59 years	38%	42%	38%	0.27
Older adult 60+ years	8%	22%	7%	<0.001
Lost at follow-up	9%	10%	9%	0.72
Household characteristics				
Head is female	47%	49%	46%	0.54
Age of head of household	52.6	54.7	52.5	0.06
Head completed primary school or higher	26%	25%	26%	0.76
Household size	5.8	5.2	5.9	0.001
Per capita monthly expenditures in USD PPP	21.18	20.33	21.22	0.45
Household owns				
Any livestock	62%	68%	62%	0.08
Any agricultural assets	57%	48%	57%	0.05
Cell phone	60%	54%	60%	0.15
Lounge suite (sofa)	8%	13%	8%	0.10

Notes: P-values are reported from Wald tests on the equality of means for each indicator comparing people with disabilities versus people without disabilities for those in the treatment and control group combined. Standard errors are clustered at the village level. * There were some missing values (Minimum samples: Full sample – *n*=6,759; People with disabilities – *n*=287; People without disabilities – n=6,472).

Source: Authors' calculations using Lesotho Child Grant Impact Evaluation data.

expenditure or asset ownership, showing that amongst CGP eligible households people with disabilities were not necessarily living in economically poorer households. These patterns of differences and similarities between people with and without disabilities was similar in the intervention and control samples.[9]

Table 2a and Table 2b present baseline outcomes for our indicators of poverty and well-being comparing people (households) with and without disabilities. Food expenditures were significantly higher among households with disabilities. On average, households experienced three months with

9. This article is supplemented by an extensive online Appendix prepared by the authors and made available to readers (see Supporting Information). For baseline data, see See Appendix 2, Table A.2.1.

Table 2a. *Baseline outcome indicators and balance tests of households with people with disabilities versus households without people with disabilities*

Food security	Full sample		Households with PWD		Households without		p-value comparing households with and without PWD
	% or Mean	N	% or Mean	N	% or Mean	N	
Real per capita monthly food expenditure (Maloti)	93.872	1,479	81.499	279	96.743	1,200	0.009
Per capita monthly food expenditures in USD PPP	20.588	1,479	17.874	279	21.218	1,200	0.009
Months with sufficient food	3.344	1,476	2.944	275	3.437	1,201	0.126
Months with some shortage of food	4.134	1,476	4.194	275	4.120	1,201	0.759
Months with extreme shortage of food	4.522	1,476	4.862	275	4.443	1,201	0.128
Food insecurity for adults	0.839	1,481	0.850	279	0.836	1,202	0.579
Food insecurity for children	0.712	1,452	0.759	272	0.701	1,180	0.088

Notes: P-values are reported from Wald tests on the equality of means for each indicator comparing households with people with disabilities versus households without people with disabilities for those in the treatment and control group combined. Standard errors are clustered at the village level.

Source: Authors' calculations using Lesotho Child Grant Impact Evaluation data.

Table 2b. *Baseline outcome indicators and balance tests of people with disabilities versus people without disabilities*

	Full sample		People with disabilities		People without disabilities		p-value comparing people with and without disabilities
	% or Mean	N	% or Mean	N	% or Mean	N	
Education (children 5 – 19 years)							
Ever enrolled in school	95%	3,131	91%	106	95%	3,025	0.22
Currently enrolled in school	87%	2,939	84%	95	87%	2,844	0.52
Health (all household residents)							
Health is rated good	81%	7,338	0.370	321	82%	7,017	<0.001
Had a long-term illness in last 12 months	11%	7,161	0.407	317	9%	6,844	<0.001
Consulted health provider in last 3 months	22%	7,231	0.365	319	21%	6,912	<0.001
Health expenditure (USD PPP) last 3 months	3.043	7,022	12.243	313	2.617	6,709	0.13
IHS of health expenditures	0.536	7,022	0.947	313	0.517	6,709	0.006
Livelihoods during last 12 months (all household residents 15 years or older)							
Engaged in household business	10%	3,986	4%	234	10%	3,752	<0.001
Engaged in farming or livestock activities	71%	3,471	57%	207	72%	3,264	0.001
Engaged in work	37%	3,964	23%	234	38%	3,730	<0.001
Engaged in any livelihood activity	75%	3,986	57%	234	76%	3,752	<0.001

Notes: P-values are reported from Wald tests on the equality of means for each indicator comparing people with disabilities versus people without disabilities for those in the treatment and control group combined. Standard errors are clustered at the village level.

Source: Authors' calculations using Lesotho Child Grant Impact Evaluation data.

sufficient food availability, four months with some shortage and another four months with extreme shortages. There were no differences by disability status for these indicators. Food insecurity among adults in the households was high, experienced by about 84 per cent of households, irrespective of disability status. Children in households with disabilities were slightly more likely to experience food insecurity. In 76 per cent of households with disabilities, children experienced food insecurity, compared to 70 per cent in households without disabilities. School enrollment among children (aged 5–19 years) was high in our sample, with nearly 95 per cent "ever enrolled" in school and 87 per cent "currently enrolled". These levels are similar for children with disabilities (84 per cent) compared to those without (87 per cent). There were large differences in health outcomes by disability status. People with disabilities were less likely to report good health (37 per cent versus 82 per cent), and more likely to have had a long-term illness in the last 12 months (41 per cent versus 9 per cent) or have consulted a health provider in the last three months (36 per cent versus 21 per cent). Consequently, medical expenditures were higher for people with disabilities compared to those without (USD 12.2 versus USD 2.6), but this difference is not statistically significant. People with disabilities, aged 15 or older, also showed poorer outcomes in terms of livelihood activities. They were less likely to engage in household enterprise (4 per cent versus 10 per cent), agricultural activities (57 per cent versus 72 per cent) or to perform casual or paid work (23 per cent versus 38 per cent). Overall, 57 per cent of people with disabilities were engaged in any livelihood activity, compared to 76 per cent of people without disabilities. These patterns of differences and similarities between people with and without disabilities were similar in the intervention and control samples (see Tables 2a and 2b).[10]

Study validity checks

As expected, the randomized design of the study ensured balance among the key indicators of interest. For the group of people with disabilities, we found two significant differences between treatment and control for all indicators. The months with some food shortage and food insecurity for children are both higher in the control group. For those without disabilities, we also found two differences: "household size" and "ever enrolled" in school.[11] The first was not an outcome variable and was included as a control variable in the regressions.

10. This article is supplemented by an extensive online Appendix prepared by the authors and made available to readers (see Supporting Information). For baseline data, see ee Appendix 2, Table A.2.3.
11. This article is supplemented by an extensive online Appendix prepared by the authors and made available to readers (see Supporting Information). For baseline data, see Appendix 2, Tables A.2.2 and A.2.4.

School enrolment was an outcome indicator and this imbalance must be taken into account when interpreting the impact results.

Next, we assessed attrition among our sample. Attrition can pose threats to the internal validity of the study if attrition is different between the treatment and control groups. At a general level, the household attrition rate was 6 per cent (Pellerano et al., 2014). In our sample, the individual-level attrition rate was 9.4 per cent and was not statistically different between people with disabilities and those without (Table 1). Furthermore, the attrition rate was not significantly different between treatment and controls in the group of people with disabilities and the group of people without a disability.[12] We are therefore confident that attrition poses no threats to our study design and we are able to estimate unbiased impacts of the CGP.

Empirical results

Our empirical results are graphically presented in Figures 1–7.[13] The first domain is food security, which was measured at the household level and used three indicators. First, there was no impact of the CGP on per capita food expenditures in the last month for either group (Figure 1). There was a significant decrease in terms of food insecurity for children, but only in households without disabilities although the difference in impact was not statistically significant (Figure 2). There was also an impact of the CGP on months with food shortages (Figure 3). Households without disabilities reported a positive impact of the CGP on the number of months with sufficient food, and a decrease in the months with extreme shortages. Households with people with disabilities reported a significant decrease in the number of months with extreme shortages attributable to the CGP (approximately 2.6 months less). Households with people with disabilities did experience a significant and differential impact on increased months with some food shortages.

The first individual-level domain is education and the main focus is school enrolment (Figure 4). In terms of "ever enrolled" in school for children aged 5–19, there was no impacts of the CGP on either group. However, for "current

12. This article is supplemented by an extensive online Appendix prepared by the authors and made available to readers (see Supporting Information). For baseline data, see Appendix 2, Tables A.2.2.
13. This article is supplemented by an extensive online Appendix prepared by the authors and made available to readers (see Supporting Information). The empirical results shown in Figures 1–7 are summarized in Appendix 1, Tables A.1.1 to A.1.10, to which readers should refer. Each table presents the baseline and endline mean of the outcome, for treatment and controls and for people with disabilities and people without disabilities separately. In addition, the impact estimates are presented for people without disabilities, for people with disabilities and the impact difference.

Figure 1. *Impact estimates of Lesotho CGP on food expenditures, by disability status*

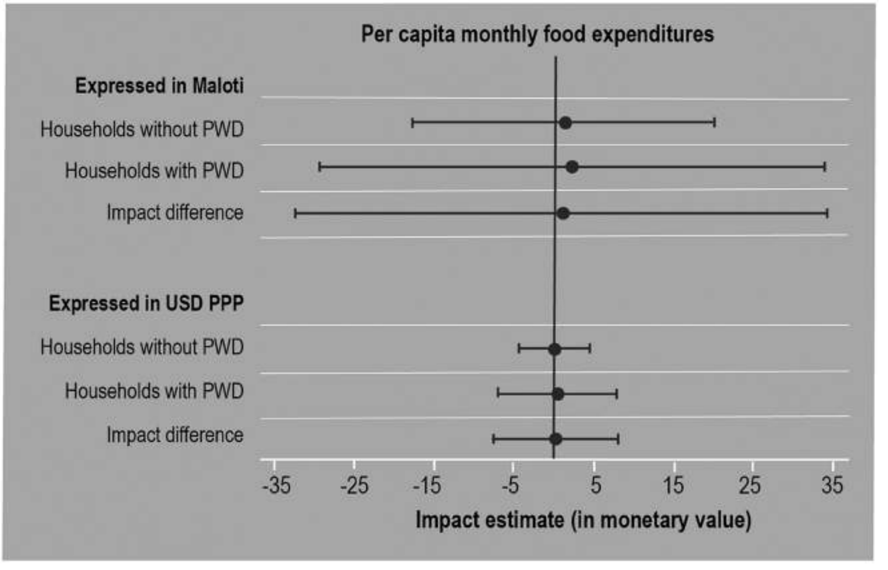
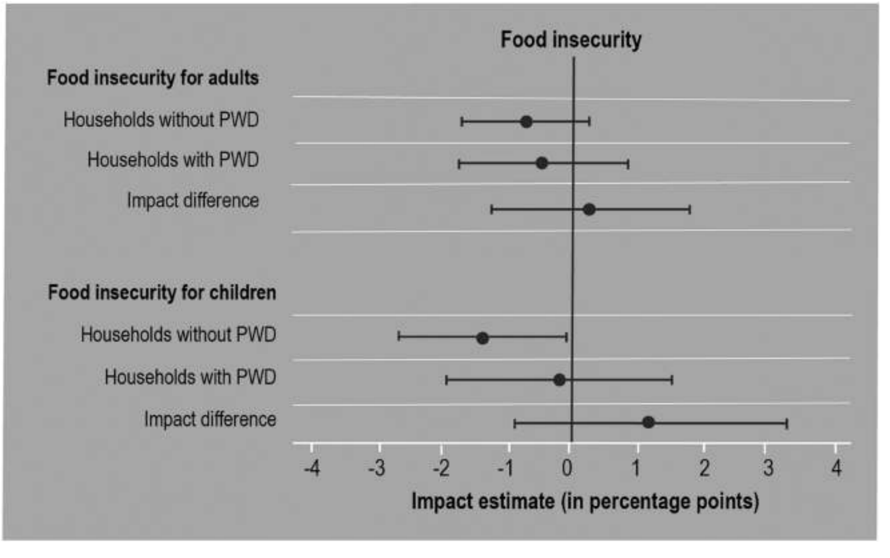


Figure 2. *Impact estimates of Lesotho CGP on food insecurity, by disability status*



enrolment", we observed a significant improvement in enrolment of about 5 percentage points (pp) for children without disabilities and no impact for children with disabilities although the difference in impact was not statistically

Figure 3. *Impact estimates of Lesotho CGP on number of months with food shortages, by disability status*

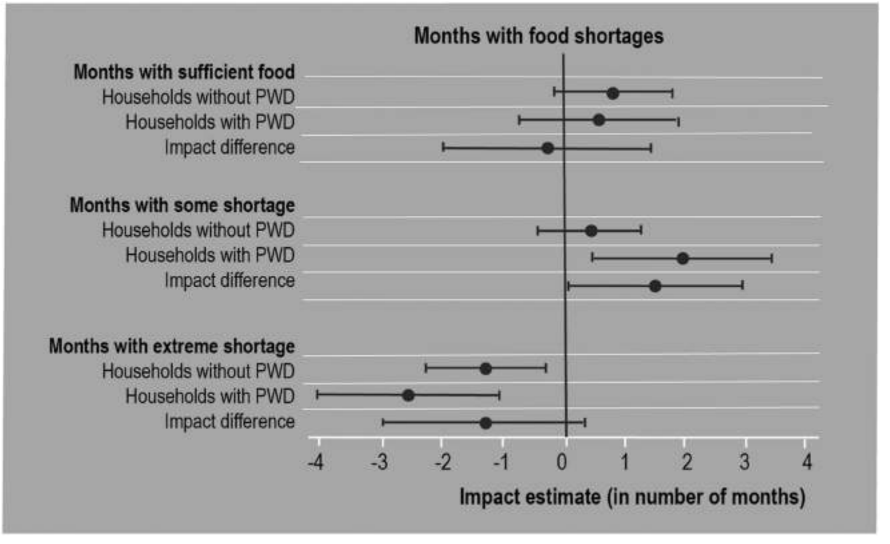
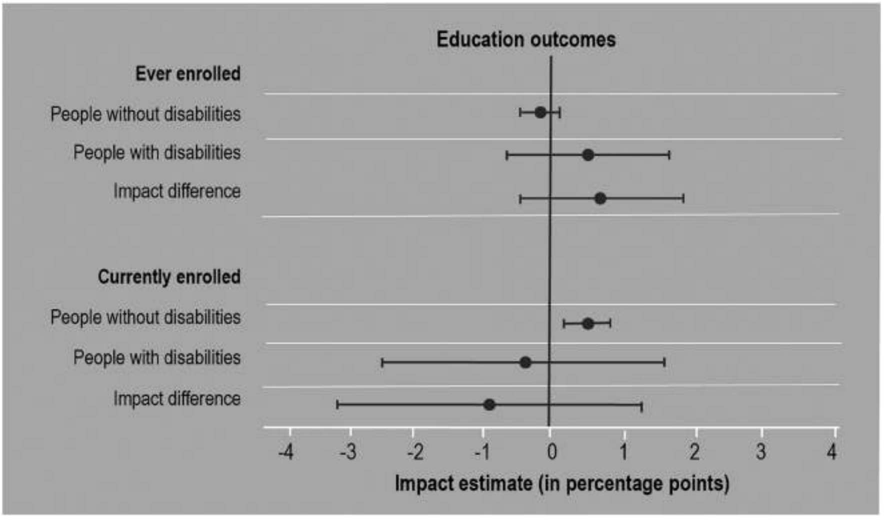


Figure 4. *Impact estimates of Lesotho CGP on educational outcomes (children aged 5–19), by disability status*



significant. This finding is similar to the overall impact on enrolment (5 pp) as presented in the official evaluation report (Pellerano et al., 2014).

