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- Informal workers and Kenya’s National Hospital Insurance Fund: Identifying barriers to voluntary participation
- Special pension schemes for workers in arduous and hazardous jobs: Functions and conditions to ensure equal treatment

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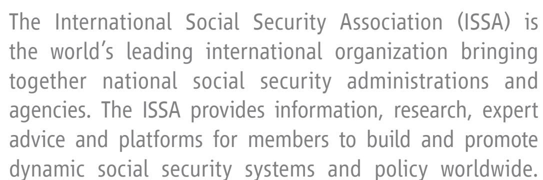

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VOLUME 76 | NUMBER 1
JANUARY–MARCH 2023

International Social Security Review

Editorial 3

Social security coverage for couriers who work through digital platforms in Mexico: A role for a special scheme?
Víctor G. Carreon-Rodríguez, Mauricio F. Coronado-García and Miguel A. Guajardo-Mendoza 5

Curbing the demographic "drifting dune" in long-term care insurance financing: The case of Germany
Lewe Bahnsen and Florian Maximilian Wimmesberger 35

The 2022 Greek pension reform: The rebirth of carve-out privatization in Eastern Europe
Nikola Altiparmakov 57

Informal workers and Kenya's National Hospital Insurance Fund: Identifying barriers to voluntary participation
Raphael Indimuli, Nina Torm, Winnie Mitullah, Lone Riisgaard and Anne W. Kamau 79

Special pension schemes for workers in arduous and hazardous jobs: Functions and conditions to ensure equal treatment
Sergio Mittlaender 109

Book review 127

In memoriam 131

Acknowledgements 139

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Editorial

The Book Review section is a core element of the *International Social Security Review* (*ISSR*), contributing to the sharing of knowledge internationally concerning key issues in the design and delivery of national social security systems and programmes. In recent years, the Book Review section has been diligently supported by the work of Hedva Sarfati, to whom this journal expresses it heartfelt thanks.

Beginning with this first issue of Volume 76 (2023), the *ISSR* is delighted to welcome Dr Silvia Borzutzky in her role as the journal's Book review editor.

Dr Borzutzky is Teaching Professor of Political Science and International Relations at Heinz College of Information Systems and Public Policy, Carnegie Mellon University, Pittsburgh, United States of America, and has published extensively in the fields of social security and social assistance.

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Social security coverage for couriers who work through digital platforms in Mexico: A role for a special scheme?

Víctor G. Carreon-Rodríguez,
Mauricio F. Coronado-García and
Miguel A. Guajardo-Mendoza

National Laboratory for Public Policy, CIDE, Mexico; Secretariat for Equality and Inclusion Cabinet, Government of Nuevo León, Mexico; El Colegio Mexiquense, Mexico

Abstract The socio-demographic characteristics of couriers who work through digital platforms in Mexico reveal that more than 85 per cent of these workers have completed full-time secondary education and 83 per cent of these workers are young (aged 14 to 44). However, only 25 per cent are covered for health services and social security benefits. Against this backdrop, and guided by international experience, we set out a proposal to provide these workers with a tailored package of social security benefits. The proposal would require to categorize couriers who work through digital platforms as "digital workers", introduce a special scheme for these workers based on voluntary affiliation, and offer a specific portfolio of benefits.

Keywords platform workers, gaps in coverage, social security legislation, social protection, social security schemes, Mexico

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Introduction

This article seeks to contribute to the literature concerning digital platform delivery workers and their access to social security benefits and does so in relation to the case of couriers who work through digital platforms in Mexico. Technological advances based on artificial intelligence (AI) and data science have modified business models. Multi-sided digital platforms (MSDPs)[1] permit consumers to acquire almost any product without face-to-face interaction with suppliers. Owing to these "disruptive technologies" (Cabrero Mendoza, Carreon Rodríguez and Guajardo Mendoza, 2020), national economies are experiencing an accelerated pace of technological change, one that has often moved beyond the present reach of regulatory schemes related to labour markets and social security coverage.

Legal frameworks on competition, tax, and labour regulation, among others, have not advanced at the same pace as these technological innovations. It is thus essential to evaluate current developments in these markets to design public policies to realize the greatest possible social gain without hindering incentives for innovation and technological development. In this context, market architecture must be adapted to assure that maximum efficiency is reached. Guajardo Mendoza et al. (2021) show that digital platforms induce higher added value and that, in the Mexican restaurant sector, delivery workers earn higher incomes. Despite increases in income security experienced by these workers, there is an ongoing important debate about the labour status of these workers and their access to social security benefits.

There is consensus that delivery workers should have access to social security benefits. However, there is no agreement on how this goal should be achieved, not least because an important factor often associated with being engaged in this form of work is the perceived freedom and flexibility that this confers to the workers (for a discussion, see Bensusán and Santos, 2021). In some countries, extending coverage to these workers has been sought through the means of traditional social security schemes. However, this approach has shown to be unsatisfactory given that work intermediated by MSDPs does not conform with assumptions regarding stability of employment and a subordinate labour market status, which conventionally contribute to defining the right of workers as employees to coverage under traditional social security schemes (Schoukens, 2021). In turn, social security schemes for independent or self-employed workers have also been shown to be insufficient to extend coverage to workers engaged in these new forms of work (Schoukens, 2021), because there is no guarantee that such work will be conducted with a necessary degree of regularity. Moreover, some delivery

1. IGI Global defines MSDPs as an intermediary to connect two or more mutually dependent groups of users (e.g. sellers and buyers) with shared economic objectives.

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workers only work through one digital platform, which makes it difficult to satisfy the definition of being self-employed and thus not being dependent on a single party.

In Mexico, the existing regulatory framework is deemed unsuitable to respond to the dynamic labour market environment; couriers who work through digital platforms are classified as self-employed workers. Therefore, this article argues that a distinctive special scheme is needed to address the question of extending coverage to workers engaged in these emerging occupations intermediated by MSDPs.

The remainder of the article is presented as follows. First, we offer a brief overview of international experience. Second, we analyse the socio-demographic characteristics of digital platform delivery workers (age, level of schooling, and access to medical services and social security coverage). Third, we present data on work hours and income generated by delivery workers. We then compare different occupational groups of workers in Mexico by using public data on the occupied population, as well on subordinated and remunerated workers, and self-employed workers. Of importance, the article then outlines options for providing medical services and social security benefits for couriers who work through digital platforms. Recommendations for public policy conclude the article.

International experience

There is no international consensus about how best to provide access to social security benefits for couriers who work through digital platforms (see, for example, Daugareilh et al. 2021). However, to inform policy learning, a number of national regulatory approaches can be called upon. This section reviews experiences from Chile, Italy and Spain, as well as a proposal for a directive from the European Parliament and Council.

Chile

Law 21.431 (8 March 2021) amends the Labour Code in Chile regulating contracts for digital service platform workers.[2] The law establishes minimum requirements to regulate relationships among workers and digital platforms related to minimum income, access to social security, the right to disconnection times, security at work, and the right of workers to organize collectively.

Law 21.431 explicitly defines platform companies and digital platform workers. It recognizes as "dependent workers" those who provide personal services for a digital service platform company under a relationship of subordination and

2. The text of Law 21.431 is accessible online.

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dependence. For "independent workers", the digital service platform company is limited to coordinating the connection between the independent digital platform worker and its users, without prejudice for establishing the general terms and conditions that allow them to operate through their computer or technological systems.

A relevant aspect of this law is that it states that "remuneration per hour actually worked may not be less than the proportion of the minimum monthly income determined by law, increased by 20 per cent, which shall be intended to compensate waiting times, as well as any other non-effective working time to which the dependent digital platform worker may be subject to".

Also, it affirms the need to i) guarantee compliance with a minimum disconnection time for independent digital platform workers; ii) provide them adequate and timely training, a protective helmet, knee and elbow pads for those who use a bicycle or motorcycle, and damage insurance to digital platform workers in the provision of the service. In addition, under this new regulation, digital service platform workers will have the collective right to form trade unions.

Finally, access to social security coverage is recognized. To this end, they must be subject to the provisions of article 92, paragraph 1 (of independent affiliates), Title IX (of independent and voluntary affiliates) of Decree Law 3,500 that established the Chilean pension system in 1980.

Italy

In Italy, there is a dispute about how delivery work through digital platforms should be classified, the outcome of which will determine the social security scheme that should be applied to couriers (Borelli and Gualandi, 2021). In practice, in the current regime for employees, the social contributions, based on salary, are paid mainly by employers. Under this scheme, employees are protected against the conventional risks covered by the mandatory social security system (unemployment, accidents at work, illness, disability, pensions, maternity, and so forth), albeit with some restrictions to access (Borelli and Gualandi, 2021). In addition, there are multiple social security schemes for self-employed workers that provide different benefits according to their contract type. Three contract types commonly apply to self-employed who work for digital platforms: i) for occasional collaboration; ii) for continuous and coordinated collaboration; and iii) for hetero-organized collaboration (Borelli and Gualandi, 2021).

In the first case, "collaboration" has a specific span; it is a one-time collaboration. This has the lowest level of social security contributions – when self-employees' monthly income is less than 5,000 euros (EUR), there is no obligation to pay social contributions. In the second case, "for continuous and

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coordinated collaboration", some steadiness is assumed in the relationship between the two parties. The social security contribution rate is the same as that for employees, with some differences. The most important difference is that workers must pay a third of the total contribution, unlike under the employees' regime where workers only pay 9.19 per cent (Borelli and Gualandi, 2021). Further, because there is no minimum wage for this group of workers, social contributions can be much lower than those for employees.

Finally, "hetero-organized collaboration", which includes self-employed people, is the contract type that has produced the greatest number of disputes (Borelli and Gualandi, 2021). Within the reach of the definition of "hetero-organization collaboration" are included the self-employed who have some degree of dependence on an employer, wherein the latter provides an organizational structure that determines the way in which their activities are carried out. To make an important distinction, this degree of subordination is less strict than the more forceful relationship of subordination associated with "hetero-directed collaboration", wherein the employer can give directives or orders, control or monitor the work done, and even punish breaches. In 2020, the Court of Cassation in Italy classified the workers of *Foodora*, a digital home delivery platform, as hetero-organized employees, a classification that entitles them to all the social security benefits provided under Italian labour law. In short, these are independent workers who are assumed to have some degree of (organizational) subordination, for which they receive the same treatment as employees (Borelli and Gualandi, 2021, p. 135).

Given the nature of Italy's legal framework, Borelli and Gualandi (2021) conclude that the discussion should not focus on whether those who work through digital platforms should fall within any one specific regime. Rather, the focus should be placed on identifying the characteristics of a special regime that would offer protection for these workers without hindering the potential for national economic growth.

Spain

Spain has a general regime for employees that covers all workers. This scheme offers cover for medical assistance, medical disabilities, maternity, birth allowance, childcare allowance, permanent disability benefits, benefits for retirement or unemployment, accident, or death. Spain also has a regime for self-employed workers that has been the one most used for providing coverage to couriers who work through digital platforms. However, in September 2020, the Supreme Court reclassified the relationship between bicycle couriers who work through

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digital platforms and digital platforms, to categorize these workers as employees, shifting the regulatory landscape (Guerrero and Rodríguez-Piñero Royo, 2021).

In Spain, there is also a special self-employed scheme in which independent workers are liable for paying social security contributions, accountable for enrolling in the system, and for submitting a declaration to set the start date of their professional activity.[3] According to Law 20/2007, an independent worker is someone who conducts economic or professional activities on a regular, personal, and direct basis, with no schedule imposed by another person. In addition, independent workers may employ others without this affecting the categorization of being self-employed (Guerrero and Rodríguez-Piñero Royo, 2021).

Finally, there is another regime, for the economically dependent self-employed worker. It has been argued that those working through digital platforms may fit into this category (Guerrero and Rodríguez-Piñero Royo, 2021). This regime includes those who conduct professional or economic activities for their own benefit on a regular and direct basis but do so for someone who is recognized as the main client. The rule requires receiving at least 75 per cent of income from that main client. Additional necessary conditions are not having employees, not subcontracting to third parties, the ownership of equipment and infrastructure, and receiving remuneration based on results from this activity.

Regardless, and because they are deemed to not fully satisfy the requirements, it has been difficult to categorize delivery workers in any one of these regimes (Berg et al., 2018; Rodríguez González, 2018). Consequently, in Spain, those employed through digital platforms have been excluded from the social security system. In response, some observers have suggested the need to develop a special regime for this type of worker (Rodríguez González, 2018).

In the context of the legal debate to define the employment status of delivery workers, on 12 May 2021, a decree was announced that clearly establishes the legal framework that will oversee the relationship between digital platforms and these workers (*Boletín Oficial del Estado*, 2021). First, the decree modifies article 64 of the Workers' Statute Law, related to the information rights of delivery workers, by adding a paragraph to provide information about the influence of algorithms or AI systems on work. The amendment to article 64 reads: "d) Be informed by the company of the parameters, rules and instructions on which algorithms or artificial intelligence systems are based that affect decision-making that may affect working conditions, access and maintenance of employment, including profiling" (*Boletín Oficial del Estado*, 2021).

Second, the decree introduces an additional provision concerning the labour status of delivery workers when digital platforms exercise the power of

3. In the general scheme for employees, these duties lie with the employer, who retains a part of worker's salary and who fulfils these procedures (Guerrero and Rodríguez-Piñero Royo, 2021).

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organization, direction, and control, through an algorithm. To this end, the amendment states: "Presumption of workmanship in the field of digital delivery platforms. By application of the provisions of article 8.1, it is presumed that the activity of persons who provide paid services consisting of delivery or distribution of any consumer product or merchandise, by employers who exercise the business powers of organization, direction, and control directly, indirectly, or implicitly, through algorithmic management of the service or working conditions, through a digital platform, is presumed to be included in the scope of this law. This presumption does not affect the provisions of article 1.3 of this Standard" (*Boletín Oficial del Estado*, 2021).

Proposal for a directive of the European Parliament and of the Council

At the level of the European Union, the European Commission published a proposal on 9 December 2021 for a directive with recommendations to improve the employment status of people working through digital platforms. This directive has three main objectives: i) determine the employment status of people working through digital platforms; ii) provide additional protection with respect to the use of algorithms by these platforms; and iii) guarantee transparency and traceability.

This directive lays down a formal definition of the digital platforms that are subject to this regulation. As defined, "digital labour platform means any natural or legal person providing a commercial service which meets all of the following requirements: a) it is provided, at least in part, at a distance through electronic means, such as a website or a mobile application; b) it is provided at the request of a recipient of the service; c) it involves, as a necessary and essential component, the organization of work performed by individuals, irrespective of whether that work is performed online or in a certain location" (European Commission, 2021).

For these types of platforms, a series of criteria is established to define whether a platform is an employer. The defining criteria are "a) effectively determining, or setting upper limits for the level of remuneration; b) requiring the person performing platform work to respect specific binding rules with regard to appearance, conduct towards the recipient of the service or performance of the work; c) supervising the performance of work or verifying the quality of the results of the work including by electronic means; d) effectively restricting the freedom, including through sanctions, to organize one's work, in particular the discretion to choose one's working hours or periods of absence, to accept or to refuse tasks or to use subcontractors or substitutes; e) effectively restricting the possibility to build a client base or to perform work for any third party" (European Commission, 2021).

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If at least two of these criteria are met, then that platform is deemed to be an employer. In such cases, the employment status of that person is adjusted, and he or she will have the right i) to receive a minimum wage (when it exists in the Member State); ii) to collective bargaining; iii) to labour benefits for employees. The aim of this directive is to give clarity to these workers, so that they may be classified as employees or to retain their status as self-employed.

However, this process is ongoing. As recently as 29 July 2022, the European Economic and Social Committee (EESC) issued an opinion questioning both the digital platforms' definition subject to this regulation, and the criteria for defining workers' employment status (*Official Journal of the European Union*, 2022). On the one hand, the EESC is asking for clarity to avoid ambiguity related to the directive's interpretation. On the other hand, the EESC suggests incorporating in the directive dynamic aspects concerning the relationship between workers and platforms, given the pace of technological change and the power of the algorithms used by these platforms.

This selective overview of international experience enables to identify common challenges for defining the working status of digital platform delivery workers, which, in turn, influences the right to and the nature of access to social security for these workers. In the remainder of this article, we look at the specific case of delivery workers in Mexico.

Couriers who work through digital platforms in Mexico: Socio-demographic indicators and social security

In this section, we present socio-demographic indicators and measures of social security coverage for delivery workers in Mexico. Presented as a share of the total employed population, we group together delivery workers (according to age, gender, and access to medical services) and compare their situation with that for subordinated and remunerated workers and self-employed workers, as of the fourth quarter of 2021 (4Q2021) (Table 1).

Of the total employed population, subordinated and remunerated workers represent 68 per cent, self-employed workers account for 23 per cent, and

Table 1. *Total workers by group*

	Employed population	Subordinated and remunerated	Self-employed	Couriers who work through digital platforms
Total 4Q2021	56,611,211	38,361,661	13,009,369	317,263
% employed population	100	67.77	22.98	0.56

Source: Encuesta Nacional de Ocupación y Empleo (ENOE), 4Q2021.

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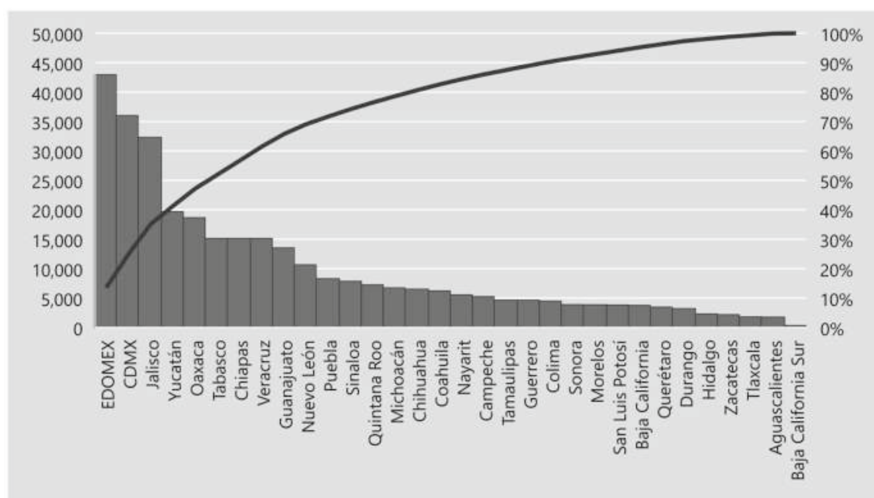
delivery workers a very small 0.56 per cent of the total employed population. If we accord to couriers who work through digital platforms the employment status of self-employed workers, they correspond to 2.44 per cent of the self-employed workforce.

Figure 1 shows the distribution of delivery people by state. Across Mexico, the five states with the greatest number of couriers are Estado de Mexico (EDOMEX), Ciudad de Mexico (CDMX), Jalisco, Yucatán, and Oaxaca, which account for 47 per cent of national total. In contrast, the states of Hidalgo, Zacatecas, Tlaxcala, Aguascalientes, and Baja California Sur have the lowest numbers of couriers who work through digital platforms, representing only 2.7 per cent of the national total.

Figure 2 shows the proportion of couriers who work through digital platforms with respect to the total employed population and the total self-employed workforce. The states that have the most delivery workers as a proportion of self-employed workers are Colima, Tabasco, Yucatán, Campeche, and Jalisco. Accordingly, only the states of Jalisco and Yucatan remain in the group with the largest number of delivery workers, both in terms of absolute numbers and percentages. Baja California, Puebla, Guerrero, Hidalgo, and Baja California Sur have the lowest proportions, with Hidalgo and Baja California Sur situated at the low end of this statistic, both in terms of absolute numbers and percentages.

Figure 1. *Delivery workers by state*



Source: Encuesta Nacional de Ocupación y Empleo (ENOE).

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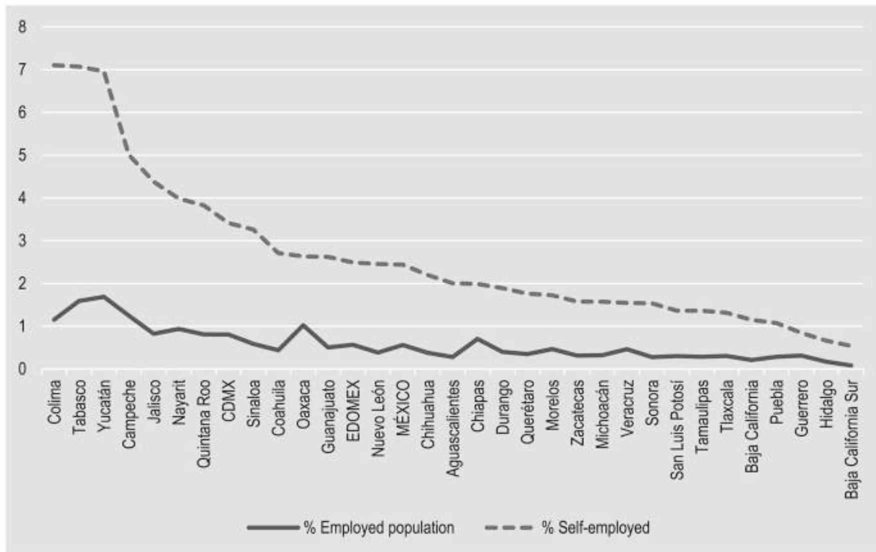
Figure 2. *Proportion of couriers by state*



Source: ENOE, 4Q2021.

Age of delivery workers

Figure 3 shows the percentage of workers across four age cohorts for the four occupational groupings. Young worker aged 14 to 24 are more likely to be delivery workers; 37 per cent of this category of worker are in this cohort, which is double or more the percentage of younger workers found in the other occupational groupings. At the other end of the distribution, only 1 per cent of delivery workers are aged 65+, compared to 13 per cent of self-employed workers. Finally, if we focus on those younger than age 45, 83 per cent of delivery workers fall into this age bracket, compared to 63 per cent of the total employed population, 69 per cent of subordinated and remunerated workers, and 45 per cent of self-employed workers.

Therefore, delivery workers are typically younger workers. These findings are consistent with outcomes in other countries (Azuara, González and Keller, 2019; Madariaga et al., 2019). This observation may suggest that younger workers give primacy to realizing greater flexibility in the number of hours and days they wish to allocate to work but do so in exchange for less access to social security coverage.

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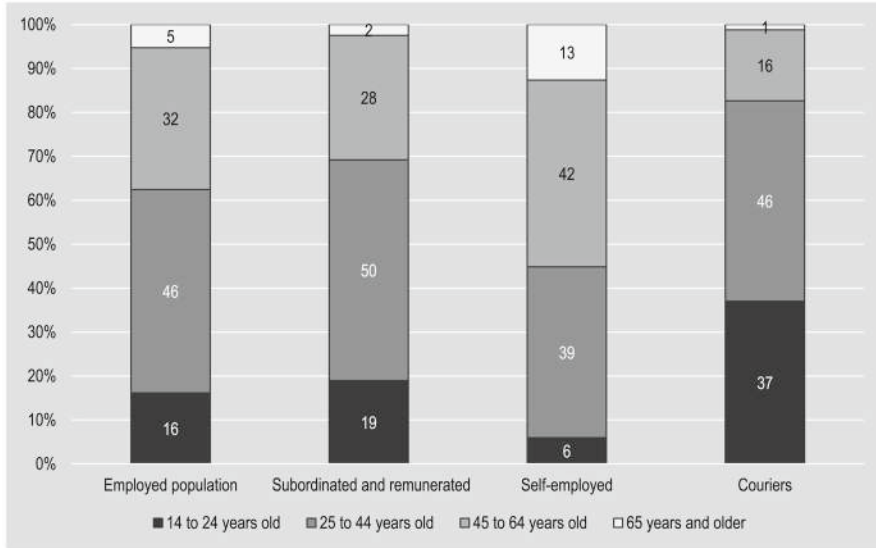
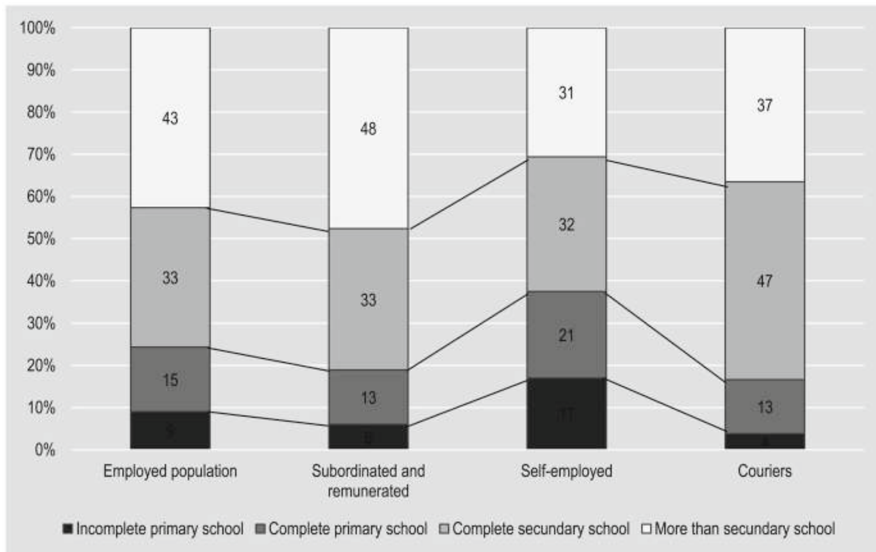
Figure 3. *Occupational group by age*



Source: ENOE, 4Q2021.

Figure 4. *Educational level by employment group*



Source: ENOE, 4Q2021.

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Educational level of delivery workers

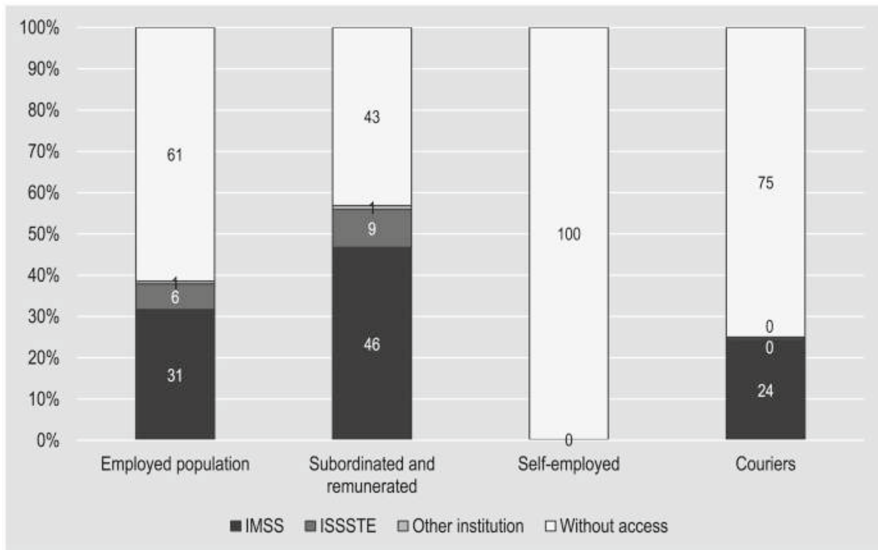
Educational level by occupational group is shown in Figure 4. As in the case of age, delivery workers largely group together under one category. In this case, a significant proportion have completed secondary school (47 per cent). Moreover, only 17 per cent of delivery workers have not completed secondary school education, compared to 38 per cent of self-employed workers, 24 per cent of the total employed population and 19 per cent of subordinated and remunerated workers.

Overall, delivery workers have a higher educational level (84 per cent with completed secondary school or higher) than self-employed workers (64 per cent), subordinated and remunerated worker (81 per cent) and the total employed population (76 per cent).

Access to medical services by employment group

Significant differences are found as regards access to medical services. In this respect, structural labour market inequalities have an important influence, including for the coverage of couriers who work through digital platforms.

Figure 5. *Access to medical services by employment group*



Source: ENOE, 4Q2021.

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Figure 5 shows, on the one hand, that almost 100 per cent of self-employed workers have no access to medical services. On the other hand, a significant percentage of delivery workers (24 per cent) do have access to medical services, compared to 31 per cent of the total employed population and 46 per cent of subordinated and remunerated workers.

That less than half of subordinated and remunerated workers have access to medical services is worthy of comment. This is counterintuitive because workers with this status should have access to medical services. Again, this marker reveals a structural failure to achieve coverage for medical services in the Mexican labour market. Although a quarter of delivery workers have access to health services, given the age structure of these workers, it is likely that this level of access is achieved either from being a dependant of a covered family member or through another economic activity that they perform.

Therefore, if we define job insecurity as the absence of medical services – and, by inference, being without access to other social security benefits – 75 per cent of couriers who work through digital platforms fall into this category, which represents a higher proportion than subordinated and remunerated workers. According to current Mexican labour market data, while the coverage rate for access to medical services for delivery workers is only 7 percentage points less than that for the total employed population it is less than half the rate for subordinated and remunerated workers, a group that is nonetheless poorly covered (56 per cent). Regardless, the total exclusion of self-employed workers is to be underlined.

Hours of work and income for delivery workers

The entry and growth of MSDPs in the Mexican economy has generated significant positive impacts. Guajardo Mendoza et al. (2021) report growth in added value for restaurants, whose share of national added value rose between 28 per cent and 33 per cent from 2013 to 2020. The same authors also report gains for couriers who work through digital platforms, both in terms of the number of people choosing this occupation and their level of income. Their income level grew continuously from 2013 to 2020 to match the average monthly income of the average worker in the economy and, on average, delivery workers' daily and hourly incomes are higher.

Despite these income trends, there is a global debate concerning the insecurity of employment experienced by these workers. To contribute to this discussion, for the four occupational groups, we analyse the number of hours worked per week and income, measured in minimum wages.

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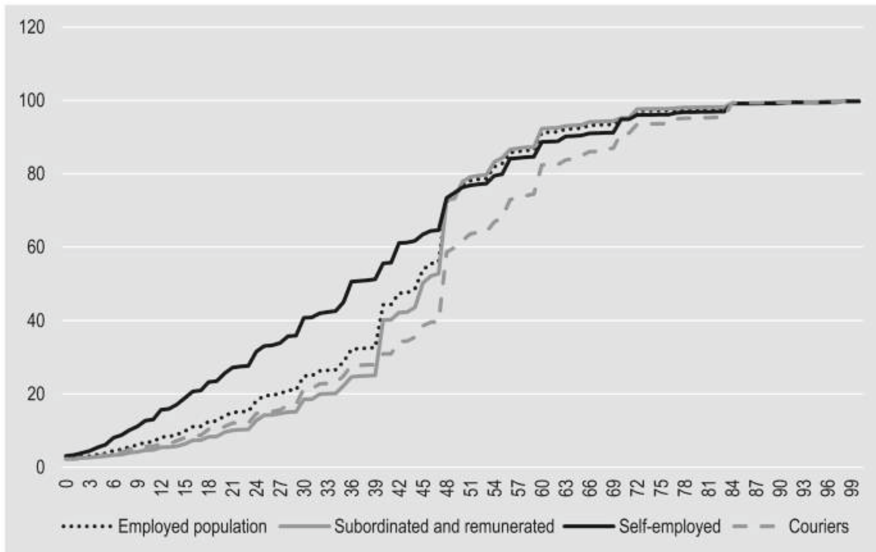
Figure 6. *Cumulative percentage, worker per hour dedicated to their occupation*



Source: ENOE, 4Q2021.

Hours per week dedicated to occupation

Figure 6 shows the cumulative percentage of workers presented according to hours worked per week, from 0 to 100. For each hour (horizontal axis), we have the number of people that allocate at most those hours per week, relative to total population (vertical axis). This figure presents interesting findings. First, the curves for the employed population and for subordinated and remunerated workers are almost identical, given that the latter group represents almost 70 per cent of the former.

