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Funded Pensions and Ageing: An Empirical Investigation

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Fon Biriktirim Sistemi ve Yaşlanma: Ampirik Bir İnceleme

Abstract

The social security reform wave in the 1990s and the early 2000s responded to the rising deficits of the public PAYG (pay-as-you-go) systems. Privatisation of social security was regarded as a cure for the population ageing problem believed to lie under the situation. Some academics were sceptic and argued that privatisation was not a remedy to the ageing problem. This paper empirically investigates the validity of this claim. Using a simple market equilibrium condition, the implications of the ageing population for saving rates are examined for more than 150 countries for the 2000 to 2100 period. It is found that ageing may cause unsustainability in funded pension systems. The impact is especially profound for southern and eastern European countries, Korea, and Japan.

Keywords : Social Security, Funded Pension Systems, Ageing.

JEL Classification Codes : J11, J32, H55.

Öz

Dağıtım esaslı sosyal güvenlik sistemlerinin açıkları nedeniyle, 1990larda ve 2000lerin başlarında bir sosyal güvenlik reform dalgası ortaya çıktı. Sorunun altında yatan yaşlanma olgusuna, sosyal güvenliğin özelleştirilmesi ile çözüm sunulabileceği düşünüldü. Bu görüşe şüphe ile yaklaşan bazı akademisyenler özelleştirmenin yaşlanma sorununa çözüm olamayabileceğine işaret ettiler. Bu çalışma, yaşlanmanın özel birikim esaslı sosyal güvenlik sütunu üzerindeki etkisinin ampirik incelemesini yapmaktadır. Basit bir piyasa denge koşulu kullanılarak, yaşlanan nüfusun tasarruf oranları için iması 2000-2100 dönemi için 150'den fazla ülke örneğinde incelenmiştir. Buradan hareketle, yaşlanmanın birikim esaslı emeklilik sistemlerinde sürdürülemezlik yaratabileceği saptanmıştır. Etki özellikle Doğu ve Güney Avrupa ülkeleri ile Kore ve Japonya'da baskındır.

Anahtar Sözcükler : Sosyal Güvenlik, Birikim Emeklilik Sistemleri, Yaşlanma.

1. Introduction

The outlook in the 1990s for public PAYG (pay-as-you-go) social security systems was dire. There were warnings against existing deficits, which were expected to worsen unless policy actions were taken (Disney, 2000; Roseveare et al., 1996; World Bank, 1994). The sustainability of the PAYG systems was regarded as a problem for developing and developed economies. With the current young and working generation financing the pension expenditure on the existing old and retirement age, the ageing population was deemed a significant threat to public PAYG systems.

The World Bank proposed a policy template. The multi-pillar system proposal of the World Bank envisioned the saving function of the social security system to be shouldered by the private sector. Given a public pillar's continued but diminished existence, a privately managed pillar would provide additional retirement-saving tools. Everyone would accumulate funds and receive pensions by their accumulated funds and the implied returns. As the individual took more responsibility for creating resources for retirement, the expenditure burden on the public PAYG systems would be reduced. With every individual saving for himself or herself, the population's demographics would be irrelevant concerning an individual's ability to finance retirement. Hence the ageing population crisis, and the implied deficits for the public PAYG social security systems, would be averted.

The public system was not seen as an efficient way to save, exemplified by low and negative returns on previous experiences (World Bank, 1994: 127-128; James, 1998: 276-277; Iglesias & Palacios, 2000: 22-28). With the private sector in control, any mismanagement by the state would be evaded. The system would fund physical capital accumulation and growth through accumulated savings. The demographic threat would be eliminated, for the system foresaw everyone saving for oneself. The redistributive function of the public PAYG system and the implied solidarity would be limited. Still, the proposal of the World Bank became the main recipe for social security system reform. It was an inspiration for reform in the 1990s and the 2000s, especially in Latin American and Central and Eastern European countries.

A considerable scholarly debate on pros and cons accompanied the introduction of the privately funded pillars. As countries experimented with multi-pillar systems, shortcomings became pronounced. Hence, the ability of privately managed funded systems to solve the existing problems of social security systems came under heavy criticism. One raised voice was Barr (2002: 7-9) concerning Barr (1979). Barr stated that a privately funded pillar would not be immune to the demographic pressure implied by the ageing economies. To see the problem, assume an ageing economy with a privately funded system. Today, a young generation saves by acquiring assets. Tomorrow, this generation will become old and sell their accumulated assets to finance retirement. However, in the future, due to the ageing population, the number of buyers of assets, that is, the young individuals buying funds to finance *their retirement*, will be below. The lack of demand for assets in the future would imply a fall in the value of assets. With their retirement wealth eroding, future pensioners

would find it challenging to finance their retirement. The public institutions may have to pick up the slack, and social security systems may return to where they have started concerning public social policy spending.

This paper comes in because of the lack of immunity of a privately managed funded system to an ageing population. This study aims to empirically investigate the impact of ageing populations on the feasibility of a privately managed funded social security system. A spurious saving-dissaving equilibrium condition with only intuitive foundations is stated with this aim in mind. Given the current saving rate, demographic dynamics, national income dynamics, and public (dis)saving, this condition can be used to calculate a future saving rate. Numerical calculations are performed for several countries to identify the future paths of saving rates required to maintain the stated equilibrium. If the calculations yield an excessively high future saving rate, the funded system is deemed unable to handle the demographic pressure on the social security system.