Figure 5. *Impact estimates of Lesotho CGP on health outcomes (children 0–17 years), by disability status*

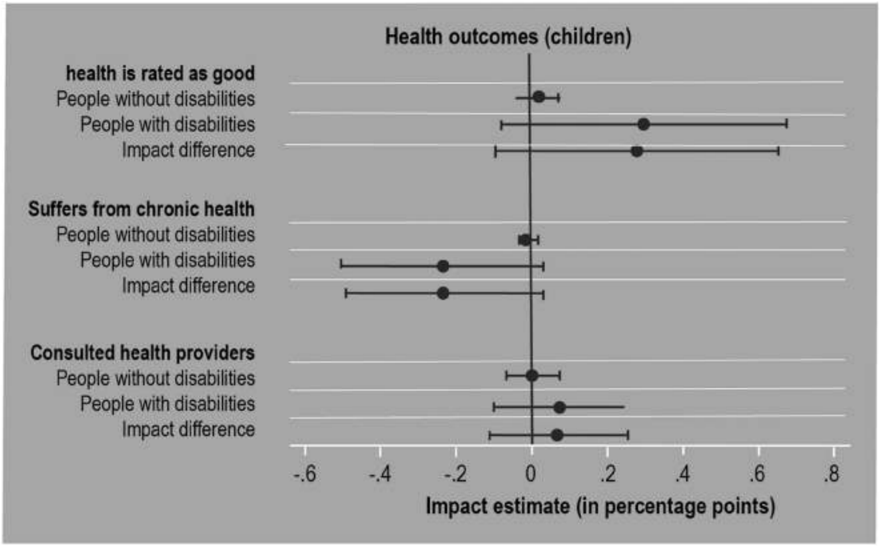


Figure 6. *Impact estimates of Lesotho CGP on health outcomes (adults), by disability status*

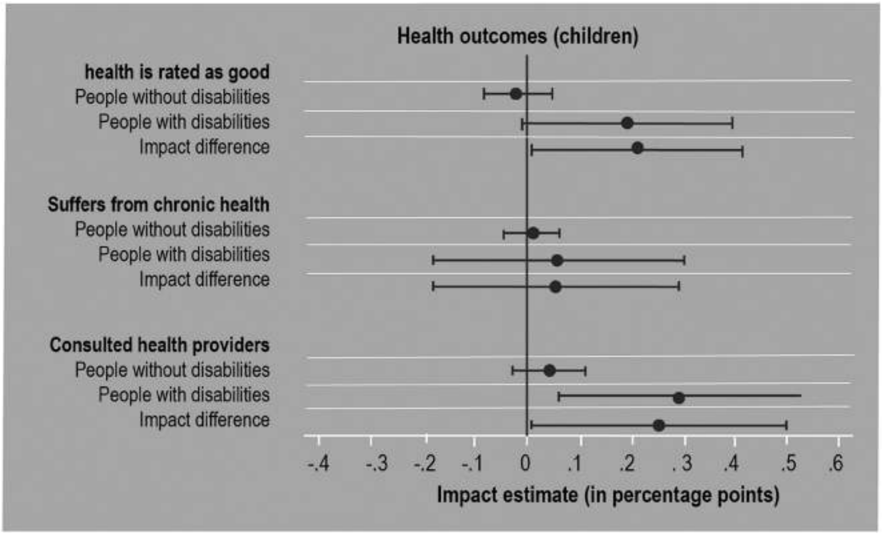
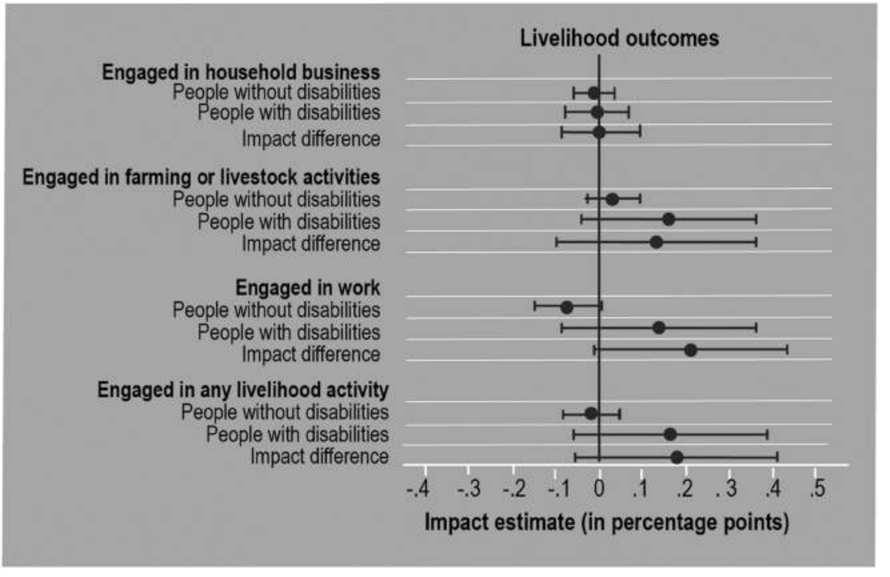


Figure 7. *Impact estimates of Lesotho CGP on livelihood outcomes during last 12 months (all household residents aged 15 or older), by disability status*



For health, several key differences emerge between children with and without disabilities (Figure 5). Children with disabilities were less likely to have had a long-term illness in the last 12 months, an outcome attributable to receiving the CGP (24 pp). In addition, households spent significantly more on health care for the child with a disability. On average, they spent USD 7.6 more on health care for the child with a disability in the preceding 3 months, compared to children with disabilities in the control group. Also the IHS transformed variable showed a positive significant impact, suggesting that this result is robust to outliers in the expenditure variable.

Adults with disabilities in households receiving the CGP were 20 pp more likely to self-rate their health as good, while there was no impact for people without disabilities (Figure 6). There was no impact on long-term illness in the last 12 months for either subgroup. We also found a significant impact on the likelihood to seek care for adults with disabilities, an increase of 30 pp. There was no change in the level of medical expenditure as a result of the CGP for adults with disabilities.

Results for livelihoods are presented in Figure 7. For engagement in household business and agricultural activities, there was no impact across the sample of people (aged 15 or older). However, we found a significant decline for people without disabilities, and a weak impact difference for engagement in paid work (21 pp).

This suggests that the impact of the CGP on the likelihood to be in paid work was higher for people with disabilities compared to the impact for people without disabilities. There was no impact on being engaged in any of the three livelihood activities.

Discussion

This article has explored the impact of the Lesotho CGP on the lives of people with disabilities, compared to people without disabilities. Overall, this study found significant and differential impacts of the cash transfer for people with disabilities compared to people without disabilities, particularly for health. Still, even with the gains attributable to the CGP, it is important to note that levels of deprivation and inequalities for people with disabilities compared to people without disabilities remained high.

Health outcomes were a clear area of positive impact attributable to the CGP for people with disabilities. Adults with disabilities receiving the CGP experienced increases in their self-rated health and their likelihood of consulting a healthcare provider. Children with disabilities were less likely to have had a long-term illness in the last 12 months and reported an increase in household healthcare spending. These effects were not observed for CGP recipients without disabilities and the difference in impact was statistically significant. Positive gains in health outcomes may have been driven by the lower baseline levels of health among people with disabilities, meaning there was a greater potential for the CGP to have an impact in these areas. These findings may also reflect that people with disabilities have poorer levels of health and higher unmet health needs, and so there is more urgency to invest in healthcare. This finding is consistent with other studies on self-reported use of cash transfers amongst people with disabilities, which find healthcare is a main source of spending (Banks et al., 2018b; Banks et al., 2018a). It is also consistent with the literature on disability-related extra costs, which finds healthcare to be a major contributor (Mitra et al., 2017) and reinforces the need for adaptations to existing programmes or the creation of complementary programmes (e.g. raising the value of cash transfers, in-kind provision of assistive devices, access to social health insurance schemes) to cover these additional costs for people with disabilities.

Despite the gains attributable to the CGP, large unmet health needs persisted: only 32 per cent of adults with disabilities in the CGP rated their health as good at follow-up, compared to 69 per cent of adults without disabilities in the CGP. Even with poorer levels of health, only half (50 per cent) of adults with disabilities in the CGP households had sought healthcare in the last 3 months at endline. As people with disabilities have higher healthcare needs – for both disability-specific and general healthcare – comparing healthcare utilization may not fully capture differences in unmet health needs between people with and without disabilities (Shakespeare, Bright and Kuper, 2018). Further evidence is needed on how the CGP and other social protection programmes, particularly social health insurance, address unmet healthcare needs, including in accessing disability-specific services (e.g. assistive devices, rehabilitation).

Additionally, there was some evidence of an impact of the CGP on food security. Food insecurity was high for all groups (>70 per cent of all households faced food insecurity) and worsened for most groups during the study period. However, recipient households of the CGP, particularly recipients households with members with disabilities appeared protected from more extreme food shortages. Both recipient groups experienced fewer months of extreme shortages that was attributable to the CGP. Although both groups had an increase in "some" shortages, particularly recipients with disabilities, this could be interpreted as households moving from extreme to more moderate shortages. Other studies from sub-Saharan African have found a positive impact of cash transfers on food security in the general population, mirroring findings in this study (Owusu-Addo, Renzaho and Smith, 2018). It is important to note, however, that since food security was measured at the household level, it does not necessarily indicate that the person with a disability had access to adequate food and nutrition even if they were living in a food-secure household. For example, a study in Kenya found children with disabilities were more likely to be malnourished compared to their siblings without disabilities (Kuper et al., 2015).

Turning to livelihood indicators, there was no impact of the CGP for adults with or without disabilities on engagement in livelihood activities overall or by type, with the exception that there was a weakly positive and differential impact on engagement in paid work for recipients with disabilities. This latter finding may reflect positive gains in functioning as a result of improved health amongst people with disabilities, which then led to a greater ability to participate in paid work. Still, adults with disabilities were much less likely to participate in any livelihood activity (67 per cent versus 81 per cent) or in paid work (21 per cent versus 31 per cent at endline) compared to people without disabilities, gaps which are consistent with other studies from sub-Saharan Africa (Mitra, 2017; Mizunoya and Mitra, 2013; Mactaggart et al., 2018a). Other studies from sub-Saharan African have found little impact of cash transfers on employment in the general population, with only one of seven studies in a systematic review finding a significant effect (Owusu-Addo, Renzaho and Smith, 2018). Additionally, further research is needed to assess the impact on the quality of employment amongst CGP recipients – such as on earnings – for both recipients with and without disabilities.

For education, the CGP had a positive impact on current enrolment for children without disabilities but not for children with disabilities; however, the lack of impact for the latter may have been reflective of the small sample of children with disabilities, as the difference in impact was non-significant and changes in enrolment were similar between the two groups. Further research with adequately powered sample sizes is needed to better explore the impact of cash transfers on school attendance for children with disabilities. Positive impacts on school attendance for children without disabilities are in line with other impact evaluations of cash transfers in the general population. For example, a systematic review of the impact of cash transfers in LMICs found 13 out of 20 studies recorded a significant impact on increased attendance attributable to the grant (Bastagli et al., 2019). More evidence is needed on the impact of cash transfers on learning outcomes for children with and without disabilities (Bastagli et al., 2019). Evidence in this area is particularly important for children with disabilities, who may be excluded from the learning process even if they attend school due to the lack of inclusive education options in many countries (UN, 2018). For example, qualitative research conducted in Lesotho found a lack of resources for inclusive education, poor understanding of the need to adapt to the special needs learners and slow policy development for inclusive education (Mosia, 2014), which would all impact learning outcomes for students with disabilities. Additionally, a study in Lesotho in 2010 found 33 per cent of students with disabilities had stopped attending school due to barriers posed by cost, transportation or a lack of adapted communication (Kamaleri and Eide, 2011; UN, 2018).

There are important strengths and limitations to the current analysis, which must be taken into account when interpreting the findings. This study addressed the impact of social protection, which is an important priority for governments, but one where impact data is lacking, particularly for people with disabilities. This was a large study overall, yet the number of people with disabilities was relatively small, limiting our ability to detect differences between groups, particularly for children. Consequently, analyses were underpowered to detect small, but statistically significant impacts for people with disabilities. There is a growing push to disaggregate data by disability, including the explicit guidance to do so in the Sustainable Development Goal 17 (UN, 2018).[14] However, our analysis has highlighted the important concern that most disaggregated analyses will be underpowered unless disability is considered when setting sample sizes.

14. See SDG target 17.18; “By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts”.

There is also a need to explore differences amongst people with disabilities, for example by gender, age and impairment type, although this will require even larger sample sizes. Another challenge of secondary analyses is that there is a lack of accompanying process evaluation data that could help in understanding why impacts did or did not occur, as well as to consider the perceived acceptability of the programme for people with disabilities. Power calculations justifying the sample size could not be identified in the official study reports. Nevertheless, the intervention and control arms were well balanced, and the attrition rate was relatively low.

There are also concerns about how disability was assessed within this study. The notion of disability can be subjective and culturally specific, and therefore difficult to measure (Mactaggart et al., 2016). The recommended approach to measuring disability in a field survey is through use of the Washington Group questions (Altman, 2016). These questions ask about functional difficulties in six domains: seeing, hearing, walking, concentrating/remembering, self-care, and communicating. Respondents can indicate whether they have "none", "some" or "a lot" of difficulty or worse in each of these domains. Unfortunately, the CGP survey did not include the Washington Group questions, but a more restrictive assessment of disability. The questionnaire asked concerning each member of the household whether they have "any physical or mental disability (blind, crippled, etc.)". One person from the household indicated "yes" or "no" to this question on behalf of each household member. This question set is likely to underestimate the true prevalence of disability, and only include people with more severe impairments (Loeb, Eide and Mont, 2008). Furthermore, comparison with studies that used other measures of disability is difficult. Another concern is that most household members did not answer the questions on disability themselves, but instead one household representative reported for everyone. This approach is likely to further underestimate the prevalence of disability (Washington Group, 2016; Mactaggart et al., 2018b).

Overall, this study makes an important contribution to the literature as few other studies have considered the impact of social protection programmes for people with disabilities, let alone compared impacts for those with and without disabilities. Available evidence on the impact of social protection amongst people with disabilities is mostly drawn from cross-sectional studies on self-reported impact, rather than objectively measured as through an RCT in this study (Banks et al., 2016). These other studies reported some positive perceived benefits of cash transfers in helping households meet basic needs (Goldblatt, 2009; Graham, Moodley and Selipsky, 2013; Levine, van der Berg and Yu, 2011; Loyalka et al., 2014), but little evidence was available on indicators of individual well-being assessed in this research such as health, education and livelihoods.

Conclusion

This study contributes to the evidence base on social protection policies and programmes, particularly for people with disabiliites. Social protection programmes are increasingly used by governments in LMICs as a key policy tool to alleviate poverty, with many countries either explicitly or implicitly targeting people with disabilities. However, despite the widespread implementation of social protection policies, there has been a lack of evidence on their effectiveness amongst people with disabilities. This study is able to provide robust evidence – using a community randomized control trial evaluation of the CGP in Lesotho, with impacts disaggregated by disability status – which can be used to inform policy to improve the effectiveness of cash transfers for people with disabilities.

Overall this research has found that the CGP had several positive impacts for people with disabilities, mainly in health. Cash transfers therefore may be an important policy tool for reducing poverty and improving well-being, particularly amongst people with disabilities. However, people with disabilities receiving the CGP still experienced high levels of deprivation, and were generally still worse off compared to people without disabilities at endline. Adapted programmes for people with disabilities (e.g. higher cash transfer value, in-kind provision of needed disability-related goods and services) and complementary interventions to mainstream disability in poverty reduction, health, education and employment are likely needed to maximize the benefits of cash transfers.

