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LONG-TERM PROJECTIONS FOR SOCIAL SECURITY IN LATIN AMERICA AND THE CARIBBEAN AND BRAZIL AND IMPLICATIONS FOR FINANCING

Dr. Rogério Nagamine Costanzi

Autonomous University of Madrid

ABSTRACT

The article made projections of pension expenditure as a proportion of GDP for Latin America and the Caribbean, Central America, South America, the Caribbean and Brazil for the period from 2022 to 2100. To make the estimates, a projection model found in studies by the OECD, IMF, European Union and IPEA was used. The results point to a long-term trend of a significant increase in pension expenditure as a percentage of GDP between 2022 and 2100 for all the regions analyzed, with replacement rate scenarios. These estimates are consistent with the expected process of intense population aging. Given this context, it would be advisable, from the point of view of public policies, to take action to strengthen funding, reduce informality and increase labor productivity. The debate is important in view of initiatives such as the exemption of payroll and Individual Microentrepreneurship (MEI) and the growing importance of digital platform workers.

Keywords: Social Security; Population-ageing; Pension Financing; Long-Term Projection; Latin America and the Caribbean.

SUMMARY

1. INTRODUCTION

With the control of the negative effects of the COVID pandemic, especially due to the advance of vaccination, the prospect is that the process of population aging, which had a short-term inflection point, should resume the long-term structural trend of an increasing share of the elderly population in the total and a worsening of the elderly dependency and social security ratio. In view of this expectation, there is a need to once again debate the need for medium and long-term public policy planning to meet the challenges of aging. The impacts are wide-ranging and diverse, with both economic and social effects.

From the more specific point of view of public social security policies and medium and long-term sustainability, in general, aging tends to put pressure on spending on social security, assistance and health (Bichara and Costanzi, 2016; IDB, 2013, 2021 and 2023; Caetano and Miranda, 2007; Caetano and Rocha, 2008; CAF, 2020; European Commission 2015, 2018A, 2018B and 2018C; Costanzi and Ansiliero, 2017; IMF, 2014; Giambiagi, 2007; OECD 2006, 2011, 2013, 2015, 2017 and 2019; *United Nations*, 2023; *World Bank*, 1994 and 2022), creating the need to find ways to strengthen the financing of these important social policies. However, there are currently problems associated with the financing of Social Security, with the significant expansion of the so-called Individual Micro-Entrepreneur (MEI), which creates a risk of replacing employment with a formal contract, and the growing importance of digital platform workers who currently seem to have low social security coverage (Costanzi and Ansiliero, 2017A; Costanzi, 2018; Costanzi and Sidone, 2022; Costanzi and Santos, 2023; Costanzi and Magalhães, 2023; Corseuil, Neri and Ulyssea, 2014).

In this context, a fundamental aspect is to project the long-term trajectory of these expenses related to the aging process. Based on this concern, this article will look at the projection of expenditure on social security or benefits, whether contributory or non-contributory, aimed at guaranteeing income security, especially for the elderly population, and thus preventing them from falling into poverty. To this end, this article is organized as follows:

1. The second section presents projections of spending on social security or benefits (contributory and non-contributory) for the period 2022 to 2100, based on data from the United Nations demographic projection and a simplified model for Latin America and the Caribbean, the Caribbean, Central America, South America, the Caribbean and Brazil.
2. The third section contains the final considerations.

2. LONG-TERM PROJECTIONS OF WELFARE EXPENDITURE IN LATIN AMERICA AND THE CARIBBEAN, CENTRAL AMERICA, SOUTH AMERICA, THE CARIBBEAN AND BRAZIL FOR 2022 TO 2100 AND IMPLICATIONS FOR FINANCING

Various studies have sought to project the trajectory of long-term social security expenditure using a model that allows long-term trends to be adequately captured by decomposing demographic, labor market and coverage effects and what would be a replacement rate for social security benefits. These studies include a document by the Organization for Economic Cooperation and Development (OECD), produced by DANG, ANTOLÍN and OXLEY (2001), the International Monetary Fund (IMF, 2014 and 2015), the Institute for Applied Economic Research (IPEA), by COSTANZI and ANSILIERO (2017), among others. Similar modeling can also be found in the European Union's *aging reports* (European Commission 2015, 2018A, 2018B and 2018C).

In general, the aim is to make projections of the long-term trends resulting from the aging process in social security up to the period 2100, using the demographic projections of the United Nations (UN) Population Division, focusing on the Latin American and Caribbean Region and then breaking it down for some regions (Caribbean, Central America, South America) and for Brazil. The methodology ends up focusing on permanent social security spending, whether contributory or non-contributory, more focused, but not exclusively, on the elderly population. Therefore, it is a methodology that ends up not capturing other temporary benefits such as temporary disability benefits or so-called sickness benefits in Brazil, which are generally aimed at people who are not elderly and who are still in the labor market. By way of example, in the Brazilian case, out of a total of 32.5 million beneficiaries of the National Social Security Institute (INSS) at the end of 2021, around 23.8 million were people aged 60 or over and 18.9 million aged 65 or over. Therefore, around 73% and 58% of INSS beneficiaries were elderly people aged 60 or 65 or over respectively at the end of 2021 . However, in any case, this is a significant portion of expenditure generally linked to permanent benefits, such as pensions, aimed more at the elderly population. In addition, in the Brazilian case there was still the so-called contribution time retirement without a minimum age, which allowed for an average retirement age of around 50, but which is gradually being eliminated with the 2019 reform (see Costanzi and Santos, 2022).

Based on this model, which will be presented and used later in this article, Dang, Antolin

and Oxley (2001) had estimated that pension spending for a group of countries should increase by an average of 3.4 percentage points of GDP between 2000 and 2050. However, the effect of demographics alone would be even greater, generating an average increase of 5.2 percentage points of GDP, which would be attenuated by the effects of the labor market and the replacement rate of benefits.

This is a point that should be highlighted in this model, specifically its ability to disaggregate variation in spending into four components: demographics, the labor market, eligibility/coverage criteria and the relationship between benefits and productivity or what would be a non-traditional replacement rate for benefits. In very brief terms, the model used to project pension spending in the long term, for application in this article, can be presented as follows, as shown in equation 1:

(1) PD = (Welfare spending) / GDP

(1) DP = (NB * BM) / (PO * PIB/PO)

(1) DP = (NB / PO) * (BM / PM);

Where:

SD = Spending on social security as a proportion of GDP;

NB = Number of Beneficiaries;

PO = Number of workers employed;

BM = Average Value of Benefits paid;

PM = GDP/PO = Average productivity measured by the ratio between GDP and employed workers

The first part of the equation is the relationship between social security beneficiaries and employed workers and, therefore, can be understood as a social security dependency ratio that relates those who will receive benefits and the potential contributors to the system, something fundamental given the predominance of the pay-as-you-go or defined benefit PAYG system, which is the case of the main and largest Brazilian system, which is the General Social Security System (RGPS, henceforth), but which is also very common in the social security systems of civil servants or the military and in many countries in the region. Although in some countries there are individual account capitalization schemes, such as Chile, this issue does not alter the projection of social security expenditure, but it is a question of how this expenditure will be financed (with savings or prior *funding* or with "current and forced" savings by active workers

or a combination of these possibilities). Equation (1) can be rewritten or transformed into equation 2:

(2) DP = (POP 65 + / POP20-64) * (POP 20-64 / PO) * (NB / POP 65+) * (BM / PM);

(2) DP = DEP * EMPR * ELEGIB * BENEF.

The first term, called DEP, marks the relationship between the population aged 65 and over, who are the potential beneficiaries, and those aged 20 to 64, who are the potential contributors. Therefore, this demographic term reflects the impact of demographics on social security spending as a proportion of GDP, being a ratio of potential beneficiaries and contributors to the social security system or dependency ratio. Although these groups, aged 20 to 64 and 65 and over, are the age groups traditionally used to calculate dependency ratios, and it is also common to use the population aged 15 to 64, the use of the 20 to 64 age group is justified given that there is a downward trend in the labor market participation rate of people aged 16 to 19, i.e. people are entering the world of work later, especially in the formal market. Obviously, the higher the ratio of beneficiaries to contributors, *ceteris paribus*, the higher the social security expenditure.

The second term reflects the conditions of the labor market, taken as the inverse relationship of the level of occupation, i.e. the population aged 20 to 64 divided by the occupied workers. With the ageing process, there is a tendency for there to be an absolute decrease in the workforce in the long term, which tends to have negative effects on economic growth. Therefore, the tendency to increase spending on social security as a proportion of GDP stems both from pressure on the spending side, on the one hand, and also, on the other hand, from possible negative effects on economic growth, in view of the exhaustion in several countries in the region, such as Brazil, of the so-called demographic bonus. Obviously, the higher the level of occupation, the higher the GDP tends to be and the lower the spending on social security as a proportion of GDP tends to be.