Second, 14 per cent of the total employed population, 9.2 per cent of subordinated and remunerated workers, 26 per cent of self-employed workers, and 11.1 per cent of delivery workers dedicate 20 hours or less a week to their occupation. Thus, the employment behaviour of couriers who work through digital platforms lies closer to that of subordinated and remunerated workers than to self-employed workers. Third, the decisions taken concerning the total allocated hours worked per week are virtually identical for delivery workers and subordinated and remunerated workers, in the range of 0 to 40 hours per week. That is, a considerable proportion of delivery workers register, on average, the same number of hours of work as do subordinated and remunerated workers.

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Fourth, flexibility for delivery workers is clearly shown in the range of 41 to 48 hours per week. On the one hand, the curve for couriers who work through digital platforms diverges from that for subordinated and remunerated worker in this range. On the other hand, they meet again at 48 hours a week, the equivalent to an 8-hour working day, 6 days a week, which is a typical employment contract for subordinated and remunerated workers.

Fifth, as the curves in Figure 5 steepen, more hours per week are dedicated to occupation. Those with the most working hours per week are delivery workers while those with the least are self-employed workers. Subordinated and remunerated workers and the total employed population are found between these two groups. For example, let us assume that 8 hours per day, Monday to Saturday, are allocated to occupation. On this basis, 72.6 per cent of the total employed population, 72.8 per cent of subordinated and remunerated workers, 73.4 per cent of self-employed workers, and 58.6 per cent of delivery workers allocate at most 48 hours per week to their occupation. This implies that a higher proportion of delivery workers allocates more than 48 hours a week to their occupation, compared to other groups. The underlying rationale for this behaviour is that subordinated and remunerated workers do not have the flexibility to choose the hours and days of work for their occupations. They face inflexible schemes with fixed hours and allocating more hours does not necessarily involve higher income. In contrast, for delivery workers, more hours of work entail higher income. This will be discussed below.

Sixth, it is interesting to compare only subordinated and remunerated workers with delivery workers. For those with 40 hours of work or less per week, there are proportionally fewer delivery workers than subordinated and remunerated workers. For those with more than 40 hours of work per week, we find the opposite. Again, flexibility explains this difference. Seventh, the jumps that occur at 40 hours and 48 hours a week relate to typical contracts for subordinated and remunerated workers, who work 8 hours per day for five or six days a week.

Finally, while it is true that delivery workers, on average, allocate more hours per week to their occupation, differences occur after 48 hours a week. To explain this, we should recall that delivery workers freely choose how much time they connect to a MSDP, while subordinated and remunerated workers are constrained by the formal conditions of their employment contract.

Income for delivery workers

Figure 7 presents income dynamics for the period covering the first quarter (1Q) of 2012 to the fourth quarter (4Q) of 2021. The number of people with the highest incomes (earning more than three minimum wages (MW)) has been falling since

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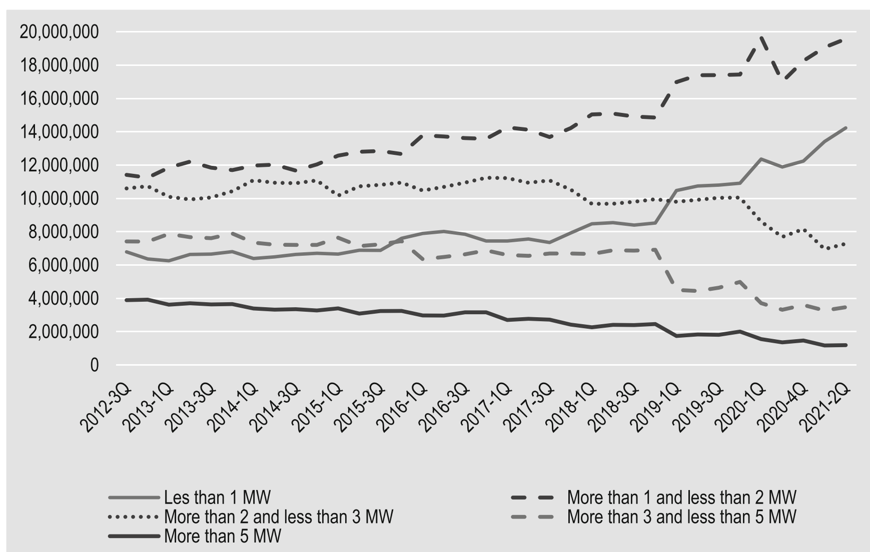
Figure 7. *Income in terms of minimum wages for the employed population, 2012–2021*



Source: ENOE, 1Q2012–4Q2021.

2012. Therefore, we see growth in the number of employed persons receiving lower incomes (no more than two minimum wages). In addition, there is a jump in the first quarter of 2019 that strengthens this trend in all categories. This indicates that income precarity is a key factor in the Mexican economy, which is not associated with any one occupational group.

Figure 8 shows information for 4Q2021 by income levels, measured by MW, eliminating those who did not specify their income. On the one hand, by comparing delivery workers with self-employed workers, 6 per cent of self-employed workers do not receive income, while only 3 per cent of delivery workers are in that condition. On the other hand, more self-employed workers (41 per cent) are in the range of less than 1 MW than are delivery workers (29 per cent). Finally, for those with higher incomes, the evidence is mixed. A greater share of self-employed workers (7 per cent) than delivery workers (4 per cent) earn more than three MW. However, more delivery workers earn 1–2 MW or 2–3 MW (46 per cent and 12 per cent, respectively) than self-employed workers (24 per cent and 10 per cent, respectively).

Second, we compare delivery workers with subordinated and remunerated workers. More subordinated and remunerated workers (9 per cent) than delivery workers (4 per cent) have incomes higher than 3 MW. At the other extreme, there are no subordinated and remunerated workers without income.

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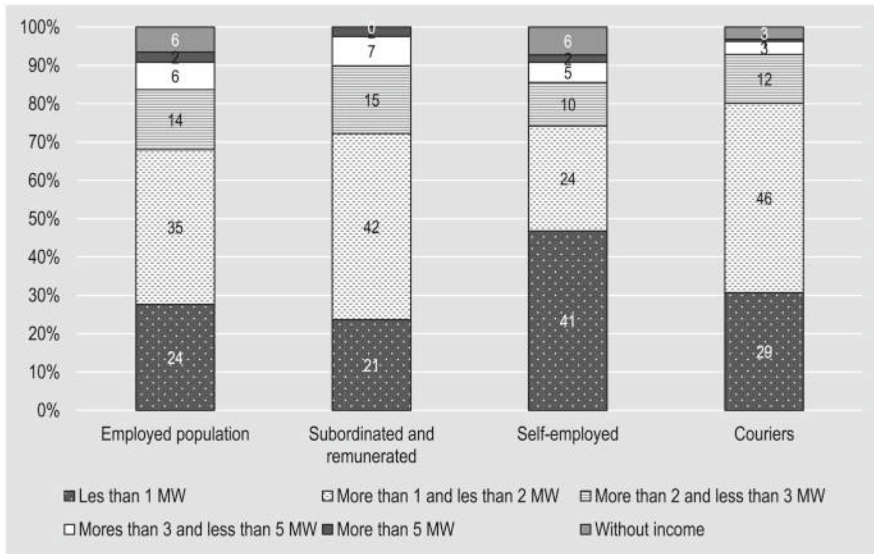
Figure 8. *Income (MW) by occupational groups*



Source: ENOE, 4Q2021.

Finally, for employed people with income below 3 MW, the findings are mixed. While there are more delivery workers (29 per cent) than subordinated and remunerated workers (21 per cent) in the range of less than 1 MW, there are more delivery workers (46 per cent) than subordinated and remunerated workers (42 per cent) with income between 1–2 MW; and the percentages are similar for the two groups for the range between 3–5 MW. Therefore, income earned from work through delivery platforms may help to partially reverse the income precarity shown in Figure 7.

We now compare hours assigned to occupation and income for each occupational group. Figure 9 (Panels 1–5) shows the relationship between income and hours per week allocated to economic activity.

The evidence points to clear differences between the groups. First, from 0 to 40 hours per week, the proportion of delivery workers is the lowest across all the income levels, and this proportion decreases as income increases. Second, from 41 to 48 hours per week, the differences for income levels less than two MW between subordinated and remunerated and delivery workers are narrower, while higher income levels remain dominated by subordinated and remunerated workers, with self-employed workers consistently maintaining the lowest proportions for incomes lower that 3 MW. For higher incomes, couriers have the lowest values of earnings from 41 to 48 hours worked per week.

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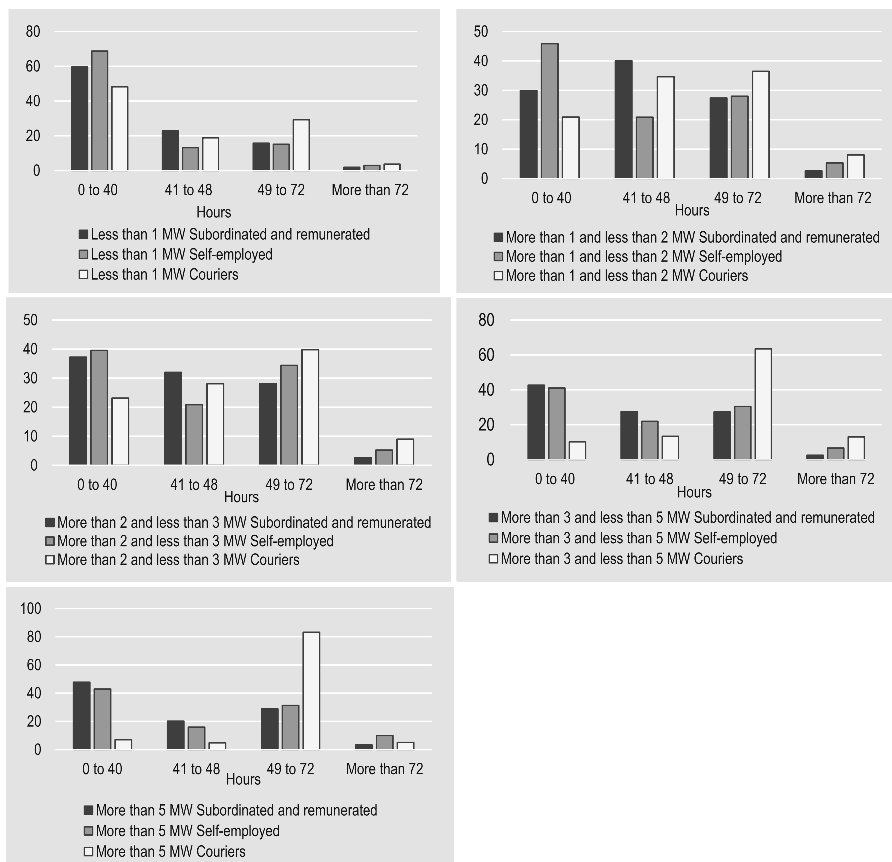
Figure 9. *Relationship between hours per week and income*



Source: ENOE, 4Q2021.

Third, from 49 to 72 hours a week, the trends in rankings are reversed, with delivery workers presenting the highest proportions for each income level. This indicates that allocating more hours to their occupation generates higher income for couriers who work through digital platforms. In this case, more than 80 per cent of these workers who allocate between 49 and 72 hours a week earn income higher than five MW. This proportion is more than double that of each of the other two groups. The same conclusion applies to delivery workers at all income levels who work more than 72 hours per week. These facts have two interpretations. First, many people must assign more than 48 hours a week to earn incomes higher that five MW, restressing the income precarity shown in Figure 7. Second, higher proportions of couriers who work through digital

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platforms, compared to people in the other groups, earn incomes higher than five MW, reversing partially this income precarity.

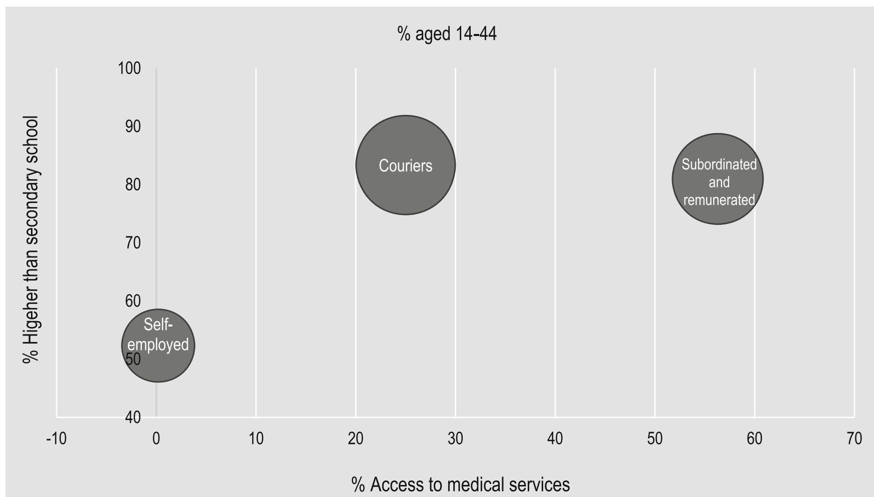
Accordingly, the claim that delivery work is precarious in terms of income and because these workers allocate more hours a week to their occupation is brought into question by the empirical evidence. As shown by the data, with more hours worked per week, a higher proportion of delivery people can earn higher income, compared to subordinated and remunerated and self-employed workers. Given that income precarity is a fact in the Mexican economy, being a courier working through digital platforms can partially reverse this condition.

Public policy proposals for providing access to medical services and social security benefits

The evidence of the previous two sections does not substantiate the view that all couriers who work through digital platforms in Mexico are confronted by income precarity. As stated in the introduction to this article, despite possibilities for higher earnings, there is an ongoing debate about the labour status of delivery workers, the outcome of which will affect their access to social security benefits.

In this section, we thus focus on the empirical context of the Mexican labour market. Importantly, we analyse strategies to provide delivery workers with

Figure 10. *Characteristics of occupational groups*



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necessary access to health services and social security benefits. To present a snapshot of workers' characteristics, Figure 10 offers information (age, level of schooling, and access to medical services) according to three occupational groups. This breakdown of characteristics provides essential input for the design of public policy targeted to provide medical services and social security benefits to these populations.

The horizontal axis stands for the percentage of population that has access to medical services; the vertical axis shows the proportion of the population with a schooling level higher than secondary school; and the size of the circles represents the percentage of population aged 14–44 engaged in each occupational group. This figure shows, that self-employed workers have no access to medical services, 50 per cent have a schooling level higher than secondary-level education, and 45 per cent are aged 14–44. For subordinated and remunerated workers, 56 per cent have access to health services, around 80 per cent have a schooling level higher than secondary-level education, and 70 per cent are aged 14–44. Finally, more than 25 per cent of couriers who work through digital platforms have access to health services, 85 per cent have a schooling level higher than secondary education, and 83 per cent are aged 14–44.

Access to medical services

Specific strategies to grant improved access to health services for workers in Mexico can be suggested, involving options provided by the State and options provided by the market.

Private health insurance paid by the employee. Private health insurance provided by private companies is, on average, too expensive for most workers given their income levels. Despite the availability of private health insurance, according to *Statista*,[4] only 2.08 per cent of Mexican population has access to health services through a private institution.

Private health insurance paid by the employer. This scheme is deemed overly complicated to administer given the characteristics of the employed workers shown in the previous sections, especially so for delivery workers. From one perspective, self-employed workers, by definition, do not have a single, stable employer over time. From a narrower perspective, delivery workers may connect to more than one platform, and have flexibility to decide when and how much time they connect. This makes it difficult to determine – if Mexico were to legally recognize MSDPs as employers – which platform should be deemed responsible for providing the insurance coverage.

4. Type of access to health services in Mexico 2020 | Statista (accessed 5 March 2022).

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Access to medical services provided by the State. The federal state authorities have at least two clearly identified schemes to provide health services to the employed population.

- **Universal access to medical services.** The mechanism for the realization of universal access to medical services is the Health Institute for Welfare (*Instituto de Salud para el Bienestar* – INSABI).[5] One of its most important goals is to:

> "Provide free health services and ensure supply of medicines and associated supplies and other elements necessary for the care of people without social security, in accordance with the legal instruments signed for this purpose with the institutions that make up the National Health System".

In addition, the enrolment process is relatively simple, requiring only i) to have a birth certificate or Unique Population Registration Code; and ii) to have an identification from the National Electoral Institute. Thus, it is not easy to explain why so many people report not having access to health services.

Clear strategies should produce immediate results. For instance, to extend coverage to delivery workers, it should be straightforward to implement an automatic registration mechanism provided by the delivery platforms following agreements between the platforms and the INSABI. Through this mechanism, all delivery workers who state they do not have access to health services could be enrolled by that platform. Enrolment is required once only, it involves low administrative costs, and access to medical services will be possible thereafter.

Access to medical services via social security schemes. In this case, health services are tied to the social security schemes recognized by the Federal Labour Law (*Ley Federal Laboral*). This option is addressed next.

Access to social security benefits

Digital technologies have shifted the dynamics of modern economies by enabling the emergence of new business models, such as MSDPs, and these platforms have radically altered labour markets, creating new occupations that may not fulfil traditional employment definitions. For instance, new occupations may not be full-time occupations. This difference is important because full-time work is a common trait used to define eligibility to be covered by social security programmes (Degryse, 2016). Often, these new occupations are task-based,

5. Under legislation announced on 31 August 2022 by the federal government, a new health institution (IMSS-BIENSTAR) will be responsible for the provision of health services to all the population, regardless of social security status. However, in the transition period, the strategy to achieve universal access to medical services remains unclear.

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temporary, voluntary, and developed by an indeterminate number of people who attend a digital space.

Another major difference is that traditional employees are subordinate to one employer, which implies control by the latter over the activities of the former during the working day. The on-demand nature of MSDPs implies that the performance of a task is offered when someone requests it, but there is no obligation for platforms to ensure that a minimum of hours will be allocated by couriers (Schoukens, 2021). Subsequently, platforms participate in multiple automatic negotiations with delivery workers through allocation algorithms.

As remarked, the specificities of these new occupations make it difficult to define a suitable social security scheme. According to article 12 of the General Social Security Law (LGSS),[6] in Mexico, the mandatory social security regime covers "natural or legal persons who, permanently or eventually, provide others of a physical or moral nature, with a paid, personal, as well as subordinate service". Coverage under the LGSS (article 11) includes insurance for job risks, illness, maternity, invalidity, death, retirement, unemployment in old age, and nurseries. Under the scheme, employers are compelled to register their workers at the Social Security Mexican Institute (*Instituto Mexicano del Seguro Social* – IMSS), account for registrations, cancellations, salary modifications, keep payroll records, determine the worker-employer quotas, and allow verification visits made by IMSS. The compulsory contributory regime is financed through worker-employer quotas shared by the employer, the worker, as well as the State. Calculation of these quotas is made by considering the worker's base salary, the value of some unit for adjustment, as well as percentages set for each insurance programme provided under the LGSS.

Article 13 stipulates other types of workers who can insure on a voluntary basis, through IMSS agreements. Specifically, those working for family industries, independent workers, merchants, non-salaried workers, small owners, and others (such as couriers who work through digital platforms), excluded, or not included in other laws or decrees as individuals covered by social security, are eligible. For voluntary coverage, enrolment is the responsibility of the insured, even in instances of collective incorporation. In addition, in accordance with article 228, these workers must pay the worker-employer dues in full; except for those working for federal public administrations, federal entities and municipalities who are excluded or not included in other laws or decrees as eligible for social security coverage.

It has been argued that traditional social security schemes for self-employed workers do not offer a coverage solution (D'Onghia, 2016) for those working

6. The General Social Security Law was enacted on 21 December 1995, and its most recent amendment took place on 18 May 2022.

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through MSDPs, even when these schemes are partially adapted, and the coverage offered is limited or voluntary. A concern is that traditional social security schemes can make work through MSDPs less attractive and will restrain work flexibility, which is one of the most appreciated features of this business model (Oxfam, 2022; Guajardo Mendoza et al., 2021).

The examples of Chile, Italy, and Spain outlined briefly in this article have additional labour status classifications to enable access to social security coverage, such as for "independent worker", and for which the assumption of subordination is relaxed. However, there are other features that have prevented delivery workers from being incorporated under these schemes (Behrendt, Nguyen and Rani, 2019), not least of which is because, to be eligible for voluntary coverage, these workers must cover the total, or almost total, cost of social contributions. This requirement can act as a disincentive to voluntary affiliation (Morales Ramírez, 2019). A concrete example of this occurred in Mexico with the 2021 pilot for the voluntary affiliation to the Mandatory Social Security Regime, under the LGSS, of delivery workers. Although this was viewed as a positive step to extend improved social protection to these workers, the burden of social contributions proved to be dissuasive. Therefore, to address this challenge, the design of the scheme requires reform.

Designing social protection coverage that provides adequate protection for forms of work intermediated by digital platforms presents a complex double challenge. On the one hand, existing gaps in social protection for workers engaged in new forms of employment can leave some people vulnerable and increase poverty and inequality. In response to this coverage challenge, if inappropriate decisions are taken which, for example, treat workers in these new occupations as they do traditional employees, the potential higher added value for economies of technology-intensive business models may be weakened. Imposing rigid social security models may jeopardise investments in technology-intensive business models, which would have a negative impact on factor productivity in these economies, making them less competitive (Behrendt, Nguyen and Rani, 2019; Brynjolfsson and Yang, 1996; Dewan and Kraemer, 2000; Zhang, Shi and Shi, 2021; Guajardo Mendoza et al., 2021).

Finally, given that delivery workers represent a small percentage of the workforce who lack adequate social security coverage, it is best to design a public policy that embraces two fundamental characteristics. First, its scope must be national as well as local, i.e., in the case of Mexico, not only at the level of federal entities. A design scope that was local only would risk creating distortions and advantages/disadvantages at the regional level. Second, since it is unfeasible to have a strategy to guarantee universal access to social security, as proposed by Hernández Trillo (2012), a special scheme for couriers who work through digital platforms is needed.

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Key factors to include in a special scheme for delivery workers

The goal must be to design the most suitable scheme for delivery workers that achieves the dual purpose of providing adequate social protection, while not generating rigidities that hinder the emergence or expansion of innovative digital technology intensive business models. The three key issues to consider are: i) who pays the social contributions; ii) the value of the total contribution; and iii) the portfolio of benefits provided (Borelli and Gualandi, 2021).

Based on these considerations, a specific scheme may be proposed (see Pérez, 2021). Moreover, it should be possible to extend this special scheme to all people in work who are without social security. According to this proposal, delivery workers should enjoy a social protection floor of benefits that would cover illness, maternity, disability, old-age, and occupational hazards. For workers whose occupational status is weakly defined or contested, specific definitions concerning the status of some occupational groups may be required to grant access to social security. As regards the focus of this article, couriers who work through digital platforms could be recognized as “digital workers” who provide to another, or others, in a non-subordinated way, personal work in exchange for economic remuneration in a virtual space, the prevailing modality of flexible work (Pérez, 2021).

Table 2. *Principles and objectives of social security schemes*

Principle	Objective
Coverage with effective access	Guarantee access to social protection regardless of the type of occupation, specifically for their situation or needs.
Adequacy	Ensure that social protection systems not only prevent poverty but provide adequate income replacement in a sustainable manner.
Portability	Ensure that social protection systems adapt to the new labour market mobility scenario, considering global labour market transformations.
Transparency	Ensure that all actors are fully aware of their rights and responsibilities.
Risk sharing	Ensure appropriate risk sharing level among all actors in the social protection system, through collective financing mechanisms that prevent a single actor from withstanding undue levels of financial risk.
Gender equity	Ensure that protection systems are sensitive to the realities of inequality faced by women in the labour market.
Good governance	Ensure that social protection systems are financed in a sustainable, equitable and comprehensive manner.
Voluntary	Delivery people must be free to enrol in any particular social security scheme.

Source: Authors’ elaboration, with information from Behrendt, Nguyen and Rani (2019).

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Another key factor is the need for tripartite financing by the "digital worker", the federal (national) government and the legal person, national or foreign, requesting the services (Pérez, 2021). This would satisfy the risk-sharing principle proposed by Behrendt, Nguyen and Rani (2019). This aims to ensure there is an appropriate level of risk-sharing among all involved actors in the social protection system designed for those working through digital platforms. In addition, allotting a financing role to the federal (national) government ensures uniformity and removes the risk of local differences arising if it were to be implemented at the state level. Finally, this proposal should include the basic principles outlined by Behrendt, Nguyen and Rani (2019) that universal access should be sought for all workers, regardless of their occupation. The scheme should fit the specific situation or needs of the workers to whom coverage is to be extended (Table 2) and the adequacy of coverage should be guaranteed. Ultimately, as a minimum, social protection systems should not only prevent poverty but must also provide adequate protection in a sustainable manner.

A further principle is the portability of social security rights, which is necessary given the likelihood of workers' mobility between different occupations over the life cycle. It is likely that technological change will gradually lead to many occupations being replaced by intelligent machines, inciting the need for higher flexibility among workers to migrate to other occupations. Portability should therefore be incorporated into the design of a special social security scheme for digital workers.

Transparency refers to the need for all actors in the system to be fully aware of their obligations as well as their rights. Currently, a profound lack of knowledge among many workers is observable in all countries, but especially in less developed economies, about what social protection systems are, their importance, as well as steps that must be taken to ensure access to them (Behrendt, Nguyen and Rani, 2019).

Given that the financing of social protection systems should not depend exclusively on one stakeholder, risk-sharing and social solidarity are crucial. Couriers who work through digital platforms should contribute, not only because benefits will be enjoyed by them and, possibly, their families, but because they generally have the financial means to contribute. In this regard, however, their contributions should be proportional to their income and not set as a regressive fixed-rate contribution. MSDPs should also contribute, to ensure that "digital workers" have access to at least a minimum floor of social protection. Finally, an argument raised in this article is that the federal state (central government) should also contribute. By so doing so, it not only supports the well-being of workers and supports the sustainable financing of adequate benefits, but also should help minimize possible distortions to markets that have the potential to inhibit investment in new technology-intensive business

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models. It goes without saying that gender equality must also be pursued, because the labour market position of women is characteristically more vulnerable than that of men (Rodríguez Pérez and Castro-Lugo, 2014; Vela Barba, 2017). Finally, it is necessary to ensure sustainable financing, as well as a balanced governance of social protection systems concentrated on these new forms of occupation.

A crucial element, but one not presented by Pérez (2021) or Behrendt, Nguyen and Rani (2019), is that membership of the proposed special scheme for couriers who work through digital platforms should be voluntary. This point is added because we would argue that social protection should be understood as the outcome of a decision-making process to maximize well-being at the family level. The evidence presented in this article has shown that it is not uncommon for those who work through digital platforms to have access to some social security benefits, because these have been provided owing to being a dependant of an insured family member or through coverage made possible by their own work in other forms of employment (Behrendt, Nguyen and Rani, 2019). For these families, mandatory affiliation could be viewed as an unnecessary use of financial resources.

Concluding remarks

This article has presented evidence, based on data on delivery workers' income and hours of work, to suggest that couriers who work through digital platforms do not face greater income precarity compared to self-employed workers or subordinated and remunerated workers. On the contrary, for some ranges of hours worked per week, delivery workers actually attain higher income than their peers in the other two occupational groups. However, the ability to earn income is only one part of the story. Notably, for the various occupational groups, the situation is different regarding access to medical services and social security benefits. In Mexico, 100 per cent of self-employed workers, 75 per cent of delivery workers and more than 50 per cent of subordinated and remunerated workers do not have access to these benefits.

According to the International Labour Organization (Ferrer, 2012), "social security" is the comprehensive protection that society provides to its members, for workers and their families. To extend social security to more people, this article agrees with the principles recommended by Behrendt, Nguyen and Rani (2019). In the context of the focus of this article, this will allow "digital workers" to be protected, while creating a supportive environment for investment in innovative business models. If the latter is not achieved, it will not be possible to sustain social security schemes and their benefits in the long run,

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thus negating the potential to maximize the social gain for societal well-being (Guajardo Mendoza et al., 2021).

Our proposal argues that the application of traditional social security schemes does not represent the best solution. Such an approach risks generating counterbalancing effects, given that "digital workers" value flexibility and independence. Also, they would face legal uncertainty regarding access to social security, given labour definitions under the LGSS. Another possibly unintended effect of poorly designed schemes is a decrease in productive investments in technology-intensive business models, which could negatively impact on competitiveness and productivity. In the context of Mexico's current labour market, such an outcome could significantly reduce the income generating activities of more than 300,000 delivery workers and their dependants.

The social security schemes for self-employed workers that operate in many countries are faced with significant coverage gaps. In the first place, to access coverage under such schemes may require the performance of economic activities with a certain regularity, without the intervention of a third party who organizes or structures how that activity is undertaken. In addition, to be self-employed, the worker should not depend on a single contractor or client (Borelli and Gualandi, 2021).

In contrast, occupations undertaken through digital platforms do not ask for regularity of everyone, only for continuity of the entire couriers' network. In addition, platforms must guarantee minimum conditions to ensure deliveries arrive on time, meaning that couriers who work through these digital platforms do not fit into traditional labour definitions. Finally, many delivery workers connect to a single platform that represents their unique source of income.

A third option is to identify platforms' activities as a special occupation, which merits a special social security regime. The proposal of this paper is to ensure that delivery workers have a social protection floor that covers illness, maternity, disability, old age benefits, as well as occupational risks. It is proposed that this scheme should be financed in a tripartite manner, involving delivery workers, who contribute proportional to their income; federal (national) government; and the legal person, national or foreign, who requests their services (as proposed by Pérez, 2021).

This social security regime for couriers who work through digital platforms should be instituted nationally. This requirement would cancel regional distortions, given that this occupation is uniform, regardless of the city and platforms involved. Lastly, the scheme must be voluntary because some delivery people have other occupations from which they receive social benefits or have relatives who provide them. Forcing them to contribute to a mandatory social security scheme could be perceived as an inefficient use of

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their limited income sources. However, this scheme should be made available to them if they only have partial social security coverage and would like to complement and improve their social protection, as suggested by Behrendt, Nguyen and Rani (2019).

Finally, the ideal scenario is that this proposal should be applied to all people without coverage from any social security scheme, and not only for delivery people. As empirical evidence shows, more than 50 per cent of total employed population does not have access to social benefits. Similar schemes should be designed to achieve universal social security coverage in Mexico. For this proposal to be successful, at least two additional components are required. First, a clear and efficient communication strategy that ensures that information reaches those who do not have social security and shows the benefits it would offer in the medium and long term. Second, to reduce transaction costs involved in voluntary affiliation under this scheme, the requirements to join must be clear and simple.

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Curbing the demographic "drifting dune" in long-term care insurance financing: The case of Germany

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Abstract Long-term care provision and financing are becoming increasingly important matters in all ageing economies. Therefore, a major challenge for policy makers is to strike a balance between adequate care and sustainable financing. In this study, we evaluate the proposal of a so-called sustainability factor in German long-term care insurance. Considering changes in the beneficiary-contributor ratio, it aims for a rule-based consideration of demographic dynamics to alleviate pressure on long-term care financing. Using the framework of generational accounting, we demonstrate that this proposal could have a relieving effect on finances, depending on the share of involvement of current and future generations. It may offer an option for pay-as-you-go long-term care insurance systems worldwide that need to curb the impact of ageing societies. Therefore, this article addresses policy makers tasked with designing a sustainable financing model for long-term care insurance. It demonstrates that the sustainability factor represents a step

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towards sustainable finances and, thus, it might be one component of a more comprehensive reform package.