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Pension coverage in Latin America: Trends and inequalities

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Abstract Using household surveys from 17 Latin American countries over 2009–2018, we analyze contributory pension coverage for the economically active population (EAP) and contributory/non-contributory pension coverage for older persons. Nine countries have "private" and eight have "public" pension systems. Inequalities in gender, income, education, location and firm size affect both coverage of the EAP and the elderly. Rather than being affected by the type of pension system – private or public –, coverage depends on structural features of the labour market and public policy interventions. Our findings confirm current understanding that level of development is directly related with coverage whereas inequality and informality are inversely related with coverage. Based on these results, we recomend policy interventions.

Keywords pension scheme, old-age benefits, coverage, Latin America

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Introduction

Latin American countries helped pioneer the implementation of social security pensions. Both Chile and Uruguay first introduced contributory pensions over a century ago. In the 1960s, contributory pensions existed throughout Latin America. Chile's 1981 structural reform fully privatized its public pension system. Eleven Latin American countries – and other countries in Central and Eastern Europe – imitated the Chilean model, although with variations. In 2008, Chile partially reformed its model and Argentina, again, revamped its system. Two years later, Bolivia reversed its private system. These additional institutional changes affected re-reforms everywhere (Mesa-Lago, 2008; 2012). Nevertheless, pension systems exhibit significant differences in coverage of both the economically active population (EAP) and older persons (aged 65+). Most importantly, coverage reflects substantial inequalities based on gender, income, educational level, place of residence and firm size.[1] This article analyzes sources of coverage inequalities and their main relationship with level of economic development and labour market informality. Coverage is only one criterion of performance. Other criteria include pension adequacy, social solidarity, gender equity, administrative efficiency and financial-actuarial sustainability (Mesa-Lago, 2008).

We use household (HH) surveys in 17 Latin American countries for the period 2009–2018.[2] HH surveys are comprehensive and nationally representative micro databases that provide crucial information. We capture information on EAP contributory pension coverage and on elderly contributory and non-contributory coverage. We assess the association between coverage, economic development and public policy intervention. A summary of the descriptives used in our estimations are presented in the Appendix, Tables A.1 and A.2.

HH survey databases possess five advantages: (i) they measure contributory coverage of the EAP and contributory and non-contributory coverage of the elderly population; ii) they are undertaken annually and posted online about one year after collection by national statistics institutes and the Inter-American Development Bank; (iii) coverage estimates are nationally representative because they include all insured workers, in “private” or “public” pension systems and in other separate funds; (iv) they are generally homogeneous because survey questions are similar; and (v) they provide socioeconomic data on the insured worker, e.g. salaried or self-employed, by income groups (quintiles), by place of residence (urban and rural), by educational level (primary, secondary and higher), and by firm size (small, medium and large). Coverage rates from HH surveys are often different from administrative data that are published by

1. The first analysis of such inequalities was done by Mesa-Lago (1978).
2. At the time of writing, the latest available data.

national social security institutions and private pension managers. In contrast to HH surveys, administrative data are calculated differently, are published with delay, and are often unavailable. In countries where administrative data are available, they are not linked to relevant demographic and socioeconomic characteristics of the insured person.

Despite these advantages, HH surveys may exhibit five limitations: (i) methodological changes or adjustments to the sample and its weights, which affect comparability over time; (ii) risks of sampling errors, representativeness and reliability; (iii) inconsistency and therefore incompatibility between countries, e.g. coverage indicators that are not exactly the same in all countries; (iv) lack of cooperation among respondents to provide correct information in a timely manner; and (v) similar questions asked in diverse ways, and errors in responses or when collecting and processing data (Mesa-Lago et al., 2017). Despite their limitations, HH surveys are best suited for the present study.

The institutional features of Latin American pensions sytems differ. For the purpose of simplification, we classify them into "private" (although five of them have a public component) and "public". Nine pension systems are "private" – broadly defined – and characterized by defined contribution, fully-funded individual capitalization and private management, but not all of them are alike: (i) four are "fully private" (Chile, Dominican Republic, El Salvador and Mexico); (ii) three are "mixed" with a main public pillar and a suplementary private pillar (Costa Rica, Panama and Uruguay); and (iii) two are "parallel" with public and private programmes competing with one another (Colombia and Peru). The remaining pension systems are "public" with defined benefits – pay-as-you-go (PAYG) or partial collective funding –, and public management (Argentina, Bolivia, Brazil, Ecuador, Guatemala, Honduras, Nicaragua and Paraguay). They exhibit significant differences.[3]

Our analysis and findings confirm current understanding for countries that the level of development and pension coverage are positively related, although severe inequality affects coverage. Further, labour market informality and coverage are inversely related. It is apparent that the extension of coverage is not affected by the type of pension system. The article concludes with suggestions for policy interventions to extend coverage.

Type of pension system: EAP and elderly coverage

Table 1 ranks countries, in 2017–18, from highest to lowest contributory EAP and contributory/non-contributory elderly coverage. In 2018, the former was below

3. The public systems of Cuba, Haiti and Venezuela do not conduct household surveys, hence they were excluded from the present analysis.

Table 1. *Coverage of the EAP and the population aged 65+ in Latin America by contributory and non-contributory pensions, 2017–18*

Countries	Contributory % EAP	Countries	Non-contributory % population aged 65+	Provision of non-contributory pensions
1. Uruguay	70.6	1. Bolivia	96.8	X
2. Costa Rica	67.4	2. Chile	88.9	X
3. Chile	65.3	3. Brazil	87.8	X
4. Brazil	56.0	4. Uruguay	86.8	X
5. Panama	50.6	5. Argentina	84.2	X
6. Argentina	45.4	6. Panama	80.8	X
7. Ecuador	40.4	7. Mexico	75.0	X
8. Dominican R.	38.3	8. Costa Rica	65.5	X
9. Colombia	35.2	9. Colombia	54.0	X
10. Mexico	29.6	10. Ecuador	53.6	X
11. El Salvador	28.1	11. Paraguay	50.8	
12. Paraguay	22.8	12. Peru	49.2	X
13. Nicaragua	22.3	13. Nicaragua	24.1	
14. Peru	21.0	14. Dominican R.	18.9	
15. Bolivia	19.6	15. El Salvador	14.0	X
16. Guatemala	19.2	16. Guatemala	12.2	
17. Honduras	16.8	17. Honduras	9.8	

Notes: Guatemala has a social assistance programme to help the elderly whereas Paraguay provides food aid to the elderly; these do not appear to be non-contributory pensions. El Salvador programme stagnated in 2014–2018. Mexico: 2016. Nicaragua: 2014.
Sources: Authors based on household surveys from IADB (2019); provision of non-contributory pensions from ILO (2017, pp. 348–349), SSA and ISSA (2018).

50 per cent of the EAP in 12 of the 17 countries (a mix of public and private systems). Conversely, combined coverage by both types of pensions of the elderly was below 50 per cent in only six countries (of which we classify three as "private" and three as "public").[4]

The distribution of elderly coverage by type of pension (contributory and non-contributory) seems to be related to the age of the contributory pension system and the level of development of the country: the most socially developed countries and oldest systems have the majority covered by contributory pensions (Chile,

4. Based on administrative data, Arenas de Mesa (2019) estimated regional EAP coverage in 2017 to be 45 per cent and elderly coverage to be 76 per cent. ILO (2017) calculated regional EAP coverage to be 40.4 per cent without a specific year.

Uruguay, Costa Rica and Panama). The least developed and newer systems have the majority covered by non-contributory pensions (Bolivia, Mexico, Ecuador and Paraguay). Bolivia is the only country that has a universal non-contributory pension granted even to those that receive a contributory pension, hence there is an overlap. A lesser developed country with a young system (El Salvador) has a tiny minority covered by non-contributory pensions that were introduced recently, but coverage has stagnated. Finally, the Dominican Republic has not yet implemented its non-contributory pension programme (ECLAC, 2018).

Neither of the two types of coverage seem to be related to the type of pension system. For instance, EAP coverage in Brazil and Argentina, with public systems, are among the six highest together with Uruguay, Costa Rica, Chile and Panama, with fully private and mixed systems respectively (70.6 per cent to 45.4 per cent). El Salvador and Peru, with private systems, fall in the group with the lowest coverage together with public systems such as Paraguay and Nicaragua (28.1 per cent to 16.8 per cent).

The relationship is even less evident concerning elderly coverage. Bolivia's public system has the highest coverage (96.8 per cent) and Brazil, also public, has the fourth highest (86.8 per cent), with coverage higher than five fully private, mixed or parallel systems (Uruguay, Panama, Mexico, Costa Rica and Colombia). In 12 countries (six private and six public), elderly coverage is higher than EAP coverage. The main reason is the introduction or extension of non-contributory pensions, which are universal in Bolivia but targeted on the poor and means-tested in 11 countries. The five countries with the lowest elderly coverage (three public and two fully private) are those lacking non-contributory pensions or where non-contributory pension coverage has stagnated.

Analysis of inequalities in EAP and elderly coverage

Not only is EAP coverage low in the majority of the 17 countries, but it is also highly unequal. Herein we analyze five forms of inequality – gender, location (urban and rural), firm size, household income, and education – and discuss some successful policies to reduce these.[5] The analysis shows that a higher degree of development equates with lower inequalities, and vice versa. The type of system does not appear to be a relevant factor: the most developed public systems (Argentina and Brazil) consistently have the least inequalities, together with fully private systems (Chile), and mixed systems (Costa Rica and Uruguay). Conversely, the countries with the most inequalities are the least developed,

5. Unless specified, all data come from the Appendix, Tables A.1 and A.2. See also the pioneering work of Rofman and Oliveri (2011).

including the public systems of Bolivia, Guatemala, Honduras and Paraguay, as well as Peru with its private system.

Gender

The labour market and the social security system often discriminate against women with respect to their EAP coverage. In the labour market, women endure a lower participation in the EAP as well as in salaried work. Women earn lower wages for the same tasks and endure higher unemployment than men (ECLAC, 2016). Women are largely insured as dependent family members of a direct insured person. For example, in Costa Rica in 2015, the proportions of direct and indirect insured women were 29.7 per cent and 45.4 per cent, respectively; among men, the rates were 48.6 per cent and 25.6 per cent, respectively (INEC, 2015). Consequently, women may be left without coverage if they divorce. Also, women may lose coverage by leaving the paid labour force temporarily or permanently to raise children or care for sick or elderly family members (ILO, 2017). In Latin America and the Caribbean, the average male and female EAP coverage rates are 38.5 per cent and 37.4 per cent, respectively. The average male and female elderly coverage rates are 62.3 per cent and 52.4 per cent, respectively (ILO, 2014).

In 2018, the most developed countries (Uruguay, Chile, Costa Rica, Brazil and Argentina) had the highest EAP female coverage (86 per cent to 45 per cent), whereas the least developed (Bolivia, Peru, Guatemala, Honduras, Paraguay and El Salvador) had the lowest coverage (18 per cent to 26 per cent). That relationship is similar for elderly coverage, save for Bolivia that has the highest female coverage among all countries (97 per cent) due to its universal non-contributory pension.

Out of the 17 countries, women's EAP coverage in 2018 was lower than that of men in 12, excluding Uruguay, Panama, Dominican Republic, Nicaragua and Honduras. The same was true for elderly coverage in 13 countries, excluding Chile, Argentina and Paraguay (but was similar in Bolivia). Where non-contributory pensions are provided, both male and female elderly coverage usually is higher than EAP coverage as a result.

Chile has introduced incentives to induce women to join and contribute to the private system: a bonus for every child born alive is deposited in the mother's individual account and accrues interest. In case of divorce, the accumulated fund in the individual account is divided between the spouses. Child care centres have been expanded, facilitating women's work. In 2015, it was proposed (but has not been implemented) to compensate women for the unpaid care of the elderly and the sick, and to replace sex-differentiated mortality rates – prejudicial to women because they retire five years earlier and live five years more than men – by unisex tables, which would increase their pensions and create an incentive to affiliate

(CAPSP, 2015; SSPS, 2016). Uruguay grants one year of service for each child born alive or adopted.[6] The introduction or expansion of non-contributory pensions usually benefit women more than men. These policies helped over 2009–2018 to increase female EAP coverage in 12 countries and elderly coverage in 14 countries.

Location (urban versus rural)

EAP contributory coverage is higher in urban areas than in rural areas. In 2018, in the seven least developed countries, urban coverage was from two to six times higher than rural coverage (Paraguay, El Salvador, Guatemala, Bolivia, Honduras and Peru). Conversely, in the most developed countries the gap was reduced significantly, to 1.1 to 1.2 times in Uruguay, Costa Rica and Chile and 1.6 times in Brazil. In 2009–2018, rural coverage expanded in 12 countries (including by 9 percentage points (pp) in Brazil, 8 pp in Chile and 4 pp in Uruguay), but decreased in four, three of which had suffered an overall decline in coverage. Coverage of the elderly in rural areas was higher than for urban areas in seven countries, the opposite was true for another seven countries and it stagnated in two (Argentina lacks data on rural coverage).

Uruguay and Chile stipulate mandatory coverage for all rural workers (Costa Rica mandates coverge only for salaried rural workers), whereas Brazil and Ecuador grant pensions for rural workers/peasants; these five countries have the highest EAP rural coverage: 66 per cent, 56 per cent, 60 per cent, 35 per cent and 34 per cent, respectively. Over 2009–2018, elderly rural coverage grew in 11 countries due to the introduction or expansion of non-contributory pensions,[7] and those that have special programmes for rural workers reached the highest levels of overall elderly coverage (Mesa-Lago et al., 2017).

Firm size

In all countries, the higher the proportion of small firms then the lower the EAP contributory coverage, and vice versa. In 2018, the ratio in coverage between large and small firms varied from 50 to 96 percentage points in five countries (Honduras, Nicaragua, Peru, Paraguay and Dominican Republic), but shrank to 2 to 7 percentage points in the more developed countries (Uruguay, Brazil, Chile, Costa Rica and Argentina). Contribution collection agencies frequently give

6. In Colombia, "community mothers" working in non-profit organizations receive a tax subsidy for their contributions to the pension system (Bertranou, 2017).
7. In addition, in the process of development, the rural population declines proportionally, and where non-contributory pensions are granted a higher percentage of the elderly population receives such pensions.

priority to inspecting large and medium-sized firms, owing to the relative greater ease of detecting and collecting contributions due. Oversight of small firms is relatively expensive and complex, in particular for micro-enterprises and when a formal employer is non-existent.

Income

HH surveys have steadily shown that EAP contributory pension coverage grows consistently with household income quintiles (Rofman and Oliveri, 2011; Arenas de Mesa, 2019). In 2018, the ratio of such coverage between quintile 5 and quintile 1 (highest and lowest, respectively), oscilated between 2 and 4 percentage points in the most developed countries (Argentina, Chile, Costa Rica, Uruguay and Brazil) but rose from 9 to 80 percentage points in the least developed (Bolivia, Nicaragua, Honduras, Peru and Guatemala). Over 2009–2018, the ratio decreased in half of the countries, stagnated in five and increased in two only. In 2018, the highest coverage rates in quintile 1 (16 per cent to 45 per cent) were in Brazil, Uruguay, Argentina, Costa Rica and Chile, whereas the lowest coverage rates (0 per cent to 1.8 per cent) were in Peru, Guatemala and Honduras. Countries with the lowest coverage in quintile 1 endure the highest poverty incidence. Clearly, non-contributory pensions to those in need can improve coverage of the elderly in the lowest quintiles. For example, Chile's re-reform of 2008 targeted 60 per cent of the poorest households, leading to the highest coverage in quintile 1 among all countries (45 per cent).