The following section outlines the evolution of social security systems and the introduction of the privately managed funded pillars. Following that, the empirical contribution of this paper is presented. Firstly, the saving-dissaving equilibrium condition is stated. This is followed by the presentation of the data and the obtained results. The last section concludes by summarising the results and discussing policy implications.

2. Establishment of Privatised Social Security

The public PAYG social security systems as we know them today originate from Bismarck's insurances of the 1880s. This foundation was further solidified by Beveridge's contributions (Scholz, 2015). Backed by the government intervention attitudes due to Keynesian economics, the notion of a welfare state gained traction after the Second World War. With the economic volatilities of the 1970s and the 1980s rose neoliberal policies. The reflection of the neoliberal policies on social security was eliminating the welfare state (Tokol & Alper, 2018).

The erosion of the welfare state was legitimised through concerns regarding the financial sustainability of the public PAYG social security systems. Social security-related debate in the 1990s and the early 2000s concerned ageing populations and the implied social security costs. Several institutional reports and academic publications provided demographic projections and calculated the implied financial burden (World Bank, 1994; OECD, 1998; Palacios & Pallares-Miralles, 2000; Roseveare et al., 1996; Sleebos, 2003).

There were calls for policy actions. The World Bank provided one policy response template. In the well-known report on the issue, the World Bank (1994) approach identified three basic functions for social security systems: insurance, distribution and saving. The World Bank perspective proposed the isolation of these functions and the introduction of three pillars that constitute the social security system.

The first pillar was envisioned as a PAYG mechanism under public management. It was financed through the tax base and provided a baseline coverage. The main functions would be the provision of insurance and redistribution implicitly consistent with the notion of solidarity. The second and third pillars were designed as funded systems, specifically, as obligatory and voluntary saving mechanisms. Financed by privately managed contributions, these pillars would enable the individuals to save for themselves. The World Bank (1994) debates the options of public and private administration for funded pillars. Given concerns regarding governments' mismanagement of accumulated funds and expectations from the private management to generate higher returns (Corondao et al., 2003; Genakoplos et al., 2000: 1-2), the recommendation weighs in favour of private management.

The World Bank system combines a tax-financed, publicly managed PAYG system and a contribution-financed privately operated system. The privately managed funded pillar takes the burden of retirement financing from the public PAYG pillar. Also, the generosity of the public PAYG pillar is reduced. This combination is expected to address the financial sustainability problem of the social security systems. Also, since individuals save for themselves under a funded system, this multi-pillar approach was expected to evade the demographic problems implied by ageing economies.

Inspired by the success of the Chilean experience (de Mesa & Mesa-Lago, 2006) in the early 1980s and consistent with the erosion of the welfare state through neo-liberal policies, the three-pillar system of the World Bank introduced the private sector into the design of pension systems. This design was heavily favoured while designing social security system reforms, especially in Latin America and the Central and Eastern European Countries.

The new multi-pillar system was expected to increase savings, generate resources for investment and promote growth. This indeed appears to be the case. Empirical studies point to increased savings due to obligatory saving mechanisms introduced (Arnberg & Barslund, 2013; Chetty et al., 2014; Lachowska & Myck, 2015; Messacar, 2015; Vaillancourt et al., 2015; Yang, 2020). However, these systems did not reduce social security system deficits in the short run.

The failure of private funded pillars to reduce the financial sustainability burden of the public PAYG pillars was primarily due to two reasons. Firstly, the performed reforms are generally carve-out. The funded pillar is carved out of the public PAYG pillar. In some cases, contributions are directed away from the public PAYG pillar to the privately funded pillar. In other cases, new entrants to the labour force are directed away from the public PAYG pillar and into the privately funded pillar. Either way, the revenues of the public PAYG pillar fall.

Secondly, while the revenues of the public PAYG pillar fall, expenditures do not decrease. The public PAYG pillar must pay pensions to exist members. If a member is retired, the obligation to pay pensions is obvious. If a member is still working, this person

has paid contributions, and thus the PAYG pillar must pay a pension or return the contributions in a lump sum manner. Either case implies that expenditures do not fall.

Thus, as the social security system evolves from a single pillar public system to a multi-pillar system with private sector involvement, the deficits of the public PAYG pillar will initially increase. Kotlikoff (1995) warns against this transition cost and highlights the importance of the approach adopted to finance this cost concerning Pareto improvement implied by the reform. Coupled with the economic hardships of the 2008 crisis, the transition cost became one of the main reasons for the rollback of pension reforms in Latin American and Central and East European Countries (Altiparmakov, 2018: 227-228; Datz & Dancsi, 2013; De Mesa & Mesa-Lago, 2006: 153; Louzek, 2014: 97; Polakowski & Hagemejer, 2018).

The rollbacks appear to have entered a new phase due to COVID-19. Because of limited incomes caused by lockdowns and other restrictive measures, people desire to access accumulated pension funds. Politicians have enabled this access. Chile, the one-time role model for privatised pensions, is about to allow further access to pension funds, having already done it twice (Pension Policy International, 2021). Such actions may adversely affect old-age pension provision, and policies necessary to restore the implied inequalities will increase the burden on the government budget (Lorca, 2021). Despite these concerns, other countries may follow suit.

Despite rollbacks and other interventions, privately managed funded pillars have entered the social security systems. It appears unlikely that they will fade away. Instead, the issue is to what extent they will prevail. Hence their existence and dynamics continue to be a research concern. Therefore, their interaction with the persisting ageing phenomenon necessitates investigation.