The third term can be considered to reflect the eligibility criteria or an indicator of the coverage of the social security system (contributory and non-contributory). It measures the ratio between the total number of beneficiaries and the population aged 65 and over, and is therefore a kind of indicator of social security coverage. Of course, a high level of coverage is desirable, both in terms of social protection and combating poverty among the elderly population. Tightening the eligibility criteria could affect this relationship, but the parameter of 65 years is an indicator that seems adequate for the Latin American and Caribbean region within the current

reality. In reality, however, several countries have legal retirement ages below this level or even differentiated treatments that allow benefits to be received at ages below 65, as in the case of Brazil.

Finally, the last term indicates that the higher the average value of benefits in relation to the average productivity of employed workers, the higher the spending on social security will tend to be as a proportion of GDP. It can be understood as a modified replacement rate for the system, different from the traditional one which usually relates the value of the benefit to the worker's salary when active (with variations on which salary to use, whether an average for a given period or the one prevailing at retirement). It also means that a system that automatically transfers productivity gains in full to the value of social security benefits is left without this possibility of adjustment.

This last term also makes it possible to show that productivity gains of active workers, which are not fully transferred to inactive workers or beneficiaries, can function as a fiscal adjustment mechanism in the social security system. However, in general, productivity gains tend to be indirectly incorporated into the value of benefits, to the extent that they affect wages, which in turn tend to affect the value of benefits, but there may be some flexibility in this relationship, including possible changes in the rules for calculating benefits.

However, it is essential that the value of benefits respects the criteria of sufficiency or adequacy in order to guarantee the fight against poverty. The social security system must reconcile high coverage with fiscal sustainability in the medium and long term and sufficiency/adequacy, guaranteeing the fight against poverty and also income redistribution. There may be *trade-offs* between these different objectives, which adds a political component to these choices.

Clements, Eich and Gupta, in a study by the IMF (2014), use a model similar to the one used by Dang, Antolín and Oxley (2001). According to this IMF study (2014), pension spending in relation to GDP depends on four main factors:

a) generosity of the benefit (measured by the ratio between the average benefit and productivity measured as GDP per capita per employed worker);

b) coverage (number of beneficiaries in relation to the population of potential beneficiaries aged 65 and over);

c) inversely related to the rate or level of occupation in the labor market;

d) demographics or population aging, which can be measured by the dependency ratios of the elderly.

Even assuming some limitations, in the sense that the different terms of the equation

are not totally independent of each other, the model is useful for projecting trends, even with exogenous parameters that can be affected by policy decisions, such as coverage/eligibility and replacement rate. As mentioned, there are also other studies that use similar models, such as the European Union's "*Informe sobre el envejecimiento 2015 - Proyecciones económicas y presupuestarias para los 28 Estados miembros de la UE (2013-2060)*". According to this study, in isolation, the old-age dependency ratio would tend to increase public spending on social security, as a proportion of GDP, by approximately 7.2 percentage points between 2013 and 2060. This effect, however, would be mitigated by the effects of the pension reforms that have occurred very frequently in Europe and are still occurring. The year 2023, for example, was marked by pension reforms in France, Spain and Uruguay . The model was also used by COSTANZI and ANSILIERO (2017) to analyze the trend in pension spending in Brazil and by Bernal (2016).

Having made this brief presentation of the model, it is worth briefly introducing the data sources or parameters that will be used for the projections. Firstly, the data for the populations aged 20 to 64 and 65 and over for the entire period from 2022 to 2100 will be those estimated by the United Nations Population Division .

Regarding coverage data, according to data from the International Labor Organization, listed in the *World Social Protection Report 2020-222* (ILO 2022), monetary benefits, both contributory and non-contributory, for older women and men are the most common forms of social protection in the world. Globally, 77.5% of people over the legal retirement age received some kind of benefit to guarantee income security in old age in 2020. However, there are still major disparities between regions, between rural and urban areas and between women and men. In the Latin American and Caribbean region, the percentage of people over the legal retirement age who received some kind of benefit to guarantee income security was 75.4% (ILO, 2021; ILO, 2021A). This level of coverage among the elderly was much higher than among economically active workers (47%), due to the process of expanding non-contributory benefits in the Latin American and Caribbean region. Despite the differences between the regions, this level seems appropriate as an exogenous variable to be used in the simulations of at least one scenario, both because it is the average for the region and because it is a good target for those countries with lower levels of coverage.

For Brazil, however, the level of elderly people aged 65 and over receiving a social security benefit of retirement and/or death pension, as well as the non-contributory or assistance benefit of BPC/LOAS, in 2019, before the pandemic, was 87.6% (estimated from microdata

from the annual Continuous PNAD for 2019). In addition, the estimate should consider all beneficiaries and not just those aged 65 or over. Considering only those aged 65 or over would generate a considerable underestimate in the projections. There will always be beneficiaries under the age of 65, both in Brazil and in the rest of Latin America and the Caribbean, firstly because in many of the region's countries the legal retirement age is lower than 65.

Even in the Brazilian case, although there is a general rule that establishes a minimum age of 65 for men and 62 for women, after Constitutional Amendment 103/2019, there are several transition rules that guarantee that, for many decades, it will still be possible to retire under the age of 65/62. As shown by Costanzi and Santos (2022), the process of convergence to the ages of 65 and 62 will be extremely gradual. In 2021, for example, considering all types of retirement, the average age of all retirements in the RGPS was 60.75 years, but 56 years when only retirement for contribution time is considered, 54.85 for women and 57.93 for men (Costanzi and Santos, 2022).

In addition, there are various pensions or differentiated treatments for certain groups, so that many can still retire before the age of 65/62. For example, rural workers, who were not affected by the 2019 reform, can still retire at the age of 60 for men and 55 for women. There is also different treatment for teachers, who can retire at 60 for men and 57 for women, as well as workers exposed to harmful agents. There are also permanent social security benefit payments for cases of disability retirement or permanent incapacity and for those receiving a death pension, which is granted to people of any age. For all these reasons, the total number of beneficiaries needs to take into account all those receiving retirement, pension and BPC/LOAS benefits and not just those aged 65 or over, otherwise the projections will be underestimated.

With regard to the level of occupation in the 20 to 64 age group, an estimate was used from the 2019 Continuous PNAD microdata for Brazil, which was 73%, considering the ratio between the population aged 20 to 64 divided by employed workers (considering the total and not just this age group). For the sake of simplicity, and also due to the difficulty of obtaining the estimate for the other regions, this will also be the parameter used as an exogenous variable for the projections for the other regions covered in this article.

Finally, it is important to establish parameters for simulating the ratio between the average value of contributory and non-contributory social security benefits and the average productivity of employed workers. Again, in this case, it is necessary to emphasize that there is a great diversity in the replacement rate between the different countries in the Latin American and Caribbean region, making parameterization complex in this case, as well as the difficulty

of obtaining the necessary data to calculate this productivity, both for the region as a whole and for each of the countries in the region.

For the Brazilian case, it was possible to estimate the last term of equation 2, using the 2019 GDP, before the pandemic, divided by the total number of employed workers. The average value of retirement, northern pension or BPC/LOAS benefits was estimated using microdata from the annual Continuous PNAD for 2019. This procedure generated a modified replacement rate of 0.29 (29%), which will be used both for the Brazilian case and also as an exogenous variable for the projections of the other regions covered in the article in the so-called scenario 1. Considering this variable as exogenous, another scenario will also be estimated with a higher ratio between the average value of benefits and the average productivity of employed workers, 0.5, which will be called scenario 2.

This second scenario is important to point out that replacement rates necessarily imply higher social security spending as a proportion of GDP. This point is relevant because the debate on replacement rates, politically speaking, does not take into account that higher parameters will certainly imply, in the future, higher levels of social security spending as a proportion of GDP, with fiscal and equity implications from an intergenerational point of view. In particular, in countries where pay-as-you-go or PAY-AS-YOU-GO (PAYG) schemes prevail, high pay--as-you-go rates can put pressure on the implicit "social contract" between generations that characterizes pension systems. Of course, however, there is a need to guarantee the sufficiency/adequacy of the value of benefits, as very low replacement rates can jeopardize the fight against poverty (IMF, 2014).