Education

The higher the attained education levels of the insured, the higher the EAP contributory coverage and vice versa. Lower levels of development mean less widespread access to education, especially at the higher level (14 years and more of schooling). In 2018, EAP coverage for those with primary level (0-8 years) education was highest (42 per cent to 56 per cent) in Brazil, Chile, Uruguay and Costa Rica, while it was lowest (4 per cent to 8 per cent) in Peru, Bolivia, Honduras, Paraguay and Guatemala. Similarly, the lowest ratios between the higher and the primary education levels (1.4 to 1.8) were in the most developed countries, whereas the highest ratios (7 to 11) were in the least developed. With few exceptions, for those with primary level education, elderly coverage is considerably higher than EAP coverage. Over 2009–2018, EAP coverage for those with primary level education grew in 12 countries, stagnated in one and decreased in four (in mainly the least developed), whereas elderly coverage expanded in all but one; ratios between higher and primary education in elderly coverage were lower than the ratios for EAP coverage. Non-contributory pensions and expanded access to education played key roles in these trends.

Factors that influence EAP and elderly coverage

We use an unbalanced panel data model with fixed effects that provides consistent estimates and assumes that the impact of time is independent and, possibly, correlated with control variables. The latter include gender, location, firm size, income and education that are used to proxy inequality.[8]

To analyze coverage – for the EAP and the elderly – we examine four separate but interrelated questions: (i) Is EAP coverage determined by level of development? (ii) Is EAP coverage lower when labour force informality is higher? (iii) Is coverage of the informal labour force inversely related to the proportion of the informal labour force in the total labour force? (iv) What is the impact of social pensions on elderly coverage?

A higher level of development, measured by the Human Development Index (HDI) (UNDP, 2018; 2019), is associated with higher urbanization and modernity, higher income, better regulation, stronger infrastructure, wider delivery of social services, and a larger proportion of the formal EAP that contributes to the pension system (Cruz Saco et al., 2018a; 2018b). Table 2, column 1, shows that HDI scores have a positive and significant relationship with EAP coverage.[9] The coefficient on the HDI in the total system is 0.195 per cent, which means that a 1 per cent increase in the HDI increases total active coverage by 0.195 per cent. The answer to the first question is affirmative. The gender and location controls are significant and with the expected results. Males have a higher probability of coverage (twice as high) and urban workers have a much higher coverage rate than rural workers. The coefficient on HDI, 0.299 per cent, is also positive and significant in private systems but not in public systems. The reason is that the latter include countries with high variability in their HDI scores, such as Argentina and Brazil, on the one hand, and Bolivia, Guatemala, Honduras and Nicaragua, on the other hand.

To answer the second question, we proxy informal EAP with the rate of self-employment (Arenas de Mesa, 2019). The justification is that in most developing countries informal workers are usually "self-employed". As shown in Table 2, column 2, self-employment has a negative and significant relationship with EAP coverage, -0.0752 per cent. A 1 per cent increase in self-employment reduces total coverage by -0.0752 per cent. Hence, the answer to this question is

8. In the estimation, we use qualitative and quantitative variables for income and education to minimize correlation.

9. Complete estimation results for total public as well as private systems are available upon request.

Table 2. *Summary of estimation results for EAP, self-employment and elderly coverage in Latin America, ca 2009–2018*

Variables	EAP Coverage		Self–employment coverage	Elderly coverage
	(1)[1]	**(2)**[1]	**(3)**[2]	**(4)**[3]
Human Development Index (HDI)	0.195***			
	(0.0347)			
Self-employment		-0.0752**		
		(0.0310)		
Self-employed workers			-0.201**	
			(0.0941)	
Demographic growth of aged 65+				0.731*
				(0.415)
Dependency ratio, squared				-0.0235*
				(0.0132)
Observations	118	127	124	136
R-squared	0.989	0.968	0.041	0.996
Number of countries[4]	16	16	16	16
Standard errors in parentheses				
***p<0.01, **p<0.05, *p<0.1				

Note 1 to Columns 1 and 2: EAP coverage with HDI and self-employment respectively. Control variables are gender, rural/urban, firm size, income quintile and education.
Note 2 to Column 3: EAP coverage of self-employed workers without control variables.
Note 3 to Column 4: Elderly coverage with demographic growth of aged 65+ and dependency ratio. Control variables are gender, rural/urban and education.
Note 4: Due to insufficient data, Argentina was dropped from the panel data model.
Source: Authors' elaboration.

affirmative. The coefficients on self-employment are also negative and significant in the public and private systems; -0.0143 per cent and -0.219 per cent, respectively. The negative association is largest in the private system suggesting more enrolment difficulties for the self-employed. The controls on gender show that if enrolled, males have a substantially higher probability of coverage. The self-employed in either rural or urban locations are equally excluded from coverage. Other controls that are significant include median company size, fourth quartile of income, and both primary and higher education levels.

We continue to proxy informal labour with self-employment to answer the third question. Table 2, column 3, shows the estimation result. As expected, a negative and significant relationship exist between the proportion of the informal labour force and its pension coverage. The value of the coefficient is -0.201. This means that a 1 per cent increase in the proportion of self-employment reduces self-employment coverage by -0.201 per cent.

Efforts to make self-employment coverage mandatory are work in progress. Coverage of self-employed workers is legally mandatory in eight countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Panama and Uruguay), but with some caveats. In Uruguay, it is mandatory after exceeding an earnings threshold, and there is a breakdown: the self-employed that own an establishment have much higher coverage than those without an establishment; the latter are covered only at 5 per cent (MTSS, 2016). In Chile, mandatory coverage is being expanded gradually. In Panama, it is mandatory in the capitalization pillar for those younger than age 35 and with earnings exceeding a threshold. In Colombia, it is mandatory for persons younger than age 35 and affiliated to the private system.

In the remaining nine countries coverage is voluntary, except Guatemala that excludes self-employed workers (in Mexico it is mandatory only for some self-employed). The Dominican Republic 2003 reform law mandated a contributory regime for the self-employed, while the Salvadorian 1998 reform law stipulated the incorporation of the self-employed according to their particular characteristics, but none had been implemented by October 2020.

In countries with compulsory legal affiliation for the self-employed, effective coverage is much greater than for those countries where it is voluntary; in 2018, it was in the range 47.8 per cent to 39.3 per cent in Costa Rica, Uruguay and Brazil. The coverage was only 24 per cent in Chile, because the implementation of mandatory affiliation is gradual. It was 13.2 per cent in Colombia because only part of the self-employed have compulsory coverage, and it was 7.6 per cent in Panama because only a small proportion of the self-employed is affiliated to the private pillar. Notwithstanding, countries with mandatory affiliation tend to have the lowest proportions of self-employed labour force (24 per cent to 35 per cent in all but two countries), which makes expansion easier.

Conversely, countries with voluntary legal affiliation (Bolivia, El Salvador, Dominican Republic, Nicaragua, Paraguay, Honduras, Mexico and Peru) have coverage rates that fluctuate between 0.3 per cent and 3.9 per cent. These countries have the highest proportion of self-employment in the EAP (40 per cent to 62 per cent in all but two countries). Mandatory legal coverage by itself cannot solve low coverage. Its complexity is compounded by the considerable size of self-employment, the dispersion and fragmentation of workers without representation and their ability for collective action, and low and unstable income.

Several countries have facilitated the incorporation of self-employed and other informal workers by simplifying registration procedures, enabling greater flexibility with contribution payments, and using post offices, banks and smart phones for the collection of contributions and payment of pensions. An effective measure to enhance contribution collection has been the use of “reminders” –

sent in the form of periodic messages to affiliates using mobile phones, emails and similar means – with projections of the value of the pension to be received upon retirement.

The Costa Rican State finances the employer share of the contribution on behalf of the low-income self-employed who satisfy a means test. Consequently, coverage relative to the non-salaried EAP rose from 15.4 per cent to 47.8 per cent over the period 2004–2018. Given that the self-employed contribute and will receive a contributory pension, claims to social pensions will reduce. Chile required self-employed professionals to be affiliated by 2018. As an incentive, the government granted benefits and incentives they previously lacked, such as family allowances and protection against occupational risks, and fiscal contributions to their pensions. In response to these incentives, self-employment coverage grew from 5.3 per cent in 2008 (before the pension re-reform) to 24 per cent in 2018 (SSPS, 2016). In Colombia, a solidarity fund financed by contributions from high-income insured workers subsidizes self-employed workers. All self-employed in Uruguay must join the public general regime, while self-employed professionals must contribute to the separate pension scheme;[10] by 2018, 44.3 per cent were covered. Argentina and Uruguay have introduced a "*monotributo*" system, which basically unifies the collection of social security contributions and income tax and any other tax payments. The monotributo simplifies the administrative process, facilitates payment and incentivizes affiliation for the self-employed and employees of micro-enterprises.[11]

Other informal workers, such as domestic employees and unpaid family relatives, have low coverage. Domestic employees usually have mandatory legal coverage, but this is very difficult to enforce due to a lack of a contract or because of collusion between the employee and the employer with the aim of avoiding paying contributions. Unpaid family workers normally are legally excluded or their affiliation is voluntary and ineffective (Mesa-Lago et al., 2017).

Given low EAP coverage, it is expected that older persons will lack a contributory pension. For this reason, governments have introduced social pensions. To answer the fourth question, we proxied social policy interventions indirectly using the demographic growth rate of persons aged 65+ and the old-age dependency ratio The justification is that policy interventions are prompted by the rising size of the elderly population without pensions and the associated reduction in elderly coverage given low EAP coverage. Hence, Latin

10. The seperate special fund for professional self-employed covers university professionals, lawyers, engineers, physicians, etc.

11. Over 2004–2013, in Uruguay the total number of enterprises that use the monotributo increased ten-fold; "*monotributistas*" are overwhelmingly self-employed and women (Naranja Sotelo, 2014).

American governments, following multilateral agency recommendations and best practices elsewhere, have introduced non-contributory pensions for the elderly to increase their coverage.

The rise in the old-age dependency ratio translates into the inability of society to support the elderly in PAYG systems unless parametric reforms are introduced. As shown by Lee (2011), the upward trend in this variable is long-term and raises the vulnerability of older pension systems. Even in private systems that have reduced or eliminated the public pillar, the increase in the dependency ratio lowers the elderly coverage due to the lagged effect of PAYG systems that preceded private systems. We expect a negative association between the old-age dependency ratio and the elderly coverage rate.

Table 2, column 4, shows estimation results. As anticipated, the population growth of persons aged 65+ and the elderly coverage rate are positively related. A population growth rate of 1 per cent among people aged 65+ increases elderly coverage by 0.731 per cent. The dependency ratio (its squared value) and elderly coverage are negatively associated. A 1 per cent increase in the old-age dependency ratio reduces elderly coverage by -0.0235 per cent. Clearly, the negative sign on the old-age dependency ratio is more than compensated for by the positive sign of the population growth rate of persons aged 65+.

Findings and concluding policy suggestions

The qualitative and quantitative analisis of 17 pension systems in Latin America based on HH surveys documents the following findings:

- Contributory coverage in 12 countries is below 50 per cent of the EAP, whereas elderly coverage in only six countries is below 50 per cent.
- Neither type of coverage seems to be related with the type of pension system (public, private); the same is true regarding the degree of inequality.
- Over 2009–2018, both types of coverage increased in 12 countries (substantially more among the elderly) because of the introduction/expansion of non-contributory pensions.
- According to the qualitative observations focused on inequalities, an increase in EAP coverage can be seen in relation to men, urban areas, size of firm, income and education. Unprotected workers are mostly women, those in rural areas and small enterprises, and with low income and education. Elderly coverage exhibits less inequalities than EAP coverage as a result of non-contributory pensions.
- The qualitative analysis indicates that the more developed countries have less inequalities, while the less developed endure the worst inequalities.

- The regression analysis is confirmatory, showing that the level of development has a positive relationship with EAP coverage, while the opposite is true regarding the size of the informal sector (measured by the degree of self-employment). It also confirms that elderly coverage is positively related with the introduction of non-contributory pensions proxied by population growth of persons aged 65+ and the old-age dependency ratio.
- The regression analysis confirms that gender, location and size of firms are associated to coverage with the expected (+/-) signs.
- The regression analysis also confirms that coverage of the self-employed is negatively associated with the proportion of self-employment in the EAP.
- Legal mandatory affiliation of the self-employed tends to increase their EAP coverage vis-à-vis voluntary coverage. Supporters of private systems argue that since the structure of the labour market is a main reason for low EAP contributory coverage in the region, this problem will not be solved until "formalization" is achieved (Iglesias, 2005).[12] While this perspective holds true, formalization of the labour market is a structural process that requires an effective development strategy over many years and several generations. Based on our findings, several short- and mid-term policies can be implemented to both increase coverage and reduce its inequalities:

- Extend non-contributory pensions as they increase elderly coverage (proportionally higher than contributory EAP coverage in most countries) and favour women and rural areas; they can also raise coverage in the lowest quintiles and among the least educated.
- Expand non-contributory pensions to the elderly, as this could compensate for low EAP contributory coverage in the least developed countries, as in Bolivia that has only 15 per cent EAP contributory coverage but has reached virtual universal elderly coverage (of both women and men).
- Impose the mandatory coverage of agricultural workers as it increases their EAP coverage; also implement special rural pensions to raise elderly coverage.
- Require mandatory affiliation of the self-employed (particularly professionals) to increase their contributory coverage. Grant state subsidies (or establish a solidarity fund) to low-income self-employed (subject to a means test) to facilitate the implementation of the legal mandate. Eventually, this action would grant the self-employed elderly coverage and reduce future expenditure on social pensions.

12. See International Federation of Pension Funds Administrators database.

- Provide incentives for women to raise their contributory EAP coverage, such as by granting a bonus or an additional one year's contributions for each child born alive.
- Facilitate the incorporation of the self-employed by simplifying their registration and period of payment, relaxing contributory requirements (e.g. lower fees with actuarially adjusted pensions, shorter years of contribution), using entities in close proximity to them for the collection of contributions and payment of pensions, and unifying all tax payments (e.g. monotributo).[13] The present study was conducted using a panel of 17 countries' HH surveys over 2009–2018. Future research should increase the number of years of HH surveys and, if possible, incorporate countries without mainstreamed HH surveys. Furthermore, the regression exercise is not a model where inequality is merely the dependent variable, but actually represents a task for future work.

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13. For other policy suggestions, see Bosch, Melguizo and Pagés (2013); Rofman, Apella, and Vezza (2013); Acuña (2015); Bertranou (2017); ILO (2017); Mesa-Lago et al. (2017); Arenas de Mesa (2019).