3. The Analysis

This section begins with an intuitive model to investigate the impact of ageing on funded pension systems. The model is a simple verbal construction of the asset market equilibrium for a closed economy with the government. The implied equilibrium condition enables the identification of the saving rate path given demographic dynamics, public borrowing and output. The following subsection presents the adopted data practices and summarises the results.

3.1. The Model

In line with the aim of this manuscript, an equilibrium condition for saving and dissaving is stated. The condition considers a closed economy with the government to account for public dissaving. For such an economy, at any point in time *t*, the saving will be a share of income by young people. Specifically, savings will be:

$$mps_t I_t N_{\mathrm{y,t}} \tag{1}$$

where mps_t is the saving rate, I_t is per capita income and $N_{y,t}$ is the number of young, and therefore the people saving in the economy. This saving is matched by dissaving from two sources: the elders selling assets to finance their retirement and the government borrowing to finance any deficit. Thus, a saving young individual can either buy the assets already held and sold by the dissaving elders or buy the debt instruments issued by the government.

The elders' current assets were obtained when they were young. Assuming no altruism, dissaving by the current old generation is the saving done by the previous generation. Therefore, the dissaving by the existing elders can be simplified as the saving by the young of the last period:

$$mps_{t-1} I_{t-1} N_{y,t-1} \tag{2}$$

Adding the dissaving of the government, a market equilibrium condition can be stated as follows:

$$mps_t I_t N_{y,t} = mps_{t-1} I_{t-1} N_{y,t-1} + g_t Y_t \tag{3}$$

where g_t is the public borrowing requirement rate out of aggregate national income, Y_t. Rearrangement of this condition yields:

$$mps_t = \frac{mps_{t-1} I_{t-1} N_{y,t-1} + g_t Y_t}{I_t N_{y,t}} \tag{4}$$

Further simplification provides:

$$mps_t = mps_{t-1} \frac{I_{t-1}}{I_t} \frac{N_{y,t-1}}{N_{y,t}} + g_t \frac{N_t}{N_{y,t}} \tag{5}$$

where we have employed the notion that national income, Y_t, is related to per capita income and population, i.e. $Y_t = I_t N_t$ where N_t is the aggregate population. Hence, $\frac{g_t Y_t}{I_t N_{y,t}} = g_t \frac{N_t}{N_{y,t}}$.

The condition as stated in Equation 5 enables the calculation of a current saving rate (mps_t) given the previous period saving rate (mps_{t-1}), the growth rate of income (I_{t-1}/I_t), the growth rate of the number of (saving) young individuals ($N_{y,t-1}/N_{y,t}$), public borrowing rate (g_t) and the share of young individuals in the aggregate population ($N_t/N_{y,t}$). Three basic relationships are obvious. Firstly, a higher output growth implies a lower saving rate. Secondly, an increase in public borrowing needs to be met by higher saving rates. Lastly, the ageing population (fall in the growth rate of youngsters and the ratio of youngsters in the population) necessitates an increase in the saving rate. The structure is simple enough to investigate the relationship between ageing and saving.

This simple construct may be criticised for its implication regarding saving and growth, as established theoretical constructs regarding saving and growth claim that these are positively related. Saving provides investment resources, thus enhancing the physical capital stock and leading to growth. This line of reasoning has considerable empirical

support as well. However, that may not always be the case. Loayzai, Schmidt-Hebbel and Serven (2000: 400-401) point to some cases where the relationship may be opposite. They point out that permanent income theory implies higher future income is related to reduced savings. Deaton (1992) exemplifies how the relationship may be uncertain in lifecycle models. Attanasio, Picci and Scorcu (2000) report a negative relationship between lags in the saving rate and current income growth, implying a saving for a rainy day type of behaviour. Thus, a negative relationship between saving and growth rates is unexpected but still a theoretical possibility.

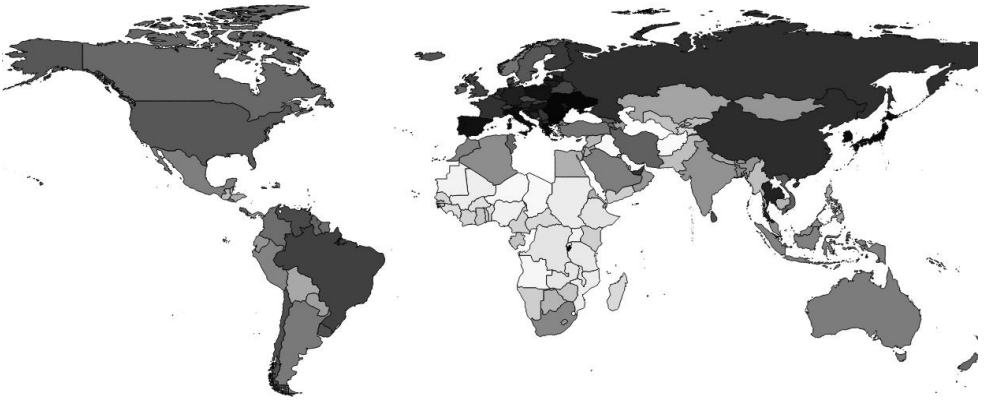
3.2. Data and Analysis

The analysis is based on calculations due to Equation 5. This requires data on demographics, national income, and government borrowing. The data from the World Population Prospects 2017 Revision of the World Bank regarding demographics. The database is available from 1950 to 2100. To ensure that the ageing phenomenon is being solidly reflected in the calculations, the population projections from the "Low Fertility" scenario have been employed. The data is available in five-year gaps, and the age group, 20-60, has been focused on. The United Nations (2017) provides details on the demographic data.