Based on the methodological procedures described above, scenarios 1 and 2 are presented for all regions, i.e. Latin America and the Caribbean, Central America, South America, the Caribbean and Brazil. In all simulations and scenarios, there will be a significant upward trend in social security expenditure as a proportion of GDP between 2022 and 2100. As the parameters have been kept constant over time, except for the demographic variables, more specifically the populations aged 20 to 64 and 65 and over, this worsening also reflects the deterioration in the old-age dependency ratio. In general, the regions analyzed here show an increasing trend in the population aged 65 and over in the period from 2022 to 2100, while the 20 to 64 age group generally begins to fall, including in absolute terms in the 2040s.

Graphs 1 to 5 and table 1A in the appendix show the projections of pension expenditure as a proportion of GDP for the period 2022 to 2100 for Latin America and the Caribbean, which are summarized in table 1 for both scenarios 1 and 2, with non-traditional replacement rates of

0.29 and 0.5 respectively. For all the regions analyzed, there is a tendency for pension expenditure to increase as a proportion of GDP between 2022 and 2100, reflecting the rapid and intense aging process in the Latin American and Caribbean region, including Brazil. As an example, for Latin America and the Caribbean, in scenario 1, pension expenditure as a proportion of GDP would rise from 2.5% to 10.2% between 2022 and 2100. In scenario 2, with a higher replacement rate, the increase would be from 4.3% to 17.6% in the same time comparison. In the Brazilian case, with the parameters used, pension expenditure as a proportion of GDP would jump from 5% in 2022 to 21.5% in 2100 in scenario 1. For Brazil, in scenario 2, with a higher replacement rate, the increase in expenditure as a proportion would be from 8.6% to 37.0% between 2022 and 2100.

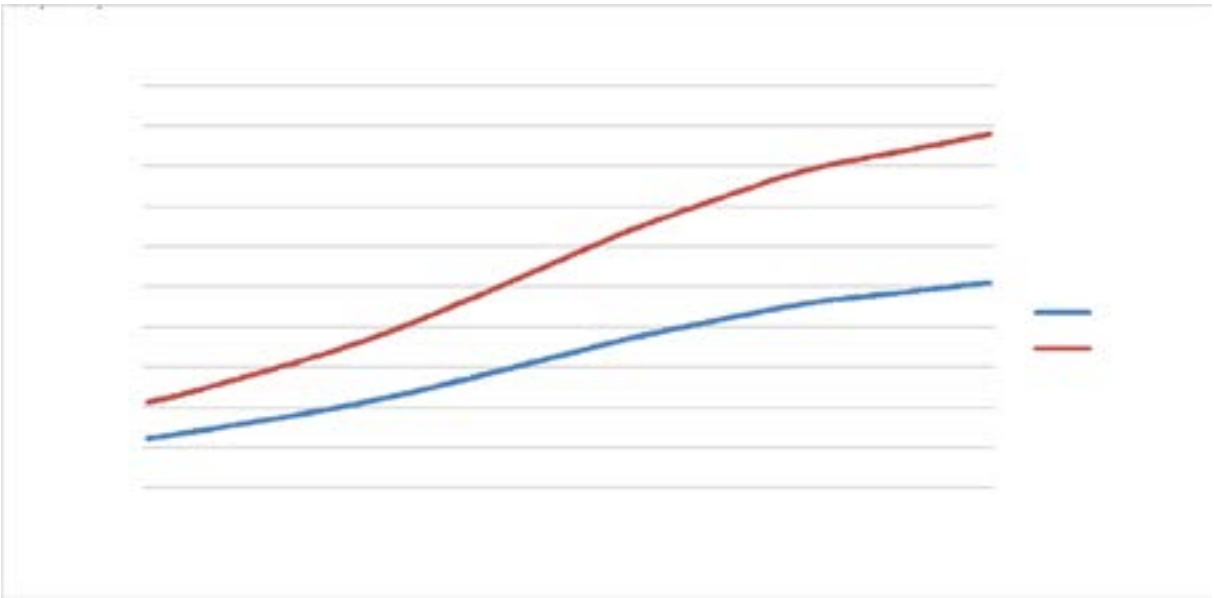
The higher share for the Brazilian case reflects the fact that the country actually has a level of social security spending above the average for Latin America as a whole and is among those countries with the highest level of spending, alongside countries such as Uruguay and Argentina. Also, for the Brazilian case, not the coverage for the 65 age group was used, but the ratio between beneficiaries of retirement, pension and BPC/LOAS of any age in relation to the population aged 65 or over. The trajectory should be partially attenuated by the pension reform carried out in 2019, but in a very gradual way, given the existence of transition rules for all those who were already affiliated before the reform, which in itself tends to generate a long transition period.

It should be emphasized that the main aim of the work was to try to assess the trend of the future trajectory of social security expenditure as a function of demographic variables or political choices in relation to the replacement rate, rather than to be able to pin down with absolute precision the estimates for the values currently prevailing in 2022, although there is some proximity . Furthermore, it seems obvious that the horizon up to 2100 is marked by profound uncertainties and, for this reason, the most important thing is the trend of the long-term trajectory. It is also important to note that this trajectory of increasing social security expenditure as a proportion of GDP is a reality for many regions of the world (see IMF, 2014 and IDB, 2013 and 2021, World Bank, 1994 and 2022) and also for the Brazilian case in recent decades. Spending on social security, considering only the General Social Security System (RGPS), has risen from a level of less than 3% of GDP at the end of the 1980s to a level of 8% of GDP in 2022. This 2022 level, however, includes not only spending on permanent benefits, but also on court judgments (precatórios) and temporary benefits such as sick pay. RGPS spending on pensions in 2022 was 5.5% of GDP, very close to the level estimated in scenario 1 .

In any case, for all the projections made, due to the process of population aging and the worsening of dependency ratios, the trend is for growth in social security spending as a proportion of GDP in the period from 2022 to 2100, based on the model used and the United Nations demographic projections. It should also be clear that there will also be impacts on health and social assistance. In this context, debates and actions aimed at structurally strengthening the financing of Social Security in the Latin American and Caribbean region and also in Brazil seem essential.

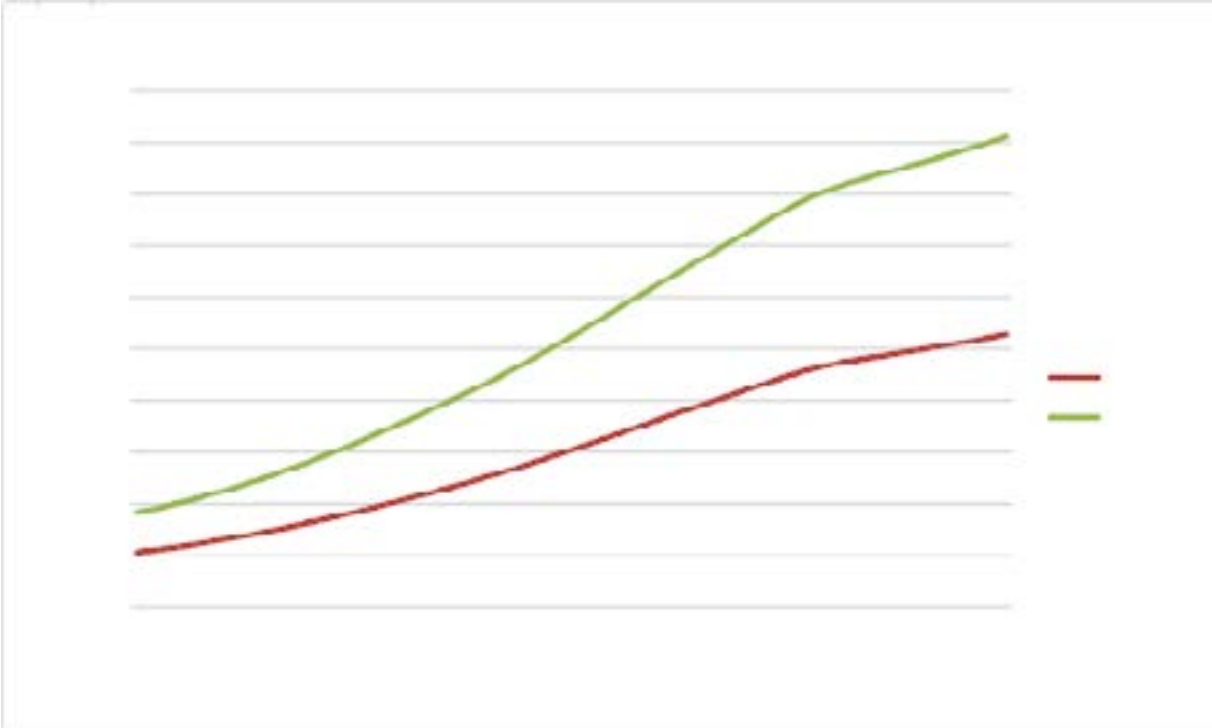
There are other projection methodologies, such as the RGPS fiscal projection model from the pension model (Informe de Previdência, 2022), which is based, among other things, on data from administrative records, as well as demographic projections. The projection is that expenditure would grow, in the base scenario, from 8% to 16% of GDP between 2022 and 2100, but considering only the RGPS, without taking into account, for example, the public servants' pension schemes and the BPC/LOAS.

