

THE BINARY PATH OF RISKS IN PENSION SYSTEMS AND POLITICAL PRESSURE

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Abstract: In this paper, we offer an explanation for cyclical reforms to pension systems, based on the experience of countries in Central and Eastern Europe (CEE) over the last three decades. We conclude that in making the transition to funded pension design, governments not only transfer longevity and fiscal risks to the individual but also absorb risks transferred from the public, with each market actor transferring undiversifiable risks to the other. This pathway of hidden risks, which has not previously been discussed in the literature, stems from a public expectation that citizens will enjoy risk premiums and adequate old-age benefits, an expectation that evolves into political pressure. The outcomes of this risk path are realized in financial transfers, such as means-tested social security and minimum pension guarantees. Consequently, funded pension designs converge naturally into a new landscape paradigm of risk-sharing, with intergenerational and intragenerational components. Financial crises such as the one accompanying the recent COVID-19 pandemic foster the convergence process.

Keywords: social security; pension; risk; minimum pension guarantee

Introduction

The pension models landscape continues its unstable trend moving from the public pay-as-you-go (PAYG) defined benefit (DB) model to individual accounts in a multipillar architecture (Ebbinghaus 2015). The main reason for this has been fiscal strictures, such as those resulting from low fertility and longer periods of retirement. Governments, particularly in an aging Europe, have no longer been able to provide adequate pension levels through PAYG DB schemes¹ without

raising taxes (Holzmann, Hinz, and Dorfman 2008). This has led to the diverting of funds from the public pension system into individually funded accounts.

In parallel to this shift, a literature strand has developed, analyzing the ways to strengthen the adequacy and sustainability of funded pension systems. Indeed, in many countries, however, these reforms have been short-lived. Following the onset of the global economic crisis, most countries that had adopted pension privatization reforms either halted them, drastically reduced their private element, or abandoned them completely (Naczyk and Domonkos 2016; Sokhey 2017). The financial market crash of 2008 caused the merits of privately funded pensions to be challenged, as their assets experienced a rapid and substantial decline (Grech 2018; Altiparmakov 2018). Consequently, trust in the sustainability of the new pension pillar system has been shattered over recent decades (Ebbinghaus 2015). The consequences of the current pandemic crisis on the trust of participants have yet to be discovered. The increased role of supplementary pension funds and the recent economic and financial downturn have led to new challenges in relation both to future financial sustainability and to the adequacy of pension benefits (Wolf and Caridad 2021b). In the course of the COVID-19 pandemic crisis, governments around the world have come up with ambitious plans for encouraging market activities and transferring social payments to the poor. The results are having grave consequences for pension design, at least in the short term, and where the obligations of governments to provide large-scale rescue and social plans for their citizens are concerned. No one ever expected that individuals would have to manage these buckets of risk alone, using the mechanisms of their personal pension accounts. The average individual is not even aware of these risks (Randle and Rudolph 2014). In parallel with this, there is a growing concern that a second debt crisis will arise in the West (Chapman 2020).

The financial crisis of 2008 and the COVID-19 pandemic crisis are examples of the market and systemic risks being realized. The current fiscal and financial crisis due to COVID-19 provides an opportunity to better understand how funded pension designs can be strengthened.

Here we build upon the works by Wolf and Ocerin (2021) and Wolf and Caridad (2021a) that investigate the point of equilibrium between the government and other actors that may enable funded pensions to exist. This paper regards financial crises as shocks that highlight the prospect of risks in pension schemes; particularly, it considers that any pension system may be appropriate if the link between return and risk is preserved. The main question is whether this relationship is maintained for all players in the field and not only for the government, as might often happen in the transition to a funded scheme. For example, we contend in this paper that participants will demand future premiums in line with the risk burdens associated with funded schemes. That particular demand is most relevant to people in low-earning

cohorts who struggle to obtain adequate pension benefits, and who may not have the resources to diversify the risk on their own.