National income data, public borrowing as a percentage of national income and data on saving rates are available from the International Monetary Fund's World Economic Outlook Database April 2018 Edition. But the national income and public borrowing rate data are not available as a projection until the year 2100, only until 2023. Therefore, using econometrics, the first task is to extend the current national income and the public borrowing rate projections. The data sources have downloaded all the variables for as long a period and as extensive a country coverage as possible. After cleaning the observations missing data, all the variables are regressed against a logarithmic time trend. The estimated coefficients are used to extend the variables into the future, enabling the calculation of Equation 5 to be extended to the year 2100. The source data coverage differs across countries, and this restricts the sample. The resulting database consists of the 153 countries listed in Appendix Table 1.

Given the compiled data, saving rates for the 153 countries were calculated till the year 2100 using Equation 5. The results of the performed calculations are visualised in Figure 1. The figure presents the values of the saving rate changes from 2015 to 2050 on a greyscale world map. High levels of change are represented by darker tones, whereas lighter tones represent lower levels of change. For 124 countries in the sample, the calculations imply a savings rate fall. However, for some countries, increases in the saving rate are needed to maintain Equation 5. The dark regions of Europe immediately become obvious. Asia is also observed to require increases in the saving rate.

Figure: 1
Changes in the Saving Sates Projected for 2015-2050

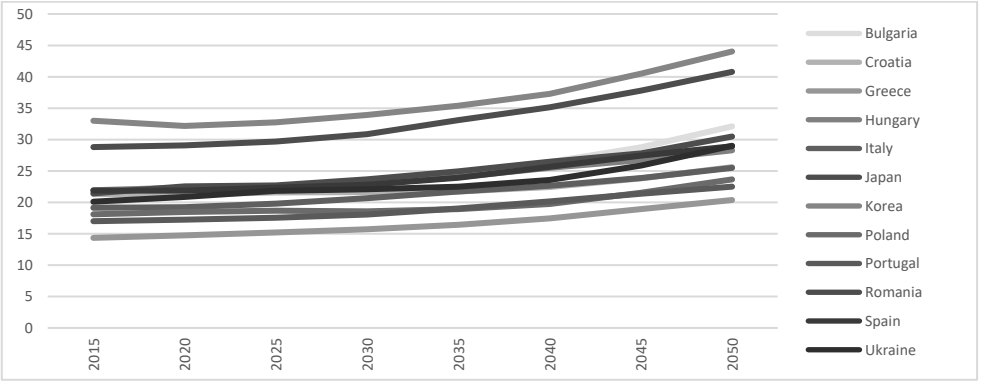


Source: Author's calculations.

A closer examination of the results shows that the saving rate must increase for 29 countries. These countries are Albania, Austria, Barbados, Bosnia and Herzegovina, Bulgaria, Burundi, China, Croatia, Germany, Greece, Hungary, Italy, Japan, Korea, Latvia, Lithuania, Macedonia, Mauritius, Moldova, Netherlands, Poland, Portugal, Romania, Russia, Slovenia, Spain, Thailand, Trinidad and Tobago and Ukraine. The changes in the saving rates range from a meagre 1% increase in the case of Mauritius to a mind-boggling 225% increase in the case of Burundi. Countries with more than a 20% increase in their savings until 2050 are considered to keep the analysis focused. Bulgaria, Croatia, Greece, Hungary, Italy, Japan, Korea, Poland, Portugal, Romania, Spain, and Ukraine. Figure 2 shows these countries' calculated saving rate paths until 2050. Burundi is excluded as an outlier for it displays an unrealistically high savings increase and is a tiny economy.

The remaining sample includes Southern and Eastern European countries, Korea, and Japan. What makes these countries unique in displaying adverse outcomes in response to the population, growth and borrowing dynamics? As stated, Equation 5 implies three important dynamics about the calculated saving rate paths: i) a higher output growth implies a lower saving rate, ii) an increase in public borrowing needs to be met by higher saving rates, and iii) an ageing population implies an increase in the saving rate.

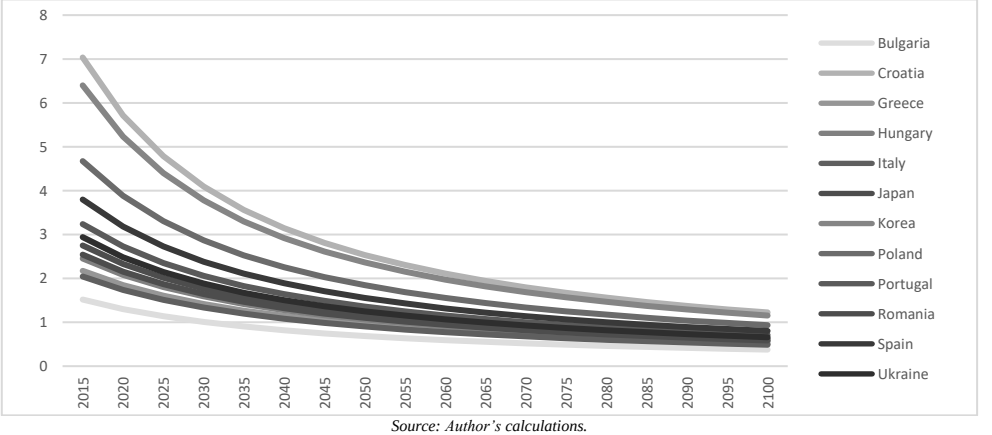
Figure: 2
Calculated Saving Rates 2015-2050 (%)



Source: Author's calculations.