Keywords long term care, social insurance, social security financing, social security reform, demographic aspect, Germany

Introduction

The need for long-term care (LTC) is becoming an increasingly pressing matter in all ageing societies. As one of the fastest ageing countries, Germany introduced a mandatory LTC insurance scheme to secure the (financial) risk of need for care in 1995. However, as it is financed on a pay-as-you-go (PAYG) basis and in the light of demographic developments, the scheme's financing situation has been subject to debate since its inception. Several studies have demonstrated that German LTC insurance is not and never has been sustainably financed, even at the outset, due to the foreseeable demographic transition (Bahnsen et al., 2020; Comas-Herrera et al., 2006; Costa-Font et al., 2008; European Commission, 2021; Fetzer, Moog and Raffelhüschen, 2002; Häcker and Raffelhüschen, 2006). Given existing concerns regarding the impact of an ageing population on the sustainability of LTC insurance financing, changes in LTC policy must be evaluated in terms of their long-term impact on expenditures (Pickard et al., 2007). However, long-term (economic) solutions often compete with short-term (politically expedient) solutions. In this context, economic necessities and political interests may oppose one another. Referring to political interests, Galasso and Profeta (2004) argue that politicians exert influence on a country's social security system, such that its political sustainability is preserved in the context of an ageing society. An older electorate has interests in receiving adequate benefits granted by the social security system. Due to their increasing proportion in the total population, older citizens are an increasingly critical electorate whose needs and concerns are a high priority for policy makers. Nevertheless, meeting their needs and concerns would make the challenge of ensuring fiscal sustainability difficult, in the sense of the equal sharing of the intergenerational burden. Thus, in LTC insurance, intergenerational equity must be considered with respect to an intertemporal budget constraint.

In the recent past, reforms have been ratified that call German LTC insurance's fiscal sustainability into question even further, as they transfer the financing burden to younger and future generations. Although no legal obligations exist thus far, there are several policy options concerning how to deal with the financial

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pressure in LTC insurance. Specifically, Bahnsen et al. (2020) highlight the following options: increase the contribution rate, cut benefits, implement additional tax financing, and implement additional capital funding – or a combination of these. Most of these options would lead to unequal intergenerational burden sharing as they are financed on a PAYG basis. Nevertheless, the (higher) capital funding option would be able to move LTC insurance towards a fiscally sustainable financing situation. However, as capital funding must be financed through a short-term increase in the contribution rate or additional tax payments, ensuring its social acceptance and, thus, political feasibility might be difficult.

Werding et al. (2020) present a reform proposal that addresses the problem of fiscal burden sharing between younger and older generations with a rule-based adjustment. Hence, they seek to address the conflict between political and fiscal sustainability. To account for demographic-induced changes in the beneficiary-contributor ratio in LTC insurance, they propose the inclusion of a so-called "sustainability factor" (SF) in the adjustment of benefits. Building on their conceptual idea, we quantify the fiscal effects of the hypothetical introduction of such an SF for the case of Germany.

Our analysis is based on a generational accounting framework that is commonly applied to German LTC insurance (Bahnsen et al., 2020; Fetzer, Moog and Raffelhüschen, 2002; Häcker, Hackmann and Raffelhüschen, 2011; Häcker and Raffelhüschen, 2004, 2006).[1] The results indicate that implementing an SF has a relieving effect on LTC insurance finances. Hence, this might be a reform option for PAYG LTC insurance systems worldwide that need to curb the impact of demographic transitions.

The aim of this study is twofold: to fill the gap that exists by quantifying the fiscal consequences of such a reform, and to raise policy makers' awareness of this potential reform consideration. Therefore, the main objectives are i) to describe the efforts to reform the German LTC insurance system, ii) to demonstrate the absence of a sustainable financing situation, and iii) to evaluate whether the introduction of an SF might be a sustainable step for LTC insurance in Germany in view of the ageing population. The remainder of this article is structured as follows: next, we present the institutional setting of German LTC insurance as well as recent reforms and reform perspectives. The underlying data and assumptions as well as the methodology are then set out. We then explain the mechanism of the proposed SF before discussing the results of our evaluation of LTC insurance financing and the SF. Final comments conclude.

1. International studies that have applied generational accounting in an LTC insurance context include those by Costa-Font and Patxot (2004) for Spain, Fukui and Iwamoto (2007) for Japan, and Wouterse and Smid (2017) for the Netherlands.

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Long-term care insurance in Germany

Institutional setting

The compulsory LTC insurance in Germany, which entered into force on 1 January 1995, provides social security against the risk of requiring LTC. Regulated in the Social Security Code (SSC) XI, it now covers approximately 90 per cent of the German population.[2] Due to its design as a partial insurance, personal responsibility continues to be crucial. If benefits are not sufficient and the insured person's private income and assets are exhausted, means-tested social assistance can be claimed.

Entitlement and benefits. To be considered in need of care – according to the definition of SSC XI – insured persons must have health-related impairments to their independence or abilities that have rendered them dependent on the help of others for at least six months. The severity of this need is determined through an assessment by the Medical Review Board of the Statutory Health Insurance (*Medizinischer Dienst der Krankenversicherung*). Five care grades are distinguished, with 1 being the lowest and 5 the highest in terms of impairment.

Once the Medical Review Board has determined the need for care and assigned a corresponding care grade, the insured person is allowed to claim benefits from LTC insurance. Essentially, these benefits are divided into cash benefits and in-kind benefits.[3] Due to the partial character of LTC insurance, all benefits are capped. Their type and scope depend on the assigned care grade as well as on whether outpatient or inpatient care is chosen. Outpatient care refers to care at home, where care is provided by professional nursing staff and/or relatives or friends. Inpatient care refers to care provided in nursing homes only by professionals.[4] In

2. This refers to social LTC insurance. The remaining 10 per cent of the population is mandatorily insured in private LTC insurance, where legal requirements exist for those who can be privately insured. On the functioning of private LTC insurance, see Riedel (2003). In the remainder of this article, we focus exclusively on social LTC insurance.
3. Economically speaking, both types are cash benefits as they are defined in euros (EUR). Hence, it would be more precise to distinguish between payments to patients (cash benefits) and payments to providers (in-kind benefits).
4. Generally, a distinction is made within inpatient care between full inpatient, partial inpatient, and short-term care. Short-term care also corresponds to full inpatient care but for a limited period of time (e.g. when home care cannot yet be provided). Partial inpatient care applies when care at home is partly possible but must be supplemented by inpatient care. In this case, day or night care can be used. In this article, we subsume these categories under inpatient care. Moreover, other services and benefits exist that are subsumed; namely, relief care, care counselling, auxiliaries, care-focused improvement of the living environment, additional outpatient benefits, other care expenditures, as well as the payment of social security contributions for informal caregivers (BMG, 2021).

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Table 1. *Benefits paid by LTC insurance (major types of benefits) in 2022*

Type of care	Type of benefit	Care grade				
		1	2	3	4	5
Outpatient care*	Cash benefits**; *x* euros per month	–	316	545	728	901
	In-kind benefits**; up to *x* euros per month	–	724	1,363	1,693	2,095
Inpatient care	In-kind benefits up to *x* euros per month	125	770	1,262	1,775	2,005

Notes: *LTC-dependent persons in outpatient care are additionally entitled to a monthly "relief benefit" of 125 euros. This is earmarked for relieving informal caregivers and supporting the LTC-dependent person's autonomy. **Cash and in-kind benefits may be combined, i.e. if only x per cent of the claim is received as cash benefits, the remaining 100−x per cent can be realized as in-kind benefits.
Source: Social Security Code XI.

inpatient care, only in-kind benefits are granted, while in outpatient care a choice exists between in-kind and cash benefits. Cash benefits are transferred directly to the LTC-dependent person, who decides on their use (e.g. allotting these to a family caregiver). Table 1 presents the amounts for the two (major) types of benefits. To counteract losses in the value of the (capped) benefits due to inflation, the German Government is required to review the necessity and scope of an adjustment every three years.

Financing and co-payments. Financed on a PAYG basis, revenues are used directly to cover expenditures in the same period. They are collected through income-based contributions, which amount to 3.05 per cent of gross income or 3.40 per cent if a person is older than age 23 and has no children. With the introduction of the LTC fund in 2015, the system was supplemented by a funded element. Into this fund, a 0.1 percentage point share of annual contribution revenues is invested. The capital stock is saved over a period of 20 years until 2035; thereafter, financial resources can be withdrawn in case of a deficit. The intention is to enable the stable financing of LTC insurance in the future by cushioning rising contribution burdens and distributing financing more evenly among the generations. Since 2022, contribution revenues have been supplemented by an annual federal tax subsidy of 1 billion euros (EUR).

Conceived as partial insurance, LTC insurance provides benefits that are usually insufficient to fully cover the costs of professional – especially inpatient – care. Consequently, private co-payments are common. Since 2017, LTC-dependent people, in care grades 2–5, pay the same facility-based co-payment for inpatient

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care; thus, people in the same nursing home pay the same co-payment regardless of their care grade.[5] Since 2022, the co-payments in inpatient care are gradually reduced for care grades 2–5 to alleviate the financial burden on people in need of care. The amount of the benefit supplement depends on the time spent in inpatient care. Specifically, it amounts to 5 per cent of the co-payments within the first year, 25 per cent within the second year, 45 per cent within the third year, and 70 per cent after three years living in a nursing home.

Recent reforms and reform perspectives

Since entering into force in 1995, the German LTC insurance has undergone several reforms. Although largely unaltered during its first ten years, it saw major reforms implemented from 2008 onwards.[6] Among these reforms are the 2008 LTC Further Development Act (*Pflege-Weiterentwicklungsgesetz*), the 2013 LTC Realignment Act (*Pflege-Neuausrichtungs-Gesetz*), and three consecutive LTC Strengthening Acts (*Pflegestärkungsgesetze*) in 2015, 2016, and 2017.[7] These three acts altered the system the most extensively. Alongside a significant increase in benefits, they introduced a new definition of LTC dependency and a fundamentally new system for assessing the need for care.[8]

With the enactment of the latest Health Care Expansion Act in 2021 (*Gesundheitsversorgungsweiterentwicklungsgesetz*), the following measures entered into force in 2022: co-payments for inpatient care for care grades 2–5 are now limited to percentage thresholds depending on the time spent in LTC; providers are now obliged to pay collectively agreed wages; and in-kind benefits in outpatient care and short-term care have increased. These measures are financed by a newly established permanent federal tax subsidy of EUR 1 billion per year and a contribution rate increase of 0.1 percentage points for childless insured persons. Based on a first analysis of the Health Care Expansion Act, Rothgang, Heinze and Kalwitzki (2021) expect that the limitation of co-payments will lead to considerably increased expenditures in LTC insurance. Usually, these would need to be financed by an increase in the contribution rate. However, due to the

5. There are no official statistics for quantifying the co-payments in outpatient care as they are highly heterogeneous due to non-regulation.
6. For a compact overview of the most crucial reform changes in German LTC insurance, see Nadash, Doty and von Schwanenflügel (2018).
7. The LTC Realignment Act saw the start of voluntary private supplementary LTC insurance being subsidized by the State. For further information on this type of insurance, the so-called *Pflege-Bahr*, see Nadash and Cuellar (2017). They provide an overview of this reform element and discuss its advantages and disadvantages in light of insurance market specifics.
8. In particular, the Second LTC Strengthening Act led to profound changes within LTC insurance and has therefore been subject to critical analyses, such as those by Bahnsen et al. (2020) and Schwinger, Rothgang and Kalwitzki (2018).

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so-called social guarantee (*Sozialgarantie* – which states that the sum of all social insurance contributions must not rise above 40 per cent), the political feasibility of such an increase is debatable. Furthermore, the Government's limited fiscal room for manoeuvre will not allow the federal tax subsidy to be increased further still.

These measures emphasize the difficulty of simultaneously guaranteeing a stable contribution rate and adequate benefits in a PAYG system in the context of an ageing society and associated changes in the labour market. Therefore, Werding et al. (2020) propose the SF as a tool for addressing this issue and mediating between the two goals. The SF's aim is to have a stabilizing effect on LTC insurance financing. It considers changes in the ratio of people in need of care to contributors. If the number of people in need of care rises faster than that of contributors, a dampening effect occurs on the benefit adjustment. Conversely, the SF amplifies the benefit adjustment, which could clarify and enhance the reliability of the expected benefits in the event of needing care. For these reasons, this current reform proposal is the subject of the analysis in this article. Although it may appear to be a one-sided shift of the burden to the disadvantage of those in need of care, it is precisely this factor that indicates the possibility for flexibility in responding to demographic changes. This eventuality has already been considered in German statutory pension insurance by using such a factor – a precedence that demonstrates its political feasibility.

Data and methodology

Data and assumptions

Our calculations are essentially based on the following four pillars: a population projection, revenue and expenditure aggregates of LTC insurance, age- and sex-specific micro profiles, as well as assumptions on the growth rate and interest rate.

The population projection is based on the 14th coordinated population projection for Germany (Destatis, 2019), the basis for which is the population structure of 2019.[9] For the future development, we assume a constant fertility rate of 1.55 children per woman and an increasing life expectancy at birth for women (men) from 83.4 (78.6) years in 2019 to 88.1 (84.4) years by 2060. Thereafter, we assume no further increase in life expectancy. Regarding long-term migration, we assume net migration of 206,000 people per year.

Data on revenues and expenditures of LTC insurance are retrieved from the German national accounts (Destatis, 2021). These aggregates are the necessary starting point for distributing payments among the cohorts alive in our base year

9. Our population projection follows the cohort component method. A formal description of the projection model is presented by Bonin (2001).

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of 2019. Accordingly, aggregate revenues of LTC insurance amount to EUR 47.24 billion, while expenditures amount to EUR 42.49 billion.[10] The distribution requires age- and sex-specific micro profiles (i.e. relative payments per capita). On the revenue side, profiles are generated based on data from the German Sample Survey of Income and Expenditure (Destatis, 2020) and the German Federal Pension Insurance (DRV, 2020). On the expenditure side, we generate profiles from data provided by the German Federal Ministry of Health (BMG, 2020a, 2020b).

Finally, we use a constant annual growth rate g of 1.5 per cent for the long-term projection of aggregate LTC insurance revenues and expenditures, which corresponds to the average real GDP growth rate for Germany in the period 1991–2019 retrieved from the World Bank database (2021).[11] The real interest rate r is set to 3.0 per cent in line with a European Commission (2019) analysis on the intergenerational dimension of fiscal sustainability.[12]

For a consideration of the present value (PV), the development of aggregate expenditure is particularly crucial. However, this is dependent on the following additional factors: the future relative share of the elderly population; future relative share of people in need of care; ratio of informal and formal care; and guaranteed benefits of LTC insurance (and thus the costs per unit of care). The future relative share of the elderly population will evolve according to the aforementioned population projection. Regarding the future relative share of people in need of care, the empirical literature does not yet provide clear evidence. Some studies have suggested an increase in LTC prevalence with increasing longevity, while other studies see a reduction (European Commission, 2021; Hackmann and Moog, 2009). Nevertheless, findings highlight age as the critical predictor for (future) LTC expenditures rather than time to death (de Meijer et al., 2011; Karlsson and Klohn, 2014). Hence, we assume constant age- and sex-specific LTC prevalence of the base year over time. The number of people in need of care will thus develop in line with population

10. This surplus is mainly the result of the contribution rate increase of 0.5 percentage points in 2019. Please note that in addition to the base year's financial situation of LTC insurance, the present study considers all policy decisions up to and including August 2022 (see section on *Recent reforms and reform perspectives*).

11. See World Development Indicators – Popular Indicators – Germany.

12. However, the determination of the assumed interest rate in the context of generational accounting is not without controversy in the context of the current low interest rate environment. Blanchard (2019) describes that the intertemporal budget constraint is only binding in case of a positive interest rate-growth differential. This implies that without this assumption, the determination of an implicit debt can be questioned. From an empirical point of view, the current negative interest rate-growth differential is not considered exceptional, as highlighted by the German Council of Economic Experts (2019). Moreover, they expect a strong interest rate risk and thus a change in the interest rate-growth differential. Following Bonin (2001), it is therefore reasonable to choose a commonly applied interest rate to ensure the comparability of work based on generational accounting. A further discussion on this issue is provided by Wimmesberger and Seuffert (2022).

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ageing. While this assumption clearly represents a pessimistic scenario, as not every gain in life expectancy will result in a longer time in health, it places the focus on the mere effect of population development on expenditures and does not consider other dynamics. The European Commission (2021) refers to the former as the "demographic scenario", which could also be considered the status quo scenario. This is conducive to the present analysis as the focus is purely on the effect of the SF. In addition, we maintain the ratio between inpatient and outpatient care constant.[13] Moreover, LTC insurance benefits are adjusted for productivity growth.

Methodology

Our analysis of the fiscal situation in German LTC insurance is based on the methodological framework of generational accounting, which was developed by Auerbach, Gokhale and Kotlikoff (1991, 1992, 1994). This is a common method for evaluating the influence of demographic changes on public finances in the long run.[14] Relying on the formal presentation of Bahnsen et al. (2020), the starting points are the PVs of future contributions and benefit payments for all generations alive in the base year of 2019, defined by the following sum product:

$$PV_x^l = \sum_{t=s}^{s+D} \sum_{a=t-s}^{D} P_{a,t} \cdot x_a \cdot \left(\frac{1+g}{1+r}\right)^{t-s} \quad \text{with } x_a = c_a, b_a \tag{1}$$

where $P_{a,t}$ describes the number of individuals at age a in year t.[15] The variable x_a is used to account for age-specific contributions or benefit payments; that is, x_a maps the constant age-specific contribution payments c_a or benefit payments b_a. Furthermore, D is the maximum attainable age of 100 years; s is the base year; and t is the respective year. In addition, the quotient $\left(\frac{1+g}{1+r}\right)^{t-s}$ describes the net discount factor based on the productivity growth rate g and interest rate r.

13. Bahnsen et al. (2020) briefly discuss the abovementioned assumptions. For the impact of a shift from outpatient to inpatient care on LTC expenditures, see Comas-Herrera et al. (2006).
14. Although other approaches exist for assessing fiscal sustainability, such as the Organisation for Economic Co-operation and Development (OECD) method by Blanchard et al. (1990) or the concept of Settergren and Mikula (2005), we choose the generational accounting framework as it is regularly applied to German LTC insurance. As Fetzer and Moog (2021) highlight, all approaches lead to similar implications.
15. In all calculations, we distinguish between male and female. However, for clarity we refrain from sex-specific indexing.

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Furthermore, we determine the PVs of contribution and benefit payments for all generations f born after the base year to evaluate the long-run fiscal situation of LTC insurance.[16]

$$PV_x^f = \sum_{t=s+1}^{\infty} \sum_{a=t-s}^{\min\{D,(t-s)\}} P_{a,t} \cdot x_a \cdot \left(\frac{1+g}{1+r}\right)^{t-s} \quad \text{with} \quad x_a = c_a, b_a \tag{2}$$

In the next step, we aim for the so-called intertemporal public liabilities IPL of LTC insurance.[17] Therefore, we calculate the differences in the benefit and contribution payments of all living and future generations as well as the current assets Y of LTC insurance:

$$IPL = \left(PV_b^l + PV_b^f\right) - \left(PV_c^l + PV_c^f\right) - Y_s \tag{3}$$

As fiscal sustainability requires $IPL = 0$, we further compute the respective necessary increase of contribution payments θ as follows[18]:

$$\theta = \frac{IPL}{PV_c^l + PV_c^f} \tag{4}$$

Moreover, we calculate the required increase of contribution payments θ as the quotient of the IPL and the sum of the contribution payments of all generations, namely the generations already living in the base year s as well as the generations f born after the base year.

With this, we derive our benchmark indicator for sustainable LTC insurance finances, which we call the "sustainable contribution rate" SCR, by multiplying the base year contribution rate CR_s by $(1+\theta)$:

$$SCR = CR_s \cdot (1+\theta) \tag{5}$$

We further project the future development of the contribution rate to draw a comparison with the benchmark (SCR), thus evaluating the financing situation of German LTC insurance with respect to sustainability. Therefore, we compute the

16. The long-run projection for all relevant variables comprises 300 years starting in the base year. Subsequently, we used a geometrical serial to determine the remaining net payments. The choice of 300 years is somewhat arbitrary, but represents a good approximation for infinity in our analysis.
17. The basic nature of PAYG financed systems must be kept in mind as they predetermine the necessity for annual budget balancing. Consequently, the explicit debt of LTC insurance is zero. However, due to acquired benefit entitlements, LTC insurance inhabits an implicit debt. This implicit debt is equivalent to intertemporal public liabilities.
18. Table A1 in the Appendix indicates that the results are robust to different interest rate-growth differentials.

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annual total contributions C_t and benefits B_t for all years t after the base year s:

$$X_t = \sum_{a=0}^{D} P_{a,t} \cdot x_a \cdot (1+g)^{t-s} \text{ with } X_t = C_t, B_t \tag{6}$$

Now, we are able to determine the annual necessary adjustment of the contribution rate γ_t, where the term $B_t - C_t$ illustrates a possible annual deficit and A_t illustrates the short-run assets of LTC insurance[19]:

$$\gamma_t = \frac{B_t - C_t - A_t}{C_t} \tag{7}$$

Furthermore, the contribution rate development is projected by multiplying $(1+\gamma_t)$ with the base year contribution rate CR_s for each year t:

$$CR_t = CR_s \cdot (1+\gamma_t) \tag{8}$$

The contribution rate is the primary adjustment mechanism for balancing the annual LTC insurance budget. Generally, the system will only remain in balance if adjustments are made on the revenue or expenditure side of the budget – or on both. The approach described in the next section seeks to mediate between the adjustment possibilities.

The sustainability factor in long-term care insurance

Adjustment formula

The proposal of Werding et al. (2020) addresses the sustainability of German LTC insurance financing while including an ongoing dynamization of benefits. The authors suggest a necessary adjustment of LTC benefits involving the SF.[20] The

19. These short-run assets are calculated per period t as the sum of possible short-run assets of the previous period, the revenues and the expenses of period t, as well as the contributions to the LTC fund. From 2035, these short-run assets (if available) can be supplemented by the financial resources from the LTC fund.

20. This idea originates from the pension adjustment formula of the German Federal Pension Insurance, according to which the current pension value is adjusted with a sustainability factor. The latter considers the development of the pensioner quotient, which is determined based on the pension expenditure volume and an average pension payment or the contribution volume and an average contribution payment. However, the current pension value is part of the pension formula, which defines the actual pension payments. The proposal under discussion differs from this formula in the following two aspects: i) the demographic development is considered explicitly through the absolute numbers of benefit recipients and contribution payers; and ii) payments to benefit recipients are adjusted directly as there are no further benefit calculations, which is comparable to the pension formula. For further details, see Bonin (2009) or Fenge and Peglow (2018).

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aim of the SF is to consider the ratio of benefit recipients and employees subject to compulsory insurance. Thus, the adjustment of the LTC benefits would be geared to the dynamics of wage and demographic transitions.

Therefore, following Werding et al. (2020), an explicit adjustment formula can be introduced regarding the benefits granted by LTC insurance. With the SF, a self-stabilization mechanism is incorporated. The scheme could thus provide the following adjustment formula for LTC benefits in year t compared with the previous year $t - 1$:

$$b_{a,t} = b_{a,t-1} \cdot \underbrace{\frac{GE_{t-1}}{GE_{t-2}}}_{\substack{wage \\ component}} \cdot \underbrace{\left(\left(1 - \frac{\frac{BR_{t-1}}{CP_{t-1}}}{\frac{BR_{t-2}}{CP_{t-2}}} \right) \cdot \alpha + 1 \right)}_{sustainability\ factor} \quad \text{with } 0 < \alpha \leq 1 \qquad (9)$$

As a result, age-specific LTC benefits b are adjusted annually with the growth in gross earnings GE (wages, salaries, and pensions), which corresponds to the productivity growth rate.[21] The actual intergenerational burden sharing depends on the weighting parameter α. Furthermore, information on the (future) care dependency ratio (i.e. the quotient of beneficiaries BR and insured persons CP) is required. For this purpose, the number of beneficiaries by sex and age group (BMG, 2020a) and the number of insured persons by sex and age group (BMG, 2020b) are used as a basis. Only insured individuals who actually pay contributions are considered. Co-insured family members remain disregarded. In line with the constant LTC prevalence assumption, resulting age- and sex-specific proportions are maintained constant in the underlying calculation. Thus, the care dependency ratio is determined over time by the population projection.

Mode of operation

The inclusion of the SF in the adjustment makes it possible to correctly relate the annual change in benefits to the two most crucial determinants of LTC insurance finances – the number of benefit recipients BR and contributors CP. A closer examination of the SF unfolds the following dynamics:

21. Using general productivity growth is rather optimistic as LTC belongs to non-productive industries with disproportionate wage increases, and productivity increases are mainly absent. Baumol (1967) refers to this phenomenon as “unbalanced growth”, where a highly inelastic demand meets limited possibilities for technical progress.

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$$\underbrace{\left(1 - \frac{\frac{BR_{t-1}}{CP_{t-1}}}{\frac{BR_{t-2}}{CP_{t-2}}}\right)}_{\boxed{1}} \cdot \underbrace{\alpha}_{\boxed{2}} + \underbrace{1}_{\boxed{3}} \tag{10}$$

Disregarding the parameter α, an increase (decrease) in BR results, ceteris paribus, due to part $\boxed{1}$ of Equation (10) in a negative (positive) value, representing the share by which the benefit adjustment is dampened (amplified). Consequently, an increase (decrease) in CP results, ceteris paribus, due to part $\boxed{1}$ of Equation (10) in a positive (negative) value, representing the share by which the benefit adjustment is amplified (dampened).

The weighting parameter α (see part $\boxed{2}$ of Equation (10)) represents an intergenerational distribution compromise by regulating the financial impact that stems from the wage component (see Equation (9)) and the care dependency ratio. Introducing the parameter $\alpha = (0, 1]$ ensures that LTC benefits are adjusted at a low rate as the care dependency ratio BR/CP rises (decreases). An $\alpha = 0$ would allocate the financial impact arising from the adjustment through the wage component to the employed alone, and therefore to the contribution rate. The SF would then not be effective. With $\alpha = 1$ and $\frac{\frac{BR_{t-1}}{CP_{t-1}}}{\frac{BR_{t-2}}{CP_{t-2}}} \neq 1$, LTC insurance would pursue a rather revenue-oriented expenditure policy. Thus, the financial impact would be transferred fully to the benefits. Accordingly, $\alpha = 0.5$ would distribute the adjustment equally among those in need of care and those paying contributions.

Eventually adding 1 (see part $\boxed{3}$ of Equation (10)) results, in total, in the actual (sustainability) factor by which the wage component is adjusted. Hence, an SF with a value $> (<) 1$ would amplify (dampen) the benefit adjustment. In our analysis, the SF takes effect from 2022 onwards.

Results

The development of the care dependency ratio in Figure 1 depicts the evolving ratio of individuals in need of care to contributors in LTC insurance. It reveals the progressive ageing of the German population. Like a “drifting dune’, the ratio moves forward over time, largely driven by the baby boomer cohorts born between 1955 and 1970.

Consequently, starting at 7.1 per cent in 2020, it increases to 9.0 per cent by 2040, reaching 10.9 per cent in 2060. This process, which is perceived as creeping, will

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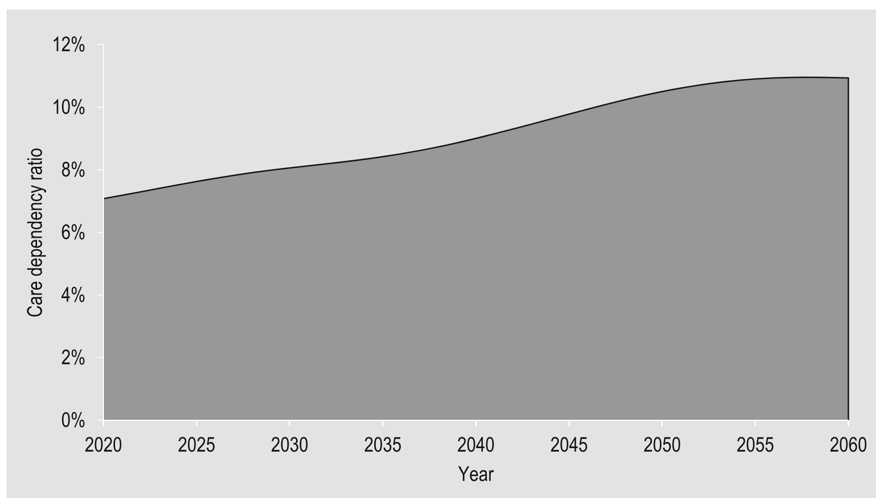
Figure 1. *Development of the care dependency ratio until 2060*



Source: Authors' calculations

accelerate significantly in the next decades. In particular, the number of people aged 80 or older will increase steadily. With this process combined with birth rates remaining low, the expected consequence is additional pressure on LTC insurance finances. The care dependency ratio will be the same in both the status quo and SF scenarios, which are elaborated in the following subsections.

Status quo scenario

Regarding our sustainability definition of $IPL = 0$, the base year contribution rate must be adjusted by θ. The contribution rate of 3.05 per cent in 2020 must be increased by 1.53 percentage points to achieve sustainability under current conditions. Hence, our status quo scenario benchmark is a sustainable contribution rate SCR of 4.58 per cent. The SCR would immediately remove the long-term fiscal imbalances in LTC insurance, yet it would heavily increase the short-term burden of private households. Bahnsen et al. (2020) highlight that implementing an SCR implies a funded system in LTC insurance. Due to the SCR, revenues in some years would be higher than expenditures. As a result, a capital stock would be formed that could be used for upcoming deficits in the future. The underlying mechanism is highly similar to the current LTC fund. However, increasing the contribution rate this rapidly by such an amount seems politically difficult, at least in the short run. More realistic is the PAYG inherent

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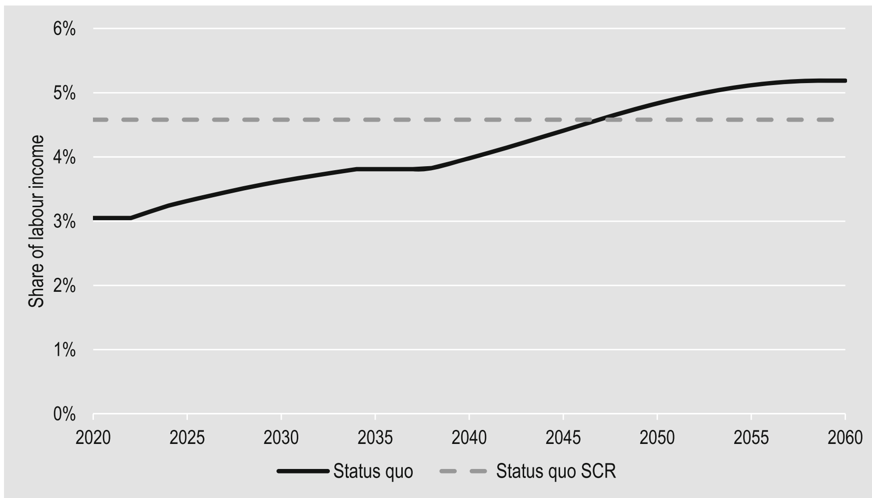
Figure 2. *Contribution rate projection until 2060 – status quo scenario*



Source: Authors' calculations.

mechanism of (potential) annual adjustments to the contribution rate CR. The development of the CR and the SCR is illustrated in Figure 2.

Our status quo projection reveals that LTC insurance's short-run assets could ensure a stable contribution rate of 3.05 per cent until 2022. Afterwards, it would increase to 3.81 per cent by 2034, the year before the beginning of the possible drawing down from the LTC fund. The fund's resources would stabilize this rate until 2037. Then, the contribution rate would rise to 5.19 per cent by 2060. It will be interesting to observe the degree to which the LTC fund will actually ensure stability in the contribution rate. Doubts exist concerning whether the fund will remain untouched in times of higher financial needs, and whether it will rapidly be depleted when the (demographic-induced) demand for LTC is high in the future.