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Appendix

Table A.1. *Pension contributory coverage of the EAP and contributory and non-contributory coverage of the population aged 65+ in nine private systems, 2009–2018*

Coverage (per cent)	Chile		Colombia		Costa Rica		Dominican R		El Salvador		Mexico		Panama		Peru		Uruguay	
	2009	2017	2009	2018	2009	2018	2009	2017	2010	2018	2010	2016	2009	2017	2009	2018	2009	2018
General																		
Contributors/EAP	58.4	65.3	28.2	35.2	65.5	67.4	31.5	38.3	28.0	28.1	32.7	29.6	49.0	50.6	16.9	21.0	64.6	70.6
Self-employed	25.7	24.0	9.7	13.2	46.2	47.8	0.0	1.6	3.0	2.1	1.6	0.6	8.8	7.6	0.3	0.3	41.0	44.3
Pensioners/pop. 65+	83.7	88.9	21.5	54.0	42.0	65.5	12.7	18.9	14.0	14.0	50.1	75.0	44.8	80.8	25.6	49.2	84.5	86.8
Gender																		
Contributors/EAP																		
Men	61.2	67.1	28.5	35.8	69.7	71.4	28.8	35.4	28.2	29.7	32.3	30.6	49.7	50.2	19.8	23.7	66.9	70.7
Women	54.3	63.0	27.9	34.3	58.9	61.5	36.4	42.4	27.6	26.0	33.3	28.2	47.9	51.2	13.5	17.9	62.0	71.4
Pensioners/pop. 65+																		
Men	83.8	89.1	26.6	58.2	54.8	73.3	16.7	21.3	19.4	17.1	56.2	77.6	52.0	82.7	33.5	53.9	84.8	88.1
Women	83.6	88.7	17.2	50.6	31.2	59.2	8.9	16.8	9.7	11.5	44.9	72.7	38.3	79.3	18.6	45.1	84.3	86.0
Location																		
Contributors/EAP																		
Rural	48.0	56.0	9.8	15.1	61.2	59.7	19.6	29.4	11.1	15.0	16.6	10.8	26.9	28.9	3.5	4.2	62.8	66.5
Urban	59.7	68.5	33.1	40.1	70.4	69.5	36.7	40.3	36.1	35.0	40.9	34.8	59.3	58.9	21.6	25.4	64.9	71.8

(Continued)

Table A.1. *Pension contributory coverage of the EAP and contributory and non-contributory coverage of the population aged 65+ in nine private systems, 2009–2018* - Continued

Coverage (per cent)	Chile		Colombia		Costa Rica		Dominican R		El Salvador		Mexico		Panama		Peru		Uruguay	
	2009	2017	2009	2018	2009	2018	2009	2017	2010	2018	2010	2016	2009	2017	2009	2018	2009	2018
Pensioners/pop. 65+																		
Rural	87.8	91.8	6.7	57.5	29.5	64.2	5.4	12.2	2.8	10.0	56.4	78.8	20.0	80.6	5.0	62.9	84.2	86.9
Urban	83.0	88.4	26.6	53.0	48.4	67.0	17.6	20.7	19.7	16.0	46.1	73.7	59.5	81.0	34.3	44.8	84.6	86.8
Firm size																		
Small	32.1	20.9	7.7	10.4	40.9	46.2	1.2	0.0	5.0	4.0	7.8	5.5	10.2	10.3	0.9	1.4	41.5	48.2
Medium	75.3	57.1	53.4	62.1	73.7	81.2	52.3	10.3	45.7	44.4	53.1	45.5	56.0	61.7	16.7	30.1	83.8	91.0
Large	85.2	86.2	89.6	94.0	89.4	95.4	86.2	95.8	87.5	82.0	81.9	78.8	88.4	93.7	71.6	78.6	97.9	99.3
Home income/EAP																		
Quintile 1	45.7	44.8	3.8	7.4	46.8	38.8	19.6	24.3	0.2	6.3	3.8	4.0	14.6	13.8	0.1	0.0	20.7	22.5
Quintile 2	53.7	60.5	16.8	22.8	62.6	62.7	25.3	34.3	5.4	24.0	17.2	16.4	38.7	40.0	4.4	3.7	32.2	37.9
Quintile 3	59.3	65.8	20.8	27.5	59.7	66.2	29.2	34.9	22.9	23.7	27.3	23.6	47.2	49.5	14.2	16.1	57.5	65.3
Quintile 4	64.0	72.0	34.5	43.7	68.3	73.2	33.5	40.6	31.6	32.6	37.3	33.3	58.9	62.2	21.4	25.3	72.1	78.7
Quintile 5	67.9	78.0	51.8	58.5	78.3	83.1	42.0	51.9	47.6	44.9	50.3	46.8	70.5	70.4	29.9	38.0	83.4	88.3

(Continued)

Table A.1. *Pension contributory coverage of the EAP and contributory and non-contributory coverage of the population aged 65+ in nine private systems, 2009–2018* - Continued

Coverage (per cent)	Chile		Colombia		Costa Rica		Dominican R		El Salvador		Mexico		Panama		Peru		Uruguay	
	2009	2017	2009	2018	2009	2018	2009	2017	2010	2018	2010	2016	2009	2017	2009	2018	2009	2018
Education																		
Contributors/EAP																		
Low (0-8 years)	43.6	51.4	12.1	15.4	54.0	55.7	18.5	21.0	10.4	10.0	14.8	11.4	26.2	27.2	3.2	4.3	51.3	54.7
Medium (9-13 yrs)	58.0	63.6	32.3	36.3	67.5	67.7	32.6	40.5	38.0	35.8	34.5	30.2	52.0	50.5	14.0	16.7	68.1	72.3
Superior (14+ yrs)	73.0	74.3	64.5	66.6	87.0	86.2	61.2	65.6	69.3	56.0	57.4	51.8	77.3	74.2	44.0	47.2	87.2	90.0
Pensioners/pop. 65+																		
Low (0-8 years)	85.7	91.4	16.7	51.4	37.1	62.7	9.8	18.4	7.3	9.5	49.0	75.2	32.1	80.6	17.3	49.3	85.7	88.5
Medium (9-13 yrs)	78.8	81.5	45.5	53.0	57.9	64.2	25.7	28.1	57.3	33.0	51.4	69.5	32.1	78.8	45.7	40.4	78.9	81.6
Superior (14 + yrs)	78.8	81.7	65.7	78.0	74.9	83.0	53.3	59.7	64.8	42.3	58.0	75.2	87.8	85.6	73.1	68.6	84.0	87.0

Notes: Costa Rica: contributors/EAP and pensioners/pop. 65+ rural in 2010; urban in 2017. Dominican Republic: education pensioners/pop. 65+ in 2017. Uruguay: contributors/EAP rural and urban in 2017.
Source: Authors' elaboration based on IADB (2019).

Table A.2. *Pension contributory coverage of the EAP and contributory and non-contributory coverage of the population aged 65+ in eight public systems, 2009–2018*

Coverage (per cent)	Argentina		Bolivia		Brazil		Ecuador		Guatemala		Honduras		Nicaragua		Paraguay	
	2009	2018	2009	2018	2009	2018	2009	2018	2010	2018	2009	2018	2010	2014	2009	2018
General																
Contributors/EAP	45.0	45.4	15.0	19.6	51.5	56.0	30.1	40.4	20.1	19.2	17.7	16.8	17.3	22.3	16.3	22.8
Self-employed			2.6	3.9	26.5	39.3	13.9	22.0	0.2	0.3	0.8	0.9	0.1	1.5	1.4	1.1
Pensioners/pop. 65+	90.1	84.2	96.7	96.8	89.0	87.8	51.7	53.6	10.4	12.2	6.6	9.8	20.0	24.1	16.6	50.8
Gender																
Contributors/EAP																
Men	45.4	46.0	16.8	21.0	53.5	56.2	30.6	40.3	19.2	19.6	15.2	15.8	16.8	20.0	16.8	23.0
Women	44.6	44.6	12.9	17.8	48.9	55.9	29.3	40.5	22.1	18.2	22.0	18.4	18.0	25.9	15.3	22.8
Pensioners/pop. 65+																
Men	88.1	81.8	96.5	96.9	92.3	90.9	53.1	55.8	12.9	14.6	7.5	11.5	23.0	24.3	15.8	48.6
Women	91.4	85.9	96.8	96.8	86.4	85.5	50.4	51.7	8.0	10.1	5.7	8.3	17.6	23.9	17.3	53.0
Location																
Contributors/EAP																
Rural			6.1	7.5	26.5	35.8	22.8	34.0	11.2	9.5	6.5	5.1	7.0	8.7	6.5	13.0
Urban	45.0	45.4	19.6	25.2	56.2	58.6	33.4	43.4	27.7	29.0	29.2	25.7	23.8	30.8	22.4	28.4

(Continued)

Table A.2. *Pension contributory coverage of the EAP and contributory and non-contributory coverage of the population aged 65+ in eight public systems, 2009–2018* - Continued

Coverage (per cent)	Argentina		Bolivia		Brazil		Ecuador		Guatemala		Honduras		Nicaragua		Paraguay	
	2009	2018	2009	2018	2009	2018	2009	2018	2010	2018	2009	2018	2010	2014	2009	2018
Pensioners/pop. 65+																
Rural			95.5	96.9	94.8	94.8	61.9	61.0	4.9	3.2	1.9	1.5	8.1	4.4	4.6	59.4
Urban	90.1	84.2	97.6	96.7	87.8	86.6	45.0	49.9	15.1	21.7	12.2	16.1	27.8	36.2	26.3	45.3
Firm size																
Small	14.2	11.7	2.4	4.6	32.1	36.3	14.1	22.8	2.3	2.4	1.0	1.3	2.0	1.7	5.0	3.9
Medium	67.4	68.9	23.3	56.2	70.7	74.8	38.1	53.5	35.6	36.1	33.1	32.1	42.2	40.4	38.7	45.4
Large	89.9	89.8	66.4	84.4	89.6	92.1	83.3	95.5	70.5	76.2	68.4	65.4	83.2	84.2	76.6	74.3
Home income/EAP																
Quintil 1	2.1	39.1	1.6	3.7	21.5	16.4	16.1	26.3	0.7	0.5	0.8	1.8	1.2	3.9	1.1	3.8
Quintil 2	19.2	24.2	10.7	14.1	41.8	46.2	21.2	28.5	11.0	7.0	8.2	6.0	8.8	17.5	10.1	14.0
Quintil 3	41.9	31.4	12.6	16.2	51.4	59.0	23.3	38.3	23.2	13.7	13.1	11.4	15.0	18.9	12.6	18.5
Quintil 4	52.1	49.1	18.5	21.4	62.1	71.2	30.2	40.7	28.8	18.0	20.2	19.3	22.2	25.1	20.0	28.1
Quintil 5	61.5	63.2	23.7	33.1	73.5	65.3	46.2	46.6	50.7	40.2	35.5	34.6	35.8	33.8	27.0	36.6
Education																
Contributors/EAP																
Low (0-8 years)	29.5	28.3	3.4	4.7	37.5	42.1	18.2	27.6	9.4	8.1	8.5	6.8	8.0	10.3	4.7	7.6
Medium (9-13 yrs)	43.9	42.1	10.5	11.9	59.5	55.7	24.4	37.9	39.8	33.0	33.7	26.1	23.2	26.7	17.5	21.6

(Continued)

Table A.2. *Pension contributory coverage of the EAP and contributory and non-contributory coverage of the population aged 65+ in eight public systems, 2009–2018* - Continued

Coverage (per cent)	Argentina		Bolivia		Brazil		Ecuador		Guatemala		Honduras		Nicaragua		Paraguay	
	2009	2018	2009	2018	2009	2018	2009	2018	2010	2018	2009	2018	2010	2014	2009	2018
Superior (14+)	61.4	60.8	48.2	52.4	80.3	76.1	59.3	70.0	57.2	62.4	62.6	56.9	50.1	56.4	50.8	50.8
Pensioners/pop. (65+)																
Low (0-8 years)	91.2	88.4	96.4	97.5	88.4	88.6	50.1	50.3	9.0	12.4	3.4	4.7	16.8	19.0	11.5	53.5
Medium (9-13 yrs)	89.6	83.6	96.1	98.2	84.5	83.5	56.8	55.3	40.3	57.7	49.6	40.2	46.8	42.9	38.1	35.0
Superior (14+ yrs)	85.4	75.0	100.0	90.9	85.6	86.4	66.2	77.5	59.6	56.6	46.1	47.2	70.6	80.8	67.9	51.2

Notes: Blank spaces data not available. Self-employed: Bolivia, Ecuador, Guatemala, Honduras and Paraguay in 2016. Brazil: several indicators are for 2017. Nicaragua: firm size for 2013.
Source: Authors' elaboration based on IADB (2019).

Minimizing inequality in the financing of Argentina's pension system: Modelling three scenarios

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Abstract One mechanism for influencing income redistribution through a pension system is to incorporate non-contributory financing. Using mathematic modelling tools, this study compares two arrangements for financing Argentina's pension system that emerged from an optimization exercise. One arrangement permits financing through income tax and the other does not. The former is found to be preferable in terms of equality and proves robust to changes in the investment rate and the inequality aversion parameter. The use of mathematical modelling tools by decision-makers with access to sufficient high-quality data would allow for a credible assessment of the extent to which a particular parametric reform might (or might not) contribute to improved income distribution.

Keywords pension scheme, income redistribution, social security financing, statistical analysis, Argentina

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Introduction

From an individual's point of view, the aim of a pension system is to facilitate consumption and provide income security. Yet from a government perspective, its objectives are more wide-ranging, including income redistribution and poverty relief (Barr and Diamond, 2009).

As per Mesa-Lago (2008), pension systems have at least two mechanisms for bringing about income redistribution: i) a financing model comprising active workers' individual contributions, employer contributions and general taxation, and ii) the universal lump-sum components of pension benefits. In terms of the former, redistribution can be helped or hindered depending on whether upper and lower limits are set on taxable income subject to proportional employee and employer contributions and whether more or less progressive taxes are used to fund the system.

Founded in the early twentieth century, Argentina's pension system is one of the oldest in Latin America. It is highly fragmented and stratified. The National Social Security Administration (*Administración Nacional de la Seguridad Social* – ANSES) is responsible for the country's main integrated pension scheme (*Sistema Integrado Previsional Argentino* – SIPA), as well as for special schemes, such as the one for teaching staff, differential schemes such as the one for construction workers, and schemes covering specific areas of activity such as domestic service. There are also 13 provincial schemes and 26 municipal ones (for public officials in the various jurisdictions), as well as 82 provident funds for self-employed professionals (ILO, 2019).

The SIPA was established at the end of 2008 following a decision to abolish the individual capitalization sub-system that had been introduced as part of the 1993 pension reform. As such, after 14 years of operating a mixed scheme combining pay-as-you-go (PAYG) and individual capitalization, a pure PAYG scheme was set up in 2009, with a compensation fund made up of the assets previously administered by the former private fund managers. Given that this fund cannot be used to cover current outlays, the benefits paid out to current pension system beneficiaries are financed through contributions made by active workers and their employers and general public taxation. This complex financing arrangement engenders redistributive effects that may – or may not – improve income distribution.

Benefits paid out under the general SIPA scheme consist of a lump-sum benefit plus a monthly pension with a replacement rate set at 45 per cent of pre-retirement income for all those who have contributed for 30 years and reached pensionable age (age 60 for women and age 65 for men) (Law 24,241, 1993; Law 26,425, 2008). The pensions are financed mainly through employee contributions equating to 11 per cent of gross salary (Law 24,241, 1993) and employer contributions that range from 10 to 12 per cent of gross salary, depending on whether they belong to the service sector or not (Law 25,453, 2001; Law 25,565, 2002). Self-employed workers pay in 27 per cent of their presumed income (Law 24,241, 1993) or 11 per cent of their gross income, according to whether or not they classify as "small contributors" *(monotributo)* (Law 24,977, 1998).

The system also receives funding from general taxation. Most of this funding comes in the form of consumption taxes: i) 11 per cent of the value added tax collected, ii) 100 per cent of the tax on diesel, iii) 21 per cent of the tax on other liquid fuels, iv) 100 per cent of the additional tax on cigarettes, v) 70 per cent of the *monotributo* (small contributor) tax and vi) 100 per cent of the tax on bank transactions – a levy that replaced, in 2017, the 20 per cent of income tax that had previously financed the system (Law 23,966, 1991; Law 27,430, 2017).

Several studies have set out to determine, from a range of perspectives and using various methodologies, whether Argentina's pension system is regressive or progressive. Drawing on micro-simulations and an intertemporal approach, Moncarz (2015) finds that the country's PAYG subsystem, in place between 1995 and 2003, was regressive, particularly for women working in the private sector. According to the author, this finding is significantly influenced by the fact that low-income workers are unlikely to achieve 30 years of contributions. For his part, Bertranou asserts that low-income workers generally obtain replacement rates higher than the value of their contributions, but the fact that the system is partially tax-funded in a context in which pension coverage is far from universal casts doubt on the system's overall distributive impact, "leading one to conclude that it cannot be progressive" (Bertranou, 2011, p. 300). As such, the financing of benefits for workers with a full record of formal employment through general taxes, most of which are levied on consumption, is, argues Bertranou et al. (2011), not only limited, but also inequitable. This situation led, in the first decade of the twenty-first century, to a series of measures known as the Pension Inclusion Plan (*Plan de Inclusión Previsional* – PIP), aimed at improving coverage. Arza (2012) believes that the PIP altered the distributive structure in favour of the poorest households. Bertranou et al. (2011) claim that, in addition to women, the main people to benefit from the PIP were those with a low level of education and those in the lowest income quintile. Pautassi, Giacometti and Gherardi (2011) draw the same conclusion, underlining that the proportion of older adults without coverage fell furthest in the lowest income quintiles.