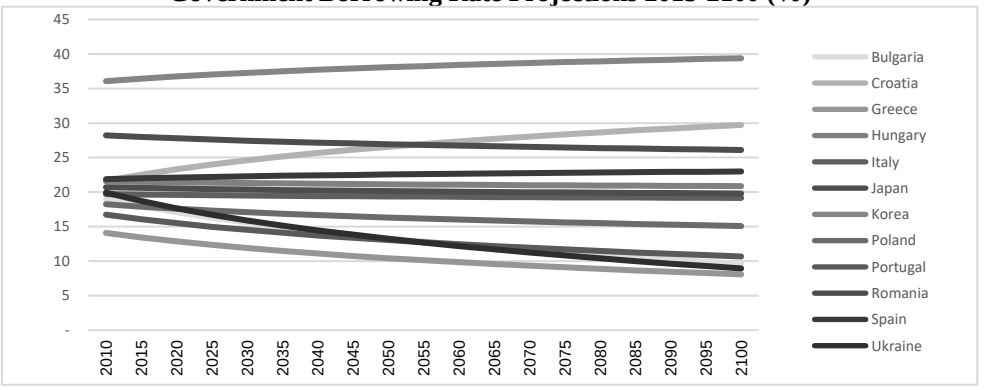
The situation relating to output growth is presented in Figure 3. The convergent behaviour of output growth rate is obvious, with the output growth rate falling to zero. The falling output growth should imply higher saving rates. This is consistent with Figure 2. Consider, next, Figure 4, where government borrowing rate trajectories are displayed. There is no consistent path that homogenises this group of countries. Some countries, such as Greece, are systematically borrowers, whereas others, such as Japan, are lenders. Hence no clear relationship between saving rate and government borrowing is apparent.

Figure: 3
Output Growth Rate Projections 2015-2100 (%)



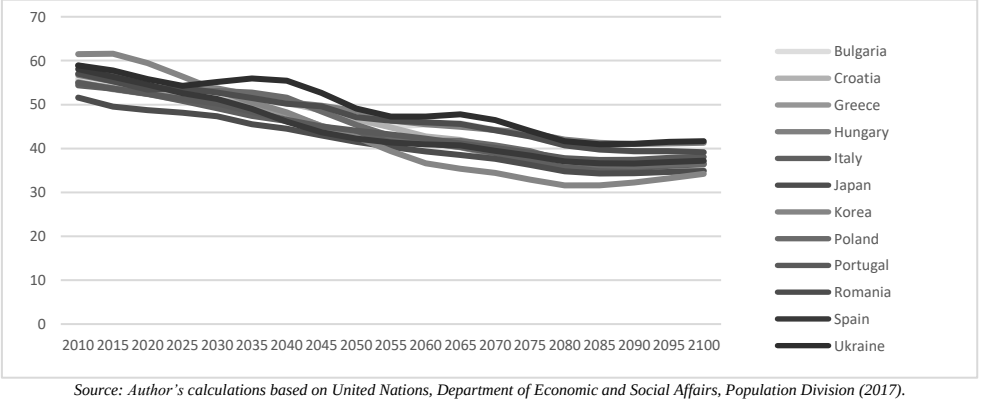
Source: Author's calculations.

Figure: 4
Government Borrowing Rate Projections 2015-2100 (%)



Source: Author's calculations.

Figure: 5
Share of Age 20-60 in Total Population 2015-2100 (%)



Source: Author's calculations based on United Nations, Department of Economic and Social Affairs, Population Division (2017).

What remains is the demographic dynamics. Figure 5 shows how the share of the age 20 to 60 cohort in the total population changes through time. The percentage of the 20-60 age group in the total population falls over time. Considering this in Equation 5, the ageing population appears to impact saving rates adversely.

It is difficult to identify a characteristic other than relatively slower population growth that provides a commonality of the countries under focus, i.e., Bulgaria, Croatia, Greece, Hungary, Italy, Japan, Korea, Poland, Portugal, Romania, Spain, and Ukraine. Bulgaria, Croatia, Hungary, Poland, Romania, and Ukraine are former Soviet countries. Last 40 years, they have integrated into the market economies of the west. Greece, Italy, Spain, and Portugal are relatively well-off European countries, all southern. Japan and Korea are known for the performance of their economies and are often cited as growth examples. Japan

is generally a saver, whereas Greece's public dissaving was a crucial issue after the 2008 crisis. The only common characteristic appears to be their demographic dynamics.

To highlight this, Table 1 has been prepared to present the population growth of these countries, the world population growth rate, and the high-income country group population growth rate. For the 1980-2020 period, high-income countries display a population growth rate of 0.67%. Only Korea exceeds this with an average growth rate of 0.79%. During the 2000-2020 period, high-income countries display a population growth rate of 0.62%. Only Spain exceeds with 0.76%. Many countries show negative population growth during these periods.

Table: 1
Annual Population Growth Rates (%)

	1980-2020	2000-2020
Bulgaria	-0,59	-0,80
Croatia	-0,31	-0,52
Hungary	-0,23	-0,23
Poland	0,18	-0,09
Romania	-0,33	-0,74
Ukraine	-0,29	-0,56
Greece	0,28	-0,03
Italy	0,13	0,21
Portugal	0,16	0,04
Spain	0,59	0,76
Japan	0,20	-0,03
Korea	0,79	0,51
World	1,42	1,21
High income	0,67	0,62

Source: Author's calculations based on annual population growth data (SP.POP.GROW) from World Development Indicators, World Bank.