Graph 1 - Projected Social Security Expenditure as a proportion of GDP



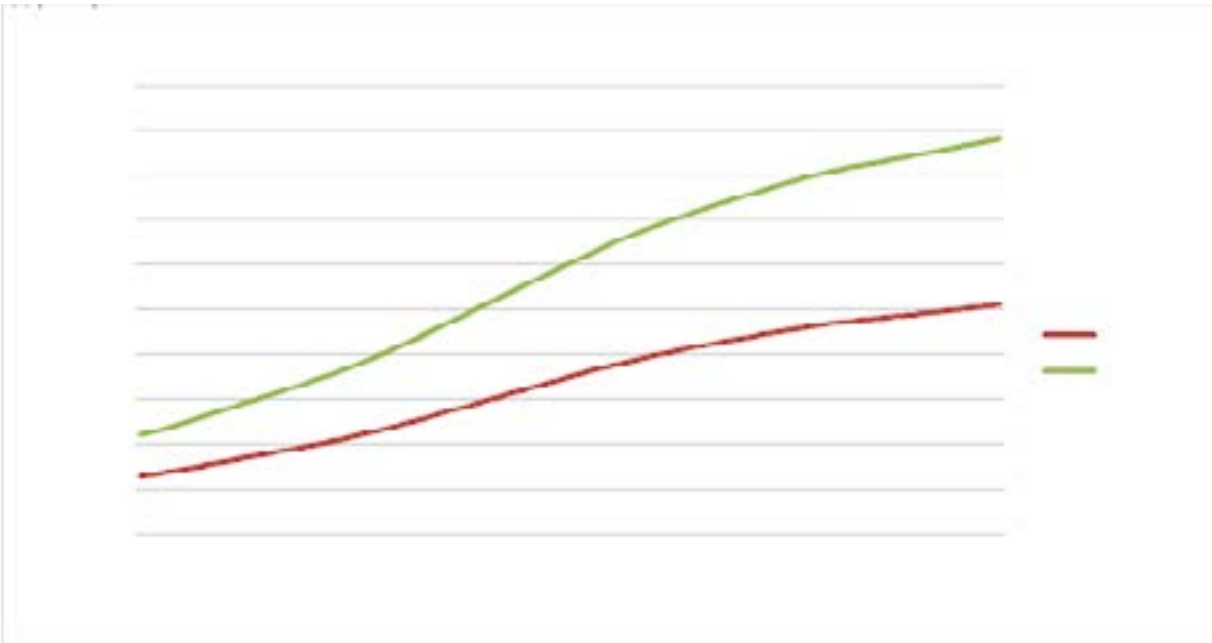
Source: Prepared by the author based on information from the UN, IBGE and ILO. Scenarios 1 and 2 with (BM/PM) ratios of 0.29 and 0.5 respectively.

Graph 2 - Projected Social Security Expenditure as a proportion of GDP



Source: Prepared by the author based on information from the UN, IBGE and ILO. Scenarios 1 and 2 with (BM/PM) ratios of 0.29 and 0.5 respectively.

Graph 3 - Projected Social Security Expenditure as a proportion of GDP



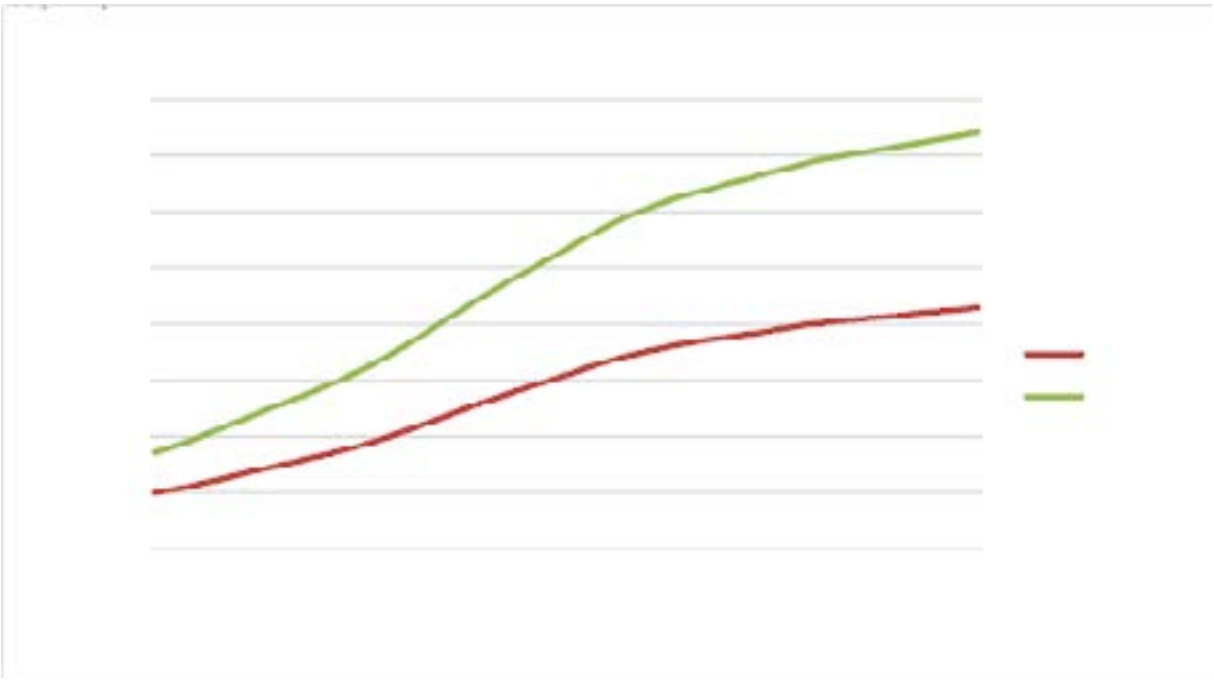
Source: Prepared by the author based on information from the UN, IBGE and ILO. Scenarios 1

and 2 with (BM/PM) ratios of 0.29 and 0.5 respectively.

Graph 4 - Projected Social Security Expenditure as a proportion of GDP

Source: Prepared by the author based on information from the UN, IBGE and ILO. Scenarios 1 and 2 with (BM/PM) ratios of 0.29 and 0.5 respectively.

Graph 5 - Projected Social Security Expenditure as a proportion of GDP



Source: Prepared by the author based on information from the UN, IBGE and ILO. Scenarios 1

and 2 with (BM/PM) ratios of 0.29 and 0.5 respectively.

Table 1 - Projection of Social Security Expenditure as a proportion of GDP
Latin America and the Caribbean, Central America, South America, the Caribbean and Brazil
2022, 2050, 2075 and 2100 - scenarios 1 and 2

SCENARIO 1					
Year	Latin America and the Caribbean	Central America	South America	Caribbean	Brazil
2022	2,5	2,1	2,6	2,9	5,0
2050	5,2	4,6	5,5	5,1	12,0
2075	8,4	8,2	8,6	7,0	18,7
2100	10,2	10,6	10,2	8,5	21,5
SCENARIO 2					
Year	Latin America and the Caribbean	Central America	South America	Caribbean	Brazil
2022	4,3	3,7	4,4	4,9	8,6
2050	9,0	8,0	9,4	8,7	20,6
2075	14,4	14,1	14,8	12,1	32,2
2100	17,6	18,2	17,6	14,7	37,0