Some authors have set out to assess the scale of the impact of some of the pension system's redistributive mechanisms by applying concentration indices. In this vein, Rofman and Olivieri (2011) conclude that income distribution would have been more unequal between 1992 and 2010 if it were not for the existence of the pension system. Similarly, Bertranou et al. (2012) state that the position of older adults in the income-distribution spectrum improved in the first decade of this century as their numbers dropped in the bottom quintile and rose in the third quintile. D'Elia (2013) observes that the PIP significantly increased coverage among the passive population, particularly among housewives of retirement age, thereby helping to reduce income inequality between 2006 and 2009. Lustig and Pessino (2014) come to a similar conclusion, affirming that Argentina's redistribution policies were especially prominent between 2006 and 2009 owing to the introduction of the PIP.

In their view, Rozenwurcel and Vázquez (2008) assert that the tax structure that underpins the financing of Argentina's pension system is inequitable as a result of its focus on consumption taxes. Cetrángolo and Gomez Sabaini (2007) agree, citing the fact that Argentina has never managed to establish a meaningful income tax and that taxes on assets have been low. In their view, the low reliance on income from the asset tax and the over-reliance on consumption taxes should be replaced by taxes that lead to a more stable, less distortive and more equitable structure (Rozenwurcel and Vázquez, 2008).

In light of the above, it is worth assessing a variety of contributory and non-contributory financing options for the Argentinian pension system, with a view to improving its distributive impact.

This study intends to explore to what extent Argentina's implementation of alternative contribution-rate, income-tax-rate and replacement-rate frameworks might have served to reduce inequalities in income distribution over the 2009–2019 period. To this end, a mathematical model has been developed to represent the functioning of the Argentinian pension system, its sources of contributory and non-contributory income and expenditure, and any resulting inequality in disposable income after all relevant transfers have taken place.

The model covers not only active and passive workers, but also their employers, who are responsible for paying wages and reinvesting in the production process in exchange for making a profit. Furthermore, it looks at both formal and informal workers. Before the model could be rolled out, data relating to 14 branches of economic activity had to be sourced from a number of different databases and organized, to construct the parameter matrices feeding into it.

Two alternative methods of financing Argentina's pension system were assessed for their impact on inequality. Both make recourse to salary-based employee and employer contributions, as well as to general taxation. They differ, though, in the use of so-called "income tax", which is permitted in one and not in the other. In both cases, rates of salary-based contributions and income tax (where applicable) are calculated through an exercise aimed at minimizing inequalities in disposable income and vary between economic sectors. Both of these approaches are then compared with a scenario that simulates the Argentinian pension system's existing financial model.

To measure inequality in income distribution between the various profiles of individuals belonging to the various branches of economic activity after the transfers intrinsic to the pension system have occurred, this study made use of the coefficient developed by Atkinson (1970). Atkinson put forward an alternative index to the traditional “Gini coefficient”, with mathematical properties making it compatible with a hypothetical social well-being function that depends on the resulting income distribution after transfers.

The use of modelling and mathematical optimization tools to support decision-making in the social security field is not new. Several projects have attempted to design models to optimize the performance of specific pension systems, often with a greater emphasis on reducing the deficit (Vidal-Meliá, Boado-Penas and Settergren, 2009; El Goumi, El Khomssi and Fikri, 2016), either by manipulating minimum retirement ages (Sayan and Kiraci, 2001; Heeringa and Bovenberg, 2012), the annual inflow of immigrants (Angrisani et al., 2012; Pianese, Attias and Vargas, 2014), employee and employer contribution rates (Alonso, Hoyo and Tuesta, 2014; Peng, Hsiao and Yao, 2016; Godínez-Olivares, Boado-Penas and Pantelous, 2016) replacement rates (Attias et al., 2016; Nepp et al., 2018), or by advocating a combination of parametric reforms such as raising the minimum retirement age and contribution rates rather than making structural changes to financing schemes (Madeiros García and Graça Lopes, 2009). To date, there have been no such studies looking at Argentina’s pension system.

This article is structured as follows. The next section outlines the proposed model, comprising an objective function and a series of constraints that are intrinsic to the functioning of the pension system and the structure of Argentina’s economy. The data sources consulted to calibrate each of the parameters are indicated and the proposed scenarios described. The results of the model are presented in subsequent sections, and an assessment is made about the sensitivity of these results to changes in the key parameters. Our conclusions are then presented.

Methodology

The model

The objective function (*FO*) to minimize (1) represents the mean concentration index (*IC*) in the period spanning from the first quarter of 2009, the year in which the pension system abandoned a mixed financing model in favour of a fully PAYG scheme, to the second quarter of 2019, the last for which a complete dataset is available.

$$FO = \frac{\sum_{t=1}^{T} IC_t}{T} \tag{1}$$

The concentration index[1] for each quarter t (2) depends on an achievement index (3) and the mean disposable income $y_{t,i,r}$ for each profile of agent i (employer, employee, retiree, informal employee and pensioner) in each of the 14 branches of economic activity r in each quarter (4).[2] The achievement index in turn depends on an inequality aversion parameter ε.

$$IC_t = 1 - \frac{A_t}{\mu_t} \qquad \forall t \tag{2}$$

$$A_t = \begin{cases} e^{\frac{\sum_{i=1}^{I} \sum_{r=1}^{R} \ln yd_{t,i,r}}{I * R}} & \text{si } \varepsilon \neq 1 \\ \left(\frac{\sum_{r=1}^{R} \sum_{i=1}^{I} yd_{t,i,r}{}^{1-\varepsilon}}{I * R} \right)^{\frac{1}{1-\varepsilon}} & \text{si } \varepsilon = 1 \end{cases} \qquad \forall t \tag{3}$$

$$\mu_t = \frac{\sum_{i=1}^{I} \sum_{r=1}^{R} yd_{t,i,r}}{I * R} \qquad \forall t \tag{4}$$

The decision variables used to manipulate the value of the objective function are the contribution rates $\tau_{t,i,r}$, income tax rates $\gamma_{t,i,r}$ and replacement rates ρ_t. It is important to note that both the contribution rates and the income tax rates can differ from one agent or economic sector to another.

The disposable income of each sector's agents is defined as gross income minus the effective income tax rate[3] (5).

$$yd_{t,i,r} = yb_{t,i,r} * \left(1 - \gamma_{t,i,r}\right) \qquad \forall t,\ \forall i,\ \forall r \tag{5}$$

1. Makdissi and Yazbeck (2015) proposed this simplified version of the Atkinson index (1970).
2. This article is supplemented by an extensive online Appendix (A.1–A.3) developed by the authors and made available to readers (see Supporting Information). See Table A.1.1 Branches of economic activity.
3. In reality, this tax is calculated by subtracting a series of deductions from the tax base (deductions that depend on family composition and other factors affecting individuals' ability to contribute) and then applying a series of rates (which vary according to the income bracket), all of which can be encapsulated in an effective rate expressed as a percentage of gross income.

The gross income equation differs according to agent type. In the case of employers[4] (*i=1*), mean gross income is the mean gross operating surplus by branch of activity, which depends on the Gross Value Added ($VABP_{t,r}$), the wage bill ($MS_{t,r}$) and the number of employers in each branch of activity and quarter ($N_{t,1,r}$). In turn, this operating surplus depends on the profit reinvestment rate ($\iota_{t,r}$), which for simplicity includes non-labour production costs, as well as the employer contribution rate ($\tau_{t,1,r}$) (6a).

$$yb_{t,1,r} = \frac{\left[VABP_{t,r} - \left(MS_{t,r} * \left(1 + \tau_{t,1,r}\right)\right)\right]\left(1 - \iota_{t,r}\right)}{N_{t,1,r}} \qquad \forall t,\ \forall r \qquad (6a)$$

For its part, the mean gross income of formal employees (*i=2*) is their salary[5] net of social security taxes (6b). These taxes comprise the employees' pension contribution rate ($\tau_{t,2,r}$) plus a 6 per cent charge to finance the main social insurance fund (3 per cent) and the retirees' welfare fund (3 per cent).

$$yb_{t,2,r} = \frac{MS_{t,r} * \left(1 - \tau_{t,2,r} - 0,6\right)}{N_{t,2,r}} \qquad \forall t,\ \forall r \qquad (6b)$$

The gross income of retirees (*i=3*) consists of a *Prestación Básica Universal* (Basic Universal Benefit – PBU_t) plus the pension replacement rate (ρ_t) for the salary in each branch of activity (6c). From this total, 3 per cent is deducted to finance the retirees' welfare fund.

$$yb_{t,3,r} = \left(PBU_t + \rho_t \frac{MS_{t,r}}{N_{t,2,r}}\right) * (1 - 0,03) \qquad \forall t,\ \forall r \qquad (6c)$$

To complete the income picture, two other types of agent are included: informal employees (*i*=4) and pensioners (*i*=5). The former earn an informal wage (6d) that is a proportion (π_4) of the disposable income enjoyed by their formal counterparts, and the latter receive a pension (6e) that is a proportion (π_5) of the disposable income of retirees. For the sake of simplicity, it is assumed in both cases that disposable income equates to gross income and that neither is subject to income tax.

4. For the purposes of simplicity, each "employer" is assumed to be an individual.
5. It should be noted that the salary does not include supplementary payments, such as family allowances.

$$yd_{t,4,t} = yb_{t,4,r} = \pi_4 * yd_{t,2,r}, \tag{6d}$$

$$yd_{t,5,r} = yb_{t,5,r} = \pi_5 * yd_{t,3,r}, \tag{6e}$$

Every individual spends a proportion of their disposable income (7), which depends on two parameters, ϕ and υ. The functional form of this equation implies that the proportion of spent income to total income diminishes as income increases. This equation illustrates the possibility of a more-than-proportional increase in spending on the part of low-income individuals in the event of tax cuts. The total spend per quarter is the sum of all individuals' spending (8).

$$pc_{t,i,r} = \upsilon * yd_{t,i,r}{}^{-\phi} \qquad \forall t,\ \forall i,\ \forall r \tag{7}$$

$$C_t = \textstyle\sum_{r=1}^{R}\sum_{i=1}^{I} pc_{t,i,r} * yd_{t,i,r} * N_{t,i,r} \qquad \forall t \tag{8}$$

Eleven per cent of the value added tax (*IVA*) collected, at a rate of 21 per cent, goes towards financing the pension system (9). This figure is incorporated in the price of the goods purchased in variable C_t.

$$IVA_t = 0{,}11 * 0{,}21\left(\frac{C_t}{1+0{,}21}\right) \qquad \forall t \tag{9}$$

Twenty per cent of the income tax (*ganancias*) collected goes towards financing the pension system (10). In the case of informal employees and pensioners, the tax rate is zero.

$$ganancias_t = 0{,}2 * \textstyle\sum_{i=1}^{I}\sum_{r=1}^{R} yb_{t,i,r} * \gamma_{t,i,r} * N_{t,i,r} \qquad \forall t \tag{10}$$

where $\gamma_{t,i,r} = 0,\ \forall i = 4;\ 5$

Finally, the other consumption taxes (*OTROS*) that help to finance the pension system are included as a proportion of the *IVA* collected (11).

$$OTROS_t = recotros_t * IVA_t \qquad \forall t \tag{11}$$

The pension system deficit (*def*) equates to the contribution deficit (*defcont*) minus the taxes that are specifically earmarked to finance the system (12).

$$def_{\mathrm{t}} = defcont_t \; - \; IVA_t \; - \; ganancias_t \; - \; OTROS_t \qquad \forall t \qquad (12)$$

The contribution deficit is the difference between expenditure (*egr*) and contributory income (*ingrcont*) (13). The expenditure is the sum of the retirement benefits and pensions paid out by the system (14). The contributory income is the sum of all the salary-based contributions plus self-employed workers' contributions (*ind*) which, given their insignificance to the overall budget, are expressed as a percentage of employees' contributions (15).

$$defcont_t = egr_t \; - \; ingrcont_t \qquad \forall t \qquad (13)$$

$$egr_t = \textstyle\sum_{i=1}^{I}\sum_{r=1}^{R} yd_{t,i,r} * N_{t,i,r} \qquad \forall t, \; \forall i = 2;\, 5 \qquad (14)$$

$$ingrcont_t = \textstyle\sum_{r=1}^{R} MS_{t,r} * \left(0.45 * \tau_{t,1,r} + \tau_{t,2,r}\right) * (1 + ind_t) \qquad \forall t \qquad (15)$$

The final two equations show the deficit (16) and the contribution deficit (17) in US dollars (dividing by the nominal exchange rate tcn_t), brought up-to-date using a discount rate (δ).

$$DEFT = \textstyle\sum_{t=1}^{T} \frac{\frac{def_t}{tcn_t}}{(1+\delta)^t} \qquad (16)$$

$$DEFTCONT = \textstyle\sum_{t=1}^{T} \frac{\frac{defcont_t}{tcn_t}}{(1+\delta)^t} \qquad (17)$$

Data sources and parameter values

When it came to data sources, given the lack of coordination between ministries and public agencies, it was necessary to consult multiple and heterogeneous sources.

The Gross Value Added by branch of economic activity – defined as the sum of employee salaries, gross mixed income, net operating profit, consumption of fixed capital, and taxes net of production subsidies – was obtained from the *Instituto*

Nacional de Estadísticas y Censos (National Institute of Statistics and Censuses – INDEC) (INDEC, 2016).

The wage bill as well as employer and employee numbers by branch of economic activity were taken from the social security bulletins produced by the Federal Administration of Public Resources (*Administración Federal de Ingresos Públicos* – AFIP).[6]

Retiree and pensioner numbers for 2009 to 2012 were obtained from the statistical social security bulletins drawn up by the Ministry of Labour, Employment and Social Security (MTEySS). For the 2013–2019 period, they came from open National Social Security Administration (*Administración Nacional de la Seguridad Social* – ANSES) data, which also provided the value of the Basic Universal Benefit over the whole period.

The number of informal workers and their income vis-à-vis that of formal workers was extracted from the *Encuesta Permanente de Hogares* (Permanent Households Survey – EPH), a quarterly survey of urban centres with more than 500,000 inhabitants carried out at the national level by the INDEC.

Detail of the contributions, value added tax, income tax and other taxes collected was sourced from the comparative files produced by the AFIP.

Finally, the nominal exchange rate was taken from *Banco Central de la República Argentina* (Central Bank of Argentina – BCRA) statistics, and the tax rates and proportions thereof used to finance the pension system emerged from a review of the relevant legal literature (Law 23,966, 1991; Law 24,241, 1993; Decree 649, 1997; Law 25,453, 2001; Law 25,565, 2002).

The investment rate (required to calculate employers' gross income) was assumed to be 20 per cent (Coremberg et al., 2007) and a subsequent sensitivity analysis was carried out to assess how sensitive the results might be to substantial changes in this parameter.

Following the lead of Makdissi and Yazbeck (2015), the value of the inequality aversion parameter (part of the achievement index) was taken to be 1. However, a sensitivity analysis was used to assess how sensitive the results might be to changes in this value.

The ϕ and υ parameters of the "propensity to consume" function were calibrated assuming the observed level of benefit payments (according to ANSES) and observed employee and employer contribution rates (according to AFIP), and by matching the value added tax and income tax collected (on the basis of the model) to those observed at each point in time (according to AFIP).