Sustainability factor scenario

Fiscal challenges arise primarily due to the development of the care dependency ratio. As Figure 1 demonstrates, this ratio will steadily increase between 2020 and 2060. Following Equation (9), this development affects the adjustment of the benefits through the SF. However, the extent of this adjustment depends on the parameter α (i.e. the parameter for steering the intergenerational distribution of the financial burden). A distinction is made between two cases,

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Table 2. *Development of the sustainability factor until 2060*

	$\alpha = 0.25$	$\alpha = 0.5$
2025	0.9963	0.9925
2030	0.9975	0.9951
2035	0.9977	0.9955
2040	0.9962	0.9925
2045	0.9958	0.9915
2050	0.9967	0.9934
2055	0.9985	0.9970

Source: Authors' calculations.

with $\alpha = 0.25$ and $\alpha = 0.5$. The former is based on the German statutory pension insurance (i.e. the parameter α of the respective SF is set to 0.25). The latter is proposed by Werding et al. (2020) and is also considered in the present analysis. Table 2 presents the development of the SF over time for these two cases.

The SF exhibits a value <1 by 2060 for both analysed variants of the parameter α; that is, the benefit adjustment would be dampened in these years in isolation. For $\alpha = 0.25$, the SF would reduce the benefit adjustment by 0.25 per cent in 2030 and by a further 0.13 percentage points by 2040. In 2060, the benefit adjustment would be amplified for the first time due to the SF. These developments also apply to a value of $\alpha = 0.5$; however, the adjustment effects are stronger. In 2030, the adjustment is found to be twice as high as in the previous case. In this variant, the benefit adjustment is also amplified for the first time in 2060 due to the SF. This can be explained by the demographic development of the ratio of benefit recipients *BR* and contributors *CP*, which has a relieving effect on LTC insurance. However, this trend is not permanent, reversing from 2067 onwards and leading again to an SF <1. This flexibility demonstrates the practicability and advantage of the SF, in that demographic development may be considered favourable for, or to the disadvantage of, contributors or benefit recipients, respectively.

Alongside the development of the SF in Table 2, with a parameter $\alpha = 0.25$, the *IPL* would decrease from 40.6 per cent in the status quo scenario to 32.0 per cent of GDP. If this parameter is increased to $\alpha = 0.5$ (so that the financing burdens are shared equally between younger and older generations) the *IPL* would amount to 24.3 per cent of GDP. These developments are also reflected in the *SCR*: in the

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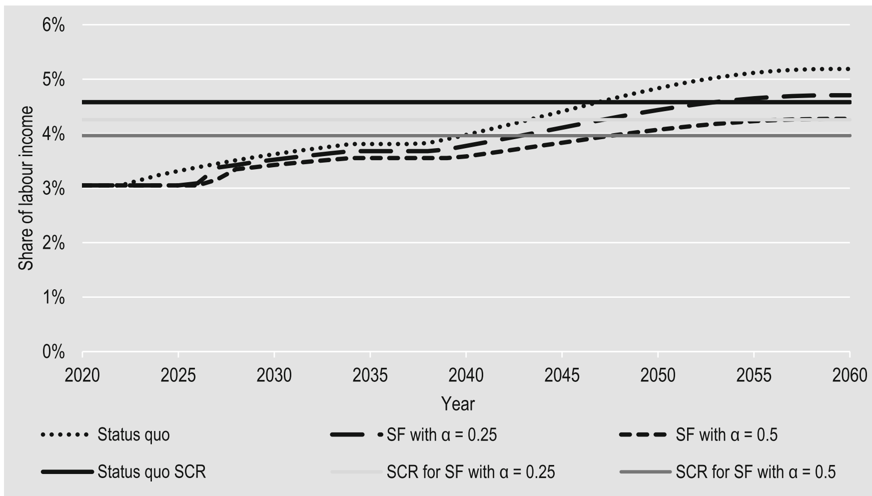
Figure 3. *Contribution rate projection until 2060 – SF scenario*



Source: Authors' calculations.

case of $\alpha = 0.25$, an *SCR* of 4.26 per cent would be required, while equal burden sharing ($\alpha = 0.5$) would require an *SCR* of 3.97 per cent. These relieving effects also become clear when examining the development of the contribution rate over time in Figure 3. The following applies to both variants: the contribution rate and thus the burden for primarily young working generations would be lower compared with the status quo scenario. For $\alpha = 0.25$, the contribution rate is 3.8 per cent in 2040 and rises to 4.7 per cent by 2060. For $\alpha = 0.5$, the corresponding values are 3.6 per cent and 4.3 per cent.

When comparing these contribution rate projections with the status quo scenario, it becomes apparent that an SF stabilizes the contribution rate for another three years ($\alpha = 0.25$) or four years ($\alpha = 0.5$).

A comparison of the necessary adjustment θ for the three scenarios reveals the extent to which the effects of demographic change can be considered with respect to the *SCR*. In the status quo scenario, the *SCR* would need to increase by 50 per cent ($\theta = 0.50$). In the SF scenario with $\alpha = 0.25$ (i.e. analogous to the German statutory pension insurance), an increase in the *SCR* of approximately 40 per cent ($\theta = 0.4$) would be necessary. The increase of the *SCR* is thus 20 per cent lower than that in the status quo scenario. This relieving effect is reinforced with $\alpha = 0.5$, resulting in an increase in the *SCR* of 30 per cent ($\theta = 0.3$), which is 40 per cent lower than that in the status quo scenario.

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Conclusion

Generally, unfavourable demographics coupled with a generous benefit scheme will lead to financial challenges in every PAYG insurance scheme, setting the system on an unsustainable path. This has been highlighted numerous times in many countries. In this sense, based on the case of German LTC insurance, we state that although structural reform efforts have been made (e.g. with the LTC fund), fiscal sustainability cannot be achieved based on the current system's design. Our analysis reveals that although the LTC fund can ensure contribution rate stability for a few years, future increases are inevitable. In the long run, a contribution rate of more than 5 per cent might be necessary. However, the political feasibility of such a high level is limited by public acceptance and the economic circumstances of the country. Furthermore, the increased financing burden would be primarily passed on to the younger and future generations. This will be so even though it is the baby boomer generation with their comparatively small number of descendants who have brought the system into imbalance. In any case, the problem of the "drifting dune" can no longer be solved demographically; thus, other – systemic – solutions must be found.

A way to distribute the financing burden more evenly among the younger and older generations is the proposed implementation of an SF. Building on the experience of the existing SF in German statutory pension insurance, the proposal has some potential. Such a mechanism would curb potential adjustments to LTC insurance benefits if the number of individuals in need of care were to rise more strongly than the number of contributors. This would dampen the benefit adjustment – in other words, it would lower the benefit level in terms of decreasing purchasing power, as benefits are not dynamized in line with growth in gross earnings. Nevertheless, it would not lower the benefits granted by LTC insurance. On the one hand, one could say that this undermines the functionality of LTC insurance. On the other hand, it may be seen as a compromise between two extreme forms of social insurance design; namely, a defined benefit scheme or a defined contribution scheme. Therefore, it could be a feasible path in terms of political and fiscal sustainability.

Our results demonstrate that the relieving effect depends on the choice of the weighting factor α. The value of α regulates the distribution of the financing burdens that arise from changes in the structure of the insured (i.e. the distribution between beneficiaries and contributors). A higher weighting factor implies a greater transfer of burdens to older generations, resulting in less of an increase in benefits for those in need of care. Consequently, a higher α leads to a higher relieving effect in terms of a lower IPL. Simultaneously, this would also curb the contribution rate's development. If the aim is to immediately eliminate IPL and therefore restore sustainability in LTC insurance, the SCR represents the

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benchmark indicator. Consistent with previous results, the *SCR* decreases due to an implemented SF and increasing α.

The present study underlines the importance of policy makers' awareness of a rule-based adjustment of benefits that considers the emerging financial strain and removes pressure from the contribution rate. The SF cannot fully solve the sustainability problem in German LTC insurance financing. However, it does represent a step towards a sustainable situation and could be one component of a more comprehensive reform package. Werding et al. (2020) highlight that an expansion of private supplemental LTC insurance will be a critical component of LTC expenditure financing in the future, and regarding potential social assistance claims also. Yet, the existing market for such products appears to be underdeveloped in Germany (Browne and Zhou-Richter, 2014; Nadash and Cuellar, 2017). Nevertheless, despite the limited coverage of LTC risk by public systems and the uncertain – but known – risk of the need for care in old age, the uptake of (supplementary) LTC insurance is also low in other countries (Lambregts and Schut, 2020).

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Appendix

Table A1. *Sensitivity analysis of the adjustment parameter θ*

Status quo			$\alpha = 0.25$		$\alpha = 0.5$	
Baseline (g = 1.5% ; *r* = 3%)			32.0%		24.3%	
IPL	40.6%					
SCR	4.58%		4.26%		3.97%	
θ	0.50		0.40		0.30	
Sensitivity case 1 (g = 1% ; *r* = 3.5%)			16.3%		12.4%	
IPL	20.6%					
SCR	4.26%		4.01%		3.78%	
θ	0.40	*-21%*	0.31	*-21%*	0.24	*-21%*
Sensitivity case 2 (g = 2% ; *r* = 2.5%)			95.1%		72.5%	
IPL	119.9%					
SCR	5.20%		4.76%		4.35%	
θ	0.71	*41%*	0.56	*42%*	0.43	*42%*

Source: Authors’ calculations.

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Check for updates

The 2022 Greek pension reform: The rebirth of carve-out privatization in Eastern Europe

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Abstract After a decade of unprecedented austerity, Greece abruptly changed the course of pension consolidation in 2022 and implemented the controversial carve-out pension funding approach, whereby a portion of existing pay-as-you-go (PAYG) contributions are diverted to fund individual pension savings, thus undermining the financing of existing PAYG pensions. Although inspired by the World Bank's 1994 pension privatization blueprint, the Greek 2022 reform features a major policy shift by entrusting the management of individual pension savings to a dedicated government body, ostensibly to try to remedy inherent market failures in private pension provision. Like earlier reforms in Eastern Europe, the multi-decade transition costs of carve-out funding have been vastly underestimated in Greece, which will give rise to fiscal distress in the coming years when annual transition costs become sizeable and favourable international financing terms start to change. Unless firm political commitment is established to implement the measures necessary to finance the transition costs, Greece may have to resort to reform reversals similar to those already implemented across Eastern Europe.

Keywords pension scheme, defined contribution plan, social security reform, social security financing, social security administration, Greece

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Introduction

The 2008 global financial crisis brought to light the unsustainable fiscal positions of many European countries, foremost Portugal, Italy, Greece and Spain – which were at the time derogatorily labelled as the "PIGS". With public pensions being the major expenditure item in Europe, fiscal problems in these countries were predominantly driven by unsustainable pension outlays that the lack of appropriate reforms over preceding years had left unaddressed. Greece was thus forced to implement harsh pension austerity measures over the 2010–2019 period to stabilize the pension system.

After much hardship, the structure of the Greek public pension system was mostly consolidated in operational and financial terms by 2019 and was on its way to achieving fiscal sustainability. In particular, the public pension system was reformed to consist of a government-financed universal old-age benefit, an earnings-related defined benefit pillar financed with a 20 per cent contribution rate, and a notional defined contribution (NDC) pillar financed with a 6 per cent contribution rate. However, after right-wing parties won the 2019 elections, the new government abruptly changed the course of pension reform and opted for the controversial carve-out pension funding approach – by legislating the transformation of the NDC pillar into a fully-funded defined contribution (DC) system from January 2022.

The 2022 pension funding reform closely resembles the carve-out pension privatization blueprint championed by the World Bank (World Bank, 1994) and implemented subsequently in many Eastern European countries, whereby a portion of existing pay-as-you-go (PAYG) contributions is diverted to private pension funds – thus creating sustained deficits in public pension systems and undermining the financing of existing PAYG pensions. The Greek reform, however, features a major policy shift with respect to the original privatization blueprint. Acknowledging the poor performance of competitive private pension provision in Eastern Europe and inspired by the impressive performance of government managed schemes in several Member countries of the Organisation for Economic Co-operation and Development (OECD), the management of pension savings is to be entrusted to a dedicated government institution.[1]

1. We use the terms "carve-out pension privatization" and "carve-out pension funding" interchangeably in this article to refer to pension funding efforts financed by a diversion of existing PAYG contributions, thus creating a transition deficit in the public PAYG system. We also use "reform reversals" in this article, since this term has become commonplace after being introduced by the World Bank, but we make use of this term without imputing any implicit negative value judgement. Finally, we classify Greece as being among Eastern European countries, although it is more often classified as belonging to those of Southern Europe in the literature.

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Notwithstanding this major policy shift from private to the government management of pension savings, the Greek government has used the pension privatization "myth" (Barr, 2000; Orszag and Stiglitz, 2001; Beattie and McGillivray, 1995) of the promise of accelerated economic growth to justify the abrupt change in course of pension reform. This is so despite more than 25 years of extensive experience in Eastern Europe having thoroughly debunked the privatization myths promoted by the World Bank (World Bank, 1994). That these reform expectations failed to be realized led to a wave of reform reversals – ranging from the outright dismantling of mandatory private pension funds in Hungary and Poland (Simonovits, 2011; Fultz, 2012), their scaling-down in Latvia, Slovakia and Bulgaria (Bielawska, Chłoń-Domińczak and Stańko, 2015) and the elimination of carve-out financing in Lithuania (Altiparmakov and Nedeljković, 2021). Coincidentally, Greece became the first among the European Union's (EU) "old" EU–15 Member States to join the carve-out pension funding bandwagon – and at a time when it was being abandoned by its Eastern European counterparts (Table 1).

This article argues that Greek policy makers failed to recognize a major lesson from Eastern Europe – to avoid the carve-out approach to pension funding. While pension funding is traditionally organized in a supplemental manner in Western Europe and North America, the adoption of carve-out financing in Eastern Europe proved to be inherently unstable and introduced fiscal and economic tensions between the traditional PAYG system and the funded pension pillar. Furthermore, the carve-out transition costs had been vastly underestimated

Table 1. *Pension privatization reform reversals in Eastern Europe*

Country	Pension privatization	Reform reversal
Hungary	1998	Dismantling, 2010
Poland	1999	Dismantling 2014, 2019
Latvia	2001	Scale-down, 2009
Bulgaria	2002	Scale-down & Back-to-PAYG option, 2011
Croatia	2002	Back-to-PAYG option 2011, 2019
Estonia	2002	Scale-down & Voluntary participation 2020
Lithuania	2004	Scale-down 2009, Carve-out eliminated in 2019
Slovakia	2005	Scale-down & Back-to-PAYG option, 2009
North Macedonia	2006	Scale-down 2014, Back-to-PAYG option 2019
Romania	2008	Scale-down & Voluntary participation 2018
Czechia	2013	Dismantling, 2014

Source: Altiparmakov and Nedeljković (2021).

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during the reform planning stage in most Eastern European countries, including Greece, which will give rise to fiscal distress in the coming years and decades. We also argue that there is no evidence to suggest that the Greek carve-out pension funding will result in any tangible acceleration of economic growth, as this macroeconomic improvement eluded earlier reformers in Eastern Europe as well as in Latin America. Finally, we note that government management of pension savings, if implemented prudently, could be a promising alternative to avoiding the drawbacks of private pension provision, but this approach will introduce additional political risks on top of the fiscal risks inherent to carve-out financing which, if left unaddressed, may incite reform reversals.

This article is structured as follows: the next section explains how the pension funding and privatization initiatives arose in Greece. The article then argues that reformers' hopes for increased national savings and accelerated economic growth are misplaced, indeed unfounded, and shows that official government estimates vastly underestimate the actual transition cost that will emerge over the next 50 years. It is further argued that the proposed government management of pension savings may offer a promising avenue to address the market failures inherent in private pension provision, provided that the accompanying political risk is successfully attenuated. Significantly, unless credible additional financial resources, possibly through "austerity" measures – most likely in the form of a permanent increase in taxes – are put in place to finance the carve-out transitional deficits, a reform reversal similar to earlier cases in Eastern Europe may become inevitable in Greece as well. Concluding comments summarize the key policy challenges.

The Greek approach to individual pension saving accounts

The Greek national public earnings-related PAYG system was founded in 1934. Like in many other European countries, the generosity of public benefits increased in the decades following the Second World War, with many influential groups and professions securing retirement privileges and special treatment. The lack of political support for appropriate reforms to entitlements (retirement age, benefit structure, privileged groups), which were required over the years to adjust the PAYG system to the evolving economic and demographic environment, gave rise to an increasingly unmanageable system after the 1980s – with pension expenditures being almost decoupled from contribution revenues, growing deficits financed by ad-hoc government transfers, and the absence of an effective brake on expenditure growth (Nektarios and Tinios, 2019). By 2010 the Greek pension deficit amounted to 7.3 per cent of GDP and accounted for two-thirds of the overall fiscal deficit (Kangur, Kalavrezou and Kim, 2021). The 2008 global financial crisis sharply deteriorated borrowing conditions and necessitated the

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implementation of the long-overdue reforms to entitlements to avoid defaulting on debt repayments. Thus, over the 2010–2019 period, Greece implemented unprecedented pension austerity, including abrupt increases in retirement ages and benefit reductions that were applied not only to new retirees but to existing pensioners, thus raising the issues of inter- and intragenerational equity and testing the participants' trust in the public PAYG system.[2]

Complementary to the development of the national pension scheme, different occupational organizations, professions and enterprises began instituting auxiliary pension provision as early as the 1930s, based on the legislation of the main earnings-related system. Auxiliary pension coverage continued to grow so that, by 1983, auxiliary pension provision had been extended to the majority of employees, albeit with differing degrees of generosity and funding levels (Nektarios and Tinios, 2019). The reform of 1992 aimed to unify benefit formulas across different sectors and funds, but a truly unified system of management was implemented only during the recent consolidation reforms, whereby all previously distinct auxiliary funds and schemes were unified and legislated to operate on a (partially funded) NDC PAYG basis from 2014. Pension rights accumulated prior to 2014 were credited with a fixed 0.45 per cent annual accrual rate, while pension accruals after this date are to be calculated in line with the NDC mechanism.

Despite ping-pong legal changes caused by court rulings and a lack of firm political support, the structure of the Greek pension system was operationally consolidated by 2019 in three complementary tiers:

Tier 1. A government tax-financed universal old-age benefit (360 euros (EUR) per month).

Tier 2. A main contributory earnings-related defined benefit, with a 20 per cent contribution rate and accrual rates around 1 per cent.

Tier 3. An auxiliary NDC tier with a 6 per cent contribution rate (3 per cent employee, 3 per cent employer, without any state contribution or subsidy).

Gross pension spending in Greece stood at 15.7 per cent of GDP in 2019 and remained, alongside Italy, the highest in the EU. However, it should be noted that this result was not solely driven by high pension expenditures, but also partly by the negative GDP dynamics which contracted by 25 per cent compared to the 2008 pre-crisis level. The Aging Working Group projections indicated that pension spending was to decline to 13.8 per cent of GDP by 2030 and to stay roughly at that level over the 2030–2050 period (National Actuarial Authority, 2021). Thus, it could be said that Greece had been successful in stabilizing its pension expenditures

2. A more detailed description regarding the disorderly manner in which several rounds of pension reforms and austerity measures were implemented over the 2010–2019 period can be found in Kangur, Kalavrezou and Kim (2021).

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over the medium-to-long term. Of the total pension expenditure of 15.7 per cent of GDP in 2019, auxiliary pensions accounted for 1.9 per cent of GDP, which was covered in full by auxiliary contributions also equal to 1.9 per cent of GDP.

The defined benefit tier provides a certain level of intergenerational risk sharing and is allowed to receive government subsidies when needed, in order to honour its pre-defined pension obligations. In contrast, the NDC tier is legally forbidden from receiving state subsidies and is required to maintain financial stability by implementing appropriate NDC balancing mechanisms, including pension indexation freezes whenever the system might enter a state of deficit. The NDC PAYG financing mechanism, with a fixed contribution rate in the face of demographic ageing and scheme maturation (the auxiliary system is not as mature as the main pension system), naturally and inevitably leads to more modest accrual rates for future cohorts. Thus, the Aging Working Group projections indicate the effective accrual rate of the NDC tier will decline from 0.45 per cent for those retiring in 2020 to 0.37 per cent for those retiring in 2040 (National Actuarial Authority, 2021). This projected decline of auxiliary pensions has been used by proponents of pension privatization to argue that the auxiliary system offers a poor return for younger workers. To counter calls for privatization, one obvious reform option could have been to merge auxiliary pensions with the main defined benefit pensions, to consolidate the two earnings-related tiers. In doing so, the development of a supplementary funded pillar to complement future public benefits would also be conceivable. Indeed, the Committee of Experts formed by the government in 2015 did suggest the integration of auxiliary pension into the main pension scheme, but the proposal failed to receive the necessary political support and was not implemented (Nektarios and Tinios, 2019).

After winning the 2019 elections, right-wing parties formed the new government and presented a comprehensive growth-enhancing package featuring a proposal for pension funding reform that was very similar to the carve-out pension privatizations implemented in many Eastern European countries. The law was adopted in August 2021 and legislated a progressive transformation of the system of NDC auxiliary pensions into a fully-funded DC pillar, starting from January 2022. The funded DC pillar is mandatory for all new entrants into the labour force, while workers younger than age 35 will be able to voluntarily opt-in until the end of 2023. Members will be able to choose one of three investment profiles with different degrees of risk (conservative, balanced and aggressive) and a life-cycle investment profile will be offered as a default retirement portfolio. On reaching retirement, the Government will guarantee future members of the funded system an entitlement to benefits equal to at least the value of paid contributions, indexed for inflation (*Athina984*, 2021a). The key policy shift with respect to earlier pension privatizations is that, to avoid the

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poor performance of competitive private pension provision witnessed in Eastern Europe, Greece has decided to entrust the management of pension savings to a dedicated and professional government body – the Hellenic Auxiliary Pensions Defined Contributions Fund (TEKA).

Notwithstanding the novelty element of government managed savings, when promoting the virtues of the 2022 funding reform, Greek officials have been mostly relying on pension privatization arguments put forward by the World Bank in 1994: namely, the expectation of accelerated economic growth and higher benefits for future pensioners (*Athina984*, 2021b). The reasoning behind the pension privatization initiatives in Greece is eloquently summarized in a World Bank discussion paper by Nektarios and Tinios (2019). The authors argue that the existing PAYG system, even after successful fiscal consolidation, would continue to undermine economic growth due to its inability to support the much-needed increase in national savings and investment that would, in turn, permit Greece to leave behind its "anaemic growth path" (Nektarios and Tinios, 2019, p. 33) – a line of reasoning, also used to promote earlier pension privatization reforms, subsequently refuted by empirical evidence and labelled as a "myth" (Barr, 2000; Orszag and Stiglitz, 2001).

The myth of pension privatization and accelerated economic growth

In the 1990s, the World Bank put forward several possible avenues through which pension privatization could lead to higher economic growth (World Bank, 1994). The most prominent avenue presented in the literature, and the one most relevant for Greece, is the assertion whereby privatization increases savings, which are then channelled into productive private investment which, in turn, accelerates the rate of economic growth. Despite this line of reasoning, it should be stressed that carve-out pension privatization per se has no influence on national savings. The carve-out privatization diverts (a part of) existing PAYG contributions into private pension funds, thus formally increasing private savings, but at the same time reducing public savings by the exact same amount – thus leaving the overall national (public plus private) savings unchanged.

This is a basic macroeconomic identity. The general lack of positive effects on national savings has also been recognized within the World Bank (Schwarz and Arias, 2014). Accordingly, it is the reaction of government and households to pension privatization that determines the actual outcome on national savings. If households trust the privatization reform and treat newly founded pension funds as genuine retirement savings, they may partially substitute their existing forms of savings with private pension fund accumulations, thus increasing their consumption and leading to an actual decrease in national savings. Therefore,

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the reaction of the government is crucial in achieving any increase in national savings during a carve-out pension privatization.

It thus falls upon government to implement credible and long-term financing measures to cover the multi-decade revenue shortfall created by the diversion of existing PAYG contributions into private pension funds. Naturally, where the financing measures are deemed to be regressive (such as the imposition of higher consumption taxes) or where financing is assured by reduced public expenditure in other domains, this will require strong political commitment and broad support. These options may be worthy of the epithet of what, in current parlance, is referred to as "austerity" measures. A further option is for higher levels of public borrowing, for instance, through the sale of government bonds. The iconoclastic complete pension privatization reform undertaken in Chile in 1981 enjoyed the support of the Pinochet regime that implemented drastic austerity measures to produce surpluses equal to 8 per cent of GDP in the non-pension part of the budget for several decades (Arenas de Mesa and Mesa-Lago, 2006). However, in Eastern Europe, political determination and social support for long-term austerity measures have mostly been absent.

In turn, econometric analysis indicates that, controlling for relevant growth covariates, pension privatization has failed to produce any statistically significant acceleration in economic growth in Latin America or Eastern Europe (Altiparmakov and Nedeljković, 2018). It is thus no surprise that the World Bank's Independent Evaluation Group (IEG) concluded that the "empirical evidence suggests that the secondary objectives of privately funded pension plans to increase savings, develop capital markets, and increase worker participation in the pension system have remained largely unmet" (Andrews, 2006, p. xxiv).[3]

Implementing a carve-out privatization without the accompanying additional public financing measures gives rise to a suboptimal PAYG mechanism in disguise (see Figure 1). With a portion of existing PAYG contributions diverted to private pension funds, the government will face a financing shortfall to pay for existing PAYG pensions. It may thus be forced to borrow in the bond market, with the lenders most often being the very same, cash-rich, pension funds to whom the carved-out contributions have been directed. Private pension funds in developing financial markets are likely to invest in bonds owing to the scarce supply of alternative domestic financial products and/or limitations to investment abroad. Indeed, domestic government bonds had been a dominant pension asset in many reforming countries, including Croatia, Hungary, North Macdedonia, Poland and Romania, where they accounted for 60 per cent or

3. The mandated goals of the work undertaken by the IEG are "to learn from experience, to provide an objective basis for assessing the results of the (World) Bank's work, and to provide accountability in the achievement of its objectives".

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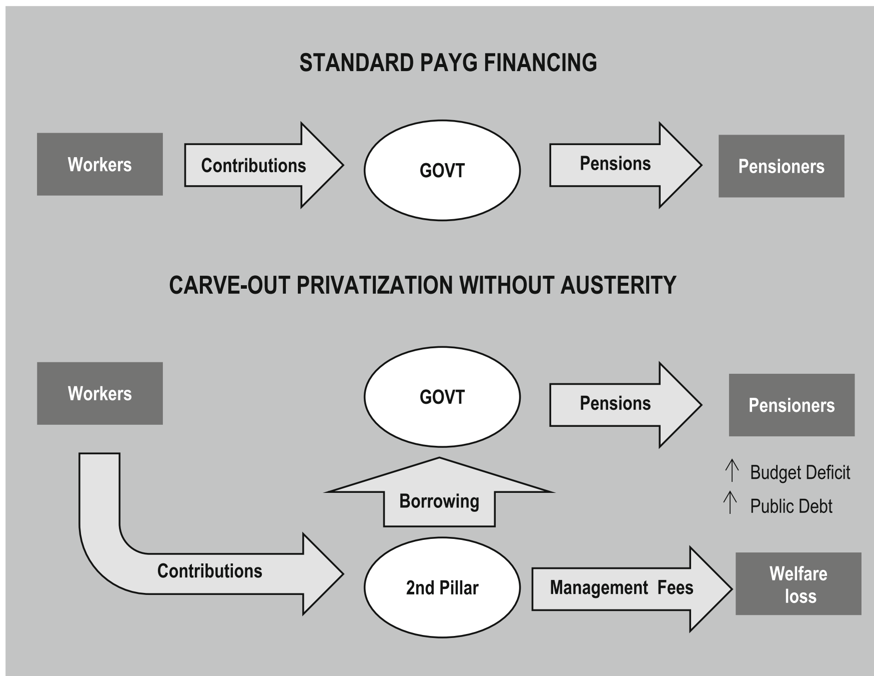
Figure 1. *The disguised PAYG financing mechanism*



Source: Altiparmakov and Nedeljković (2021).

more of investment portfolios. These outcomes are obviously suboptimal not only due to hefty management fees charged by private funds, but also due to the increase in budget deficit and public debt these transactions create. Thus, the Polish reform reversal in 2014 was aimed exactly at eliminating this "disguised" PAYG mechanism,[4] by replacing it with a conventional public NDC PAYG financing mechanism (Altiparmakov, 2018a).

Given the negative experiences of its Eastern European counterparts, what is the likelihood of Greece building a firm political commitment in support of the long-term measures necessary to finance the carve-out transition costs? Judging by recent history – not very likely. The root cause of the 2010 Greek fiscal and pension crisis was precisely a persistent lack of political commitment to fiscal prudence.

4. While some privatization proponents look favourably at this transformation of the implicit pension debt into explicit public debt, the fact is that financial markets and rating agencies treat public debt less favourably than the implicit pension debt (Cuevas et al., 2008).

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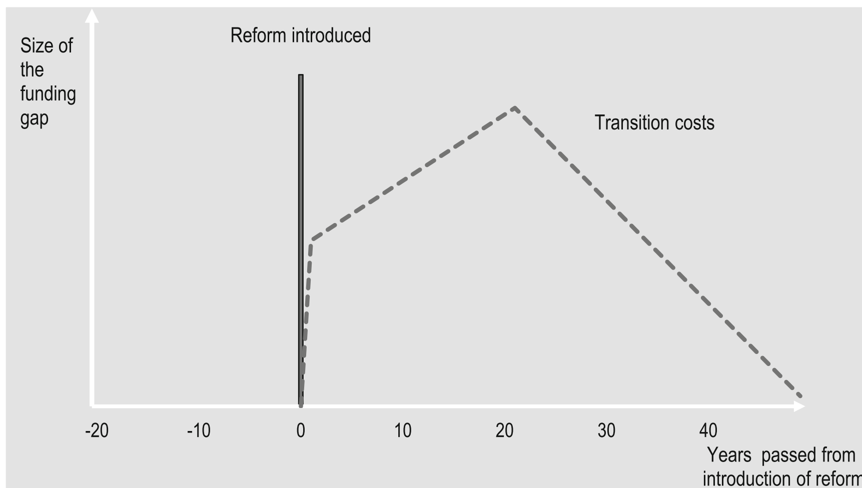
Transition costs

For any society considering pension privatization, the most demanding task is deciding how to finance the multi-decade transition costs, or the so called “double-burden problem”, where existing generations of workers must pay not only for the PAYG pensions of existing retirees but also pre-fund their own private pensions. The policy decision taken regarding the transition costs will necessitate intra- and intergenerational redistribution on a very large scale, which can prove to be politically challenging, if not often impossible.

From a technical point of view, projecting the transition costs is a straightforward task, as carve-out transition dynamics follow the generic trajectory depicted in Figure 2. For the sake of simplicity, we assume a uniformly distributed labour force covering ages 25 to 65. In the inception year, new entrants into the labour force, aged 25, are required to participate in the funded system while those aged 26–35 are allowed to voluntarily opt-in. We will also assume that all workers aged 26–35 opt to join the funded system. Thus, in the inception year, all workers aged 25–35 participate in the funded system, while workers aged 36–65 do not. This results in revenue losses for the PAYG system equivalent to the contributions paid by the 25 per cent of the labour force that are aged 25–35. The following year, workers aged 25–36 would be participating in the funded system, while those aged 37–65 would not, which would imply a PAYG revenue loss for contributions paid by the 27.5 per cent of the labour

Figure 2. *Typical transition cost dynamics*



Source: Simonovits (2003, p. 156).

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force. With every subsequent year, a new cohort of young workers joins the private funded system, which correspondingly increases the annual transition cost by 2.5 p.p. of the labour force until, 30 years after the inception, the entire labour force has joined the private system and annual transition costs have peaked. After the thirtieth year, the oldest cohorts participating in the private pension system move to retirement and, with the corresponding payments from the private pension funds, the annual transition burden start to decline. However, it takes another 20 years or so until outflows from the funded system surpass inflows into it and the transition costs cease.