The paper further argues that in addition to the familiar shifting of risks from the government to the individual, there is also a risk path that proceeds from the public to the government. Consequently, we maintain that the mutual expectations of risk-sharing between the public and the government will eventually create an equilibrium of pension pillar sizes, with each actor trying to shift undiversifiable risks to the other. We link the above-mentioned reasons for the reversals in the countries of CEE and Latin America to a lack of risk-sharing mechanisms between governments and the public. This gap results in political pressure and, eventually, cyclical pension reforms.

In the first section, we describe the mutual risk-sharing model as it applies to the funded pension scheme. Second, we detail the opportunities for individuals to share risk with the government. We define the levels of government intervention in the market as risk-sharing “orders.” We argue that the probability of another pension reform depends on the effectiveness of these orders. We review the different financial, personal, and structural risks that are being diversified through risk-sharing orders. Third, we examine the implementation of risk-sharing orders in pension system reversals across CEE countries as part of the process of convergence toward equilibrium among actors in the field. Fourth, we discuss the linkage between risk-sharing theory and the pension experience of CEE countries. Finally, we draw conclusions.

The Expectation Model

Consistent with the principle of risk and return, this section describes the expectations of the various actors in the pension field (Rappaport and Peterson 2014). The difference between pension arrangements reflects exposure to different types of risks. Pension plan designs range from those that place virtually all the risk on the plan, such as the traditional PAYG DB design, to those that place nearly all the risk on the individual covered by the plan, as with the Defined Contribution scheme. Neither type is ideal, and no model is superior (Rappaport and Peterson 2014). The risk involved is also capable of explaining the behavior of each of the actors.

The Government

The government is in a twofold position. On the one hand, it has other annual public spending commitments (G) and fiscal constraints and is thus anxious to lower its pension spending and minimize its risks. Transitioning to a funded pension scheme enables the government to lower the first pillar size (social security) and to redirect taxes to financing other public needs (Esping-Andersen 1990).

On the other hand, the government mediates between different generations of participants and different field actors (Tausch, Potters, and Riedl 2013). Consequently, it must seek to balance the expectations of all the actors, including itself.

The Society

For the most part, the literature relates to society as representing the group of participants. Here we relate to the individual as a separate entity. However, Aaron (1966) and Feldstein and Rangelova (2001) claim that society seeks to improve pension conditions and to avoid raising taxes. In an aging market, the PAYG scheme thus cannot satisfy needs in the long term, and society will undergo a shift to a funded pension scheme. There is no recognition of separate earning cohorts within this entity.

The Individual

Under any pension scheme, the individual expects to be able to retain his or her standard of living in old age and to avoid poverty (Sokhey 2017; Ebbinghaus 2015). From the perspective of the individual, the fiscal risk transition is translated into a bucket of risk families, such as longevity risk, market risk, solvency risk, asymmetric information risk, career risk, and systemic risk. Some of the risks have been transferred directly from the government, such as longevity risk, and some have arisen out of the system change, such as market risk. From the individual's point of view, the source of the risk is not important. The important thing is his or her ability to diversify it.

The individual expects a risk premium for the risks he or she cannot diversify. The market risks are the most intuitive example, as plotted in Figure 1. The individual uses political pressure to increase the risk premium to a satisfactory level.

Here, we contend that the level of income inequality in the market affects the pension equilibrium. Since the government transfers the risks to the individual, the opposite risk-sharing depends on the strength of the particular actor. As more individuals find themselves in a common financial situation, the individual becomes stronger with relation to the government and the probability of a pension reversal increases.

Based on global experience, as will be discussed in the second part, we argue that the expectation of risk premiums evolves into political pressure, and into pension reversals or structural changes (Altiparmakov 2018). If a system is not seen by the electoral majority as beneficial, that is, if it does not help them maintain their pre-retirement living standards, the government may be forced to abandon it (Bradley, Pantzalis, and Yuan 2016; Grech 2018).

We assume that the former PAYG DB benefit level is only a theoretical reference point. The expectations depend on a range of personal and general variables, such as risk appetite and peer group pension benefits at retirement.