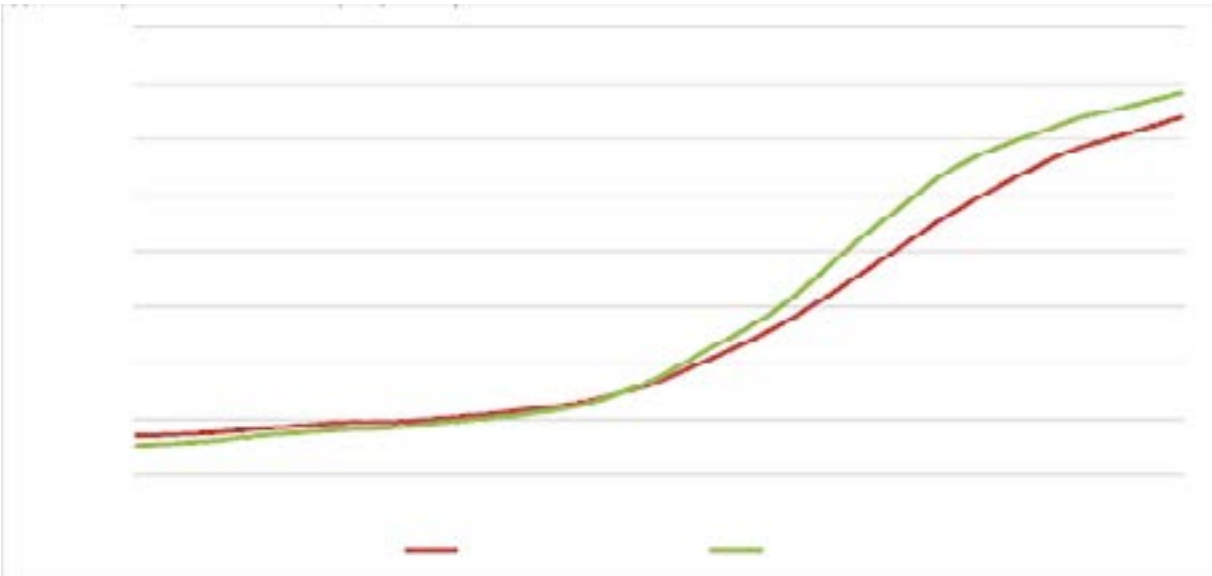
Source: Prepared by the author based on information from the UN, IBGE and ILO. Scenarios 1 and 2 with (BM/PM) ratios of 0.29 and 0.5 respectively.

It is worth noting that, given the control of the COVID pandemic, thanks to the advance of vaccination, the short-term inflection resulting from the pandemic should give way to the resumption of the structural process of rapid and intense population aging, the result of the combination of an increase in (over)life expectancy at all ages and a drop in fertility. The population aged 65 and over in Latin America and the Caribbean is expected to grow from around 59 million in 2021 to 206.9 million in 2020, more than tripling in that period. The population aged between 20 and 64, which includes the majority of potentially active workers and social security contributors, is expected to start falling in absolute terms as early as the 2040s, according to the United Nations demographic projections . In fact, the total population of Latin America and the Caribbean as a whole is estimated to be smaller in 2100 than in 2022. As a result, the share of elderly people aged 65 and over in Latin America and the Caribbean would grow from around 9% in 2021 to 32% in 2100. In 1950, this share was estimated at 3.2%. Roughly speaking, the elderly, who today represent 1 in 10 of the region's population, will represent 1 in 3

by 2100. As a result, there will obviously be a significant worsening of the old-age dependency ratio both for Latin America and the Caribbean and for Brazil (Graph 6). The estimate, however, is that the dependency ratio will be worse in the Brazilian case than for the Latin American and Caribbean average (graph 6).

The trajectory is very similar in Brazil. The share of the elderly aged 65 and over in the total population has grown from just 2.4% in 1950 to an estimated 9.6% and 33.5%, respectively, in 2021 and 2100, according to the UN demographic projection. In absolute terms, the population aged 65 and over in Brazil went from around 1.3 million in 1950 to an estimated 20.5 million and 61.9 million in 2021 and 2100 respectively, i.e. it will more than triple between 2021 and 2100. The population aged 20 to 64, which makes up the bulk of potential taxpayers, is expected to start falling in absolute terms by the end of the 2030s (see graphs 1A and 2A in the annex). According to data from the continuous annual PNAD, the share of pensioners in the total population grew from 11.7% to 13.3% between 2012 and 2022. The first results of the 2022 demographic census point to a significant reduction in the population growth rate, to just 0.52% p.a. between 2010 and 2022 (IBGE, 2023). However, the data has not yet been disaggregated by age or age group.

Graph 6 - Elderly Dependency Ratio (65 years and over/20 to 64 years)
Latin America and the Caribbean and Brazil



Source: Prepared from United Nations data

In this context of rapid and intense population aging, it is advisable, from the point of

view of medium and long-term planning of public policies, to strengthen the financing of social security in Brazil and in the Latin American and Caribbean region. However, there are some risks that could weaken the financing of social security in Brazil. A first risk is the significant expansion, with the risk of replacing employment with a signed work permit and not necessarily reducing informality, of the so-called Individual Micro-Entrepreneur (MEI, henceforth), which is extremely subsidized from an actuarial point of view, with a contribution of only 5% of the minimum wage, bordering on non-contributory. The MEI, which was created by Complementary Law 128/2008, at the end of 2008, but began to operate effectively in 2009, has created a risk of replacing employment with a formal contract with a pseudo "pejotização" (pejotization), which can damage social security funding and make the job market more precarious without necessarily providing gains in coverage or reducing informality. In very brief terms, various evaluations of the MEI (Costanzi and Ansiliero, 2017A; Costanzi, 2018; Ansiliero, Costanzi and Fernandes, 2020; Costanzi and Sidone, 2022; Costanzi and Magalhães, 2023), which reached around 15.2 million registrants on June 10, 2023 , have pointed out the following problems or risks:

a) Inadequate targeting: considering that the contribution is extremely unbalanced in actuarial terms, bordering on a non-contributory benefit, it should be focused on low-income workers, with little or almost no ability to contribute, but evaluations showed that only 18.4% of taxpayers registered as MEI were among the poorest 50% of the population, considering per capita household income, and 81.6% were among the richest 50% of the population. There is a very significant increase in the number of workers with higher education among MEI registrants;

b) Risk of substitution/migration, including of employees with a formal contract, and not necessarily a reduction in informality: an assessment showed that 56% of MEIs registered in the 2009-2014 period did not represent formalization, but only substitution of the type of social security relationship, to the detriment of jobs with a formal contract. As the MEI is formally a legal entity, it also does not have labor protection such as unemployment insurance and FGTS. There is a risk that the MEI will "mask" employment relationships;

c) Increase in the actuarial imbalances of the General Social Security System (RGPS, henceforth);

d) Encouraging under-invoicing;

e) Possible weakening of RGPS funding: in 2021, the MEI reached the level of around 10% of all taxpayers, but accounted for only around 1% of the system's revenue.

As shown by Costanzi and Magalhães (2023), there has been a very significant growth in the MEI, which is completely different from the rest of the RGPS insured, which is a clear indication of substitution and not necessarily formalization. The total number of individual RGPS contributors grew by just 8.1% between 2011 and 2021 (annual average of +0.8% p.a.), while the MEI, over the same period and using the same concept, grew by 634.8% (annual average of +22.1% p.a.). As a result of this large discrepancy, there was a significant increase in the MEI's share of all RGPS contributors. Considering those with at least one contribution in the year, the MEI's share of total RGPS contributors grew from 1.6% to 10.6% between 2011 and 2021, even though they only accounted for around 1% of RGPS revenue in 2021 (Costanzi and Magalhães, 2023).

The discrepancy between MEI and insured employees is also alarming. The accumulated growth rate of insured employees between 2011 and 2021, considering at least one contribution in the year and the average number of monthly contributors, was only 1.2% and 6.2%, respectively. The MEI, in the same period, had increases of 634.8% and 764.2%, respectively, by the same criteria. In terms of the annual average, between 2011 and 2021, the total number of insured employees grew by just 0.1% p.a., while the MEI grew by 22.1% p.a. over the same period. As for the monthly average number of contributors, between 2011 and 2021, while the total number of insured employees grew by 0.6% p.a., the MEI grew by 24.1% p.a. over the same period (Costanzi and Magalhães, 2023).

One point that stands out is that the justification for the MEI was to expand social security coverage for self-employed workers. However, some 14 years after this policy was introduced, there is still an extremely high level of informality among the self-employed, with no sign of any structural change. As an example, considering the PNAD Continuous microdata for the fourth quarter of 2022, for those employed aged 16 or over, out of a total of 25.4 million self-employed workers, only 8.6 million or 33.9% contributed to social security (1 in 3). Therefore, 16.8 million self-employed workers did not contribute to social security, i.e. almost half (48.4%) of the total of 34.8 million non-contributing workers.