In the case of Greece, auxiliary pension contributions amounted to 1.9 per cent of GDP in 2020 and are projected to decline to 1.7 per cent of GDP over the next 40 years (National Actuarial Authority, 2021). If most of the eligible workers younger than age 35 decide to switch to the new funded system, the transition costs in the inception year will likely be about 0.4 per cent of GDP.[5] Transition costs will constantly grow, year on year, until the annual transition burden peaks at 1.7 per cent of GDP after 30 to 35 years. Thereafter, the annual transition burden will start to decline, but it will take another 20 years or so until it is fully eliminated. Roughly speaking, the annual transition costs can be expected to average close to 1 per cent of GDP over the next 50 years.

Despite being a straightforward technical task, significant cases of the underestimation of transition costs and associated controversies have been witnessed in earlier cases of pension privatization. Drahokoupil and Domonkos (2012) identify the underestimation and outright neglect of transition costs as one of the root causes of the first wave of reform reversals in Eastern Europe. In Hungary, the financing of the transition cost did not seem to have entered the public policy debate in the mid-1990s. The social democratic government implementing the privatization assumed that the reform would bring accelerated growth and increased employment, and these expected outcomes would address the transitional deficit in the PAYG system. Subsequently in Eastern Europe, countries pursuing a privatization agenda took more notice of transition costs, but most of these did not implement credible austerity measures to provide long-term financing. Some, such as Slovakia, relied on the proceeds from the privatization of state-owned enterprises, but this source of financing could last for a few years only at most, and was not suitable for covering multi-decade

5. We assume that a majority of young workers would opt to join the funded system since this was the case in most Eastern European counterparts where initial plans and projections had consistently underestimated the number of voluntary participants (Drahokoupil and Domonkos, 2012). If younger workers predominantly were to decide not to switch to the private system, this would make the transition trajectory more back-loaded but leave the overall cumulative transition costs unchanged – the annual transition burden would be lower in the early years, but this would be compensated by prolonging the initial transition period by ten years.

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costs. Credible financing mechanism, in the form of a permanent increase in income or value added taxes, was used in only one of the privatizing countries.[6]

Reform packages in many privatizing countries, including Croatia and Poland, relied on drastic PAYG parametric reforms to reduce the generosity of entitlements in the public system to finance the transition costs. However, many parametric reforms proved to be politically unfeasible and were soon reversed, leaving transition costs unfinanced and forcing governments to resort to debt financing. In fact, public debates in several countries were not even informed of the true extent of privatization transition costs, but only about the remaining transition costs after accounting for the envisioned savings that the (severe) parametric PAYG reforms were supposed to deliver. A classic example of this is a World Bank discussion paper (Anusic, O'Keefe and Madzarevic-Sujster, 2003, pp. 69–72) that estimated the transition costs for Croatia to be less than 10 per cent of GDP and to last for less than 15 years. Needless to say, these optimistic projections did not materialize, with cumulative transition costs over the 2002–2020 period being about 24 per cent of GDP and persisting at the annual level of 1.3 per cent of GDP in 2020.[7]

The transition cost was very much a controversial issue during the reform planning stage in Greece. The National Actuarial Authority (NAA) of Greece projected that the transition costs for replacing the auxiliary NDC pensions with fully funded DC pensions would be around EUR 50–70 billion over 50 years, or about EUR 1.2 billion per year on average (SSA, 2021). Bearing in mind that Greek GDP is currently about EUR 200 billion, this estimate is, both in terms of size and duration, broadly in line with our simplified estimation procedure presented earlier in Figure 2. However, the official government estimates state that the overall transition cost over the 2022–2070 period would amount to only EUR 6 billion, with average annual costs not surpassing EUR 120 million (*Ekathimerini*, 2021). The reason why the official government annual transition cost estimate is a tenth of that provided by the NAA is because it is based on a macroeconomic model that implies significant growth acceleration alongside increased rates of investment, employment and wages, notwithstanding a complete lack of empirical evidence behind such optimistic projections.

6. The only exception is Estonia which relied on additional 2 per cent add-on contributions to finance the privatization. Czechia was also planning to increase the contribution rate by an additional 2 per cent and to increase the value-added-tax rate to finance the transition costs, but due to a lack of political support, the mandatory private pension system was dismantled only one year after being introduced in 2013.

7. Author's calculations based on official data for annual contributions and payments from the second funded pension pillar in Croatia; available at HANFA, the Croatian Financial Services Supervisory Agency, Annual report 2020.

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Drahokoupil and Domonkos (2012) argue that the neglect and underestimation of transition costs in Hungary can be explained, to an extent, by the lack of relevant information available regarding pension privatization drawbacks 25 years ago. At the present juncture, such an explanation is not plausible for the case of Greece. To rely on growth effects, which miraculously are expected to address 90 per cent of the anticipated transition costs (*Athina984*, 2021b), ignores the empirical evidence concerning the disappointing lack of growth acceleration from earlier pension privatizations in Eastern Europe. It is thus discomforting to realize that after unprecedented consolidation and austerity efforts over the 2010–2019 period in Greece, that were made necessary by the imprudent pension policies of previous decades, the official Greek estimates once more feature an obvious underestimation of the costs of current pension policies.

The policy shift to government-managed pension savings

The carve-out approach to financing pension privatization is controversial because austerity measures that would finance the multi-decade transition costs require firm political commitment that is hard to secure in many democracies. In fact, the most well-known examples of private funded pension systems – such as those found in North America, Western Europe or Australia – have been developed in an add-on manner. As such, in these systems, private pension benefits do not replace but supplement existing public PAYG benefits.

The only rational motivation for the carve-out approach is to credibly expect the rate of return of private funds to significantly outperform the rate of return of the PAYG system – for all practical purposes, the rate of return for the latter can be approximated with GDP growth. If this expectation proves to be correct, after several decades of bearing the transition costs, future retirees will receive higher pension benefits. This indeed was the original motivation because the empirical evidence had suggested that the rates of return on (well diversified) capital were, in general, tangibly higher than GDP growth (Abel et al., 1989). Thus, before privatization was implemented in Eastern Europe, simulations had assumed private funds to achieve rates of return that were between 1.5 per cent and 2 per cent higher than GDP growth (Price and Rudolph, 2013, p. 61). The actual outcomes were not in line with these expectations, as shown in Table 2.

Actual rates of return in Croatia, North Macedonia, Poland and Romania were higher than GDP growth and, at first glance, look healthy at around 4 per cent in real terms. However, it should be stressed that the operation of private pension funds in all these countries makes heavy use of disguised PAYG financing, depicted in Figure 1, with domestic government bonds accounting for 60 per cent or more of investment portfolios. As such, it is not meaningful to look at the formal rates of return given that they do not represent actual returns to capital but, instead, reflect

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Table 2. *Performance of mandatory private pension funds in Eastern Europe*

		Since inception until end-2020			Standard deviation	
Country	Inception	Real returns	GDP growth	Difference	Funded pillar	GDP growth
Hungary*	Jan. 1998	1.6	2.5	-0.9	9.3	3.2
Poland	Jan. 1999	3.8	3.5	0.3	9.0	2.1
Latvia	July 2001	-0.2	3.1	-3.3	7.3	6.2
Bulgaria	Apr. 2002	1.4	3.1	-1.7	7.6	3.3
Croatia	May 2002	3.6	1.3	2.4	6.0	4.0
Estonia	July 2002	0.7	3.0	-2.3	9.1	5.8
Lithuania	June 2004	2.0	3.0	-1.1	9.8	5.4
Slovakia	Apr. 2005	0.0	3.1	-3.0	3.4	4.2
North Macedonia	Feb. 2006	3.6	2.5	1.2	6.3	2.7
Romania	May 2008	5.0	2.1	2.9	3.9	4.4
Average		2.2	2.7	-0.6	7.2	4.1

Note: *Data for Hungary concludes at the end of 2010, as the second pillar was dismantled.

Source: Authors' calculations based on official national statistics for nominal rates of return and survey data from the International Monetary Fund (IMF) World Economic Outlook for inflation and GDP growth.

(the inverse of) their credit rating. For example, government bonds accounted for 60 per cent of portfolios in both Hungary and Poland, but Impavido and Rocha (2006) show that the formally higher returns in Poland compared to Hungary were driven by the lower Polish credit rating at the time, and the correspondingly higher interest rates on Polish government bonds.

In contrast, Bulgaria, Estonia, Latvia, Lithuania and Slovakia, were able to successfully diversify their private pension portfolios so that they were not dominated by local government bonds. However, contrary to the initial expectations, the actual rates of return in these countries have been disappointingly low – up to 2 per cent in Bulgaria and Lithuania, close to zero in Estonia and Slovakia, with Latvia posting negative real rates of return. With returns in all these countries significantly lower than GDP growth, private pension funds are being dynamically inefficient (Samuelson, 1958; Aaron, 1966) and yielding inferior performance compared to the PAYG systems they were intended to replace and improve.

Although a detailed analysis of the poor rates of return in Eastern Europe is beyond the scope of this article, it should be noticed that this outcome was, at least in part, driven by the market failures inherent in private pension provision, including excessive operating and marketing costs, unproductive active asset management, and irrational consumer behaviour. Similar instances of

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Table 3. *Performance of government-managed schemes in selected OECD countries (%)*

Country	Data starts from	Performance until end-2020		
		Real returns	GDP growth	Difference
Norway – Global Fund	1998	4.4	1.6	2.8
Canada – CPPIB	1999	6.1	1.9	4.2
Sweden – AP1,2,3,4	2001	4.7	1.9	2.8
Sweden – AP7	2001	5.6	1.9	3.7
Denmark – ATP*	2001	6.9	1.1	5.8
New Zealand	2004	5.0	2.3	2.7
Average		5.5	1.8	3.7

Note: *Data on Denmark's ATP is based on the Danish Financial Supervisory Authority, which includes proceeds from interest rate hedging, which were considerably positive over the 2001–2020 period. Care was taken to report all returns data in Table 2 and Table 3 on a comparable basis, after taxes, but not all jurisdictions provide fully comparable data on this account.

Source: Authors' calculations based on official national statistics and survey data from the International Monetary Fund (IMF) World Economic Outlook for inflation and GDP growth.

disappointing private pension outcomes have been documented in other countries, including those in Latin America (Gill, Packard and Yermo, 2005), the United Kingdom (Zalewska, 2018) and Australia (Vidler, 2011). Having been made aware of these disappointing market outcomes, Greek policy makers opted to look to successful examples of government managed pension savings. In particular, as shown in Table 3, government-managed schemes in several OECD Member countries have been very successful over the last couple of decades and have produced impressive rates of return, both in terms relative to GDP growth and also relative to private funds in Eastern Europe.

The impressive performance of government-managed schemes (Table 3) contradicts the notion of private pension management premia (Iglesias and Palacios, 2000), which provided a foundation for the World Bank's pension privatization agenda (World Bank, 1994). The evidence from developed OECD countries would suggest that countries with good public governance can successfully fulfil pension management fiduciary duties and deliver good investment performance. From the point of view of financial economics, there is no reason why this would not be the case, given that the efficient market hypothesis suggests that active investors cannot outperform the market in the long run.[8] Thus, competition among private pension providers does not

8. For example, the S&P–500 market index outperforms 60 per cent of investment funds over the course of one year, 72 per cent of funds over the course of five years, 85 per cent of funds over a 10-year period and 92 per cent of funds over a 15-year period. For more details, see SPIVA research.

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necessarily produce any value added over passive indexed funds, and could actually result in inferior performance due to substantial sales and marketing costs.

The case studies of Australia and Sweden are illuminating examples in this context. The pension market in Australia is very competitive with several hundred management agencies organized in two significantly different ways: i) traditional for-profit management companies organized by financial institutions and ii) not-for-profit companies that evolved from industry occupational schemes, which had existed for decades before pension market liberalization in the 2000s. The not-for-profit industry funds have been delivering vastly superior performance over the years, with real returns of 4 per cent per annum over the 1997–2020 period, compared to only 2.3 per cent real rate of return delivered by for-profit pension companies.[9] Despite their inferior performance, the for-profit companies have been successful in maintaining their 40 per cent market share over the years, mostly due to effective advertising campaigns (Altiparmakov, 2018b).

The pension market in Sweden is also very competitive, with several hundred alternative asset managers. In contrast with pension privatizations undertaken in Eastern Europe, Sweden instituted a government-administered fund, the AP-7, to compete with private providers as well as to offer a default fund for workers who have not actively chosen a private fund. With real returns of 5.6 per cent over the 2001–2020 period, the AP-7 fund has vastly outperformed private counterparts, which produced an average real rate of return of only 3.3 per cent over the same period. This example provides further evidence to question the merits of opting for competitive, private pension provision for countries with high levels of good public governance, a trait that can help realize the successful government management of pension savings.

In Greece, while government intervention may seem warranted from an economic point of view, it will undoubtedly introduce significant political risk and test whether the quality of Greek public governance is comparable to those of developed OECD countries (see Table 3). Furthermore, it should be noted that government-managed pension funding plans in several OECD countries have also experienced setbacks – for example, France failed to secure an appropriate level of annual prefunding contributions, while Ireland redirected its accumulated retirement-related funds to save the failing banking sector during the global financial crisis (Berger and Lavigne, 2007; Healy, 2013). Ignoring the possibility of the outright mismanagement of pension funds, political risk will likely emerge in Greece with respect to the possibility of using disguised PAYG financing (see Figure 1). This is likely because the transitional deficits have been

9. Author's calculations based on annual rate of return statistics from the Australian Prudential Regulatory Agency, available at APRA, as well as survey data on inflation from the International Monetary Fund (IMF) World Economic Outlook.

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evidently vastly underestimated, which will lead to higher financing needs and the Government may be tempted to satisfy these by borrowing from the funded pension pillar – as was the case with many Eastern European reformers. If this were to happen to any significant extent, it would defeat the purpose of the pension funding reform, since replacing NDC auxiliary pensions with a funded pillar plagued with disguised PAYG financing will obviously not improve the members' welfare.

In fact, the optimal life cycle investing approach suggests that, for younger workers, savings should not be invested in any kind of bonds but in (international) equities. The Swedish AP-7 fund, for example, invests savings exclusively in equities for all members younger than age 55, after which it starts to slowly switch to bond investments until, at age 75, bonds account for two-thirds and equities for one third of members' pension portfolios. If Greece were to follow this approach, all pension savings over the next two decades should be invested exclusively in equities, since the cut-off age for participating in the funded pension pillar has been set at age 35 in 2022.

If political risks are successfully addressed and pension savings properly diversified and prudently invested with low management fees, the funded pension pillar could become a meaningful source of retirement income for future generations of Greek pensioners. However, for this to happen, the issue of carve-out financing must be resolved.

Carve-out financing policy lessons

The previous episodes of pension privatization reversals in Eastern Europe differed in their characteristics, magnitudes and driving forces, but the root cause in all instances can be traced back to the initial carve-out financing approach. By diverting the existing PAYG contributions to the funded pension pillar, carve-out financing creates a transitional deficit in the public system. Thus, carve-out privatization does not represent pension funding in the macroeconomic sense, unless it is accompanied by appropriate financing measures to remedy the transitional deficits and permit an overall increased level of national saving. However, most reforming governments have either vastly underestimated the transition costs or relied on unsustainable and unfeasible measures to finance these, which gave rise to the fiscal distress that escalated during the global financial crisis in 2008 and which then set in motion the first wave of reform reversals in countries such as Bulgaria, Hungary, Latvia, Poland and Slovakia (Bielawska, Chłoń-Domińczak and Stańko, 2015; Altiparmakov, 2018a).

Besides fiscal distress, carve-out financing can also create economic tension by promising contributors that the new funded pillar will have a superior performance of over pre-existing PAYG financing. The failure of funded pillars to

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outperform PAYG financing (see Table 2) resulted in suboptimal pension outcomes and created political incentives for the second wave of reform reversals, irrespective of the fiscal stance. The case in point is Estonia, which – despite its impeccable fiscal track record – decided to dismantle its mandatory private pension system in 2020 because of the low rates of return. Similarly, Lithuania used its strong fiscal position in 2019 to switch from carve-out financing to traditional supplementary financing. The purpose of the switch was to remove the inherent tension between the PAYG system and the funded pillar, which was producing poor rates of return inferior to that of PAYG financing (Altiparmakov and Nedeljković, 2021).[10]

Orenstein (2011) argued that the first wave of reform reversals would not be the end of the pension privatization trend and that a "rebirth" of privatization initiatives in another, more fiscally prudent, form would be likely. Drahokoupil and Domonkos (2012) further concluded that a weakening of political appetite for measures necessary to finance transitional deficits would allow only for more modest carve-out plans to be considered in Eastern Europe, with at most 3 p.p. of PAYG contributions being diverted to funded pillars on a sustainable basis. The rebirth of pension privatization in Greece, however, is going in the opposite direction – with 6 p.p. of PAYG contributions being diverted to the funded pillar, the extent of carve-out financing is more akin to that of earlier reformers. The novelty feature of the Greek reform is not fiscal prudence but the policy switch from the private to public management of pension savings.

With transition costs vastly underestimated and without a credible financing source secured to cover them, the 2022 reform is bound to cause fiscal distress in Greece in the coming years, like that observed previously in Eastern Europe. One subtle but important difference in Greece is the fact that the age threshold (age 35) for (voluntarily) opting into the funded system is by far the lowest compared to earlier carve-out reforms, where the threshold for switching to the funded system averaged about age 50 (Bielawska, Chłoń-Domińczak and Stańko, 2015). This means that the Greek transition costs will be more back-loaded compared to Eastern European counterparts and will take more time to become a materially significant drag on public finances. It remains to be seen whether the back-loading of transition costs will create sufficient time for the new funded pillar to become entrenched in Greek society, not least to garner political support for the additional financing measures whose adoption will become a necessity as annual transition costs become sizeable.

The existing financing conditions, which are characterized by historically low interest rates, cannot be expected to constrain imprudent fiscal practices in any

10. In dealing with the poor performance of private funds, countries such as Bulgaria, Croatia, North Macedonia and Slovakia are allowing members to freely return to the public system in order to receive full PAYG benefits. These short-term fixes are however suboptimal and will lead to increased policy uncertainty in the future.

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effective way. In this respect, the current conditions (at the time of writing, in 2021) are reminiscent of the favourable financing terms that, despite unsustainable pension policies, Greece enjoyed for many years before the emergence of the 2010 crisis. Nominal yields on Greek 5-year bonds were in the 3 per cent to 4 per cent range over the decade 2000–2010, before skyrocketing to over 50 per cent during the 2010–2012 crisis, only to plummet and eventually become negative in 2021. Nonetheless, when international financing terms start to change, to revert to their historic averages, the fiscally imprudent aspects of the 2022 reform will be brought to fore, as was the case earlier in Eastern Europe with the emergence of the global financial crisis. When this happens, Greece will face the dilemma of having to source additional financing, which will probably necessitate austerity measures, or to opt for a reform reversal based on Eastern European precedents.

Implementing the required financing measures will be a challenging fiscal task that will likely necessitate a permanent increase in taxes coupled with stronger political commitment than that observed during the 2017 pro-growth reform bill – which was repealed before it was enacted because of a lack of political support for the required austerity measures. In particular, the repealed 2017 pro-growth reforms would have required realizing budget savings of 1 per cent of GDP in the first year of implementation. Thereafter, the level of austerity would have slowly dissipated, albeit still requiring an average annual austerity effort of 0.5 per cent of GDP over the 20-year transition period (Kangur, Kalavrezou and Kim, 2021). As regards the 2022 reform, the transitional deficits this has caused are much higher and longer lasting, despite being initially more modest in the initial years (and up to the 0.4 per cent of GDP). The 2022 transition costs will steadily grow for years to come, so that the average annual transitional deficit will be close to 1 per cent of GDP across the next 50 years, as we can observe from transition dynamics in Figure 2. Financing these transition costs will thus require stronger social and political commitment than would have been the case with the repealed 2017 pro-growth reform.

Concluding remarks

The 2022 carve-out pension funding reform in Greece can be considered unexpected given that it abruptly changed the fiscally prudent course of pension consolidation up to that point, while it is also stands in contrast with the reform reversals of carve-out pension funding in other Eastern European countries. Entrusting the management of pension savings to a dedicated government institution, TEKA, is a welcome novelty in attempting to avoid the poor performance of competitive private pension provision in Eastern Europe. This approach represents a major policy shift from the original pension privatization

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rationale put forward by the World Bank in 1994, but it includes considerable political risk as it remains to be seen whether public governance standards in Greece will be able to reach the high levels found in a handful of successful OECD Member countries.

As was the case for earlier reformers in Eastern Europe, the Greek Government has vastly underestimated the multi-decade transition costs. These will lead to fiscal distress in the coming years when increasing transition costs become sizeable and favourable international financing terms start to change. Maintaining the 2022 carve-out reform will thus require the implementation of the additional financing measures, most likely in the form of a permanent increase in taxes, the adoption of which will in turn require strong political commitment. These political-economy considerations are left open for future research.

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Check for updates

Informal workers and Kenya's National Hospital Insurance Fund: Identifying barriers to voluntary participation

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*Lone Riisgaard*** *and Anne W. Kamau**

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Abstract This article investigates the barriers to informal workers' voluntary participation in Kenya's national health insurance scheme – the National Hospital Insurance Fund. Based on primary data from both qualitative and quantitative methods, we find that the key determinants of enrolment include social factors, such as marital status, which create demand for insurance, and the role of informal workers' associations that promote the voluntary uptake of health insurance and prevent default through contribution support. Participation barriers and reasons for inactiveness stem from the nature of informal work characterized by irregular earnings, which combine with apprehension about having to pay penalty charges for the late payment of premiums, inadequate levels of knowledge about health insurance schemes, institutional constraints such as complex registration procedures, as well as premium costs and poor-quality

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services, all of which discourage enrolment or the reactivation of lapsed membership. There is thus a need for health insurance schemes, such as Kenya's National Hospital Insurance Fund, to educate informal workers on insurance services and protocols and to improve services to encourage uptake and reduce default behaviour.

Keywords health insurance, informal workers, gaps in coverage, social protection, voluntary insurance, income, Kenya

Introduction

The labour force of most low-income countries is dominated by informal workers. This article adopts a broad definition of informal employment promoted by the International Labour Organization (ILO), which includes all jobs whether carried out in formal or informal enterprises (ILO, 2002). Although the informal economy contributes to economic growth and employment creation, informal workers mostly operate in environments that, according to the ILO, "cannot be termed decent" (ILO, 2002, p. 1) and that generally do not provide social insurance benefits, such as sick leave and maternity leave, which are accorded to formal workers. Social insurance has its roots in Europe where national labour forces are dominated by formal employment. There have thus been concerns (Atkinson, 1991) as to whether this financing approach can be extended to low-income countries considering the structure and size of the informal workforce, which makes the enforcement and collection of contributions difficult. Nevertheless, the recognition of informal actors as major contributors to national economies has translated into international efforts to extend social insurance to these workers under the slogan that "no one should be left behind".[1] Efforts have been made by the World Health Organization (WHO) to extend one aspect of social insurance – health insurance – to informal workers. The basis for the provision of health insurance, which is the focus of this article, is anchored in international instruments such as the Universal Declaration of Human Rights of 1948 and policy frameworks such as the Sustainable Development Goal (SDGs). SDG 3 on health considers access to health care as a right and calls for investment

1. See, for example, "Leave no one behind: Working to end poverty", the 2014 statement by Guy Ryder, ILO Director-General, on the occasion of the International Day for the Eradication of Poverty.

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in universal health coverage. The ILO Social Protection Floors Recommendation, 2012 (No. 202), expects governments to establish a framework for providing basic social protection to all citizens.[2] The introduction of health insurance to informal workers aims at realizing the right to health care and reducing exposure to catastrophic health expenditures. Specifically, those who fall ill or have a family member in need of health care but who do not have health insurance are forced to pay for health care directly out-of-pocket – a practice that is often associated with falling into poverty and which may prevent people from seeking necessary medical attention.

The ILO classifies informal workers as a vulnerable group because they are more likely to fall into poverty due to a catastrophic shock, such as an illness. To help manage expenditure for health care among informal workers, some African countries have either introduced or adapted their health insurance schemes to accommodate informal workers (Barasa et al., 2018). Kenya is among the countries that have made reforms to their national health insurance scheme to accommodate informal workers. The process of reform to the National Hospital Insurance Fund (NHIF),[3] to extend voluntary coverage to informal workers, began in 1972 through an amendment of the original Act of 1966; however, there is a lack of data on informal workers' participation in the scheme until 2005. Those enrolled in the NHIF between 2005 and 2015 were required to pay a flat-rate premium equivalent to 1.60 US dollars (USD) per month.[4] In 2015, the NHIF took the decision to increase the premium rate to USD 4.90 to allow for the expansion of the benefit package to include outpatient services. Despite the upward revision of premiums, there has been a significant increase in enrolment of informal workers in the NHIF from 110,000 in 2005/06 to about 4.2 million workers in 2018/19; the latter enrolment figure is only slightly lower than for formal workers, which increased from 2.4 million to about 4.3 million workers during the same period (KNBS, 2005, 2017, 2020).

The increasing share of informal workers in the scheme over the years has made it possible to postulate that informal workers might dominate the scheme in future. However, despite the increase in enrolment, the coverage of informal workers by health insurance is still low at 19 per cent (Barasa et al., 2021). This is markedly different from the coverage rate for formal workers under the scheme, which is close to 100 per cent. From one perspective, the low percentage coverage level of

2. See the full text of the ILO Recommendation, 2012 (No. 202).

3. Under the National Hospital Insurance Fund (Amendment) Act, 2022, the name of the National Hospital Insurance Fund was changed to the National Health Insurance Fund on 28 January 2022. The research reported in this article was completed prior to this amendment.

4. The average US dollar (USD) to Kenyan Shilling (KES) exchange rate used in this article is KES 101.20 to USD 1.00, which is the average rate from June 2018 to December 2018, the period during which data for the study was collected.

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informal worker reflects the massive increase in the population of informal workers, from about 6.6 million in 2005/06 to 14.3 million workers in 2018/19. Conversely, during the same period, the population of formal workers has only increased from about 1.8 million to 2.9 million workers.

In sub-Saharan Africa (SSA), only four out of a total of 36 countries surveyed have health insurance coverage levels for informal workers that are higher than 20 per cent. For these countries, (Rwanda, 78.7 per cent; Ghana, 58.2 per cent; Gabon, 40.8 per cent; Burundi, 22 per cent), coverage is financed by tax revenue (Barasa et al., 2021). One factor which might explain the low rates of coverage of informal workers in voluntary contributory schemes is financial constraint, which is closely associated with earnings and the cost of premiums, or the lack of prioritizing health insurance due to competing needs. However, the observed increasing trend in enrolment of informal workers in Kenya's NHIF does not seem reconcilable with financial constraints being an issue – unless, of course, Kenya's NHIF is only attracting informal workers with higher earnings. This therefore begs the research question concerning the extent to which the earnings of informal workers influence their participation in the NHIF? This article uses data on urban informal workers from three sectors dominated by informality – micro trade, construction, and transport – to explore the relationship between earnings and participation in the NHIF scheme, and to identify the barriers to participation. Given that micro trade tends to be dominated by women (Indimuli, 2021), while men tend to dominate both the informal construction (Mitullah, 2021) and transport (Kamau, 2021) sectors, the inclusion of these three sub-sectors of the informal economy in our analysis also provides a basis for examining the link between gender and participation.

In this article, the term "participation" refers to the act of taking part in the activities of the NHIF scheme. There are three levels of participation: non-membership, active membership, and inactive membership. The NHIF classifies those enrolled either as active or inactive members based on the status of their contributions to the scheme. Active members refers to members who are making monthly contributions to the scheme, while inactive members are those who have stopped making monthly contributions for over a year. However, it is important to point out that there are two types of inactive members under the scheme: i) those who have defaulted for less than a year, and ii) those who have defaulted for more than a year (Indimuli et al., 2022). This article focuses on the latter category because the existing NHIF data on inactive membership does not capture the former, despite our qualitative interviews providing evidence concerning their existence.

The remainder of this article begins by providing a methodology describing the process of data collection, including the methods used for gathering information. This is followed by a brief literature review on the participation of informal

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workers in contributory schemes, with special attention placed on schemes in Africa. We then introduce the theoretical framework, based on Rogers' (1995) adoption theory, which is used as a lens to understand participation. The results are presented, discussed and a conclusion based on the discussed results provided.

Methodology

The article uses primary data collected from both quantitative and qualitative methods including a survey, focus group discussions (FGDs), and interviews. Data was sampled from two Kenyan cities, Nairobi and Kisumu. The two urban areas are hubs of informal economic activities, such as micro-trading, transport, and construction work, among others.

A total of 644 informal workers were interviewed in the survey. Of these, three-quarters were sampled through geographical location to ensure a degree of randomness, bearing in mind that is not possible to obtain a representative sample without a defined sampling frame. The remaining quarter was sampled purposively through informal worker associations, while being aware of the potential bias that this introduces to the sample. The reason for adopting this approach was to ensure broad coverage of different associations, which is necessary to understand the relationship between associations and access to formal insurance (for sampling details refer to Riisgaard, Mitullah, and Torm, 2021). In accordance with the ILO's broader conceptual view of informal employment, the survey covered own-account workers, wage workers without a contract but possibly working for a formally registered enterprise, and micro-enterprise owners with a maximum of two employees, where the enterprise activity is mobile or immobile, but excluding those with permanent structures such as kiosks or operating in regular designated markets.[5] As regards the sectors, for the transport sector, the study covered *matatu* operators (mainly drivers and conductors) and *boda boda* riders.[6] In the construction sector, skilled and unskilled workers (both wage workers and own account workers) employed directly by construction site managers or indirectly via an intermediary (e.g. sub-contractors) were covered. As for the construction sites, the study covered large and medium construction/building sites and "waiting sites",[7] for example streets and buildings. Residential housing sites were excluded.

5. However, under the Micro and Small Enterprise Act of 2012, micro-enterprises refer to enterprises employing a maximum of ten employees.
6. *Boda boda* are motorcycle taxis, while *matatus*, according to the Traffic Act CAP 403, are public service vehicles (PSV) with a passenger capacity of not more than 25, exclusive of driver.
7. Waiting sites are places where construction workers congregate as they wait for employment opportunities. These sites are known to employers and construction workers.

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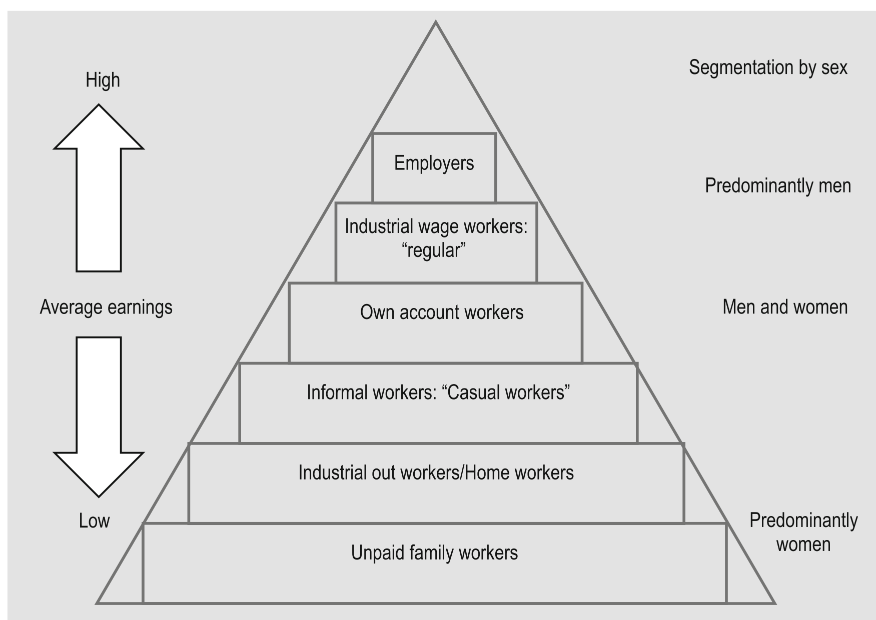
Figure 1. *Classification of IWs based on earnings*



Source: Authors interpretations based on Chen (2012).