Pension Market in Equilibrium

Figure 1 shows the balance mechanism that underlies an equilibrium of pension benefit. On the one hand, the government transfers fiscal risk and changes the pension system to a funded capitalized one. With the same objective, the government tries to cut fiscal transfers to the individual. On the other hand, the public expects to receive a risk premium corresponding to the excess of risks that its members cannot diversify or transfer on their behalf. This risk-sharing process converges into an equilibrium of benefits and risks.

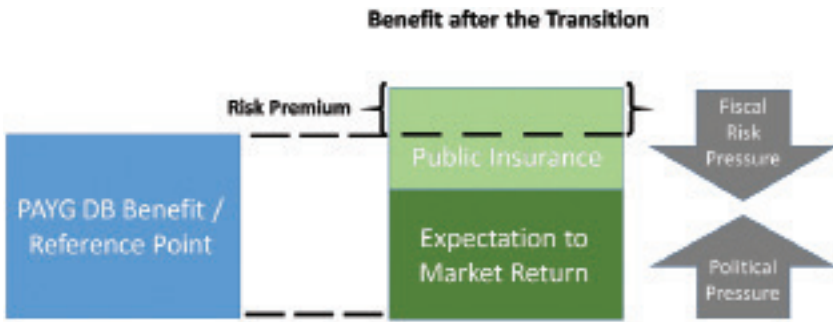


Figure 1 Individual Expectation of Pension Benefit

Source: Author’s elaboration.

If the shift to a funded pension scheme transfers longevity and fiscal risk from the government to the individual, the individual seeks ways to transfer risks that he or she cannot diversify. We refer to three levels, or “orders,” of government intervention in the market. These orders can be considered as an opposite pathway of risks, proceeding from the individual back to the government. In addition, these orders embody the risk premium the individual demands for exposure to risk in relation to the former pension design (see also Mabbett 2020).

Each order relates to a different set of risks. The first order is the basic one, while the third is not trivial and complements the other two orders. The government is readily able to manage the first order, but its influence over the other two orders is less. The perspective of the individual provides a mirror image of that of the government. For example, the first order corresponds to risks that are not in the individual’s sphere of influence, such as longevity risk and asymmetric information. Figure 2 describes these mirror relations.

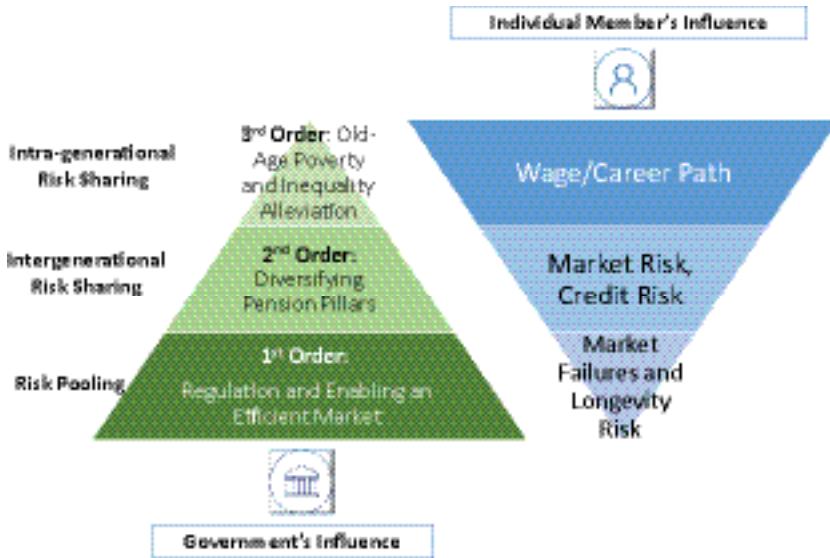


Figure 2 Orders and Influence

Source: Author's elaboration.

The First Order: Substantial Risk-Sharing by Market Design

Countries choosing to base their pension systems on private funds must first have well-established financial markets, as well as adequate public and government understanding and mutual trust (Bohn 2010). The individual is not capable of managing inherent market failures/risks or of transferring them to the government's responsibility. The success of the Israeli pension system as a radical DC scheme is partially because of high American influence and sophisticated capital markets for many years (Wolf and Caridad 2021b).