6. Between 2014 and 2019, it was necessary to adapt the branches of economic activity set out in MERCOSUR's 2011 *Clasificación de Actividades Económicas para Encuestas Sociodemográficas* (Classification of Economic Activities for Sociodemographic Surveys – CAES) to those of the 2001 CAES, as used by the INDEC throughout the entire period.

Although income tax rates are a decision variable, in order to compare a number of hypothetical scenarios with the current situation, in certain calculations it was necessary to look at their observed values. As such, the observed income tax rates applying to each worker and pensioner were derived from the deductions permitted for a single, childless taxpayer and the income brackets in effect each year (Decree 1,426, 2008; Law 26,731, 2011; Decree 244, 2013; Decree 2,354, 2014; AFIP, 2016).[7,8]

Scenarios analysed

By specifying different values for the mathematical model's parameters, it is possible to simulate or optimize a range of situations or "scenarios". On the basis of the mathematical model outlined above, three scenarios (E0, E1 and E2) were defined in this study.

In each of these scenarios, "observed values" refer to the values obtained from the aforementioned data sources and "optimal values" refer to the values that result following resolution of the problem.

Scenario E0 represents the status quo. It is a simulated scenario in the sense that the resolution algorithm need only identify the value of certain calculated variables, given that the values of both the parameters and the decision variables (contribution rates $\tau_{t,i,r}$, income tax rates $\gamma_{t,i,r}$ and replacement rates ρ_t) are already fixed. The values of the decision variables in this scenario are the observed values, with the sole exception of the income tax rates paid by employers in each branch of economic activity. These were calibrated through an optimization process using the same model. More specifically, rates that would minimize inequality were sought for each sector, matching the revenue generated to the observed revenue.

In E1, the value of the "propensity to consume" function parameters calibrated in E0 is retained, but income tax is withdrawn completely and employee and employer contribution rates are given the freedom to assume any value from 0 to 0.11 for the former and 0 to 0.27 for the latter, the maximum limits permitted under the cited laws. At the same time, system expenditure is given free rein, with the replacement rate allowed to take any value between 0 and 0.45 – the upper limit for all retirees who are legally entitled to claim the Basic Universal

7. This article is supplemented by an extensive online Appendix (A.1–A.3) developed by the authors and made available to readers (see Supporting Information). See Table A.2.1. Notional income tax rates for each period; and Table A.2.2. Evolution of the income-tax-free minimum.

8. The only deductions taken into account are the tax-free minimum and the *deducción especial* (special deduction). No other deduction (for example, medical expenses, mortgage interest, domestic staff, etc.) was included in the calculation of observed rates.

Benefit,[9] having contributed for 30 years. Finally, an additional constraint – that of zero deficit – is imposed. E1 is an optimization scenario, in which the rates can have multiple possible values and the model's resolution algorithm must find the combination that achieves the lowest possible mean value on the Atkinson index (respecting the model's remaining constraints).

Lastly, E2 is another optimization scenario since it is identical in almost all respects to E1 (including the zero-deficit condition). The only difference lies in the fact that income tax rates are allowed to assume any value between 0 and 0.35, in the hope of finding a solution that further reduces the objective function.

It is naturally anticipated that replacing a progressive income tax with a regressive one will have a negative impact on the equitable financing of the pension system. The desire to test this hypothesis lies behind the choice of these three scenarios.

The mathematical modelling and optimization software General Algebraic Modeling System (GAMS), version 24.2.3, was used to solve the constrained optimization problem, and CONOPT3 for nonlinear programming models, version 3.15P, was selected as the solver. The parameter matrices, vectors and scalars[10] were created using version 3.6 of the R software.

Results

Figure 1 shows the quarterly evolution of the Atkinson index between 2009 and 2019, assuming the observed employee and employer contribution rates and income tax rates paid by workers and retirees, the observed value added tax and income tax generated, the observed pension system expenditure, and a reinvestment rate of 20 per cent. This scenario (E0) aims to simulate the pension system's observed financing model.[11] As shown, the concentration index oscillated between 0.992 and 0.994 – values that are, incidentally, extremely high.

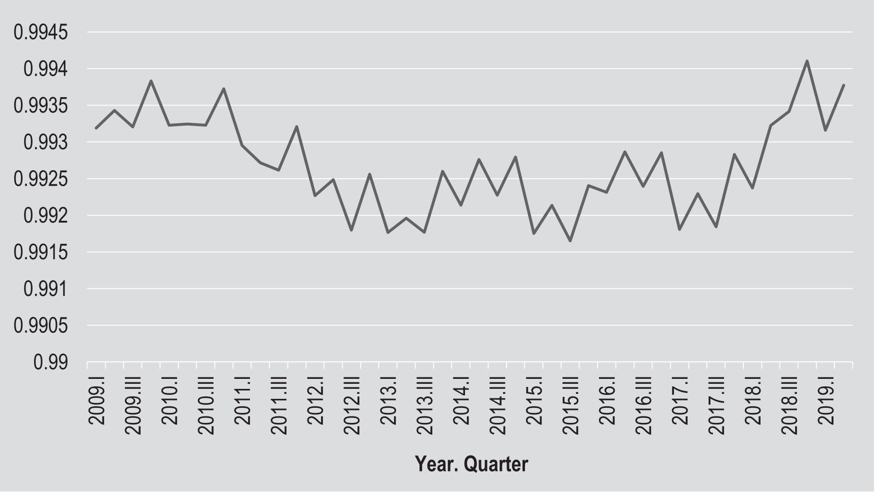
Although Law 24,241 (1993) obliges employed workers to contribute 11 per cent of their salary to SIPA, observed employee contribution rates between 2009 and 2019 ranged from the 7 per cent paid by workers in activity branch B ("Mining and quarrying") to the 13 per cent paid by those in branch G

9. So as not to further complicate the analysis, the fact that many current retirees have not accessed the Basic Universal Benefit by virtue of meeting the criterion of 30 years of contributions as set out in Law 24,241 (1993), but instead as beneficiaries of the PIP (Law 24,476, 1995; Decree 1,454, 2005; Law 26,970, 2014), has been overlooked.

10. This article is supplemented by an extensive online Appendix (A.1–A.3) developed by the authors and made available to readers (see Supporting Information). See Appendix 3. Parameters.

11. As mentioned in the Methodology section, in this scenario the income tax rates paid by employers emerged from an optimization exercise aimed at minimizing inequality. Since this was not the case in reality, it can be assumed that this scenario underestimates the true level of inequality during the period under analysis.

Figure 1. *Atkinson index for disposable income (E0-simulation)*



Source: Authors' elaboration.

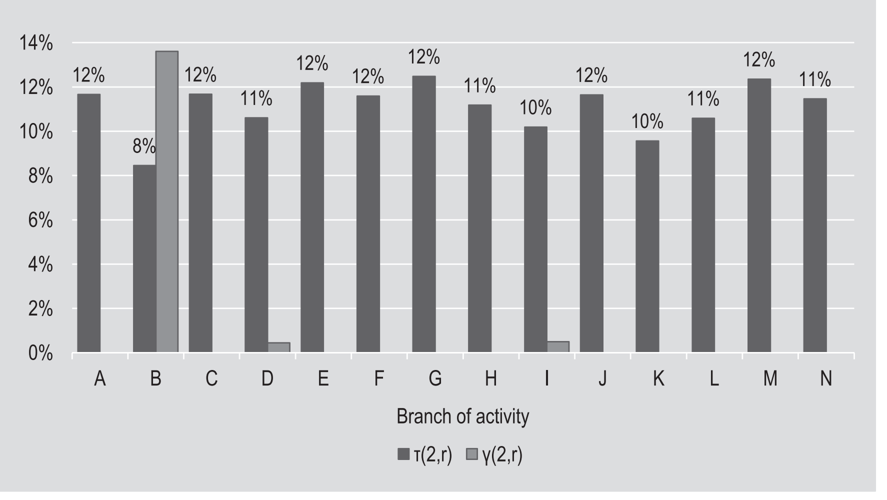
("Hotels and restaurants"). Regardless, given the income tax deductions available to employees each year, the only workers who paid income tax were those in branches B ("Mining and quarrying"), D ("Electricity, gas and water") and I ("Financial intermediation").

Figure 2 shows, for each branch of economic activity, the mean quarterly employee contribution rate for the period under analysis,[12] as well as, for the same period, the mean rate of income tax that employees in the three branches of economic activity subject to this tax would have paid under scenario E0.

Since branch B workers have the highest per-capita wage bill and branch G workers the lowest, the structure of employee contribution rates appears suboptimal in E0. Similarly, law 25,453 (2001) and law 25,565 (2002) set out that employers in branches of activity pertaining to service provision must contribute 27 per cent of their employees' salaries, while other employers contribute just 23 per cent – of which only 12.71 per cent and 10.17 per cent, respectively, go towards financing the pension system (ANSES, 2011). This said, due to the existence of special regimes and numerous provisions aimed at reducing employers' contributions, observed contribution rates between 2009

12. This is the quotient between the wage bill declared to the AFIP and the value of the employee contributions collected in each branch. Divergences from the legally established contribution rate (of 11 per cent) may have multiple causes, such as the existence of sector-specific legislation or temporary contribution-reduction plans.

Figure 2. *Formal employees' mean contribution and income tax rates by branch of activity (E0-simulation)*



Source: Authors' elaboration.

and 2019 ranged from the 7 per cent paid by employers in activity branch L ("Teaching") to the 19 per cent paid by employers in branch E ("Construction").

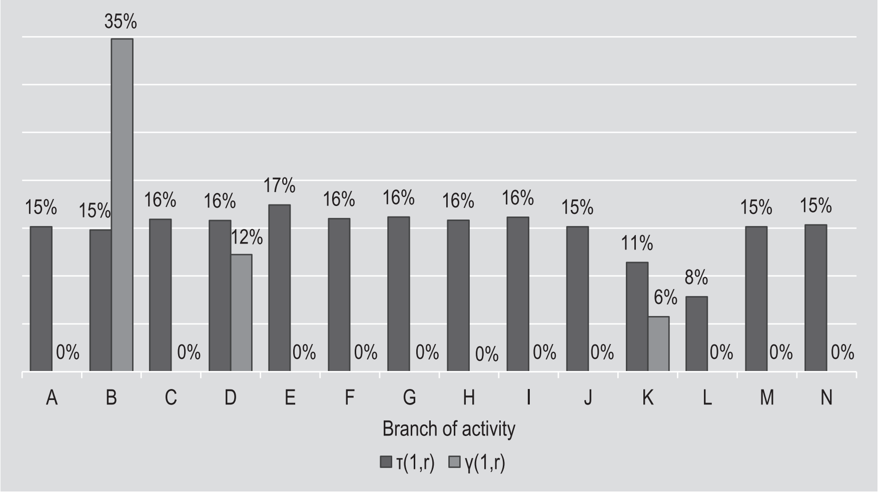
Figure 3 shows the mean quarterly employer contribution rates observed during the 2009–2019 period, as well as the simulated income tax rates to which employers would have been subject under scenario E0.

It is worthy of comment that, although law 24,241 (1993) and law 26,425 (2008) entitle retirees in receipt of the Basic Universal Benefit the equivalent of 45 per cent of their mean pre-retirement income, the observed replacement rate between 2009 and 2019, taking into account the observed level of expenditure, would not have exceeded 30 per cent. This may be down to the fact that a significant proportion of beneficiaries claimed a benefit through the PIP, replacing income that was likely lower than that of formal employees.

In this context, a question to answer is whether optimizing the structure of employee and employer contribution rates across the different branches, as well as that of income tax rates and the replacement rate offered to retirees, would serve to reduce the inequality observed, given the presumed parameter values. Table 1 provides an overview of the resulting objective function values, contribution deficits and overall deficits, shown in billions of US dollars, under scenarios E0, E1 and E2.

Given the lower value of the objective function in scenario E2, it can be deduced that, from an equality perspective, it would be helpful to introduce income tax as a

Figure 3. *Employers' mean contribution and income tax rates by branch of activity (E0-simulation)*



Source: Authors' elaboration.

Table 1. *Results of the interest variables across the various scenarios*

Variable	E0 (simulation)	E1 (optimization)	E2 (optimization)
Objective function	0.993	0.993	0.987
Contribution deficit	104,371	69,936	513,260
Total deficit	-24.615	0 (constraint)	0 (constraint)

Notes: In E0, the deficits and objective function values are simulated based on the actual observed values of $\tau(i, r)$, $\gamma(i, r)$ and ρ. E1 imposes $\gamma(i, r)=0$ i, r, obtaining optimal values for $\tau(i, r)$ and ρ. In E2, optimal values are obtained for $\tau(i, r)$, $\gamma(i, r)$ and ρ.

Source: Authors' elaboration.

source of financing, optimizing the various rates. In other words, regardless of the employee and employer contribution rates set for each branch of economic activity, a more equitable system would result from a focus on improving the structure of income tax rates. This is not surprising if one considers that contribution rates apply exclusively to salaries, while income tax rates apply to all forms of income, both employees' and employers', ultimately taking into account the added value of what is produced by society as a whole.

In E1, all employers would have paid 27 per cent of their wage bill every quarter, while employees in the various branches of economic activity would have paid the mean contribution rates shown in Figure 4.

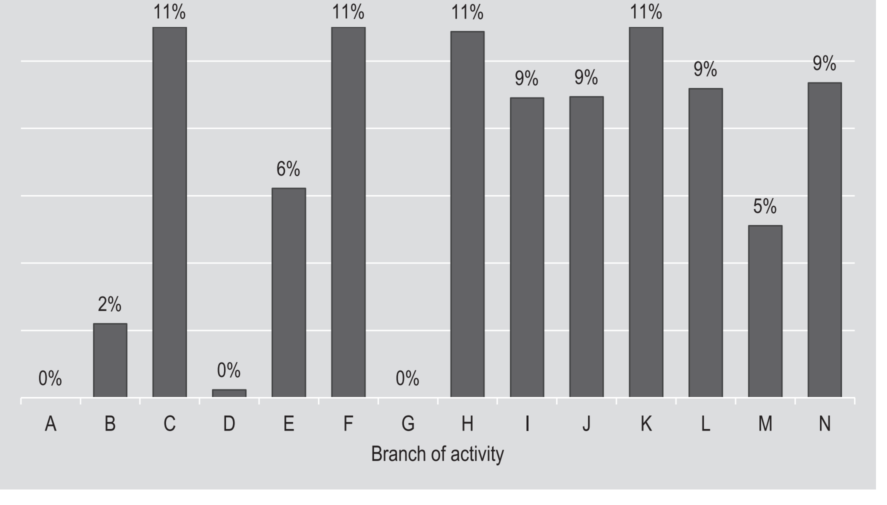
During the period under analysis, the revenue collected from these sources and that stemming from consumption taxes (equivalent to 69.936 billion US dollars) would have financed a mean replacement rate of 27 per cent. Generally, rates paid by workers have gone up between 2009 and 2019, while the replacement rate has gone down, with no significant reductions in the Atkinson index each quarter.

However, in E2, employers in each branch of activity would have paid the mean income tax and employer contribution rates shown in Figure 5.

Likewise, in E2, no worker or retiree would have paid income tax, the contribution rate would have been zero for all workers throughout the entire period, and all retirees would have received a replacement rate of 45 per cent each quarter. Consumption taxes and income tax would have covered some 513.260 billion US dollars of pension expenditure.