The participation of informal workers in contributory schemes

Most countries in sub-Saharan Africa have adopted contributory schemes as the mode of health care provision to informal workers (Barasa et al., 2018). There are two dominant models of financing health care (Abel-Smith, 1992). One is the Bismarck model, where coverage is employment-based and is mainly financed by membership contributions. The other is the Beveridge model, which is financed mainly by taxes and where coverage is universal. Coherent with its Universal Health Coverage (UHC) agenda,[8] the WHO advocates[9] for a universal approach to the provision of health insurance.

Countries such as Ghana, Kenya, and the United Republic of Tanzania are providing health insurance coverage to informal workers using the Bismarck

8. The World Bank (2016) note that most African countries have integrated the goal of UHC in their national policy agendas.
9. See the WHO public website, Universal health coverage (UHC).

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model. Although the Ghanaian national health insurance system is financed partly by taxes, informal workers are still required to pay annual premiums to access health care, although the amount (USD 6.00 per year) is relatively small. In comparison, the amount paid by Kenyan informal workers is about USD 60.00 per year. Countries such as Ethiopia and Rwanda have community-based health insurance systems that are not based on employment but on social networks. While the participation of informal workers in Rwanda is compulsory, in Ethiopia it is voluntary.

This article focuses on contributory schemes that are voluntary for informal workers and examines the extent to which the level of earnings influences the participation of informal workers in such contributory schemes. This is done using the example of the Kenyan NHIF scheme. Given that the informal economy is dynamic with differences occurring at the sector level and the individual level as well as the fact that informal worker participation in the NHIF may vary across sectors, this study incorporates data on three sectors dominated by urban informal workers. The earnings of informal workers are likely to vary by gender, sector and location. To be borne in mind is that women dominate in micro trade, whereas the construction and transport sectors are male dominated. Chen, Roever and Skinner (2016) argue that female informal workers tend to have lower earnings compared to their male counterparts. It is important to note that, although the three sampled sectors are integral parts of the urban informal economy, they do not represent the poorest category of informal workers – unpaid family workers – as presented in Chen's (2012) classification of informal workers based on earnings (see Figure 1). Given that unpaid family workers are the largest group of informal workers (Figure 1), this suggest these workers perform their activities in premises that are not enterprise-based, but most probably in the agricultural sector – which is the dominant sector and largest employer in sub-Saharan Africa (Charmes, 2012). Nevertheless, our article focuses solely on urban occupations and excludes rural occupations, which tend to be dominated by agricultural workers. Among the existing forms of informal occupation in sub-Saharan African cities, the most visible and most common urban occupations are micro trade (Herrera et al., 2012; Chen, Roever and Skinner, 2016) and informal transport, both of which operate in public spaces, as opposed to construction work which often takes place in private spaces.

Although there is a vast literature on informal workers and health insurance, studies looking at the relationship between earnings and participation in insurance schemes are scarce. Most of these studies (e.g. Alfers, 2012; Fenenga et al., 2015; Kamau and Kamau, 2016; Mathauer, Schmidt and Wenyaa, 2008) have focused on seeking an understanding of the low uptake of health insurance among informal workers. A few studies (Torm, 2020; Duku, 2018; Kazungu and Barasa, 2017) have found earnings to be one determinant of the uptake of health

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insurance. Although there are numerous factors associated with the low uptake, these factors can be broadly classified into two groups: i) individual factors and ii) institutional factors (Indimuli et al., 2022). Individual factors are tied to personal characteristics, such as age, income, gender, and membership of an association, while institutional factors relate to attributes of the insurance scheme, such as the cost of premiums and registration procedures. This article focuses mainly on individual factors concerning workers' uptake.

The theoretical underpinning for understanding participation in contributory schemes

This study uses Rogers' (1995) adoption theory to understand the participation of informal workers in voluntary contributory health schemes. Adoption theory seeks to explain how and why new ideas, innovation, practices, products, or services are accepted or rejected. Although the idea of health insurance is not new, it may be perceived as new by those who were previously unaware of it or have never enrolled in a scheme. Rogers posits that ideas spread through a target population in five stages, namely: i) knowledge, ii) persuasion, iii) decision, iv) implementation, and v) confirmation. An individual first becomes aware of the idea and is then persuaded to accept it through social interaction. If convinced, he or she makes the decision to accept it based on a cost-benefit analysis. After the decision to adopt the idea, the individual decides to implement it. If the costs of implementation are lower than the perceived benefits, the individual will likely continue with the idea. However, if the costs are higher, they will likely abandon it.

Rogers' theory of adoption has two levels of decision making. The first level is the decision to accept or reject an idea. The second level is the decision to continue with the idea if satisfied, which Rogers terms the "continuance decision", or the decision to abandon if dissatisfied, which Rogers terms the "discontinuance decision". In this article, Rogers' two levels of decision making are conceptualized simply as "participation". Diverging from Rogers' theory, we apply three levels or categories of participation. The first level is the decision not to enrol in the scheme (non-enrolment). The second level is the decision to stay enrolled and to continue paying premiums (active membership). The third level is the decision to drop out of the scheme or to cease paying premiums (inactive membership).

According to Rogers, the decision to accept or reject an idea is based on an individual assessment of the characteristics of the idea. He provides five key characteristics of decision making: relative advantage, complexity, compatibility, trialability, and observability. Relative advantage refers to the extent to which an

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individual perceives the idea to be of personal benefit. Ideas that are perceived to have higher costs than benefits are more likely to be rejected or abandoned. Compatibility refers to the extent to which the individual perceives the idea to be complex or easy to use. Ideas that are complex are more likely to be rejected or abandoned. Observability refers to the extent to which an idea can be experimented with prior to adoption and whether the results of acceptance of an idea are observable to the individual.

Figure 2 provides a conceptual framework that combines the concepts from Rogers' theory and the empirical literature. The focus of the study is placed on the relationship between participation (dependent variable) and earnings (independent variable), which falls under the individual factors presented in Figure 2. Individual factors aside, other factors that are likely to influence participation are institutional factors, such as premium cost and registration procedures, and the five characteristics espoused by Rogers.

The aims of the following sections are threefold. First, to provide a brief description of informal workers' characteristics based on the survey data. Second, to identify individual and sectoral differences that may explain participation in

Figure 2. *Conceptual model on relationship between earnings and participation*

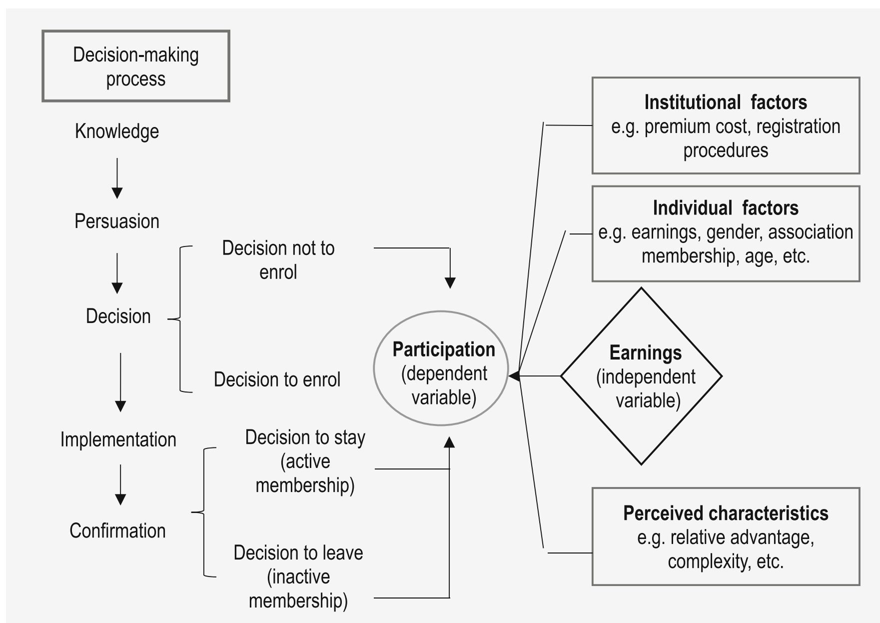

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Table 1. *Summary statistics, informal workers*

	Construction	Trade	Transport	Average
Participation				
Active	35%	39%	50%	41%
Inactive	14%	11%	15%	13%
Non-member	51%	50%	36%	46%
Male	90%	45%	97%	77%
Age	35.77	36.65	36.16	36.20
Married	79%	63%	87%	76%
Education level				
Primary incomplete	7%	16%	11%	11%
Primary complete	39%	40%	48%	42%
Secondary complete	54%	43%	42%	47%
Location				
Nairobi	56%	57%	58%	57%
Kisumu	44%	43%	42%	43%
Employment status				
Wageworker	95%	5%	66%	55%
Micro-enterprise owner	3%	14%	6%	7%
Own account	2%	81%	28%	38%
Assets	29%	23%	28%	27%
Mean earnings (USD)	10.81	11.12	10.95	10.74
Lowest	8.12	5.17	6.3	6.53
Highest	13.4	17.07	15.5	15.39
Awareness of NHIF	98%	95%	96%	96%
Association membership	33%	47%	67%	48%
Association type				
SACCO/chama	19%	41%	58%	39%
Worker-related	26%	13%	12%	17%
Religious/ youth/ women	3%	7%	3%	4%
Associational benefits				
Social cushioning	5%	0%	3%	3%
Job-related	24%	9%	30%	21%
Health	5%	0%	3%	3%

(Continued)

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Table 1. *Summary statistics, informal workers* - Continued

	Construction	Trade	Transport	Average
Voice	0%	1%	7%	2%
Loan-based	19%	51%	34%	34%
Cases	221	223	200	644

Notes: Variable "awareness of NHIF" not included in regression due to lack of variation. *Median daily earnings for informal workers are USD 8.70.

Source: Authors' elaboration based on survey data for 2018.

the NHIF scheme. Third, to examine the extent to which earnings influence participation of informal workers in the scheme.

Results

Main characteristics

Given that individual characteristics may influence participation in contributory schemes, Table 1 provides summary statistics of informal workers across the three sectors under study (micro trading, transport, construction).

Technically, inactive members (Table 1) are still members of the NHIF, although these people consider themselves to be previous members. Owing to the fact of having stopped paying premiums, these people cannot access NHIF benefits. Their coverage situation is thus no different to the average of 46 per cent of informal workers across these three sectors who have not enrolled in the NHIF (Table 1). Nevertheless, the importance difference is that their status as inactive members can be rectified, and their membership reactivated. This entails paying a penalty of 50 per cent of the monthly contribution for each month (up to a maximum of 12 months) for which the premium has not been paid, in addition to the requirement to pay in advance the total cost of an annual premium. For inactive members who have defaulted for more than one year, they must recommence paying premiums but will only be eligible for benefits after a waiting period of 90 days, as is the case for all newly registered members.

At the sector level, the share of active members was higher among transport workers (50 per cent) than among micro traders (39 per cent) and construction workers (35 per cent). In part, this is because transport-sector workers tend to be more organized compared to micro traders and construction workers. The share of inactive members was slightly higher among transport workers (15 per cent) and construction workers (14 per cent) than among micro traders (11 per cent).

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The lower rate among micro traders is because micro-trader associations tend to assist their members in the payment of NHIF premiums, which is not the case for the respective transport and construction workers' associations.

As regards earnings, which is the main independent variable of interest to this study, Table 1 shows that the average daily earnings for informal workers was USD 10.00. However, due to the large variation in earnings shown by the standard deviation, the median figure offers a more accurate representation of the earnings level (USD 8.70). Bearing in mind that previous research (Charmes, 2012; Chen, Roever and Skinner, 2016) has revealed that the earnings of informal workers are unstable, informal workers were asked in the survey to indicate their highest and lowest daily earnings. The lowest median earnings were USD 4.90, while the highest was USD 11.00, which provides evidence of variability in earnings. The earnings measure is thus the average of the highest and lowest median earnings.

Health insurance has been associated with gender (Alfers, 2012; Duku, 2018; Kazungu and Barasa, 2017), education level (Torm, 2020; Duku, 2018; Fenenga et al., 2015), age (Duku, 2018; Fenenga et al., 2015; Kazungu and Barasa, 2017), marital status (Duku, 2018; Kazungu and Barasa, 2017), employment status (Torm, 2020; Kazungu and Barasa, 2017), location (Torm, 2020), association membership (Torm, 2020; Indimuli, 2021), and personal awareness about the health insurance scheme (Kamau and Kamau, 2016; Mathauer, Schmidt and Wenyaa, 2008). Thus, it is important to include these control variables in the analysis, given that they will have an influence on the dependent variable (participation in the NHIF scheme). Table 1 reveals that micro trade tends to be dominated by women (55 per cent) while men dominated in the construction (90 per cent) and transport (97 per cent) sectors. In terms of education level, a large proportion of informal workers across sectors had completed secondary level (47 per cent). The average age of informal workers was 36 years, and most were married. As regards geographical location, the largest share of informal workers (56 per cent) was based in Nairobi. In terms of employment status, the trade sector tended to be dominated by own-account workers (81 per cent), followed by micro-enterprise owners (14 per cent) and wage workers (5 per cent). In construction, an overwhelming majority were wage workers (95 per cent) and only 5 per cent were micro-enterprise owners and own-account workers. In the transport sector, the *matatu* subsector largely comprised of wage workers, mainly drivers and conductors, while the *boda boda* subsector mainly comprised of own-account workers (i.e. riders). Concerning assets, only a small share of informal workers across the sectors (averaging 27 per cent) owned primary assets, such as land or a residential property.

Looking specifically at the data from the 75 per cent of informal workers sampled randomly, the share of informal workers belonging to an association

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(some workers belong to more than one) was higher among transport workers (67 per cent) than among micro traders (47 per cent) and construction workers (33 per cent). The high incidence of associations in transport is partly associated with the National Transport and Safety Authority requirement that all public service vehicles operators belong to a Savings and Credit Cooperatives Organization (SACCO).[10] Survey results reveal the dominant associations in transport are SACCOs, while in trade the dominant associations are grassroot associations commonly known as *chamas*.[11] Discussions with association members revealed that *chamas* are often organized around welfare issues aiming to cushion members against costs related to ill health, funerals, and weddings, among others. Associations for workers in the construction sector are mostly organized around finding employment for members. Umbrella associations are more commonplace in the transport and trade sectors than in construction. These associations have a role to play in giving voice and representation to workers in the frequent conflicts that arise between workers and authorities on issues of the use of public space and compliance with government regulations.[12]

In terms of awareness about the NHIF, an overwhelming majority of informal workers (96 per cent) knew of the scheme. This high level of awareness suggests that we cannot consider the issue of a possible lack of awareness as a major barrier to enrolment.

Participation in the NHIF scheme

The three levels of participation that are addressed in this study were identified through the following two survey questions: "Are you or your spouse registered in the NHIF scheme?", and "Have you previously been a member of the NHIF scheme?". Those who responded positively to the first question were identified as active members based not only on their registered status but on the fact that they were making contributions to the scheme at the time of interview. For instance, out of 265 workers, 192 of these paid their own contributions, 55 had contributions paid on their behalf by their spouse, and one worker's contributions were paid for by his/her children. Those who were previous members of the NHIF scheme were identified as inactive members because they had ceased making contributions to the scheme. Given that these workers self-identified as previous

10. Although the name SACCO suggests these associations are organized around savings and loans, this is often not the case, as they are usually a means for workers to obtain a license to operate.
11. *Chama* is a Swahili term.
12. An example of an umbrella association in trade is the Kenya National Alliance of Street Vendors and Informal Traders (KENASVIT), while in transport there is the Boda Boda Association of Kenya (BAK).

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members, this indicates that they belong to the group of inactive members who have defaulted for more than a year. Those who had neither registered nor been previous members of the scheme were classed as non-members of the scheme. Regardless, it is important to bear in mind that active/inactive status depends on the monthly payment of premiums. As stated, while there is the possibility of active members becoming inactive due to a failure to pay the monthly contribution, inactive members may reactivate their contributions to again become active. Indeed, as will be discussed, there is evidence of the former in our qualitative interviews, but not of the latter. Nevertheless, the NHIF does not publicize its data on inactive membership, except for enrolment data (Indimuli et al., 2022). Hence, it is difficult, using NHIF data, to determine active/inactive membership trends both within a yearly period and for periods longer than a year. It is also difficult to gauge enrolment trends by sector, given that the existing enrolment data is not disaggregated by sector. Nevertheless, the aim of this article is to understand the three levels of participation by examining the characteristics of workers in the three sectors dominated by informality.

To identify the variables or characteristics that influence participation, we use the Independent Samples t-Test to distinguish between those with access to NHIF benefits (active members) and those without access (inactive members and non-members) (Table 2). We also use the test to distinguish between active and inactive members (Table 3), both groups of whom are members of the NHIF. The first level of differentiation seeks to identify the determinants of active membership, while the second seeks to identify the determinants of inactive membership. Table 2 confirms the variable "earnings" as one of the significant variables. However, further analysis finds "earnings" not to be the main determinant of active membership when other factors are controlled for. Apart from "earnings", Table 2 and Table 3 also reveal that there are other variables influencing the participation of informal workers in the NHIF. These include age, marital status, education level, employment status, sector, association membership, and location.

The results in Table 2 suggest that active members are more likely to be married, older, and of higher education status. They are also more likely to belong to a work-based and a loan-based association. In terms of sector, transport workers and micro traders are more likely to be active participants compared with construction workers. Concerning geographical location, informal workers from the capital city, Nairobi, are more likely to be active than informal workers from Kisumu, the third largest city in Kenya. In terms of employment status, workers in micro-enterprises are more likely to be active than own-account and wage workers.

Evidence from the literature confirms that individuals who are married, of higher education status, with higher earnings, belonging to a social network, and

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Table 2. *Differences in worker characteristics by NHIF enrolment*

	NHIF	No NHIF	Difference	t-value
Member	0.69	0.54	0.16	4.03***
Association type				
SACCO/chama	0.44	0.35	0.09	2.33**
Worker-related	0.21	0.15	0.06	1.98*
Religious/youth/ women	0.05	0.04	0.01	0.35
Associational benefits				
Job-related	0.21	0.20	0.01	0.25
Loans	0.43	0.29	0.14	3.68***
Voice	0.03	0.02	0.01	0.73
Social cushioning	0.03	0.03	0.00	0.29
Location				
Nairobi	0.63	0.53	0.10	2.56**
Kisumu	0.37	0.47	-0.10	-2.56**
Male	0.76	0.77	-0.01	-0.24
Married	0.88	0.68	0.20	5.98***
Age	37.23	35.47	1.76	2.25**
Average earnings (USD)	12.22	10.09	2.13	2.85**
Assets	0.29	0.25	0.04	1.13
Education level				
Primary incomplete	0.08	0.14	-0.06	-2.54**
Primary complete	0.38	0.45	-0.07	-1.87*
Secondary complete	0.55	0.41	0.14	3.49***
Sectors				
Construction	0.29	0.38	-0.08	-2.19**
Trade	0.33	0.36	-0.03	-0.80
Transport	0.38	0.26	0.11	3.08***
Employment status				
Wage worker	0.52	0.56	-0.04	-1.01
Own-account	0.36	0.39	-0.03	-0.82
Micro-enterprise owner	0.12	0.04	0.07	3.46***
Observations N=644	265	379		

Notes: * p<0.10, ** p<0.05, *** p<0.01.
Source: Authors' elaboration.

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Table 3. *Differences in worker characteristics by NHIF membership*

	Active	Inactive	Difference	t-value
Member	0.69	0.62	0.07	1.21
Association type				
SACCO/chama	0.44	0.48	-0.04	-0.66
Worker-related	0.21	0.12	0.09	1.86*
Religious/youth/women	0.05	0.02	0.02	0.89
Associational benefits				
Job-related	0.21	0.21	-0.00	-0.01
Loans	0.43	0.32	0.11	1.78*
Voice	0.03	0.04	-0.01	-0.23
Social cushioning	0.03	0.06	-0.03	-1.21
Location				
Nairobi	0.63	0.42	0.20	3.34***
Kisumu	0.37	0.58	-0.20	-3.34***
Male	0.76	0.78	-0.01	-0.27
Married	0.88	0.80	0.08	1.73*
Age	37.23	38.91	-1.67	-1.47
Mean earnings (USD)	12.22	12.21	0.01	0.01
Assets	0.29	0.21	0.08	1.42
Education level				
Primary incomplete	0.08	0.09	-0.02	-0.55
Primary complete	0.38	0.42	-0.05	-0.76
Secondary complete	0.55	0.48	0.06	1.04
Sector				
Construction	0.29	0.36	-0.07	-1.22
Trade	0.33	0.29	0.03	0.59
Transport	0.38	0.34	0.04	0.60
Employment status				
Wage worker	0.52	0.56	-0.04	-0.64
Own-account	0.36	0.41	-0.05	-0.88
Micro-enterprise	0.12	0.02	0.09	2.58**
Observations (*N*=350)	265	85		

Notes *$p<0.10$, **$p<0.05$, ***$p<0.01$.
Source: Authors’ elaboration.

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living in urban areas as opposed to rural areas are more likely to affiliate to health insurance (e.g. Duku, 2018; Fenenga et al., 2018; KNBS, 2018).

The link between marital status and active participation in the NHIF scheme was confirmed in an interview response provided by an NHIF official:

> "NHIF is attractive because it takes care of the household. Other insurances like Jubilee insurance mostly cover an individual but if you want to add a member of the family you have to add some money. NHIF covers you, your spouse, and five children" (KII, NHIF official, Nairobi, 2019).

Considering that the cost of the premium is the same for those with and without dependents, this may discourage those without dependents and those who are healthy from taking health insurance or from committing to the payment of premiums. Since unmarried healthy individuals are less likely to enrol and, when enrolled, more likely to be inactive (Indimuli et al., 2022), this introduces the problem of adverse selection, which may lead to financial losses for the NHIF.

Among the variables influencing the participation of informal workers in the NHIF, association membership is particularly important (Torm, 2020). Discussions with association members and interviews with informal workers and responses from key informant interviews (KIIs) confirm that associations indeed play a crucial role in encouraging participation of informal workers in the NHIF. Across the three sectors, the impetus to become a member of NHIF was greater in the trade and transport sectors but less so in construction. This is deemed to be partly due to the weak organization of workers in the construction sector. Many trader associations required their members to enrol in the NHIF. The rationale for having this rule was that, once insured, the association leadership would be relieved of the burden of asking for financial assistance from members to support fellow members who require medical care or who have a family member admitted to hospital. This burden of medical care costs would be covered by the NHIF. In transport, the SACCO management required their staff/employees to become members of the NHIF scheme. However, there was only one case of a transport association that required drivers and conductors to enrol in the NHIF, the Matatu Welfare Association (KII Transport, Nairobi, 2018). Notwithstanding, most associations across sectors cushioned their members who required health care, although the support was inadequate since it was provided only upon hospital admission and was often in the form of a one-off payment.

Although the construction and transport sectors are dominated by wage workers, interview responses by informants from both sectors revealed that participation in the NHIF was perceived as an individual choice, and was not the responsibility of the employer:

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> "We are trying for member to have NHIF cards. The acquisition of the card is an individual initiative for group members. They are doing it by themselves" (KII Construction worker, Kisumu 2018).

> "NHIF contributions are done individually. Only about five members have active NHIF cards" (KII Construction, Nairobi, 2018).

> "This is an area that the union has not really done well, because there are very few members that have joined NHIF. Those that have joined have done it using their own initiatives but not through any organized effort from the union" (KII Transport, Kisumu, 2018).

> "The drivers and touts can move freely from one SACCO to another. This makes it impossible to follow up on NHIF contributions" (KII Transport, Nairobi, 2018).

According to the NHIF Act, although employers are responsible for remitting premiums to the scheme on behalf of their employees, in practice this requirement is not enforced, partly because of the informal nature of operations, such as a lack of contracts or the temporary nature of jobs. Given that employment in construction is multi-layered, comprising of clients, contractors, sub-contractors, and workers, it is difficult to know who is responsible for providing insurance to workers. Interviews with construction informants and observations revealed that contractors and sub-contractors were likely to have NHIF membership partly because they were formal (i.e. they were licensed to work or their businesses were registered). In the transport sector, SACCO officials of *matatus* were more likely to have NHIF membership and contracts, unlike drivers and conductors who receive a license to operate from SACCOs. According to one informant, there is less push to provide insurance to transport workers because jobs in the transport sector are not secure (KII Transport, Kisumu, 2018). In the trade sector, unlike for transport and construction, the issue is not so much about job security, but about regularity of earnings, given that most traders (80 per cent) are self-employed own-account workers. In the transport sector, government regulation that requires vehicles to be insured is complied with partly because the possession of vehicle insurance is necessary and is strictly enforced. The mandatory nature of vehicle insurance sits in contrast to health insurance, which is interpreted as an individual choice. Nevertheless, workers in the transport sector are represented by the workers' trade unions and welfare associations and this may explain why enrolment levels are quite high among transport workers compared to construction workers.

Table 3 presents the variables that differentiate active members from inactive members: employment status, type of association and marital status. Given that there is no significant difference in earnings between active and inactive

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members, the level of earnings does not seem to explain inactive membership. Discussions with informal workers reveal that inactive membership is tied to the irregularity of earnings, quality of services, and penalty charges. In terms of association membership, no significant difference exists between active and inactive members. However, active members could be distinguished from inactive members by type of association, thus suggesting work-based and loan-based associations play a crucial role in discouraging default behaviour. This finding was confirmed during discussions with association members and interviews with informal workers. Indeed, some associations assisted their members in paying premiums. In transport, the contributions of SACCO employees or management were deducted from their salaries. In trade, some associations assisted their members to pay for NHIF membership:

> "If a member is unable to pay the KES 200, the group takes the money from the members' savings and pays for him or her. The member who is being paid for is not considered to have a debt which he or she must pay" (FGD Trade, Kisumu, 2018).

An interview with an association member from the trade sector confirmed this finding:

> **Interviewee:** … there are NHIF officials who are always invited in our group in case we have a new member who is not registered in NHIF.
> **Interviewer:** Does your group help members to contribute to NHIF?
> **Interviewee:** Yes, there is amount of contribution which is directed to NHIF at the end of the month.
> **Interviewer:** Is it a rule within the group?
> **Interviewee:** Yes, it is in the group constitution. If you say that you don't have money the group will deduct a certain amount from your contribution. For example, if you contribute KES 100, the group will deduct KES 25 for NHIF and KES 75 will be taken from your shares (Interview Trade, Kisumu, 2019).

This excerpt provides evidence of the role of associations in facilitating access to formal health insurance (for further details, see Riisgaard, Mitullah, and Torm, 2021). It also shows that the link between associations and participation is strengthened by the support of NHIF officials. Of note, a report prepared for the International Finance Corporation (IFC) of the World Bank Group (Deloitte, 2011), which reviewed the performance of the NHIF scheme for the period 2005 to 2010, recommended that the NHIF should focus on informal workers' associations to encourage their coverage by the scheme.

On marital status, the findings in Table 3 suggest that unmarried individuals are more likely to be inactive members. This finding is consistent with the literature

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arguing that individuals who are healthy and who are unlikely to benefit from insurance due to lack of dependants are less likely be insured and, if enrolled, are more likely to stop making payments. This also came out in the focus group discussions, where young people stated that they did not perceive a need to affiliate to the NHIF, when it was rare that they had a serious health problem. In terms of location, the results in Table 3 suggest that inactive members are more likely to come from Kisumu than Nairobi. This was confirmed in an interview with an official of the NHIF who attributed high default rates in Kisumu to the promise of free health care due to the introduction of the UHC programme in Kisumu. Indeed, why pay for health insurance when there is a promise of free health care?

Earnings and participation

To examine the extent to which earnings influence enrolment, we use a logistic regression to test the correlation between earnings and active membership (which is a binary variable, where 1 signifies active membership and 0 no membership; the latter includes inactive members) while controlling for those variables that were significant in Table 2. In Table 4, column 1, the variables that are significant are earnings, association membership, gender, post-secondary education, marital status, and location. This finding suggests that informal workers who are married, female, have higher education status, higher earnings, and work in Nairobi are likely to be active NHIF members. In column 2, employment status variables are included in the model, but only micro-enterprise ownership was significant. This suggests that micro-enterprise owners are more likely to be active than own-account or wage workers. However, the variable “earnings” loses its significance when employment status is introduced, indicating that it is not a key determinant of active membership. The remaining variables in column 1 retain their significance all through columns 2, 3 and 4. In column 3, sector variables are included in the model, but only the transport sector is significant. This finding suggests that transport workers are more likely to be active members compared to micro traders and construction workers. In column 4, association types are included in the model and the variable “worker-related” is significant, suggesting that informal workers belonging to associations that offer work-related services are likely to be active NHIF members. Moreover, employment status loses its significance when association types are introduced, suggesting that it is not a key determinant of active membership.

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Table 4. *NHIF membership determinants, active versus inactive/ non-members*

	Model (1)	Model (2)	Model (3)	Model (4)
Association Membership	0.316*** (0.112)	0.297*** (0.113)	0.234** (0.114)	
Male	-0.284** (0.131)	-0.258* (0.140)	-0.378** (0.157)	-0.393** (0.158)
Age	0.053 (0.037)	0.052 (0.038)	0.048 (0.038)	0.046 (0.038)
Age squared	-0.062 (0.046)	-0.062 (0.046)	-0.056 (0.046)	-0.054 (0.046)
Married	0.725*** (0.151)	0.724*** (0.151)	0.708*** (0.154)	0.710*** (0.154)
Assets	0.075 (0.122)	0.061 (0.123)	0.062 (0.123)	0.056 (0.124)
Post-secondary dummy	0.662*** (0.153)	0.656*** (0.155)	0.739*** (0.158)	0.740*** (0.159)
Average earnings (logged)	0.122* (0.074)	0.092 (0.075)	0.086 (0.078)	0.080 (0.078)
Nairobi	0.390*** (0.114)	0.387*** (0.114)	0.381*** (0.115)	0.389*** (0.116)
Own-account		0.018 (0.120)	-0.009 (0.165)	-0.013 (0.166)
Micro-enterprise owner		0.404* (0.216)	0.415* (0.248)	0.405 (0.248)
Trade			0.077 (0.209)	0.095 (0.211)
Transport			0.403*** (0.142)	0.435*** (0.147)
SACCO/chama				0.192 (0.125)
Worker-related				0.321** (0.162)
Other				0.205 (0.267)
Constant	-2.391*** (0.739)	-2.320*** (0.745)	-2.261*** (0.764)	-2.221*** (0.764)
N	644	644	644	644

Notes: Standard errors in parentheses. *$p<0.10$, **$p<0.05$, ***$p<0.01$.
Source: Authors’ elaboration.

In summary, this section finds the variable “earnings” not to be a key determinant of active membership in the NHIF scheme, given that earnings across active, inactive and non-members do not differ significantly compared to other variables such as marital status and association membership. The next section applies Rogers’ theory to discuss the results of this study.

Discussion

In Rogers’ decision-making process, lack of awareness is seen as one barrier to enrolment. According to Rogers, individuals without knowledge of how and why a particular innovation works are less likely to adopt it and, if adopted, are more likely to abandon it. Although an overwhelming majority of informal workers knew about the NHIF, discussions with association members revealed a general

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lack of understanding of the NHIF and how it functions. For instance, those who had not used it often thought that to do so would mean to risk losing their contributions:

> "Why should I pay for over five-year period and only utilize it once? What about those who have contributed over ten-year period and died without using it; where does this money go?" (FGD Construction, Nairobi, 2018).