This order can create a pooling of risk in favor of longevity risk. When shifting from a DB scheme, the government naturally transfers longevity risk to the individual. Regulation and market design enable risk-pooling in the annuities market² (Reichling and Smetters 2015). An annuity creates a redistribution *ex-post*, as some individuals die early and forfeit their resources to those who die later. Using that mechanism, individuals, through plan sponsors, can manage idiosyncratic mortality risk. Additionally, by enabling the annuity market, the individual shares this risk with his or her same-age cohort.

The first order also enables individuals to alleviate the risk of *asymmetric information*. This market failure risk includes insufficient regulation and transparency; fiduciary risk; undeveloped financial infrastructure; and imperfect information regarding the labor market and the insurance companies. Many individuals do not have the motivation,

knowledge, or skill to provide a satisfactory retirement income on their own. Naturally, a transition of the pension system depends on sustainable market infrastructure, which can give the individual the opportunity to pool these risks with others and to make rational decisions (Leisering 2003). Clearly, these two risk families are supposed to be managed at the macro level by government agencies and regulation, as the individual lacks the power to influence the system (Einav, Finkelstein, and Schrimpf 2010).

The Second and Third Orders: Intergenerational and Intragenerational Risk-Sharing

If the individual is able to manage their pension account within an efficient market, and if the first order is valid, we can turn to managing accumulations of risks throughout the individual's working phase. We define the second order as the implementation of social security and the third order as public social transfers, such as means-tested programs and the implementation of minimum pension guarantees. In both of these orders, the government is an active mediator between other players. In the second order, the government mediates between adjacent generations, and in the third acts as a mediator between different earning cohorts. The diversification of the social security mechanism is achieved through redistribution between adjacent generations as part of the unfunded PAYG feature. The third order augments and intensifies the second order's risk diversification effect.

The government's income redistribution mechanism enables the diversifying mainly of financial risks and wage/career risks, which individuals cannot themselves manage through their own portfolios (Mabbett 2020). Risks of these kinds are, naturally, much more critical for weak cohorts that lack sufficient resources to diversify or manage realizations of these risks.

Implementing minimum pension guarantees, as part of the third order, deepens the diversification of personal and financial risks that may be realized due to wrong decisions along the individual's career path, to economic shocks, or to systemic risk. This means that minimum pension guarantees can provide a safety cushion in times of recession, when capital markets fall, and a strong correlation exists between wage reduction and unemployment (Antolin et al. 2011).

In times of financial crisis, unfunded pillars and/or minimum pension guarantees are uncorrelated with capital markets, and provide a cushion against market falls. For that reason, many countries operate rate-of-return minimum pension guarantees within funded pension schemes (OECD 2019). In times of financial crisis, such as in 2008 and during the COVID-19 pandemic crisis periods that see correlations realized between financial, personal, or systemic risks, we witness a significant rise in government transfers.

These orders make up a kind of pipeline that leads from the individual to the government, which also transfers wage and career risks. The risks are correlated with the

individual’s choices and fortune over the course of their career and at the end of their working phase. Due to the accrued effect in funded pension schemes, continuity of working is highly important for adequate pension benefits. Government social transfers, which are not correlated completely with the individual’s wage path, may diversify risks of these kinds on some level, such as providing an economic cushion for old age. In that case, the government participates to a certain point in that risk.

Figure 3 describes a “mirror” position in which risk is shared between the individual and the government. As explained earlier, the government’s fiscal spending diversifies the above risks at various levels. In practice, the government as a mediator participates in risk-bearing through the instruments of social security and minimum pension guarantees. The effectiveness of these orders is higher, with low correlations between wages and government transfers (Grande and Visco 2010). That is essential during times when tail risk is being realized and for the weak earning cohorts who lack the wealth and knowledge to diversify that risk through their own portfolios.

Panel B: Classic Bidirectional Risks Flow					
Actor / Government Intervention Scale	Pure Funded DC	1st Order: Market Design and Regulation	2nd Order: Mix Scheme	3rd Order: Mix Scheme + Minimum Pension Guarantee	DB PAYG
Government	Low				High
Individual	High				Low

Figure 3 Classic Bidirectional Risks Flow

Source: Author’s elaboration.