All this data makes it clear that there is an urgent need to debate the MEI in more depth, or other initiatives to reduce social security contribution rates, which could weaken the financing of the RGPS and make the labor market more precarious without necessarily bringing structural gains in terms of social security coverage. It should be clear that informality is a complex phenomenon, which stems from a variety of factors, such as workers' qualifications and others, and cannot be summarized as a question of (high) social security contribution rates. As an example,

in June 2023, the Senate's Economic Affairs Committee (CAE) approved a reduction in the employer's social security contribution rate from 20% to 8% for municipalities with a population of less than 142,600 . According to preliminary data from the 2022 Census, 5,357 municipalities had a population of less than 142,000 inhabitants, or 96.2% of the total . The CAE also approved the extension of the payroll tax exemption until 2027, even with impact assessments that question the effect on job creation (Garcia, Sachsida and Carvalho, 2018).

An obvious aspect, but one that seems to be neglected, is that the definition of social security contribution rates should reflect, to some degree, the sufficiency to finance social security expenditure (Costanzi and Ansiliero, 2022), but apparently this is something that is neglected in the discussions, where a minimalist short-term view of informality predominates as an apparently exclusive result of the level of social security contribution rates.

Another relevant aspect in the debate on financing is the need to adapt social security funding to the transformations taking place in the world of work. Digital platforms have led to significant deregulation of the labor market, with difficulties in regulating working conditions, such as working hours, but they have also resulted in a high level of lack of social security protection. Although the Continuous PNAD has so far not made it possible to identify digital platform workers precisely, some studies have estimated a very low level of social security contributions: considering the 3rd quarter of 2022, there were 2.8 million workers in Brazil driving motorcycles and driving cars, cabs and pickup trucks (Costanzi and Santos, 2023). Of the total of 1.6 million self-employed workers in these occupations, around 1.2 million (74.4%) declared that they did not contribute to social security and only around 416,000 were contributors (25.6%). This estimate points to low social security coverage and high informality among digital platform workers in Brazil.

What's more, digital platforms are not limited exclusively to passenger transportation and the delivery of goods, but can enter many other segments of the service sector (Costanzi and Santos, 2023).

In light of this reality, we must urgently seek to regulate work on digital platforms in order to guarantee adequate working conditions and sustainable social protection. Regulation has already taken place in countries such as Spain and Chile (Costanzi and Santos, 2023).

All the estimates presented show the need for greater attention to be paid to the long-term planning of public welfare and social security policies, with measures such as: strengthening funding, reducing informality, increasing labor productivity and expanding participation in the labor market, especially among women, among other alternatives. This need to strengthen the

long-term financing of social security generally clashes with the more short-term political horizon, which tends to prioritize reducing social security contribution rates, without any actuarial or targeting assessment, as well as increasing the value of social security benefits. These policies will have important implications from the point of view of fairness between generations in the future.

It's also worth noting that although the 2019 pension reform was quite broad, there are important issues that remain unresolved beyond the MEI. Another important point to be addressed is the exclusion of states and municipalities from Constitutional Amendment 103/2019, which brings a great risk of several different pension rules between public servants, depending on whether they are federal, state or municipal, something that did not exist before the 2019 reform, remembering that there are more than 2,000 municipal pension systems. As established in article 40 of the Federal Constitution, with the wording given by EC 103/2019, civil servants covered by their own social security system will be retired, within the scope of the Union, at the age of 62, if a woman, and at the age of 65, if a man, and, within the scope of the States, the Federal District and the Municipalities, at the minimum age established by amendment to the respective Constitutions and Organic Laws, observing the contribution time and other requirements established in a complementary law of the respective federative entity. It was also established that the rules for calculating retirement benefits will be governed by the law of the respective federal entity. Even among state governments, there are those that have not established retirement ages of 65/62 years, but different parameters (see survey in the appendix - table 2A), a lack of heterogeneity that tends to be accentuated in the case of municipalities. After EC 103/2019, of the 27 state governments, 19 carried out reforms to adapt to or after the Amendment (see table 2A) at the end of 2021. At the beginning of 2023, among the capitals only 11 of the 26 capitals had carried out reforms and, among the other municipalities, 652 of 2,093 had carried out reforms (only 31%) . The requirement established in EC 103/2019, for the Servants' Pension Schemes to set up complementary pensions within two years of the entry into force of EC 103/2019, as established in paragraph 6 of article 9 of that Amendment, was also not fully met, or by many municipalities, even in May 2023: 228 municipalities had not even approved or sent a law setting up the complementary pension scheme .

It is also worth debating the provisions of §2 of article 9 of EC 103/2019, which establishes that the list of benefits of the social security systems is limited to pensions and death pensions. This is a conceptual distortion, since temporary benefits such as sick pay or even maternity pay and others are benefits of a social security nature and, therefore, such a rule may

be inappropriate from the point of view of transparency and correct accounting of public social security expenses.

There are also other aspects that jeopardize the financing of the RGPS. For example, in the case of special retirement, the granting of this type of retirement is highly judicialized (Costanzi et al, 2021), about 3 out of every 4 benefits granted, but a large proportion of these judicial grants occur without the additional contribution required in the case of this type of retirement having been made. As an example, a study showed that 75% of beneficiaries of special pensions granted by court order did not make the additional contribution (DATAPREV, 2022). This data makes it clear that a significant portion of the special retirement benefits granted therefore end up occurring without the additional funding provided for in the legislation .

3. FINAL CONSIDERATIONS

This article has made long-term projections of pension expenditure as a proportion of GDP for Latin America and the Caribbean, Central America, South America, the Caribbean and Brazil for the period from 2022 to 2100. A projection model used in studies by the OECD, IMF, European Union and IPEA was used to make the estimates. The results point to a long-term trend of a significant increase in social security expenditure as a proportion of GDP between 2022 and 2100 for all 5 regions analyzed, in two alternative scenarios from the point of view of the replacement rate or the relationship between the value of the benefit and average labor productivity. Obviously, higher replacement rates imply higher levels of expenditure in the future. As an example, for Latin America and the Caribbean, in scenario 1, pension expenditure as a proportion of GDP would rise from 2.5% to 10.2% between 2022 and 2100. In scenario 2, with a higher replacement rate, the increase would be from 4.3% to 17.6% in the same time comparison. These estimates are consistent with the expected process of rapid and intense population ageing that is already taking place and which is expected to continue over the coming decades in Latin America and the Caribbean and also in Brazil. There should continue to be a significant increase in the participation of the elderly in the total population and also a worsening of the elderly dependency ratio, which in practice represents a worsening of the relationship between potential contributors and beneficiaries for social security.

Faced with this context, it would be advisable, from the point of view of public policies, to take action to: strengthen financing, reduce informality, increase labor productivity and increase participation in the labor market, especially among women, among other alternatives.

This need to strengthen funding is also even more important in view of the growing importance of so-called digital platform workers, a new way of organizing work and production, which has generated a major process of deregulation of the labour market, with possible negative effects on working conditions and also on social protection and its respective funding. Estimated using micro-data from the Continuous PNAD, only 1 in 4 self-employed motorcycle and car drivers contributed to social security.

In addition, in the Brazilian case, the very significant expansion of the Individual Micro-Empreneur (MEI) also generates possible negative effects on the financing of the General Social Security System (RGPS), since, although it reached the level of around 10% of the total contributors to this system, in 2021, it accounted for only around 1% of the total revenue or collection of the RGPS. In addition, there are problems of inadequate targeting, the risk of substitution of employment with a signed work permit by MEI and not a reduction in informality, encouragement of under-invoicing, use of MEI to mask employment relationships or pseudo "pejotização", among various problems. These risks could lead to a further weakening of RGPS funding and a more precarious labor market, without more structural gains in social protection and social security coverage. The MEI issue needs to be addressed in greater depth. Another aspect that the 2019 reform did not address, but which should be analyzed as a matter of urgency, was the exclusion of state and municipal governments from EC 103/2019. It was also shown that there are problems in the financing of special retirement, given that 3 out of 4 are granted through the courts and, of these, around 75% did not have the additional contribution required for this type of benefit.

Therefore, in general terms, the fundamental point is that as the ageing process continues, there is a need for medium and long-term planning of public policies aimed at strengthening social security, given the pressure on spending due to the demographic issue. However, transformations in the world of work could jeopardize funding, such as the growing importance of so-called digital platform workers. Furthermore, in the Brazilian case, the MEI poses serious risks to the financing of the RGPS and needs to be rethought with a view to strengthening medium and long-term financing.