There were others who lacked knowledge about the health contingencies covered by the scheme:

> "I beg to ask, how many diseases cannot be covered by NHIF … I did not know that it does not cover many diseases" (FGD Construction, Kisumu, 2018).

Others still had incorrect information about the scheme, believing that the NHIF only covered patients admitted to hospital (FGD Transport, Kisumu, 2018).

Rogers points out that social networks are important in influencing the adoption decision through persuasion. This current study and previous studies (Fenenga et al., 2015, 2018) reach the same conclusion. The analysis reveals that association members are more likely to enrol in the NHIF scheme than those who do not belong to any association. Furthermore, the survey findings reveal that the two main modes for the spread of information concerning the NHIF are social networks (such as friends and family) and associations (40 per cent) or the media (30 per cent). Social networks are an important source of information about insurance, irrespective of whether this is positive (to encourage enrolment or continued contributions) or negative (to discourage enrolment or result in default behaviour).

Of Rogers' five characteristics that influence adoption decisions, the three most important in understanding participation in the NHIF are relative advantage, complexity and compatibility. Concerning relative advantage, Rogers argues that those individuals who perceive an idea as having more benefits than costs are more likely to adopt it or continue using it, while those who believe there are more costs than benefits are more likely to reject it or abandon it. Since an overwhelming majority of association members contributed regularly to their association, these individuals are more likely to perceive the cost of health insurance as low compared to those who do not belong to any association. As discussed, it was not about cost per se, given that some associations required their members to enrol in the NHIF while a few supported their members to pay for NHIF membership.

The higher observed enrolment among association members is also tied to the IFC-recommended strategy for the NHIF to increase coverage among informal workers through associations (Deloitte, 2011). Discussions with informal workers

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revealed that NHIF officials visit association members and provide them with information:

> "An officer from the NHIF came to visit groups with active members. Then, we were to begin to pay USD 14.80 for the first three months, and USD 4.90 for subsequent months" (FGD Trade, Kisumu, 2018).

The fact that scheme officials are conducting visits and providing necessary information tends to encourage NHIF uptake because workers in the informal economy are time constrained, many find it difficult to abandon work to undertake registration, which is perceived to be tedious and lengthy, and to accord time to register means losing crucial earnings:

> "I think it is good, but I have not had the time" (FGD Trade, Nairobi, 2018).

The survey findings reveal that the main reason inactive/non-members do not contribute to social insurance was because they felt that it was expensive (45 per cent). Since the analysis reveals that participation in the NHIF is not entirely dependent on earnings, this finding likely relates to fluctuating earnings. During discussions with informal workers belonging to associations, an argument was made that the NHIF was expensive because their earnings were irregular due to the nature of their employment, which makes earnings unpredictable:

> "It is difficult to commit to payment because you have money today and none tomorrow … the penalty is KES 250 if you default for a month" (FDG Construction, Kisumu, 2018).

This quote also reveals informal workers' apprehension regarding potential penalty fees, which are less easily cushioned by irregular earnings. However, most association members during discussion argued that the current rate of premium of USD 4.90 was not high. Considering that most association members (85 per cent) made regular contribution to their association, this may explain why many perceived the cost of NHIF premium to be low. The median monthly association contribution across the three sectors was USD 15, which is considerably higher than the USD 4.9 voluntary monthly contribution to the NHIF. The practice of making regular contributions to associations partly explains why most informal workers who belonged to associations (69 per cent) were active NHIF participants: the practice is consistent with that of premium payment. As noted earlier, there were others who were in more than one association and hence who paid multiple contributions.

Rather than costs, association members during discussions complained of poor-quality services, the inadequate supply of medicine and hospital supplies,

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poor treatment of NHIF clients by service providers, and long queues in public hospitals. Poor treatment in public hospitals as well as the lack of medicines, which forces NHIF users to purchase medicines directly from pharmacies despite having health insurance, were noted as factors that discouraged enrolment and contributed to default behaviour. Due to poor services, those who fell ill preferred treatment in private hospitals, or to self-medicate when treatment in private hospitals was not affordable. In other cases, people postponed treatment until their medical condition worsened. It is feasible, as asserted by Rogers (1995), that people affected in this way may abandon using the service and spread negative information about it, further discouraging others from enrolling.

Rogers suggests that those who perceive an innovation to be complex are less likely to adopt it or will abandon it if already adopted. The fact that most informal workers did not understand how the NHIF functions, including its administrative procedures, suggests that the NHIF is complex. Indeed, discussions with association members and interviews with informal workers revealed that there are some who had problems accessing registration documents, such as birth certificates and marriage certificates, arguing that the process of getting these was slow and tedious. Individuals in "unofficial" marriages, with more than one spouse, or with more than the maximum number of children covered under the scheme, are likely to perceive registration as cumbersome. Those with children aged 18 or older but who are otherwise still dependent are likely to find the age requirement a hinderance:

> "Some children who do not do well in school have reached 18 years while still in school. They cannot be covered by the NHIF, yet they are under the parents. The age limit is a hindrance" (Interview Trade, Nairobi 2019).

According to Rogers, innovations that are incompatible with the practical beliefs and values of potential adopters are less likely to adopted. An interview with a key informant revealed that some were reluctant to join the NHIF because of cultural beliefs:

> "Some people do not join because they believe insurance comes with a bad omen. There is a Deputy Commissioner, who is my friend, who believes that having an insurance brings bad omen. I know people who share the same belief" (KII Trade, Nairobi, 2018).

One micro trader was more precise and believed that taking out insurance would invite disease (KII Trade, Kisumu, 2018). This finding is consistent with the literature showing that cultural and religious beliefs serve as a barrier to the uptake of health insurance (Hassan, Mwaura-Tenambergen and Muthoni, 2017).

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Rogers argues that an individual may decide to abandon an idea due to dissatisfaction or to replace it with a better alternative. Among the inactive members, the three main reasons for leaving the scheme were because "it was expensive" (51 per cent), there was a "shift from formal to informal employment or separation from spouse" (22 per cent), and "dissatisfaction with NHIF services" (12 per cent). Noting that inactive members had significantly higher earnings than non-members, the perceived costs most likely relate to the challenge of irregular earnings or to dissatisfaction with the price of the premium. Interviews with inactive members reveal that some of those who left had done so because it was deemed too expensive and did so following the NHIF decision to increase the monthly premium from USD 1.60 to USD 4.90, an increase of about 213 per cent (Barasa et al., 2018). This can be construed as dissatisfaction with the NHIF, despite the NHIF's argument that the increased premium would expand the benefit package, including for the introduction of outpatient services. However, there are other members who found it "expensive" owing to the irregular nature of their earnings. This argument was not only made by inactive members but also by active and non-members.

During follow up interviews with active members – undertaken with the purpose of better understanding active membership – it was revealed that some had defaulted on their contributions citing financial constraints attributed to the poor performance of their businesses. This finding shows that "active" status is not static and may lapse into inactive status depending on the inconsistency of earnings. It also reveals questions about the design of the payment plan, which expects informal workers to contribute at the end of the month and penalizes them for failing to do so. Although some inactive members were willing to reactivate their status, they found it difficult because of accrued penalties. While the NHIF regulation does allow informal workers who have remained active members for more than a year to reaffiliate with the scheme without paying penalties (but wherein access to services is only possible after a waiting period of three months), knowledge of this regulation was lacking.

Conclusion

Using the case of Kenya's NHIF, this article has sought to examine the extent to which "earnings" influence the participation of informal workers in contributory health insurance schemes and, more generally, to identify barriers to participation. It has used data from three economic sectors dominated by informal workers to understand the relationship between earnings and participation decisions (the decision not to enrol, the decision to remain active, and the decision to default/lapse contribution payments). Based on analysis

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of quantitative and qualitative data, the article has argued that the main driver of enrolment and active membership is not the size of earnings but social influence through the marital relationship, which creates demand for health insurance. This factor combines with the role played by informal workers' associations in the promotion of the uptake of health insurance and in discouraging default decisions through paying members' contributions to the scheme. This role was most prominent among trade and transport associations. In the trade sector, the demand for NHIF membership was driven due to associations having structures (such as regular contributions) and rules that require members to enrol and make regular contributions to the NHIF. In both the construction and transport sectors, the uptake of NHIF membership was more common among top-level officials, but lower among workers due to the temporary nature of jobs. Most associations dialogued with NHIF officials, who provided information about registration procedures. Such positive interaction with NHIF officials was expected – a strategic objective of the NHIF is to use informal worker's associations as a vector to increase health insurance coverage among informal workers.

The article has argued that participation barriers stem from the nature of informal work. Such work is characterized by low/irregular earnings and inadequate knowledge of the rule/procedures of the scheme.

The instability of employment and irregularity of earnings creates apprehension concerning the possibility of having to pay penalty charges when unable to pay the monthly premium. This acts to discourage enrolment among non-members as well as presenting a financial barrier to the reactivation of the payment of contributions among inactive members.

A lack of knowledge of the rules and procedures of the scheme, as well as poor quality of services offered by service providers, encourages the spread of false and negative information about the scheme, which can discourage potential members from enrolling in the scheme. The poor quality of services may lead to dissatisfaction and negative attitudes about the scheme among scheme members, which can lead to the decision to default.

The article applied Rogers' theory on adoption (Rogers, 1995) to understand the participation of informal workers in the NHIS scheme. Of the five characteristics stipulated by Rogers that individuals use to assess whether they will accept an idea, the most important in explaining participation are relative advantage, complexity, and compatibility. On relative advantage, Rogers argues that ideas which are perceived as having more benefits than costs are more likely to be accepted. In the case of the NHIF, married traders are more likely to perceive the cost of making regular contributions as low compared to single traders. Association members who contribute regularly to their associations are more likely to perceive the cost of making regular contributions to be low. In terms of

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complexity, informal workers lacking understanding of how and why the NHIF works are likely to perceive NHIF procedures and regulations to be complex. To increase coverage, there is therefore an identified need for insurance schemes to communicate the benefits of enrolment to informal workers. In addition, service providers need to improve service quality to make informal workers perceive that they are receiving value for their contributions. Dissatisfied users are more likely to drop out of the scheme or spread negative information, which may discourage enrolment or lead to further drop out. Finally, given that the present as well as previous studies have established that variability in the earnings of informal workers acts as a barrier to uptake, there is also a need to reconsider the design of penalty regulations that assume that the earnings of informal workers are regular.

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Special pension schemes for workers in arduous and hazardous jobs: Functions and conditions to ensure equal treatment

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Abstract Most jurisdictions grant differentiated and more beneficial treatment – usually in the form of early retirement, and commonly under special pension schemes – to workers in arduous or hazardous jobs. Several justifications for such treatment have been advanced, including i) compensating the worker for the hardship, ii) protecting the worker from the hazard, and iii) realizing the principle of equality in the distribution of costs and benefits in the social security system. This article analyses these functions from a socioeconomic perspective and explains how early retirement for workers in arduous and hazardous jobs is necessary to ensure equality by treating "unequals unequally", and in proportion to their inequality. Moreover, this article presents a precise formula to calculate when a worker should be allowed to retire, so that workers in occupational domains with a shorter life expectancy do not systematically enjoy lower expected benefits from the pension system while having contributed the same amount. Implications for the design and desirability of special pension benefits are discussed.

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Keywords pension scheme, eligibility, equal treatment, occupational safety, international

Introduction

Differentiated and more beneficial treatment, dispensed only to certain people covered by the social security system, requires a justification to comply with the principle of non-discrimination or with the constitutional right of equal treatment. In fact, most countries provide special pension benefits to workers in arduous or hazardous jobs based on the grounds that they compensate workers for the hardship of the job, protect workers from the hazards of the work or, more rarely, are required to realize equality and implement proportional justice. In the European Union (EU), more than two-thirds of the countries have special pension schemes for workers in arduous or hazardous jobs (Natali, Spasova and Vanhercke, 2016; Eckefeldt and Pătărău, 2020), and recent reforms introduced a full-fledged system providing special benefits to such workers in Italy, France and Finland.[1] In Brazil, the People's Republic of China, and the Russian Federation, the norm that allows such workers to retire earlier is understood to perform a crucial social role and has remained virtually intact throughout all recent reforms of these national social security systems.

Still, several crucial questions remain. In what dimensions are those workers different? This depends, as will be explained, on the current amount of effort and energy that workers spend on their work and on the different risks they are exposed to; namely, the present risk of injury and accident as well as the future risks of incapacity, illness, and the reduction in quality and expectancy of life that arise due to the type of work they perform. The suitability of special pension schemes to compensate workers for, or protect them from, each of these harms depends on the structure of the market in which they intervene. This determines to what extent workers are already compensated through wage premiums for some of those harms, whether and to what extent they still need to be compensated for other harms, and whether there are other branches of the social insurance system that already provide such compensation. Moreover, at what cost should their situation be equalized? This answer determines the extent to

1. In Italy, the benefit was introduced by Decreto Legislativo 11 Agosto 1999 and regulated by Decreto Legislativo 21 Aprile 2011. In France, it was introduced by *Loi 2010-1,330 du 9 novembre 2010*, regulated by *Loi 2014-40 du 20 janvier 2014*, and subsequently reformed by the *Ordonnance 2017-1,389 du 22 septembre 2017*. In Finland, the "years-of-service" pension is regulated in the *Työntekijän eläkelaki* [Employees Pensions Act] (395/2006), Section 53.

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which special pension schemes should be shaped to foster the prevention of arduous and hazardous working conditions and who should pay for the costs of the scheme. In the end, the most relevant question to be addressed is *what kind* of equality, if any, should be offered, and to *whom* and *when*? It determines to which extent the statutory retirement age should differ depending on the hazards that workers are exposed to. Accordingly, this article specifies *when* a worker who has worked for a certain number of years in an arduous or hazardous job should be allowed to retire, depending on different factors, with the aim to ensure fairness in the pension system by balancing out contributions and expected benefits.

This debate has acquired high relevance as differentiated benefits have been advanced as a fair and adequate measure to counterbalance the trend of increasing the retirement eligibility age for workers, which imposes a disproportionate burden on those whose health suffers due to arduous or hazardous work. These workers are the ones who are most at risk from the current policy shift towards longer working lives. The European Commission, in fact, has recognized how:

> "a specific category that often benefits from more favourable schemes and rules covers workers in arduous and hazardous jobs. Even though, during the past decade, the main trend has been towards tightening eligibility conditions and phasing out schemes, some countries have pushed through reforms creating more favourable conditions for this category" (European Commission, 2018, p. 105).

The International Labour Organization (ILO) Invalidity, Old-Age and Survivors' Benefits Convention, 1967 (No. 128), asserts that "[i]f the prescribed age is 65 years or higher, the age shall be lowered, under prescribed conditions, in respect of persons who have been engaged in occupations that are deemed by national legislation, for the purpose of old-age benefit, to be arduous or unhealthy" (article 15). The physical effort and strenuousness involved in certain professions justifies the worker's exit from the arduous or hazardous job since workers need to be in good physical condition to exercise their job and might be unable to perform a physically strenuous activity well when at an older age. There are, however, different policies apt to redress their situation, and these policies have different financing mechanisms, which are more or less just depending on the extent to which they correct or create unequal conditions for workers in arduous or hazardous jobs.

This article analyses the functions and justifications advanced by scholars, courts and legislators for differentiated and more beneficial treatment of workers in arduous or hazardous jobs. While there are different rights that the law might grant to such workers (Eckefeldt and Pătărău, 2020), the most paradigmatic and

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usual one is a lower retirement age compared to workers in the general scheme. In the analysis that follows, the focus lies on this right, denoted herein the "special pension benefit" that workers in arduous and hazardous jobs might be entitled to. The legal analysis considers European countries that provide such a benefit to those workers as well as for the three emerging countries mentioned, namely Brazil, the People's Republic of China (hereafter, China), and the Russian Federation (hereafter, Russia).

Results provide insights into *why* special pension schemes are in place and concern *how* they should be designed to realize legitimate legal goals. In specifying the negative consequences of special pensions, and comparing them with alternative policies, this article reveals when special pensions could and should be substituted for alternative ones, what the main threats are to their implementation and, consequently, to achieving legitimate legal goals. The essential function of special pensions that is not performed by any other branch of the social security system is to create a fair distribution of costs and benefits between workers who suffer a reduction in life expectancy caused by the work they perform and those who do not face this risk. To perform this function without creating an unequal treatment that is not justified, the special benefit provided to these workers must be calculated precisely, and this article specifies how the special benefit should be calculated.

The remainder of the article is organized as follows: next, the main ways by means of which different legal systems recognize arduous and hazardous jobs, and the type of benefit most often provided to those workers, are described. In turn, the consequences of arduous and hazardous jobs that can justify the goals of compensation, protection, and fairness, as well as alternative social policies that also perform those functions are explained. The article then investigates these three potential functions of special pensions and draws the contours of how the special scheme should be designed to perform these, including the sources of finance and interaction with other policies. Before final conclusions are presented, the article specifies the conditions for special pensions to ensure the equal treatment of workers in unequal conditions and presents a formula to calculate the retirement age of workers in arduous and hazardous jobs.

Legal recognition and treatment of arduous and hazardous jobs

Most countries with a well-established social security system provide differentiated and more beneficial treatment to workers in jobs or working conditions that the law recognizes as arduous or hazardous. Out of the 27 EU Member States, only five do not have any differentiated provision for those workers (Denmark, Ireland, Malta, the Netherlands and Sweden) (Natali, Spasova and

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Vanhercke, 2016). In Brazil, beneficial treatment allows workers exposed to heavy hazards to retire up to 15 years earlier than the minimal retirement age, in Russia up to 10 years earlier, and in China, France and Italy up to 5 years earlier.[2] In contrast, many countries including Australia, Japan, Switzerland and the United States of America do not have any special provision for those workers.

Few countries have a legal definition of arduous or hazardous work. The French Labour Code (art. L4121-3-1) considers *pénible* – a concept that includes both elements of arduous and hazardous work (Volkoff, 2015) – those jobs in which the employee is "exposed to one or more factors of professional risk determined by decree and connected to marked physical constraints, an aggressive physical environment or certain health patterns likely to have a lasting, identifiable and irreversible impact on health". Countries that have such an abstract definition provide lists of environmental conditions that allow workers who can demonstrate that they were exposed to those factors to claim more beneficial treatment. In China, for instance, these conditions include underground work, high altitude, high temperature, strenuous activity, or any other work that is harmful to the health or body.[3] Other usual factors include underwater work, handling of certain chemical materials, or proximity to nuclear elements.

Most countries, however, recognize arduous and hazardous work for broad categories of workers through lists of occupations or professions that are deemed arduous or harmful, such as work carried out by miners, metalworkers, aircraft staff and pilots, dancers, seafarers, assembly line workers, drivers of heavy vehicles, and bullfighters. Other countries recognize only a few occupations as arduous or hazardous and define workers in those fields as entitled to some social protection benefit that is tailored to them. For instance, Germany and Norway grant early retirement only to miners and seafarers.

When recognized, workers engaged in arduous or hazardous activities are entitled to special provisions that facilitate early labour market exit. While the special benefit dispensed to such workers consists most often in access to full pension benefits prior to reaching the statutory pensionable age and, but less often, in the possibility of part-time work with full or almost full wages at an older age, it can also be implemented through a more advantageous accrual of pension rights or, at least in theory, through lower contributions paid by those workers while still active.

2. In Brazil, the matter is regulated by Lei No. 8.213/1991, art. 57; in China, by the State Council's Provisional Measures Concerning the Retirement and Resignation of Workers, art. 1, Number 2; in Italy, by *Decreto Legislativo 21 Aprile 2011*, n. 67, art. 1; in France, by the *Code de la Sécurité sociale*, art. L351-6-1.

3. In China, the State Council's Provisional Measures Concerning the Retirement and Resignation of Workers, art. 1, Number 2.

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Table 1. *Consequences of arduous and hazardous work*

Arduous	Hazardous		
Present	Present	Future	
Exceptional physical effort and energy	Risk of accident and injury	Risk of incapacity to perform (i) the specific work or (ii) any type of work	Risk of illness causing (i) reduced life quality or (ii) reduced life expectancy

Source: Author's elaboration.

In fact, after years of debate, and several legislative changes to the initial project, France adopted a full-fledged system of specific provisions in 2014 (with substantial changes in 2018) that provide a menu of choices for those workers. It considers *pénible* any work involving night shift, work shift, repetitive work, work in a hyperbaric chamber, or when exposed to extreme temperatures and noise. These workers accumulate points over the years that they can later use i) for early retirement, ii) to change from full-time to part-time work without wage reduction, or iii) for the financing of educational programmes to reconvert to another profession.[4]

The consequences of arduous and hazardous jobs

Arduous work means exertive or strenuous work that requires a high level of physical or mental effort and energy. The classification of a certain activity as arduous requires a comparison between such an activity and those that require a level and intensity of effort and energy considered normal, average, or median (Bruno, 2015). There are objective criteria to measure the exceptional effort and energy spent while in a job, such as calories spent per hour of work (while seated desk-work consumes 92 kilocalories per hour, working on a car assembly line consumes 176, gardening 323, coal mining 425, and loading trucks 435) (Lieberman, 2013, p. 219), but the classification of a job as arduous is always a subject of debate (for instance, how many more calories does a worker need to consume for a job to be considered arduous in comparison to another job).

Hazardous work imposes risks to the worker's health. These include, as depicted in Table 1, i) the present risk of accident or injury while working, ii) the future risk that the worker will not be capable to perform either the specific job she or he performs or any type of job in the future, and iii) the future risk of illness causing a reduction in life quality or in life expectancy. Certain jobs might

4. See text of the *Code de la Sécurité sociale*, art. L4163-7.

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involve one or more of those risks. Carrying very heavy loads, for instance, involves the present risk of injury to the back, the risk that this will develop into a permanent back injury preventing the worker from performing virtually any type of job in the future, and the risk of reduced quality of life after retirement due to injury-related movement difficulties. In contrast, working in contact with asbestos might not impose, by itself, any risk of accident or injury in the present, nor the incapacity to perform the job in the future, but instead, potentially, a heavy toll on a person's life expectancy due to the development of serious illness in old age (Alleman and Mossman, 1997).

The future risks involved in hazardous jobs include, for example, the long-lasting harm caused by mine dust on miners (leading to pneumoconiosis), hyperoxia and decompression stress on commercial divers (leading to a loss of lung function), contact with mercury, lead, arsenic, silica and other chemical agents by industrial or construction workers (leading to different serious diseases), and of low-dose exposure to ionizing radiation by workers in nuclear facilities (leading to cancer) (Schubauer-Berigan et al., 2015).

Potential functions of special pension schemes

To compensate the worker for hardship or hazard

The first potential function of special pension schemes is to compensate the worker for the arduousness of, or for hazards related to, the work. It involves the intervention of the State in the labour market by providing a benefit to affected workers as compensation for such negative consequences of the work. A competitive labour market, however, already has mechanisms providing some form of compensation to workers in those sectors through wage premiums. Instead of operating in a vacuum, the legal intervention allowing workers in those jobs to retire earlier interacts with wages set in the labour market, and the final consequence for the worker – i.e. the provision of a real compensation or not – might be different from the one intended by the legislator.

In the absence of special pension benefits, workers in a competitive labour market will consider how arduous or hazardous the job is and will accept it in place of some other job that does not involve such conditions only if they are offered some offsetting advantage such as a higher wage. Firms must offer compensating wage differentials to incentivize workers into accepting such jobs (Rosen, 1986; Hwang, Reed and Hubbard, 1992). Compensating differentials are necessary to equalize the monetary advantages and nonmonetary disadvantages (arduousness or hazard) among different jobs, with evidence of positive wage premiums for shift work (Kostiuk, 1990; Lanfranchi, Ohlsson and Skalli, 2002),

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work in contact with pollution (Cole, Elliott and Lindley, 2009), seasonal work (Del Bono and Weber, 2008), unsafe and dangerous work (Gunderson and Hyatt, 2001; Lalive, 2003), and work involving the risk of a fatal accident (Black and Kniesner, 2003; Viscusi and Aldy, 2003; Kniesner et al., 2012). Workers in those sectors earn higher wages than workers in normal sectors and employment levels in arduous and hazardous sectors are lower than in normal sectors.

In the presence of special pension benefits that are not subsidized, the costs of financing the benefit are borne only by the involved parties; namely, either employers, employees, or both in any specific proportion. The benefit – early retirement – has a value for workers, given by the present value of the stream of pension payments that they will receive during the years of early retirement, and that they would not receive if they were working in other sectors. The effect of early retirement is that to attract workers, employers do not need to offer the same wage premiums that they would need to offer in its absence. The legal intervention is, in this case, innocuous, except for a shift in the timing in which workers receive the compensation for the arduousness or hazard. In the absence of early retirement, they receive it while working, earlier in life, through higher wages. In the presence of early retirement, the wage premium diminishes, and workers receive compensation when they retire. There is no welfare loss as employment levels in those sectors remain at the same level as they would have been in the absence of the mandated benefit, and wage differences reflect the amount that workers value the benefit (Summers, 1989).

In the presence of subsidized special pension benefits, while workers receive the benefit in full, its costs are financed through contributions collected from all insured persons, independent of whether they are entitled to the special benefit, or from all firms, independent of whether they employ workers entitled to it. Employers do not need to offer wage premiums since workers will take those jobs for a lower wage knowing that they are also receiving future compensation for the arduousness or hazard in the form of the right to retire earlier. Employers do not pay for this benefit that their workers receive, and the State compensates those workers by bearing the costs of their early retirement. Therefore, when the benefit is subsidized, it compensates workers, but only at a high price: first, a share of the value of the benefit is captured by firms through their possibility to lower wages and still attract workers; second, arduous and hazardous jobs are maintained instead of reduced; third, the costs of the subsidy are paid by other parties, who must suffer a reduction in the provision of some other public service or bear the costs through higher taxes.

If workers are not aware of the hazard, then they will accept to work for the same wage they would earn in normal sectors. This is problematic for at least three reasons: first, workers are not compensated for the hazard through wage premiums – they are, in fact, if employers are aware of the hazard, being

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exploited; second, the hazardous sector employs too many people by taking advantage of the possibility to attract workers without the need to pay wage premiums; third, risk matching does not occur, as workers who are risk averse the most or the least will equally enter that sector, with the risk averse workers being very inefficiently allocated in the job. In this case, special pension benefits such as early retirement compensate workers for the risk they incur without their knowing. However, if the benefit is subsidized, then only a share of its value will be captured by workers, with firms capturing the other share. Employers profit at the workers' and the State's expense and have therefore incentives to employ too many people in industries that would otherwise have vanished or diminished in size given the risk they pose to workers.

Special pensions are, however, most often not necessary to provide compensation for workers. When workers are aware of the arduousness or hazard, they are already compensated by wage premiums, and they are efficiently matched to firms offering wage premiums for the arduousness and hazards that maximize their utility. When workers are, in contrast, unaware of the risk, for instance the risk that work with asbestos or other chemicals impose on their future health, then there are other policies that can simply inform workers directly about the hazard or risks, if the State itself is aware of these, or impose the obligation on employers to inform workers, if firms are aware of these. Many jurisdictions impose the duty to disclose information on firms, as for instance in France, where employers must identify, evaluate, and inform employees about such risks, prevent those that can be prevented, and specify the measures undertaken to mitigate the remaining ones in a collective agreement that must be bargained with a representative body of workers.[5]

Most importantly, there are other branches of the social insurance system that already perform the role of compensating workers for most of the hazards they are exposed to in their jobs. First, the future incapacity to work or to perform the same activity is the object, respectively, of disability pension or occupational disability insurance. While the former insures a worker's income against disabling medical events, the latter insures workers who become disabled and unable to perform the majority of the occupational duties they used to perform. Second, the present risk of injury in hazardous work is the object of workers' compensation. It provides wage replacement and medical benefits to employees injured in the course of employment. Third, the future risk of illness in old age resulting from hazardous work is the object of health insurance and long-term care insurance. If the worker develops an illness because of the type of work she or he undertook, then health insurance compensates the medical expenditures

5. See the *Code de la Sécurité sociale*, art. L. 4121-1.

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necessary to heal the ailment, and long-term care insurance compensates for the incapacity to perform activities of daily living.

The sole consequence of hazardous work that is not addressed by any branch of the social insurance system is the reduction of life expectancy. There are some studies linking worker's occupation to mortality (Johnson, Sorlie and Backlund, 1999; Katikireddi et al., 2017; Lee et al., 2016) or life expectancy (Moore and Hayward, 1990; de Wind et al., 2020; Deeg, Tavernier and de Breij, 2021). The estimates provided by these range from a maximum difference between favourable and unfavourable working conditions of around 2.5 years (de Wind et al., 2020) to 4.5 years at age 55 (Moore and Hayward, 1990), and around 3.3 years at age 65 (Deeg, Tavernier and de Breij, 2021).

To protect the worker from hazard

A second potential function of special pensions is to protect the worker from the hazard of the work. The protection could be achieved in two ways. First, it can provide incentives for employers to invest in prevention and in measures apt to avert the hazard. Second, it can provide incentives for employees to exit those jobs, either by them changing occupation or by retiring early.

When workers are aware of the hazard, then employers already have incentives to invest in prevention, since by doing so they reduce the hazard and thereby lower the compensating wage differential they must pay to hire workers. They will, in the absence of special benefits and, in fact, of any type of legal obligation, invest in prevention until the marginal cost of the investment is equal to its marginal benefit for the firm; namely, the reduction in the wage premium it must pay to attract workers to the risky job. Special pension benefits are not apt to provide incentives for firms to increase investment beyond that point.

When workers are unaware of the hazard, the aptitude of special pensions to reduce risks depends on whether the benefit is subsidized or not. If it is subsidized, then firms profit from the subsidy just as workers do. Since workers are not aware of the risk, firms make no investments to reduce the risk because doing so would not lead to any reduction in wages, as workers are unaware of the risk, and investing to reduce or avert risks only creates costs for the firm, with no monetary gain. Special pensions can provide incentives for firms to invest in preventive measures when workers are not informed, and the benefit is not subsidized. Firms then bear at least a share of the costs of the benefit for their workers, which they can reduce by investing. They internalize the negative externality that hazardous jobs create for workers, and which is because of informational problems not considered in the wages set in the market.

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Yet, even in this case, special pension schemes will not create incentives for employers to invest in preventive measures if the benefit is provided to whole categories. A firm that invests in prevention would still have to bear the costs of financing the benefit and has therefore no incentive to do so. A mining company whose workers must work underground cannot avoid the costs of financing early retirement of its employees by allowing them more pauses above ground, providing better equipment, and so forth, if they would still, after all these investments, count as underground workers by law, and remain entitled to early retirement that is financed by the same mining company.

Several types of arduous jobs and hazards are not prevented because of the manner in which the law regulates special pensions. In Italy, for instance, all those working in tunnels, caves, and mines can retire early, just as can all deep-sea divers.[6] Firms have no incentive to provide better equipment, longer pauses above water for better decompression, or other amenities, because as long as their workers must work underground or underwater, the latter will still be entitled to the benefit, and firms will still have to pay the costs of the benefit independent of the working conditions they provide.

In contrast, if the benefit is provided in an individual manner, and only to workers who are in fact exposed to the hazard in a specific firm, then firms have incentives to invest in prevention. A firm that, for instance, invests by changing its production methods at a cost, to avoid its employees coming into contact with mercury, would then be exempt from having to finance the costs of early retirement of those workers because those jobs would no longer fall under the category of “hazardous”. Workers, in turn, would not require higher wages to perform that job in that specific firm.

The recent reforms in France were explicitly aimed at preventing arduous and hazardous jobs. The system entitles workers who are exposed to certain risk factors in a specific firm – and not to whole professions or categories – to special benefits. It imposes on the employer the duty to issue a declaration of the risks that each individual employee is exposed to, and to create a “personal prevention account” for each of them. Since some of the costs of the benefit are borne by those firms exposing workers to hazards, it is apt to achieve its purpose.