4. Conclusion

Ageing populations were considered a severe threat to the financial sustainability of the public PAYG social security systems in the 1990s. Following the World Bank perspective, several countries privatised their social security systems. Their shortcomings became visible as private-funded pillars rose to supplement public PAYG pillars. One of the issues raised was whether private-funded pensions would solve the ageing-induced financial sustainability problem of public PAYG systems by shifting the financing obligations from the state to the individual.

This paper employs a simple asset market equilibrium condition to investigate the impact of ageing on funded pensions. Given economic growth, government borrowing and demographic dynamics, saving rates for more than 150 countries are calculated until 2100. The observed dynamics imply that saving rates must increase considerably to maintain equilibrium in Eastern and Southern Europe and East Asia (especially Japan and Korea). The funded pension systems in these countries are vulnerable to demographic shocks, and these countries may have to revert to public PAYG systems.

This result should be approached with caution. Out of the more than 150 countries considered in this study, only a handful display a systematic relationship between ageing

populations and excessive savings rate increases. Hence a generalisation of this conclusion should be made with notes of caution. This empirical analysis cannot address some issues.

Political sustainability of social security arrangements, for example, is an issue that is hard to investigate empirically. If social security is a public good, Samuelson's condition implies that privatisation of social security may reduce social welfare (Samuelson, 1954). Indeed, Wolf and del Rio (2021) consider retrenching private pensions less of an issue related to funding returns or ageing. They proposed that if a sufficient number of individuals end up with lower pensions under privatised social security, a retrenchment pressure arises. Wold and del Rio (2021) claim their findings are relevant for the reversal pressures in Latin America and Central and Eastern Europe.

For the Korean case, Jung (2009) points to introducing the funded pillar by emphasising saving rather than being embedded in a system of intergenerational solidarity. Jung (2009) points out that such an emphasis on saving and the possibility of fund exhaustion places the funded pillar in Korea differently than in Western cases. Lack of trust may make a funded pillar unsustainable, in this case. Hence the sustainability of private funded pillars is a political economy issue, a point not addressed in my empirical investigation.

The projections presented are done using time trends. Lacking an account for unforeseeable events, this study has certain limitations. The empirical analysis cannot factor in significant shocks, such as COVID-19 and possible technological leaps in the 21st century. COVID-19 has been a substantial blow to the global economy. A further shock has recently been introduced due to the Ukraine-Russia war. If one can include them in growth projections, the impact would be lower growth paths. Due to Equation 5, this necessitates higher saving rates, complicating the analysis.

Leaps in growth-enhancing technology could push the discussion in unforeseen directions. Debates on Industry 4.0 paint a picture of a production process with less but better-educated labour. What will happen to those pushed out of the labour force? Can they even save for themselves and finance their retirement? What use is a funded pillar in social security systems if they cannot? Discussions point to further integrating the state in welfare provision, as phrases like the taxation-of-robots enter social policy literature. Such dynamics are not accounted for in this analysis.

There are different complex output dynamics. Ageing implies threats to the sustainability of funded pillars. Falling output growth rates contribute to this. This means that policies aimed at high economic growth rates could contribute to the sustainability of funded pillars. This complicates the World Bank (1994) perspective where savings aimed at retirement financing would lead to growth. At least for some countries, growth may be necessary for private-funded pillars to succeed. Failure to grow may force a rollback of the privately funded pillars.

Even for the countries with relatively solid privately managed funded pillars, ageing may be an issue. This study provides empirical evidence and points to several countries. To the author's best knowledge, no institution monitors ageing about private funded social security. One policy action would be to institutionalise a watch on ageing in this regard.

Yet the relevance of such action is debatable. Reversals of pension privatisation are already underway in some countries. With COVID-19 and the implied economic hardships, many countries have eased access to accumulated retirement funds. Individuals are using up retirement resources to overcome their current financial difficulties. Social security system design focuses on shifting from multi-pillar systems to shock-responsive social policy systems capable of responding to significant events such as COVID-19. Many countries feel the need to experiment with alternative social security system options. Current debate prioritises universal basic income, implying a reduced role for the private sector in pension provision in the future. Hence the near future appears less likely to be a debate regarding funded private pensions.

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Appendix Table: 1
Country and Time Coverage of the Data