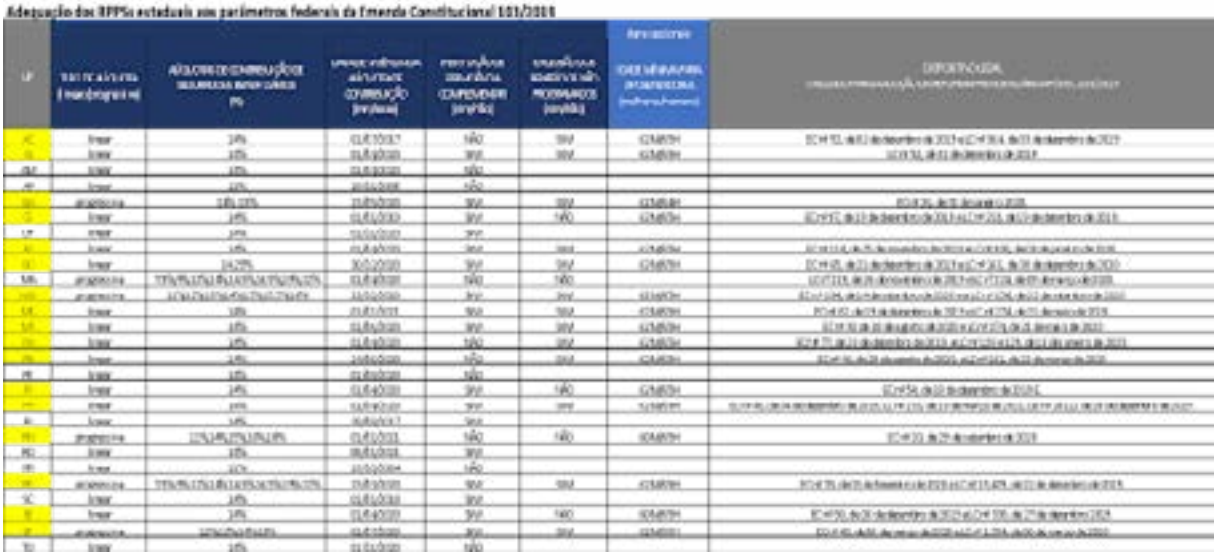
Appendix - Table 1A - Projection of social security expenditure 2022 to 2100 as a % of GDP - scenarios 1 and 2

Year	Latin America and the Caribbean		Central America		South America		Caribbean		Brazil	
	scenario 1	scenario 2	scenario 1	scenario 2	scenario 1	scenario 2	scenario 1	scenario 2	scenario 1	scenario 2
2022	2,5	4,3	2,1	3,7	2,6	4,4	2,9	4,9	5,0	8,6
2023	2,5	4,4	2,2	3,8	2,6	4,5	2,9	5,0	5,1	8,9
2024	2,6	4,5	2,2	3,8	2,7	4,7	3,0	5,2	5,3	9,2
2025	2,7	4,6	2,3	4,0	2,8	4,8	3,1	5,3	5,5	9,5
2026	2,8	4,8	2,4	4,1	2,9	5,0	3,2	5,5	5,7	9,9
2027	2,8	4,9	2,4	4,2	3,0	5,1	3,3	5,6	5,9	10,3
2028	2,9	5,0	2,5	4,3	3,1	5,3	3,4	5,8	6,2	10,6
2029	3,0	5,2	2,6	4,4	3,2	5,4	3,5	6,0	6,4	11,0
2030	2,1	5,4	2,6	4,5	3,3	5,6	3,6	6,2	6,6	11,4
2031	3,2	5,5	2,7	4,7	3,3	5,8	3,7	6,4	6,8	11,8
2032	3,3	5,7	2,8	4,8	3,4	5,9	3,8	6,6	7,1	12,2
2033	3,4	5,8	2,9	4,9	3,5	6,1	3,9	6,7	7,3	12,5
2034	3,5	6,0	3,0	5,1	3,6	6,2	4,0	6,9	7,5	12,9
2035	3,5	6,1	3,0	5,2	3,7	6,4	4,1	7,0	7,7	13,3
2036	3,6	6,3	3,1	5,4	3,8	6,6	4,2	7,2	7,9	13,6
2037	3,7	6,4	3,2	5,6	3,9	6,7	4,3	7,4	8,1	14,0
2038	3,8	6,6	3,3	5,7	4,0	6,9	4,4	7,5	8,3	14,4
2039	3,9	6,8	3,4	5,9	4,1	7,0	4,4	7,6	8,6	14,8
2040	4,0	6,9	3,5	6,1	4,2	7,2	4,5	7,7	8,8	15,2
2041	4,1	7,1	3,6	6,2	4,3	7,4	4,6	7,9	9,1	15,6
2042	4,2	7,3	3,7	6,4	4,4	7,6	4,6	7,9	9,3	16,1
2043	4,3	7,5	3,8	6,6	4,5	7,8	4,7	8,0	9,6	16,6
2044	4,5	7,7	3,9	6,8	4,7	8,0	4,7	8,1	9,9	17,1
2045	4,6	7,9	4,1	7,0	4,8	8,2	4,8	8,2	10,2	17,7
2046	4,7	8,1	4,2	7,2	4,9	8,5	4,8	8,3	10,6	18,2
2047	4,8	8,3	4,3	7,4	5,0	8,7	4,9	8,4	10,9	18,8
2048	4,9	8,5	4,4	7,6	5,2	8,9	4,9	8,5	11,3	19,4
2049	5,1	8,7	4,5	7,8	5,3	9,2	5,0	8,6	11,6	20,0
2050	5,2	9,0	4,6	8,0	5,5	9,4	5,1	8,7	12,0	20,6
2051	5,3	9,2	4,7	8,2	5,6	9,7	5,1	8,9	12,3	21,2
2052	5,5	9,4	4,9	8,4	5,7	9,9	5,2	9,0	12,7	21,8
2053	5,6	9,6	5,0	8,6	5,9	10,1	5,3	9,2	13,0	22,4
2054	5,7	9,9	5,1	8,8	6,0	10,4	5,4	9,3	13,3	23,0
2055	5,9	10,1	5,2	9,0	6,2	10,6	5,5	9,5	13,6	23,5
2056	6,0	10,3	5,4	9,3	6,3	10,9	5,6	9,7	14,0	24,1
2057	6,1	10,6	5,5	9,5	6,4	11,1	5,7	9,8	14,3	24,6
2058	6,3	10,8	5,7	9,7	6,6	11,3	5,8	10,0	14,6	25,1
2059	6,4	11,0	5,8	10,0	6,7	11,6	5,9	10,1	14,9	25,6
2060	6,5	11,3	5,9	10,2	6,9	11,8	5,9	10,3	15,2	26,1
2061	6,7	11,5	6,1	10,5	7,0	12,1	6,0	10,4	15,5	26,7