The minimum pension guarantee is unique in its risk-sharing effect. It may be financed from the state budget (intergenerational risk-sharing) or with differentiation on the basis of the first pillar benefits allocation (intergenerational + intragenerational risk-sharing). This means that retirees cannot receive benefits greater than the contributions collected plus fair value accumulation (Grande and Visco 2010). All this, however, is true to the sum-up level. As a result of intergenerational diversification between young and old and intragenerational diversification, there is not always a direct bond between contributions and benefits.

Figure 4 summarizes the risk-sharing incentives and evolutions of each side. The government aims to reduce fiscal risk from its portfolio of liabilities. Consequently, that fiscal risk is levied on participants in the form of market risk, longevity risk,

solvency risk and asymmetric information. Meanwhile, the individual does not remain indifferent, and through political pressure shifts back to the government a variety of risks that he or she cannot diversify. As claimed in Wolf (2021), the various risks that are transferred to the government by social security and unfunded pillars do in fact participate in aspects of market risk, systemic risk, and career risks.



Figure 4 Risk Transfers

Source: Author's elaboration.

The Experience of Convergence toward Pension Design Equilibrium

Why CEE Countries?

While Western European countries with mature public pay-as-you-go systems have dismissed pension privatization initiatives, profound and extensive pension reforms have taken place since the 1990s in Latin America and Eastern Europe (Bielawska 2015). In this section, we examine the process of convergence that has seen the implementation of risk-sharing mechanisms in funded pension schemes.

Between 1981 and 2018, some 29 countries undertook pension reforms, introducing either partial privatization or full privatization with individual accounts and private administration (Altiparmakov 2018). However, a total of 19 countries, 13 in Eastern Europe and 6 in Latin America that is, 60% of the countries that had privatized pensions later reversed that privatization. Five other countries in Latin America have strengthened the zero pillar of the minimum pension guarantee (Mesa-Lago and Valero 2020).

Here we focus on the reversals in CEE countries, from a risk-sharing orders perspective. Specifically, the literature finds common characteristics in the history of cyclical pension reforms in the following CEE countries: Russia, Latvia, Estonia, Bulgaria, Croatia, Lithuania, Kazakhstan, North Macedonia, Poland, Hungary, Czechia, Romania, Slovakia, and Slovenia.

Lack of the First Risk-Sharing Order

The CEE countries in the 1990s had just emerged from their communist regimes, and their capital markets still lacked supervision and mutual trust. Mesa-Lago and Valero (2020) note that in Poland, for instance, private fund supervision went through continuous organizational changes and took almost ten years to develop while remaining riddled with inefficiency and excessive politicization. Inadequate consulting and marketing practices, early withdrawal penalties and low tax incentives, as well as crowding out by the first pillar, prevented voluntary pensions from expanding. Undeveloped markets result in inefficient investments, high volatility, and risk for participants (Munnell and Quinby 2009). Empirical evidence shows that these reforms failed to deliver the improvements that were initially promised by the global organizations. Coverage rates stagnated or decreased, pension benefits deteriorated, and gender and income inequality increased (Fultz and Hirose 2019).

In contrast to the reforms to funded pension designs introduced in CEE countries, most high-earning countries in Europe still implement the dominant first pillar in the form of DB PAYG pension schemes (see Figure 5). According to the OECD annual report (OECD 2019), most of the pension reforms in advanced countries can be summed up as constituting parametric changes, such as consistently raising the retirement age and adapting contribution rates, with no drastic reforms.