		Gross domestic product, constant prices, the national currency	Gross national savings, per cent of GDP	General government primary net lending/borrowing, per cent of GDP
1	Afghanistan	2002 to 2023	2002 to 2023	2004 to 2023
2	Algeria	1980 to 2023	1980 to 2023	1990 to 2023
3	Angola	1980 to 2023	1980 to 2023	1996 to 2023
4	Antigua and Barbuda	1980 to 2023	2014 to 2023	1990 to 2023
5	Argentina	1980 to 2023	1980 to 2023	1993 to 2023
6	Armenia	1992 to 2023	1995 to 2023	2005 to 2023
7	Australia	1980 to 2023	1980 to 2023	1990 to 2023
8	Austria	1980 to 2023	1980 to 2023	1988 to 2023
9	Azerbaijan	1992 to 2023	1992 to 2023	1994 to 2023
10	Bahrain	1980 to 2023	1980 to 2023	1990 to 2023
11	Bangladesh	1980 to 2023	1980 to 2023	1990 to 2023
12	Barbados	1980 to 2023	1980 to 2023	1994 to 2023
13	Belarus	1992 to 2023	1993 to 2023	2001 to 2023
14	Belgium	1980 to 2023	1980 to 2023	1980 to 2023
15	Belize	1980 to 2023	1980 to 2023	1996 to 2023
16	Benin	1980 to 2023	1980 to 2023	1989 to 2023
17	Bhutan	1980 to 2023	1980 to 2023	1987 to 2023
18	Bolivia	1980 to 2023	1980 to 2023	1985 to 2023
19	Bosnia and Herzegovina	1996 to 2023	1998 to 2023	1998 to 2023
20	Botswana	1980 to 2023	1980 to 2023	2000 to 2023
21	Brazil	1980 to 2023	1980 to 2023	2002 to 2023
22	Brazil	1980 to 2023	1980 to 2023	2002 to 2023
23	Bulgaria	1980 to 2023	1980 to 2023	1998 to 2023
24	Burkina Faso	1980 to 2023	1980 to 2023	1985 to 2023
25	Burundi	1980 to 2023	1980 to 2023	1992 to 2023
26	Cabo Verde	1980 to 2023	1980 to 2023	1994 to 2023
27	Cambodia	1987 to 2023	1986 to 2023	1996 to 2023
28	Cameroon	1980 to 2023	1980 to 2023	2000 to 2023
29	Canada	1980 to 2023	1980 to 2023	1980 to 2023
30	Central African Rep.	1980 to 2023	1980 to 2023	1988 to 2023
31	Chad	1980 to 2023	1980 to 2023	1995 to 2023
32	Chile	1980 to 2023	1980 to 2023	1990 to 2023
33	China	1980 to 2023	1980 to 2023	1989 to 2023
34	Colombia	1980 to 2023	1980 to 2023	1989 to 2023
35	Comoros	1980 to 2023	1980 to 2023	1984 to 2023
36	Costa Rica	1980 to 2023	1980 to 2023	1990 to 2023
37	Cote d'Ivoire	1980 to 2023	1980 to 2023	1997 to 2023
38	Croatia	1992 to 2023	1992 to 2023	1992 to 2023
39	Cyprus	1980 to 2023	1980 to 2023	1995 to 2023
40	Czech Republic	1995 to 2023	1995 to 2023	1995 to 2023
41	Dem. Rep. of Congo	1980 to 2023	1980 to 2023	1996 to 2023
42	Denmark	1980 to 2023	1980 to 2023	1980 to 2023
43	Djibouti	1991 to 2023	1990 to 2023	1990 to 2023
44	Dominican Republic	1980 to 2023	1980 to 2023	1997 to 2023
45	Ecuador	1980 to 2023	1980 to 2023	1995 to 2023
46	Egypt	1980 to 2023	1980 to 2023	1999 to 2023
47	El Salvador	1980 to 2023	1981 to 2023	1990 to 2023
48	Eritrea	1992 to 2023	1992 to 2023	1992 to 2023
49	Estonia	1993 to 2023	1993 to 2023	1995 to 2023
50	Ethiopia	1980 to 2023	1980 to 2023	1980 to 2023
51	Finland	1980 to 2023	1980 to 2023	1980 to 2023
52	France	1980 to 2023	1980 to 2023	1980 to 2023
53	Gabon	1980 to 2023	1980 to 2023	1990 to 2023
54	Georgia	1994 to 2023	1994 to 2023	1995 to 2023
55	Germany	1980 to 2023	1980 to 2023	1995 to 2023
56	Ghana	1980 to 2023	1980 to 2023	1980 to 2023
57	Greece	1980 to 2023	1980 to 2023	1988 to 2023
58	Grenada	1980 to 2023	2014 to 2023	1990 to 2023
59	Guatemala	1980 to 2023	1980 to 2023	1995 to 2023
60	Guinea	1980 to 2023	1980 to 2023	1990 to 2023
61	Guinea-Bissau	1980 to 2023	1980 to 2023	1991 to 2023
62	Guyana	1980 to 2023	1980 to 2023	1997 to 2023
63	Haiti	1980 to 2023	1980 to 2023	1997 to 2023
64	Honduras	1980 to 2023	1980 to 2023	1990 to 2023