Special pensions schemes protect workers in hazardous jobs through permitting early exit from the hazardous job, thus avoiding the risk that the worker might lose further years of life expectancy were she or he to remain in the job until the statutory retirement age. By allowing the worker to retire earlier, she or he is spared from working for a greater number of years in the harmful job, and hence avoids greater harm caused to health. Instead of retiring at, for example, the minimum retirement age of 65, after 35 years of hazardous work, the worker

6. *Decreto Legislativo 21 Aprile 2011*, art. 1, 1, a.

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who is allowed to retire at age 60, after 30 years of hazardous work, avoids working five more years in that job, and thereby is less exposed to the risk of suffering harm.

While this is apt to partially protect the worker from harm, it offers only a limited benefit for workers, unless they are allowed to retire much earlier, which is extremely rare. If having worked in a hazardous job (for example, underground mining) for five years diminishes a person’s life expectancy by one year, a worker who starts working at age 30 and retires at age 60 loses, in expected terms, 6 years of her or his life expectancy. This loss can be compared to that of a worker who does not enjoy preferential treatment and who retires at age 65, with an expected loss of 7 years of life. Early retirement or a change to part-time work in old age cannot ever completely prevent the harm: this would require a prohibition of those jobs.

To implement equal treatment

A third potential function of special pension schemes is to realize the “principle of equal treatment”: to treat “equals equally and unequals unequally” in proportion to the inequality. Treating all workers indistinguishably, and allowing them all to retire only at, say, age 65 is unjust with regard to those workers who contribute the same amount to the financing of the system but who have a life expectancy of no more than 65 years. Equality in the distribution of goods (benefits from the social security system) to persons who are unequal in one relevant aspect of old-age insurance (namely, life expectancy) requires proportional, and not numerical, equality (Aristotle, n.d., V. 3. 1131a10-b15, cited in Barnes, 1984).

If a worker in a hazardous job has a lower life expectancy than another worker because of work-related risks (hence, being unequal), the average reduction in the life expectancy (the proportion of the inequality) is known, and if they both contribute equally to the pension scheme by paying the same contribution rate, then by allowing the worker in a hazardous job to retire proportionally earlier, this inequality is corrected, and both workers contribute to and profit from the pension system equally.

In the absence of differentiated treatment, workers who have a lower life expectancy because of the hazards involved in their work systematically enjoy lower benefits from the pension system than other workers: they receive pension payments for less time but contribute to the financing of the system to the same extent. In the absence of special treatment, and when the contribution rate paid by them does not depend on the hazard of the job (as is the case in all jurisdictions known to the author), there is redistribution of income from workers in hazardous jobs to workers in “normal” jobs.

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There is no legitimate reason why such a pattern of redistribution should be accepted, and correcting it seeks to implement the legal principle of, and constitutional right to, equality.

Consider, for instance, workers entering the labour market at age 20, as depicted in Figure 1. In normal jobs, workers retire at age 65, after 45 years of work, and live on average until age 80, enjoying 15 years of pensions. Therefore, for every three years of work, the worker earns one year of pension. In a hazardous job, we expect workers to have a lower life expectancy. Consider, for instance, an activity that reduces the life expectancy by one year for every five years of work. After working 45 years, the worker loses nine years of life expectancy, and enjoys pensions for only six years. Accordingly, for every 7.5 years of work, the worker earns one year of pension.

Special pension schemes implement unequal treatment for workers with unequal life expectancy. If allowed to retire at age 59, instead of at age 65, they create two immediate effects. First, as explained before, special pensions offer some protection for the worker from the hazard as it leads her or him to exit the job earlier; in this example, saving 1.2 years of life expectancy (as the worker only works for 39 years in the hazardous job, instead of 45 years). Second, it avoids redistribution from the worker in hazardous sectors to other workers: she or he works for 39 years and then enjoys 13 years of pensions. For every three years of work, she or he earns one year of pension, just as workers in normal jobs do.

Figure 1. *Distribution of costs and benefits in the social security system*

Source: Author's elaboration.

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How to ensure equal treatment in retirement conditions for workers in arduous and hazardous jobs

To be apt to realize equal treatment, special pension schemes must, first, provide a general differentiated requirement for the concession of the benefit that is proportional to the life-expectancy reduction. This ensures that any worker who is exposed to the hazard is entitled to the benefit. It is therefore incompatible with systems that provide this special benefit only to a few categories of workers, such as those providing early retirement only to miners or seafarers, as in Germany or Norway. While apt to correct the inequality between these and other workers, it does nothing to all for those others not covered by those restrictive and exceptional rules.

Second, the differentiated requirement must be based on an ex ante accurate measure of life expectancy, given the harm imposed by the performed activity (Zaidi and Whitehouse, 2009). This leads to an “unequal treatment of unequals” that is proportional and just. Otherwise, it would be arbitrary, reflecting only the respective bargaining and political power of different groups of workers. If it were arbitrary, then it would create inequality rather than avoid it, by conferring a benefit to individuals who are equals and by imposing the duty to pay for it upon others who are also equals.

Third, the scheme must consider the possibility of workers changing jobs during their lifetime, and hence consider the real hazard suffered by each individual worker. The consequences of the hazard might be nonlinear and therefore complicated to calculate, such as in cases where the consequences start to materialize only after many years of work under the same conditions, and then grow at an exponential rate. While job changes should be considered, the years spent in non-hazardous jobs should not count for the special benefit. The Italian system, for instance, used to provide early retirement to workers in listed types of jobs if they had held the job for at least seven out of the last ten years before applying for retirement; starting from 2018, they must now have spent at least half of their career in those jobs. Neither the old rule nor the new one is compatible with providing truly proportional treatment, because a worker who has spent 40 years working underground is likely to suffer a higher reduction in life expectancy than a fellow worker who has worked underground for seven or 20 years.

To address this challenge, and considering all the above requirements, a way to achieve more equal treatment can be calculated precisely, according to the formula below. The retirement age in hazardous jobs R_h shall depend on the general statutory retirement age R_n, on the number of years spent on the hazardous job y_h, on the hazard rate h imposed upon the individual worker, on the general life expectancy at the statutory retirement age in the population of the country L, and on the numbers of years that workers in normal jobs y_n must work to retire:

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$$R_h = R_n - y_h h + (R_n - R_h)(L/y_n)$$

The term $y_h h$ captures the loss of life expectancy caused by y_h years of hazardous work, and the last term on the right-hand side of the equation captures the protective function of special pensions through early exit from the hazardous job $(R_n - R_h)$, weighted by the accrual rate, in years, in other non-hazardous jobs L/y_n.

The key argument is that it is insufficient simply to allow a worker who, for example, has worked for 20 years in a harmful job, which carries the risk of a loss 0.2 years of life expectancy per laboured year, simply to retire four years earlier. This would be neither proportional nor truly fair. If one were not to consider the last term of the equation, and the protective function of early retirement for those workers, then assuming a general life expectancy of 80 years in the population, age 65 as the general retirement age, that workers in normal jobs need to work three years for one year of pension, and that this worker starts working at age 20, then she or he could retire at age 61.[7]

She or he would work for 41 years, from age 20 until age 61, and live until age 76, given the expected loss of four years of life expectancy. After 41 years of work, she or he would enjoy an expected 15 years of pension income, wherein 2.73 years of work would have been required for each year of pension, which is less than workers in normal sectors.

Instead, following the formula above, this person should be allowed to retire at age 62, according to the formula:

$$R_h = R_n - y_h h + (R_n - R_h)(L/y_n) \text{ or } R_h = 65 - 20 \cdot 0.2 + (65 - R_h)(15/45) = 62$$

In this case, she or he would work for 42 years, lose 4 years of life expectancy for the 20 years laboured in the hazardous job, and enjoy an expected 14 years of pension income, from age 62 until age 76. She or he would have to work three years for each year of pension, just as workers in other sectors.

When determined in this precise manner, the special benefit is fair and proportional, fulfilling all the conditions discussed above: it is i) general, ii) based on an ex ante accurate measure of life expectancy given the hazard imposed by the performed activity, and iii) considers only those years worked in a hazardous job and, therefore, the associated harm.

One of the difficulties in calculating *when* a worker should be allowed to retire in this manner is related to the assessment of the hazard rate h, which depends on the type of work undertaken by the worker for a period of y_h years. Different activities

7. This would correspond to simply using the formula $R_h = R_n - y_h h$. In the example above, it would correspond to $R_h = 65 - 20 \cdot 0.2 = 61$.

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impose a different toll on the worker's life expectancy, and this rate h should be based on the average harm imposed on workers performing the same activity. Some workers in a certain hazardous job might, in fact, live longer than workers in normal jobs, and these workers would benefit disproportionally from early retirement. Yet, workers in the hazardous job would not be systematically better or worse off, on average, than workers in normal jobs if allowed to retire at R_h. In fact, the injustice that workers performing the same job for the same number of years might die at different ages, some benefiting more from the pension system than others, is inherent to old-age social insurance, and special pension schemes do not correct for this type of injustice. Rather, they aim to correct for injustice across types of jobs and occupations. In the absence of special pension schemes, miners would, for example, systematically receive lower benefits from the pension system because of their lower life expectancy caused by the job.

A further difficulty is related to the age at which the worker starts performing the activity. If it is assumed that the harm imposed on life expectancy is greater for workers who start performing the job at an older age than for workers who start at a younger age, then a refined measurement of h, potentially dependent on the age at which the worker started performing that activity, should be considered if available.

Conclusion

Special pension benefits can perform different socioeconomic functions and the purpose they promote depends on how they are financed. If the intended purpose is to compensate workers to a higher extent than wage premiums set in a competitive labour market, then the special pension benefit must be subsidized. However, an outcome of this is that subsidized benefits allow employers to capture a share of the subsidies, which acts to help maintain jobs and sectors that would otherwise decline. Furthermore, the provision of the right to retire earlier, as a means to protect workers by preventing the hazard, is rarely apt to incentivize investments in prevention by employers. Of course, early retirement does lead workers to exit the hazardous jobs earlier, and when they do so, they are no longer exposed to the hazard, and thereby are protected from further harm. The effect is slight, however. Unless the worker is allowed to retire much earlier, the reduction in life expectancy that early retirement avoids is small. Similarly, alternatives such as a change to part-time work or developing new work competencies (so called "re-capacitating") or occupational reorientation programmes for older workers in arduous or hazardous jobs are equally suitable to prevent further harm, but effective to a limited extent only.

The proposal presented in this article explains how to achieve fair treatment using special pension schemes. As argued, required is an approach that is

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proportional in the realization of equal treatment for those who bear the consequences of hazardous work on life expectancy but who should also contribute to its financing equally, and who otherwise would not be in an equal position to benefit from the pension system as do other workers. Special pension schemes, thus, should be designed precisely in this manner to redresses this inequality, otherwise the risk is to create special pension schemes that exacerbate unequal treatment by generating privileges solely for well-organized groups of workers.

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BOOK REVIEW

Mesa-Lago, Carmelo. **Evaluation of four decades of pension privatization in Latin America, 1980–2020: Promises and reality**. Mexico City, Friedrich Ebert Stiftung, 2020. 247 pp. ISBN 9786078642823.

Carmelo Mesa-Lago is the author of over 90 books – most of which address social security and pensions – and the recipient of multiple prestigious international awards for his work in these fields and, consequently, he needs no introduction to the readers of this journal. His well-established positions on social security and pensions are respected across the board because of his rigorous and careful analysis of data and a commitment to the protection of Latin America's elderly population. The volume reviewed here provides another powerful demonstration of Mesa-Lago's knowledge of the field as regards the data collected and analysed and the recommendations provided to improve retirement systems in the region.

As noted by the author, the goal of this monograph, which covers 40 years of pension reforms and re-reforms in selected Latin American countries, is not only to integrate part of his previous work, but most importantly to evaluate the privatization promises based on reliable statistics and the relevant academic literature. The seven chapters that comprise this book contain an analysis of the structural neoliberal reforms, the political economy of reforms and social dialogue, and the unfulfilled promises and realities of private pension systems. The so-called re-reforms, geared to reduce the negative effects of the privately administered defined contribution systems, are also analysed. The conclusion evaluates the retirement systems of the countries addressed in the book, and the last chapter contains valuable recommendations.

Mesa-Lago's goal is to compare and contrast the benefits provided by privatized systems in nine Latin American countries: Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Mexico, Panama, Peru and Uruguay. These countries show wide variation in the degree of their privatization of pension provision, ranging from 99 per cent in Chile, El Salvador and Mexico to 16 per cent in Panama. The date of adoption covers from 1981 (Chile, the pioneer reformer) to 2003 (the Dominican Republic's adoption of a private structural reform).

The question of the impact that society has had on the adoption of the privatized or semi-privatized system is critically important. By and large, privatization took place either under highly repressive dictatorships, as was the case in Chile, where society was afforded no space to express its approval or disapproval of the policy, or by elected regimes that used political manipulation or one-party control of the political system to avoid having to consult with those affected by the reforms. For instance, in the case of Peru, the reform took place under the Fujimori dictatorship even though it was opposed by workers and pensioners; in Mexico the process was controlled by the government but was opposed by right-wing political parties as well as by pensioners; and in El Salvador's limited democracy, the process was controlled by the ARENA party. In contrast, the region's more democratic countries,

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such as Costa Rica and Uruguay, adopted mixed or parametric models that preserved some of the elements of universality and solidarity that were abandoned elsewhere during the privatization process. Thus, one can conclude that the less democratic a country's polity at the time of adoption, the less concern there was for preserving or creating a system based on equity and solidarity. In these countries, we also saw a larger emphasis placed on individual capitalization and the private administration of pension funds. The influence of the World Bank in the adoption of privatization is also clear as the reforms were often a condition for either World Bank or International Monetary Fund loans.

What has been the impact of the reforms? While the proponents of privatization argued that the reduction or elimination of the social security "tax" would expand employment and, consequently, coverage and benefits, the opposite has happened. For instance, in Chile, 79 per cent of the economically active population (EAP) was covered by the multiple pension systems before the 1981 reform and only 29 per cent was covered in 1982. Coverage has remained at about 50 per cent for most of the period between 1981 and 2020. Though in other countries the percentage of the EAP covered by private pensions has increased, the author notes large differences in coverage across countries. On average, coverage extends to about 40 per cent of the EAP. Often left out of the system are the self-employed and those working in the informal economy, who are also among society's poorest and those who would have least resources at the time of retirement – ironically, these are the same shortcomings that privatization proponents often highlight about social insurance systems.

As has already become very clear, the private systems do not address two critical issues: social solidarity and equity. Thus, we see a large degree of inequality embedded in the system while, as shown by Mesa-Lago, those with higher income levels are more likely to be covered and receive a larger pension. Moreover, the private systems accentuate gender inequalities that result from the gender pay gap and reduced years of work due to childbearing and child-rearing responsibilities as well as other family obligations. These countries also encourage or mandate women to retire earlier than men – in many countries women can or must retire five years earlier than men – even when women may have saved much less for retirement. The consequence is that pensions for women are very often insufficient – but women are not alone in this regard. As noted by Mesa-Lago and others, the privatized systems have a replacement rate that is very low, with an average replacement rate of 45 per cent of the last salary. In countries such as Peru, the average replacement rate is 39 per cent, in Chile it is 34 per cent, and in the Dominican Republic is only 27 per cent.

Low replacement rates, and in practice low pensions, are related to several factors including insufficient contributions and high administrative costs. The administrative costs (commissions and fees) charged by the private corporations responsible for managing the pension funds are often outrageous, such as in Peru where charges amount to 30 per cent of the deposit or in Chile where charges amount to 28 per cent of the deposit. The administrators' profit over "net patrimony" (assets) ranged between 47 and 12 per cent in the countries studied in this book. Profits, in turn, have allowed the pension administrators to accumulate an exorbitant amount of capital and, equally so, extensive economic influence. For instance, in Chile the capital accumulated by seven administrators amounted to 80 per cent of gross domestic product in 2019. Additionally, the very unimpressive return on capital that has been common to all the countries studied also contributes to inadequate pensions. As one example, in Colombia, the real annualized return was estimated at 3.9 per cent. In brief, the rent-seeking behaviour of administrators has a significantly negative impact on the pensions received by the pensioners but a significantly positive effect on the economic power acquired by the administrators.

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It is regrettable that the re-reforms conducted in Argentina, the Plurinational State of Bolivia, Chile and El Salvador did not address fully the major shortcomings and inequities of their systems. What Mesa-Lago notes is that all the re-reforms increased the role of government by adding or creating new benefits financed by the State, but without reducing the economic influence (power) or earnings of the private administrators. As I have noted in my own work on "reforming the reform in Chile", while the addition of the public pillar improved pension adequacy for lower-income groups and reduced old-age poverty by means of a minimum pension financed and guaranteed by the State, the essential features of the system remained unchanged. In other words, these re-reforms have been a win-win for the administrators because they continue to make profits that are much larger than in the banking industry or other financial institutions.

The book concludes with a performance evaluation of the private pension systems and recommends that future reforms be based on an expanded use of social dialogue, which should include conversations about social solidarity, expansion of coverage, gender equity, adequacy of benefits, reasonable administrative costs, and financial and actuarial sustainability. However, instead of proposing a general approach to reform, the author argues that reform should be determined by the needs and characteristics of each country and its society.

There are three ways in which one can evaluate this critically important book. First, to the best of this reviewer's knowledge, it is the only book that provides an analysis of both the privatization process and the re-reforms in nine Latin American countries. Second, it provides both country-based and comparative data that illustrates the impact of these policies on society and especially on those groups with limited incomes. Third, it provides valuable recommendations for making those policies more inclusive, equitable and responsive to the needs of society.

Mesa-Lago shines a light on the role of government as well as of governance in the policy field of pensions and retirement in the countries analysed and more widely in the region. If the role of government is to provide support for those who cannot provide for themselves and to pursue the goal of equity in highly unequal societies, the book offers not just an analysis of the failure of the privatized pension systems, but also a failure of government and governance. In turn, this failure has had critical social and political consequences, as testified by the examples of massive social movements in some of the countries analysed in this book. Additionally, the failure of government and governance in the context of the economic crisis produced by the COVID-19 pandemic has led to massive withdrawals of funds that, at least in some of these countries, have defunded the private retirement systems.

In conclusion, the need for a third wave of reforms is clear and, following Mesa-Lago's advice, it should be one that responds to the needs of the country and its society, and it must be geared to reduce gender, income and wealth inequities, and should be the product of an inclusive social dialogue and a democratic polity.

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Michael Cichon (1953–2022)

"How to walk the talk"

Michael Cichon was an exemplary international civil servant in the best sense of the term. A forceful advocate for social justice, he was an honest man with a clear vision and sharp intellect who genuinely cared for every human being. Being dedicated, principled and generous with his time, he was a role model, teacher, mentor as well as a friend to many of his colleagues and students. Michael was always ready to help those who needed support. He believed in converting words into actions and urged others to do the same.

Initially trained as a mathematician and actuary, he complemented a Master's degree in Pure and Applied Mathematics from the Technical University in Aachen, Germany, with a Master's degree in Public Administration from Harvard University in the United States and a PhD in Health Economics from the University of Göttingen, Germany. He joined the German Ministry of Labour and Social Affairs as an actuary and health economist, and eight years later, in 1983, moved to the Social Security Department of the International Labour Office (ILO). Michael joined the ILO Budapest Office at the time when its multidisciplinary advisory team for Central and Eastern Europe was established to support the countries in the sub-region, which were starting their transitions from centrally planned to market economies. He served in Budapest, between 1993 and 1995, as the senior social security specialist. In 1995, he returned to Geneva as Chief of the Financial, Actuarial and Statistical Branch of the ILO's Social Security Department and, in 2005, he was appointed Director of the ILO's Social Security Department. He retired from the ILO at the end of 2012, just six months after the International Labour Conference had adopted a new landmark social security standard, the Social Protection Floors Recommendation (No. 202). His leadership and dedicated commitment and efforts across nearly three decades had culminated with this visionary outcome that provides guidance to countries to improve the lives of billions of people around the world.

Michael was an ardent promoter of the values and principles enshrined in the Universal Declaration of Human Rights, on the right to social security for all, and the ILO's normative framework. He was the visionary strategic policy planner who led the ILO's work in the field of social security and social protection over 17 years. Michael was a not just a leader, but also an agent of change with a long-term vision of the goals to be achieved. He had a unique talent in touching people's hearts and minds. He has left a rich legacy that will have an enduring positive impact. As a manager, even when fulfilling

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time-consuming bureaucratic duties, he never ceased to be fully engaged in departmental research, technical cooperation work and authoring.

As Chief of the Financial, Actuarial and Statistical Branch, he focused essentially on helping social security institutions around the world to ensure financial sustainability and sound financial governance. However, he quickly realized that, in the Global South, those institutions predominantly covered those working in the formal economy, while the majority of the population remained excluded. Thus, while improving the functioning of these institutions was of great importance, he was convinced that more work was required to extend social protection and create fiscal space for social protection in all countries, to bring the world closer to achieving the objective of "social security for all" – as was prominently highlighted by the International Labour Conference in 2001.

He believed ardently that social insurance was a core element of comprehensive social protection systems and an indispensable mechanism of social solidarity as well as for horizontal and vertical redistribution. Despite this, he realized that going beyond contributory schemes and expanding tax-financed social assistance programmes, which were at that time largely non-existent across low-income countries, was essential to close existing coverage gaps and to build at least minimum levels of protection for all in need. Such expansion was necessary to achieve the aims and purposes highlighted in the Declaration of Philadelphia of 1944, and in ILO Recommendation No. 67 on Income Security and ILO Recommendation No. 69 on Medical Care, both also from 1944. The concept of a "socio-economic floor for the global economy" was introduced by the World Commission on the Social Dimension of Globalization in 2004 and further spelled out in the 2004 follow-up report by the ILO Director-General to the International Labour Conference, to which Michael certainly contributed.

He challenged the prevailing doubts on the affordability of social protection for low-income countries with a series of strategically important papers developed by his team under his leadership. These costed a basic social protection package and estimated its potential impact on poverty reduction. Simulations confirmed that "nobody is too poor to share" and that social protection was indispensable for building decent societies. However, they these also showed that some countries would require international solidarity-based financing to start building their social protection systems. Subsequent ILO simulations showed that only a small proportion of global GDP was required to eradicate extreme poverty.

At the same time, while convincing policy makers and decision makers of the need for and the affordability of a basic level of social protection, Michael embarked on a further challenging and daunting task to develop a concept to concretize international solidarity for low-income countries. Michael was a firm believer, promoter and active supporter of international solidarity to eradicate poverty worldwide. However, he also believed that international solidarity should

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complement domestic efforts and that national political will and commitment, and national institution building and strengthening, were essential for achieving sustainable long-term positive social outcomes. He thus spearheaded, with colleagues within and outside the ILO, the development of a proposal for the "Global Trust Fund", which sought to match the efforts of low-income countries to alleviate poverty and extend social security coverage. The concept was piloted in Ghana with financial support from a Global North trade union and other members of civil society. Michael not only preached international solidarity – he practiced it. Until the end of his life, he was an active member and advocate of the "1% Fund for Development" collecting funds to finance small projects proposed by NGOs active in the Global South.[1]

Having formulated arguments backed by concrete figures on the affordability of a basic level of social protection benefits, as well as developing a concept for international solidarity financing for low-income countries, the next step was to convince the naysayers, both inside and outside the ILO, those who were opposed to promoting an approach that went beyond contributory schemes. Thus, the need arose to provide further evidence and stronger arguments and to engage in broad dialogue with all stakeholders to forge a coalition of support.

After numerous internal ILO discussions, a consultation paper "*Social security for all: Investing in global social and economic development*" was published in August 2006 and distributed widely to ILO constituents and development partners. It referred to the global socio-economic floor concept proposed by the World Commission on the Social Dimension of Globalization in 2004. The document conceded that existing international (both ILO and the UN) instruments "say very little on the actual levels of protection and the order of priority by which they should be pursued, thus leaving room for discretion to the ILO and member States". As the document observed:

> The ILO interprets the entirety of (the existing international instruments) as a mandate to define a basic minimum protection package (that could also be described as a "minimum social floor") to fulfil the international recommendations, notably the requirements of article 22 of the Universal Declaration of Human Rights. The floor should, in fact, consist of a hierarchy of floors that has to be reached at different levels of development. Setting global floors for social rights and social transfers may halt "the race to the bottom" – when it comes to curbing social rights and social spending – at an acceptable decent level. ILO social security standards with a support of core labour standards can be seen as a tool in the global process to protect the fiscal space of social security systems. New and wider instruments might have to follow.

1. Readers may wish to visit: www.onepercentfund.net.

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The consultation paper proposed that the poorest countries could start with an initial package of basic social benefits and services.

It is in this paper that, for the first time, the concept of social security "floors" and the need for a new international standard was spelled out publicly by Michael and his team. This concept was further developed in an article published in the *International Social Security Review* in 2007, to not only explain the need for the international community to agree on what a set of basic social benefits ("the global social security floor") would comprise, but also "to assume some responsibility in helping the poorest countries to achieve this".

The task of developing a new standard required intensive dialogue with all stakeholders, both inside and outside the ILO, at the national as well as global level. Michael, an excellent leader and technician, also had the rare skill of being able to speak convincingly with ease, yet with humility, to any audience. He was more than capable of using solid, fact-based arguments and evidence to convince even the most reticent. The list of those he would have to convince was daunting. Among those to persuade were social security specialists in the ILO, and elsewhere, that the floor concept would not weaken contributory social security schemes; experts in other ILO technical areas that the extension of social protection would ensure more and higher quality employment; and ILO constituents – governments, workers and employers – that adopting a new social security standard on the extension of social security was necessary and would not dilute the provisions of ILO Convention No. 102. In a determined manner, Michael and his team tirelessly engaged in necessarily intensive dialogue. It would take a number of years before a consensus was reached, just before the crucial discussion on "Social security for social justice and a fair globalization" at the 2011 International Labour Conference. This was achieved largely due to Michael's diplomatic skills. The International Labour Conference agreed on the key elements of a possible Recommendation and decided to move into a standard-setting discussion the following year. This decision was taken against the backdrop of the repercussions of the global economic and financial crisis of 2008–09, which had spurred the establishment of the UN-wide Global Social Protection Floor Initiative, co-led by the ILO and the World Health Organization, and of the Social Protection Floor Advisory Group under the leadership of Michelle Bachelet, as well as a further intensification of interagency work, in which Michael also played a crucial role.

The Social Protection Floors Recommendation (No. 202) was adopted unanimously in June 2012 by the governments, employers and workers of the ILO's then 184 member States. Michael's long-term vision had thus become firmly embodied in the international normative framework. Although non-binding, the Recommendation asserted the commitment to guarantee at least a basic level of social security for all, while aiming at higher levels of protection and

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adequacy of benefits in line with other more advanced social security standards. For Michael it was certainly a very important breakthrough and achievement, but it was never a final goal. He never allowed himself, or those working alongside him, to celebrate the achievement for long. As always, his question was – so, what comes next?

Michael knew about the importance of international standards as a cornerstone of a global policy consensus, as a key instrument in realizing the human right to social security for all. He worked untiringly for this goal for more than a decade. However, in an article published in 2013 in a special issue of the *International Social Security Review*, he asked whether a six-page document can really change the course of social history. The answer was, of course, that to achieve the objectives of the Recommendation many things must also happen. The global coalition of international organizations and civil society had to be expanded to effectively push for: a) social protection to be included into the international accepted development goals agenda (this was achieved in 2015, when social protection, including floors, became part of the SDG goals and policy toolkit), b) a global social protection fund or similar international funding mechanism to be agreed and implemented, c) a binding international instrument in the form of either a UN or ILO Convention (still debated) to be adopted, and d) at the country level, trade unions and civil society should build national coalitions and use the Recommendation to actively fight for establishing social protection floors and achieving universal coverage.

Michael retired from the ILO at the end of 2012 and continued his work for the global social justice agenda, but now doing so “unchained” from UN bureaucracy. That said, he unceasingly and generously always made time to provide advice for as well as support the ILO’s social protection work. Engaging with civil society organizations, he served as President of the International Council on Social Welfare (2013–2016) and continued to be one of the leading and most active figures of the Global Coalition for Social Protection Floors.

Deeply committed across his career to capacity building as a long-term objective and vision, Michael led various efforts to build capacities for the sound financial governance of social security bodies and for quantitative policy analysis in national governments, along with social partners and international organisations. For him, capacity building was indubitably linked to the objective of extending coverage to all.

He achieved this goal through leading the development work for the quantitative models (actuarial and social budgeting) of the ILO, accompanied by a textbook series on Quantitative methods in social protection, published jointly with the International Social Security Association, as well as through intensive cooperation with the ILO’s International Training Centre in Turin. The ILO’s flagship *World social protection report* series also bears his signature. Together with the University of Maastricht, Michael, working closely with another

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prominent figure in the ILO Social Security Department – the late Wolfgang Scholz – and other ILO colleagues, established and shaped a Master's degree programme on Social Protection Financing, which evolved into the Master of Science in Public Policy at UNU-MERIT, as well as further joint academic curricula for social protection specialists with the University of Mauritius and the University of Lausanne. He trained more than a generation of social protection specialists who now occupy important decision-making positions in ministries, social security institutions, academia, civil society organizations and international organizations, and who carry his critical spirit and policy vision forward.

Following his retirement, he accepted a professorship at the University of Maastricht and devoted his time and energy to what he liked and enjoyed the most – sharing his knowledge with young people and involving them in the research agenda devoted to social goals. As Michael's former student and friend, Zina Nimeh, evoked: "Michael Cichon had a long-standing relationship with UNU-MERIT as an honorary professor and as the driving force behind the establishment of the Master's programme in Social Protection Financing (SPF) … Michael often said that this was the most impactful endeavour he undertook in his career."

At the sessions of the International Labour Conference in 2011 and 2012, several of his former students represented national delegations at the two social security discussions. How proud he was to see his former students in those important decision-making roles.

Michael was fully dedicated to the case of social security as a human right. In 2019, he submitted his candidature to become UN Special Rapporteur on Extreme Poverty and Human Rights. This passage from his letter of motivation speaks for itself:

> So far, my career took me from service in a national government, an international organization to civil society and academia. As the director of Social Security at the ILO, I had the opportunity to oversee the conceptualization, formulation, promotion and finally the negotiations leading to the adoption of the ILO Recommendation No. 202 on National Floors of Social Protection. I co-chaired the UN crisis initiative on the social protection floor (2009–2012) and was the first co-chair of the SPIAC-B (the social protection inter-agency co-ordination board) (2012). The overarching theme of these 40 years has been to prove that rights-based social protection is affordable and feasible nearly everywhere.
>
> I would like to complete my professional work by supporting governments and the international community to include the right to an adequate standard of living into national and international legislation as a central objective of the State. The road to that objective has to lead from sound factual situational analyses to

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constructive dialogue with governments and societal stakeholders. I am convinced that it can be done.

The road will be long, but it is important to start walking.

Regrettably, the COVID-19 pandemic and the advancement of his medical condition put an end to those ambitions. He devoted the last years of his life mainly to his family: his wife Irmgard, his children, Barbara, Bernadette, Rebecca and David, and his grandchildren. Unfortunately, he did not finish writing what was planned to be his second novel, after the UN-based thriller "Mission Creep" of 2018, which can be found published on his website: writings-with-convictions.com.

He wrote poetry throughout his life. In a poem written exactly a year before his death, he penned:

I will go … leaving the people I love and their world in the hands I trust. Their own.

It now remains for all of us to live up to his expectations.

Michael's memory and legacy will live on – through the many people whom he inspired and trained throughout his life, and the policies in many parts of the world that he helped to shape directly or indirectly. The global policy shift towards universal social protection would not have happened if it were not for his vision, commitment and dedication to the achievement of social justice and the betterment of the life of each and every human being.

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