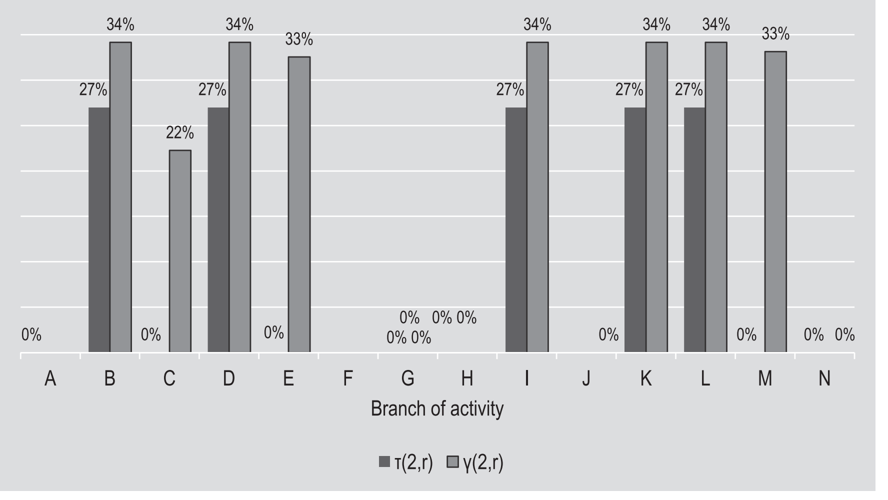
With a view to assessing the sensitivity of these results to changes in the values of the more uncertain parameters, two sensitivity analyses were carried out: the first on the investment rate, and the second relating to the degree of inequality aversion in Argentinian society.

Figure 4. *Formal employees' mean contribution rates by branch of activity (E1-optimization)*



Source: Authors' elaboration.

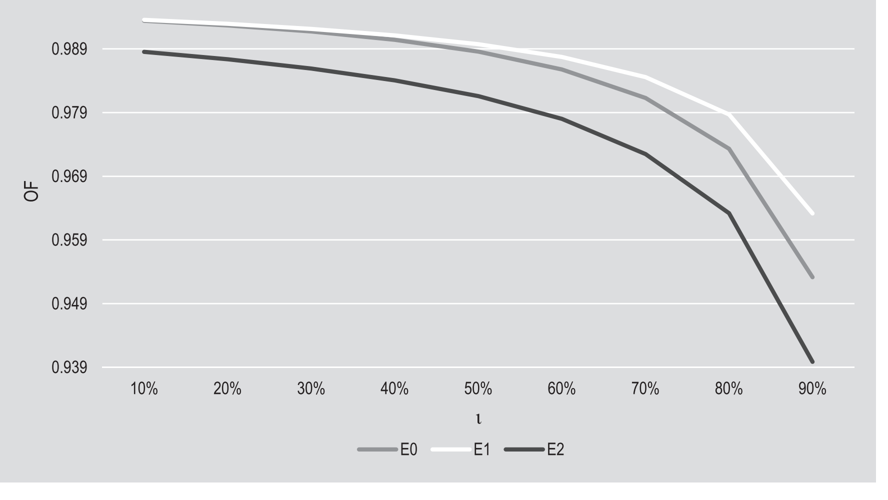
Figure 5. *Employers' mean contribution and income tax rates by branch of activity (E2-optimization)*



Source: Authors' elaboration.

Figure 6 shows, for the three aforementioned scenarios, the impact on the objective function of altering the value of the reinvestment rate between 10 per cent and 90 per cent.

Figure 6. *Objective function results for each scenario*



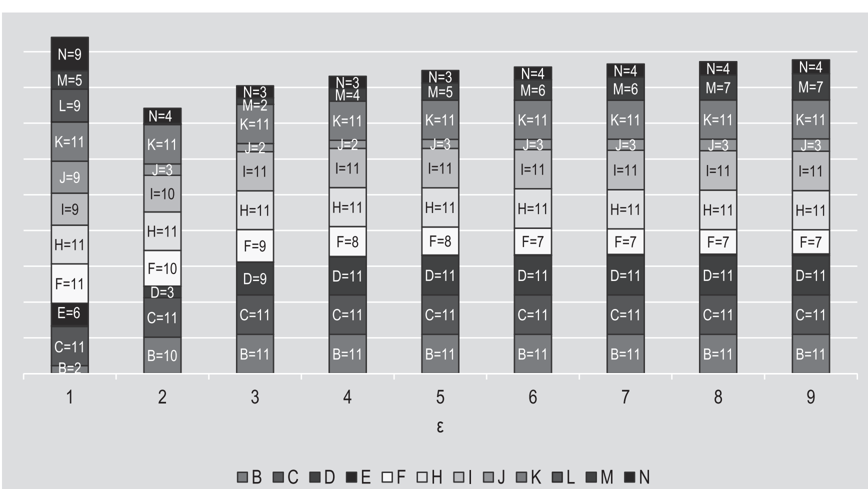
Source: Authors' elaboration.

It is notable that, at lower investment rates, scenarios E0 and E1 do not differ greatly in terms of inequality. Yet as the investment rate increases, the gap between these two scenarios widens, with E0 showing less inequality. This finding probably owes itself to the fact that, although employee and employer contribution rates and the replacement rate are freed up in E1, the removal of income tax, despite its initial suboptimal design, increases inequality, cancelling out the effect of optimizing the replacement rate and the contribution rates. However, whatever the investment rate, E2 always outperforms the other two scenarios in equality terms. This is because complementing the semi-contributory financing model based on regressive consumption taxes and employee and employer salary contributions with a progressive tax on all types of income would allow workers and retirees to secure a greater share of the value generated by society as a whole.

To conclude, we looked at how the E1 and E2 results might alter in response to changing levels of inequality aversion, as depicted by parameter ε. Figure 7 shows how, in E1, the optimal mean employee contribution rates vary in line with different ε values. For their part, the optimal mean employer contribution rates remain constant at 27 per cent, regardless of the value of ε.

It can be observed that moving from a value of $\varepsilon = 1$ to that of $\varepsilon = 2$ brings about a change in the functional form of the achievement index, as represented

Figure 7. *Formal employees' mean contribution rates* by branch of activity (E1-optimization)(percentage)*

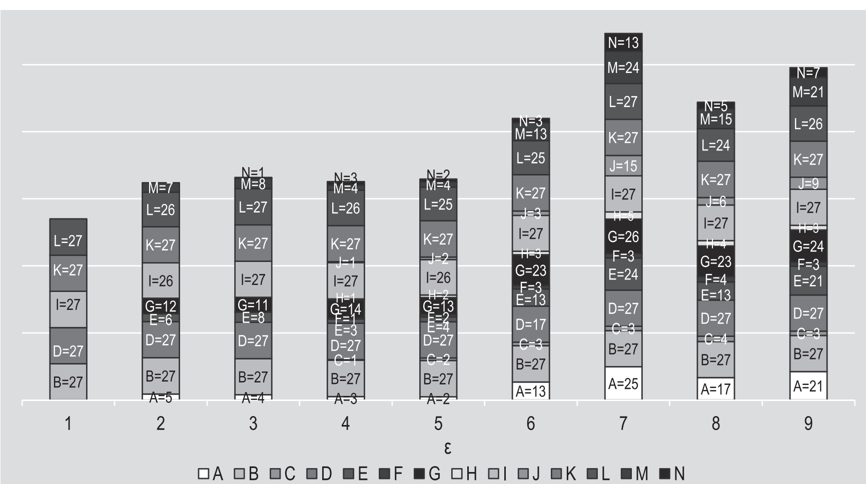


Note: *Zero values omitted.
Source: Authors' elaboration.

by equation 3. As a result, the overall burden on formal employees drops sharply, but subsequently begins to rise in line with an increase in ε. More specifically, mean employee contribution rates go up in branches B ("Mining and quarrying"), D ("Electricity, gas and water"), I ("Financial intermediation") and, to a lesser extent, M ("Social and health services"). The mean employee contribution rates in branches E ("Construction"), F ("Trade and repairs"), J ("Real-estate, business and rental activities"), L ("Teaching") and N ("Other") go down. The mean employee contribution rates remain stable in all other branches as ε increases. This results in higher taxation of formal employees with a higher gross income per capita and lower taxation of those with a lower gross income per capita as inequality aversion increases. In other words, the greater the degree of inequality aversion, the less tolerable income disparities between employees become, which could lead to a redefining of contribution rates in certain branches of economic activity. For its part, the mean replacement rate for the period falls from 27 per cent to 24 per cent as the ε value goes from $\varepsilon = 1$ to $\varepsilon = 2$, remaining in this ballpark at higher ε values.

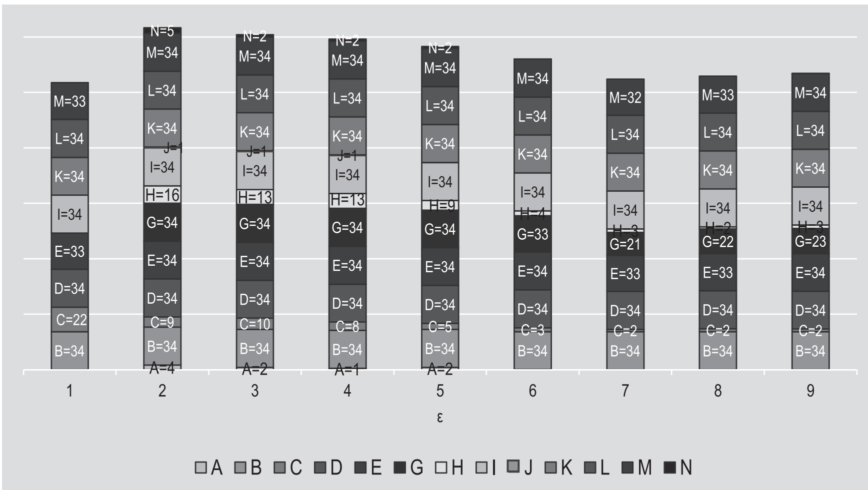
Finally, Figure 8 shows how mean rates of employer contributions might vary by branch of economic activity in E2 in line with different ε values, and Figure 9 depicts how mean employer income tax rates might vary by branch of economic activity as this parameter increases. Regardless of the value of ε, all workers

Figure 8. *Employers' mean contribution rates* by branch of activity (E2-optimization) (percentage)*



Note: *Zero values omitted.
Source: Authors' elaboration.

Figure 9. *Employers' income tax rates* by branch of activity (E2-optimization) (percentage)*



Note: *Zero values omitted.
Source: Authors' elaboration.

would be exempt from income tax, and those belonging to branches B ("Mining and quarrying"), D ("Electricity, gas and water") and I ("Financial intermediation") would only pay employee contributions of between 1 per cent and 2 per cent from $\varepsilon = 6$ onwards.

It can be noted that as inequality aversion increases, so too does the overall financing burden on employer contributions, until this peaks at $\varepsilon = 7$, from which point it begins to fall again. More specifically, the contribution rates applying to branches A ("Agriculture, livestock, hunting, forestry and fishing"), E ("Construction"), G ("Hotels and restaurants") and M ("Social and health services") rise considerably. The contribution rates applying to branches C ("Manufacturing"), F ("Trade and repairs"), H ("Transport and communications"), J ("Real-estate, business and rental activities") and N ("Other") increase more marginally. The employer contribution rates in all other branches remain more or less stable and at their maximum value. In other words, as inequality between employers and non-employers (i.e. the rest of society) becomes less tolerable (the greater the degree of inequality aversion), the greater the burden faced by employers in terms of employer contributions, including in the branches with a lower gross operating surplus.

Finally, the income tax burden on employers increases dramatically when moving from $\varepsilon = 1$ to $\varepsilon = 2$, from which point it begins to fall again. More specifically, the most obvious effect of a rising aversion to inequality is a reduction in the tax burden on employers in branch C ("Manufacturing") and an increase on those in branch G ("Hotels and restaurants"). In certain other branches, such as A ("Agriculture, livestock, hunting, forestry and fishing"), J ("Real-estate, business and rental activities") and N ("Other"), income tax rates increase at mid-range ε values, but then return to their $\varepsilon = 1$ values. As for the replacement rate, this peaks at $\varepsilon = 4$, with some retirees finding themselves subject to income tax from this level of inequality aversion onwards.

Conclusions

This study finds that eliminating income tax as a source of non-contributory pension system financing is not advantageous if the decision-maker's objective is to reduce inequality in financing, even if employee and employer contribution rates are structured optimally. Income disparities increase in the two scenarios in which income tax either does not feature or is suboptimally defined.

It concludes that, from an equality standpoint, it is preferable to supplement contributory sources of pension system financing with the collection of income tax, assuming that income tax rates result from an optimization process to minimize inequalities in disposable income after the transfers inherent in the system have taken place. This is clearly due to the fact that, while employee and employer contribution rates apply to the wage bill, income tax rates apply to the gross income of all agents – not just employees – thereby permitting workers and retirees to secure a greater share of the value generated by society as a whole.

It should be noted that, while introducing income tax does reduce inequality, the constraints imposed by pension law and tax law mean that this reduction is limited to a mere 0.6 per cent on the baseline scenario. Greater reductions in inequality are only possible by imposing employer contributions in excess of 27 per cent and/or setting income tax rates of more than 35 per cent, or indeed raising retirees' replacement rates above 45 per cent, figures that stem in all cases from the relevant legislation. As such, this study was designed to test strictly conservative scenarios to assess the extent to which income distribution could be improved through parametric reforms, without making radical changes.

It is also evident that these results do not change with variations in the investment rate, a parameter that, in line with Coremberg et al. (2007) and in the absence of more detailed information, was fixed at 20 per cent across all branches of economic activity. Nonetheless, it would be beneficial to carry out a deeper sensitivity analysis on a range of investment rate values by branch of economic activity, since assuming a flat rate across all branches could be subject to criticism. Similarly, this study assumes that each employer is a single individual, when in practice there could be multiple partners. This could mean that it overestimates inequality based on the present presumptions. In this regard, the lack of publicly available data on these parameters rather limits the scope of a deeper analysis.

Finally, the study evaluated how the results might be affected by changes in the degree of inequality aversion present in society. It was found that, as levels of aversion rise, there is less tolerance for income disparities between employees, which makes it necessary to levy higher income taxes on employees working in branches of activity with higher per capita income. Likewise, a growing aversion to inequality also leads to the system leaning more heavily on employers in terms of their own contributions and income tax, as there is less tolerance for inequality between employers, workers and retirees.

One shortcoming of this analysis is that it draws on mean salary values and production values by branch of activity, sidestepping through a lack of data the likely income heterogeneity within each branch. Neither does it explicitly look at the fact that a number of pension moratoriums have shifted income from employers and formal workers to informal workers. As such, while various authors agree that the PIP has had a positive impact on income distribution beyond incentivizing the update of formal employment, it could have been designed in such a way as to identify sources of finance that reduced inequality further still. Unfortunately, a lack of information about the employment history of moratorium beneficiaries makes it impossible to broaden the analysis to measure the impact of this plan with any degree of precision.

In spite of the aforementioned shortcomings, this type of exercise can play an extremely useful role in pension decision-making. The use of mathematical modelling and optimization tools, combined with access to sufficient high-quality data, allows an assessment to be made of the extent to which a particular parametric reform might (or might not) contribute to improved income distribution.

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Corrigendum: What are the effects of cash transfers for refugees in the context of protracted displacement? Findings from Jordan

In Hagen-Zanker et al., 2018, the acknowledgements were incomplete. They should be:

This journal article draws on the ODI report: **Hagen-Zanker, J. et al.,** 2017. *Cash transfers for refugees. The economic and social effects of a programme in Jordan*. London, Overseas Development Institute. Thank you to the many Syrian refugees and key informants who participated in this study, and to Aya Consultancy for coordinating and conducting the fieldwork. Many thanks to Zina Nimeh and Hanna Roeth, who conducted a mapping of social protection and humanitarian assistance in Jordan; and in particular Zina Nimeh also provided additional context and advice. Thanks also to colleagues who provided valuable feedback during the research and to Markus Loewe and Fabio Veras Silva for feedback on an earlier draft of this article. All remaining errors are our own.

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Hagen-Zanker, J.; Ulrichs, M.; Holmes, R. 2018. "What are the effects of cash transfers for refugees in the context of protracted displacement? Findings from Jordan", in *International Social Security Review*, Vol. 71, No. 2.