65	Hungary	1980 to 2023	1980 to 2023	1995 to 2023
66	Iceland	1980 to 2023	1980 to 2023	1980 to 2023
67	India	1980 to 2023	1980 to 2023	1989 to 2023
68	Indonesia	1980 to 2023	1980 to 2023	1993 to 2023
69	Islamic Rep. of Iran	1980 to 2023	1980 to 2023	2002 to 2023
70	Iraq	1998 to 2023	2004 to 2023	2004 to 2023
71	Ireland	1980 to 2023	1980 to 2023	1995 to 2023
72	Israel	1980 to 2023	1980 to 2023	2000 to 2023
73	Italy	1980 to 2023	1980 to 2023	1988 to 2023
74	Jamaica	1980 to 2023	1980 to 2023	1990 to 2023
75	Japan	1980 to 2023	1980 to 2023	1980 to 2023
76	Jordan	1980 to 2023	1980 to 2023	1985 to 2023
77	Kazakhstan	1992 to 2023	1992 to 2023	2002 to 2023
78	Kenya	1980 to 2023	1980 to 2023	1982 to 2023
79	Korea	1980 to 2023	1980 to 2023	1995 to 2023
80	Kuwait	1980 to 2023	1980 to 2023	1990 to 2023
81	Kyrgyz Republic	1992 to 2023	1992 to 2023	1995 to 2023
82	Latvia	1992 to 2023	1992 to 2023	1998 to 2023
83	Lesotho	1992 to 2023	1992 to 2023	1995 to 2023
84	Lithuania	1995 to 2023	1995 to 2023	2000 to 2023
85	Luxembourg	1980 to 2023	1980 to 2023	1995 to 2023
86	FYR Macedonia	1992 to 2023	1992 to 2023	1997 to 2023
87	Madagascar	1980 to 2023	1980 to 2023	1980 to 2023
88	Malawi	1980 to 2023	1980 to 2023	2002 to 2023
89	Malaysia	1980 to 2023	1980 to 2023	1990 to 2023
90	Maldives	1980 to 2023	1980 to 2023	1990 to 2023
91	Mali	1980 to 2023	1980 to 2023	2000 to 2023
92	Malta	2000 to 2023	1980 to 2023	2000 to 2023
93	Mauritania	1990 to 2023	1990 to 2023	2004 to 2023
94	Mauritius	1980 to 2023	1980 to 2023	2000 to 2023
95	Mexico	1980 to 2023	1980 to 2023	1990 to 2023
96	Moldova	1992 to 2023	1992 to 2023	1995 to 2023
97	Mongolia	1980 to 2023	1980 to 2023	1991 to 2023
98	Montenegro	2000 to 2023	2001 to 2023	2002 to 2023
99	Morocco	1980 to 2023	1980 to 2023	1990 to 2023
100	Mozambique	1980 to 2023	1980 to 2023	1980 to 2023
101	Myanmar	1997 to 2023	1998 to 2023	1997 to 2023
102	Namibia	1990 to 2023	1989 to 2023	1990 to 2023
103	Nepal	1980 to 2023	1980 to 2023	2000 to 2023
104	Netherlands	1980 to 2023	1980 to 2023	1995 to 2023
105	New Zealand	1980 to 2023	1980 to 2023	1985 to 2023
106	Niger	1980 to 2023	1980 to 2023	1995 to 2023
107	Nigeria	1990 to 2023	1990 to 2023	1990 to 2023
108	Norway	1980 to 2023	1980 to 2023	1980 to 2023
109	Oman	1980 to 2023	1980 to 2023	1990 to 2023
110	Pakistan	1980 to 2023	1980 to 2023	1993 to 2023
111	Panama	1980 to 2023	1980 to 2023	1994 to 2023
112	Paraguay	1980 to 2023	1980 to 2023	1980 to 2023
113	Peru	1980 to 2023	1980 to 2023	2000 to 2023
114	Philippines	1980 to 2023	1980 to 2023	1989 to 2023
115	Poland	1980 to 2023	1980 to 2023	1995 to 2023
116	Portugal	1980 to 2023	1980 to 2023	1986 to 2023
117	Qatar	1980 to 2023	1980 to 2023	1991 to 2023
118	Romania	1980 to 2023	1980 to 2023	1991 to 2023
119	Russia	1992 to 2023	1992 to 2023	1998 to 2023
120	Rwanda	1980 to 2023	1980 to 2023	1992 to 2023
121	Saudi Arabia	1980 to 2023	1980 to 2023	1991 to 2023
122	Senegal	1980 to 2023	1980 to 2023	1994 to 2023
123	Serbia	1998 to 2023	1997 to 2023	2000 to 2023
124	Seychelles	1980 to 2023	1980 to 2023	1983 to 2023
125	Slovakia	1993 to 2023	1993 to 2023	1995 to 2023
126	Slovenia	1992 to 2023	1992 to 2023	1995 to 2023
127	Solomon Islands	1980 to 2023	1980 to 2023	1997 to 2023
128	South Africa	1980 to 2023	1980 to 2023	2000 to 2023
129	Spain	1980 to 2023	1980 to 2023	1980 to 2023
130	Sri Lanka	1980 to 2023	1980 to 2023	1990 to 2023
131	Sudan	1980 to 2023	1980 to 2023	1990 to 2023
132	Suriname	1980 to 2023	1991 to 2023	1990 to 2023
133	Sweden	1980 to 2023	1980 to 2023	1980 to 2023
134	Syria	1980 to 2023	1980 to 2023	1990 to 2023

135	Tajikistan	1992 to 2023	1992 to 2023	1998 to 2023
136	Tanzania	1980 to 2023	1980 to 2023	1991 to 2023
137	Thailand	1980 to 2023	1980 to 2023	2000 to 2023
138	Togo	1980 to 2023	1980 to 2023	1989 to 2023
139	Trinidad and Tobago	1980 to 2023	1980 to 2023	1988 to 2023
140	Tunisia	1980 to 2023	1980 to 2023	1991 to 2023
141	Turkey	1980 to 2023	1980 to 2023	2000 to 2023
142	Uganda	1980 to 2023	1980 to 2023	1997 to 2023
143	Ukraine	1992 to 2023	1992 to 2023	1995 to 2023
144	United Arab Emirates	1980 to 2023	1980 to 2023	1991 to 2023
145	United Kingdom	1980 to 2023	1980 to 2023	1980 to 2023
146	United States	1980 to 2023	1980 to 2023	2001 to 2023
147	Uruguay	1980 to 2023	1980 to 2023	1999 to 2023
148	Uzbekistan	1992 to 2023	1992 to 2023	1996 to 2023
149	Venezuela	1980 to 2023	1980 to 2023	1988 to 2023
150	Vietnam	1980 to 2023	1980 to 2023	1998 to 2023
151	Yemen	1990 to 2023	1990 to 2023	1990 to 2023
152	Zambia	1980 to 2023	1980 to 2023	2000 to 2023
153	Zimbabwe	1998 to 2023	2009 to 2023	2005 to 2023

Notes: Gross domestic product (constant national currency), gross national savings (per cent of GDP) and general government primary net lending/borrowing (per cent of GDP).