2062	6,8	11,7	6,2	10,7	7,1	12,3	6,1	10,5	15,8	27,2
2063	6,9	12,0	6,4	11,0	7,3	12,5	6,2	10,7	16,1	27,8
2064	7,1	12,2	6,5	11,3	7,4	12,8	6,3	10,8	16,4	28,8
2065	7,2	12,4	6,7	11,5	7,5	13,0	6,4	11,0	16,7	28,8
2066	7,3	12,7	6,8	11,8	7,7	13,2	6,4	11,1	17,0	29,3
2067	7,5	12,9	7,0	12,0	7,8	13,4	6,5	11,2	17,2	29,7
2068	7,6	13,1	7,1	12,3	7,9	13,6	6,6	11,3	17,4	30,1
2069	7,7	13,3	7,3	12,6	8,0	13,8	6,7	11,5	17,6	30,4
2070	7,8	13,5	7,4	12,8	8,1	13,9	6,7	11,6	17,8	30,8
2071	7,9	13,7	7,6	13,1	8,2	14,1	6,8	11,7	18,0	31,1
2072	8,0	13,8	7,7	13,3	8,3	14,3	6,8	11,8	18,2	31,4
2073	8,1	14,0	7,9	13,6	8,4	14,5	6,9	11,9	18,4	31,7
2074	8,2	14,2	8,0	13,8	8,5	14,6	7,0	12,0	18,5	31,9
2075	8,4	14,4	8,2	14,1	8,6	14,8	7,0	12,1	18,7	32,2
2076	8,5	14,6	8,3	14,3	8,7	14,9	7,1	12,3	18,8	32,4
2077	8,6	14,8	8,5	14,6	8,8	15,1	7,2	12,4	18,9	32,7
2078	8,7	14,9	8,6	14,8	8,8	15,2	7,3	12,5	19,1	32,9
2079	8,8	15,1	8,7	15,1	8,9	15,4	7,4	12,7	19,2	33,1
2080	8,9	15,3	8,9	15,3	9,0	15,5	7,4	12,8	19,4	33,4
2081	9,0	15,5	9,0	15,6	9,1	15,7	7,5	12,9	19,5	33,6
2082	9,1	15,6	9,2	15,8	9,2	15,8	7,6	13,1	19,6	33,9
2083	9,2	15,8	9,3	16,0	9,3	16,0	7,6	13,2	19,8	34,2
2084	9,2	15,9	9,4	16,1	9,3	16,1	7,7	13,3	20,0	34,4
2085	9,3	16,0	9,5	16,3	9,4	16,2	7,8	13,4	20,1	34,6
2086	9,4	16,2	9,5	16,4	9,4	16,3	7,8	13,5	20,2	34,8
2087	9,4	16,3	9,6	16,6	9,5	16,4	7,9	13,6	20,3	35,0
2088	9,5	16,4	9,7	16,7	9,6	16,5	7,9	13,7	20,4	35,1
2089	9,5	16,4	9,7	16,8	9,6	16,6	8,0	13,8	20,5	35,3
2090	9,6	16,5	9,8	16,9	9,7	16,7	8,0	13,9	20,5	35,4
2091	9,7	16,6	9,9	17,0	9,7	16,7	8,1	13,9	20,6	35,6
2092	9,7	16,7	10,0	17,2	9,8	16,8	8,1	14,0	20,7	35,7
2093	9,8	16,8	10,0	17,3	9,8	16,9	8,2	14,1	20,8	35,9
2094	9,8	17,0	10,1	17,4	9,9	17,0	8,2	14,2	20,9	36,1
2095	9,9	17,1	10,2	17,5	9,9	17,1	8,3	14,3	21,0	36,2
2096	10,0	17,2	10,2	17,7	10,0	17,2	8,3	14,4	21,1	36,4
2097	10,0	17,3	10,3	17,8	10,0	17,3	8,4	14,5	21,2	36,5
2098	10,1	17,4	10,4	17,9	10,1	17,4	8,4	14,5	21,3	36,7
2099	10,1	17,5	10,5	18,1	10,2	17,5	8,5	14,6	21,4	36,9
2100	10,2	17,6	10,6	18,2	10,2	17,6	8,5	14,7	21,5	37,0

Source: Prepared by the author based on information from the UN, IBGE and ILO. Scenarios 1 and 2 with (BM/PM) ratios of 0.29 and 0.5 respectively.

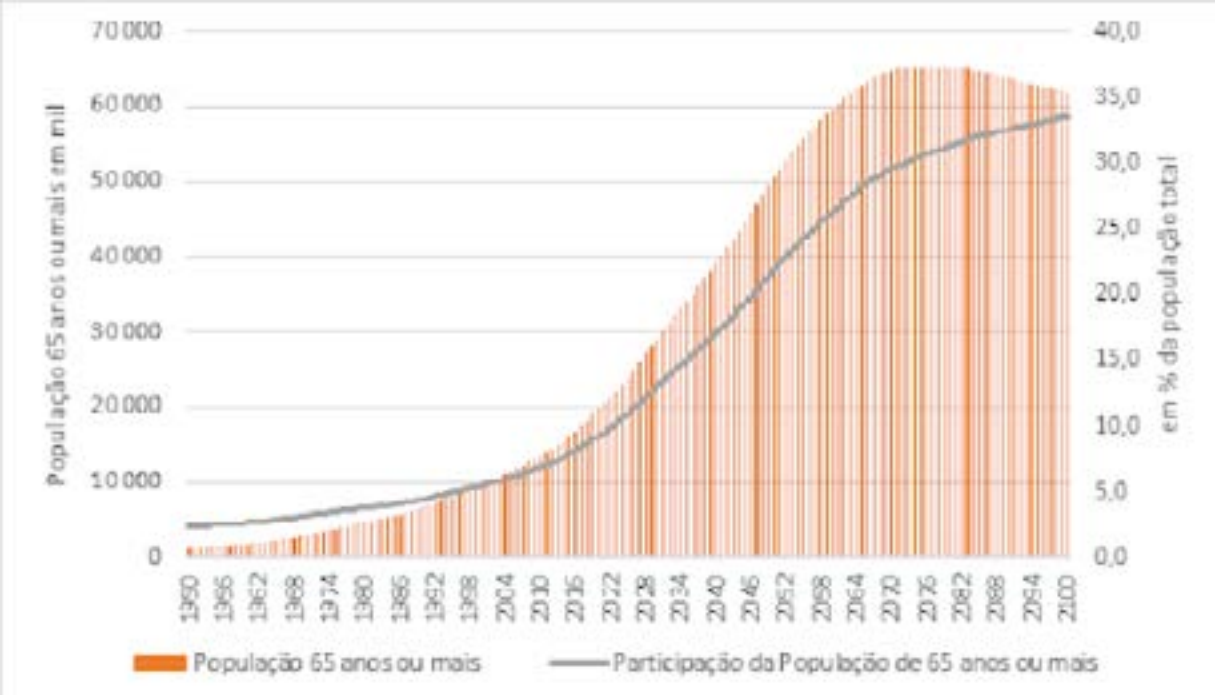
TABLE 2 A SURVEY OF STATE GOVERNMENTS' PENSION REFORMS IN RELATION TO EC 103/2019



Source: Prepared by the author based on information from the Ministry of Labor and Social Security and the respective state government Amendments cited. Position at the end of 2021.

ANNEX

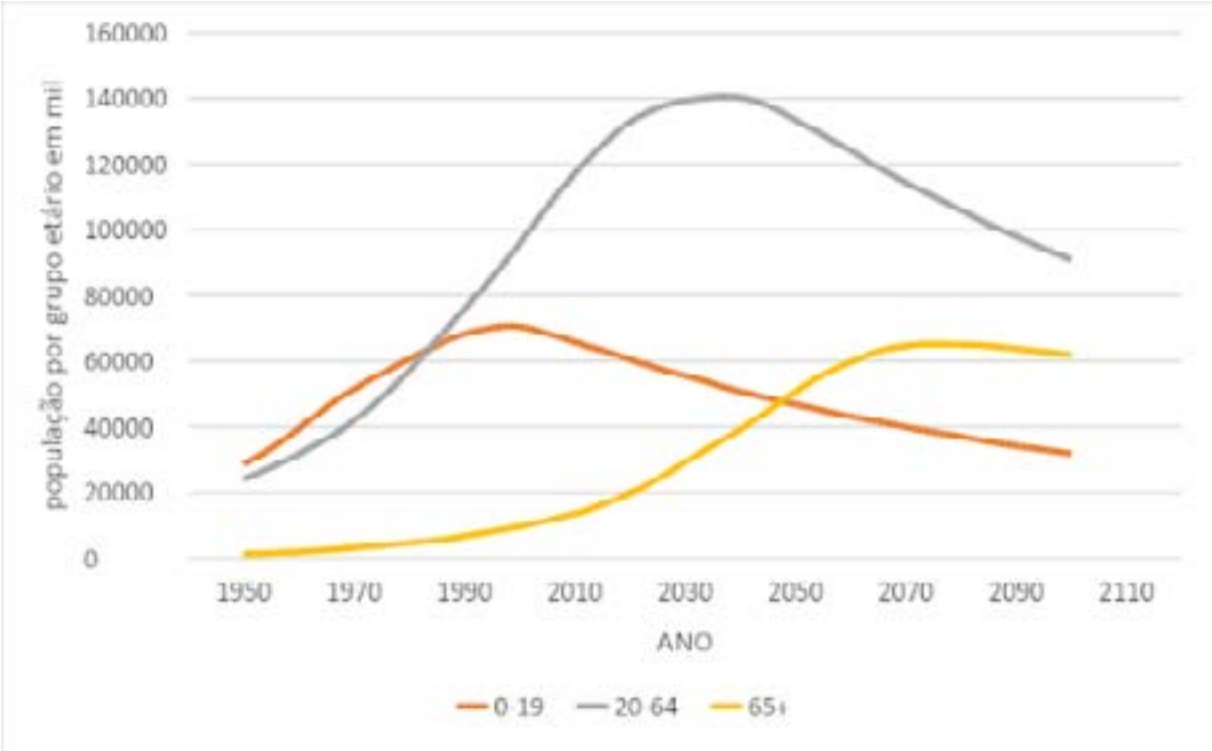
Graph 1A - Population aged 65 and over and share of total population in % Brazil - 1950 to 2100



Source: Based on UN demographic projections

Graph 2A - Brazil's Population by Age Groups in thousand

Brazil - 1950 to 2100



Source: Based on UN demographic projections

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