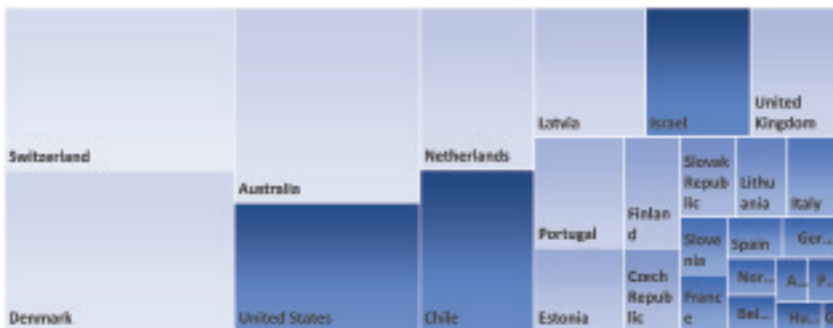


Figure 5 Contributions to Funded Pension Schemes (% GDP)

Source: Author’s elaboration based on OECD data 2019.

We show how the pension reversals substantially improved market design, regulation, and governance. Over the years following the end of the Soviet-era regimes, government intervention created trust among actors, with more transparency and efficiency in the private funds' operations.

Until well into the 1990s, many European governments maintained a “voluntarist approach” to organizing private welfare provisions. This implies that the allocation of occupational and personal welfare benefits was left to “private initiative” (see Esping-Andersen 1990). The lack of governance in designing pension reforms became apparent when many CEE governments (Croatia, Estonia, Latvia, North Macedonia, Poland, and Slovakia) launched their second pillar before defining in law the benefits package that workers could expect to receive (Fultz and Hirose 2019).

The major design problems in most of the privatization reforms were dealt with through a strengthening of centralized public administration. Governments set out to ensure adequate policy formulation and to improve the related decision-making processes. The re-reforms reinforced the government role in the administration, regulation, and supervision of the pension systems. Most of the countries involved, including Poland, Hungary, and Kazakhstan, eventually created autonomous bodies for the regulation and supervision of private pensions (Mesa-Lago and Valero 2020).

The Lack of the Second and Third Risk-Sharing Orders

The financial crisis severely affected financial and capital markets, significantly reducing the real value of private pension assets and, consequently, causing popular outrage with the results of the private system. The risk created by financial market fluctuations was left to pensioners to deal with (Wolf 2021).

Increasing levels of the poverty rates in old age in these countries may indicate that the pension systems lack sufficient risk-sharing mechanisms and suggest one of the reasons behind the pressure to enact re-reforms (Hardy 2020). After the re-reforms this trend changed. For example, the reduced old-age poverty rate in Slovenia may be attributed to the abolition, as part of the re-reforms, of the second pillar. The improvement in Slovakia may have reflected the lateness with which a partial privatization-capitalization pillar was installed; together with a small second pillar, which operated for only three years until the reversal. In both cases, the third order may have played an important role.

In Figure 6, we point to a convergence process that has seen the implementation of minimum pension guarantees or target pensions following pension reform reversals. In the dark are the CEE countries that experienced pension reform during the 1990s and that ultimately reversed these measures. These countries are compared to the countries of Western Europe, indicated in bright, that implemented target pensions or minimum pension guarantees.

While in Western Europe, there were mainly parametric reforms, keeping on a bi-pathways risk-sharing mechanism, in CEE countries a process of convergence was done.



Figure 6 Implementation of Minimum Pension Guarantee in Europe

That involves implementing the three orders gradually, deepening the connection among earning cohorts, among adjacent generations, and between the individual and the governments. In the Appendix, we present an overview of the main reversals carried out in European countries, based on the definitions of the risk-sharing orders. All of the countries analyzed have been re-balancing their radical reforms since the 1990s and early 2000s by implementing second and third risk-sharing orders and recognizing public social insurance. Further, they have redesigned their social security systems based on the principles of social solidarity between actors, redistribution, and shared responsibility for pension provisions (Fultz and Hirose 2019; Marchal, Marx, and van Mechelen 2014).

The re-balancing of pension systems was carried out using various methods:

- Increasing the first pillar contributions at the expense of the second pillar—Poland, Bulgaria, Latvia, Lithuania, and Czechia.
- Allowing individuals the option of returning to the first pillar of public pensions, with social security from the second pillar (privately financed funds)—Bulgaria, Croatia, Hungary, and Slovakia.
- Imposing minimum pension guarantees and intergenerational diversification—Hungary, Poland, Czechia, Slovakia, Latvia, Slovenia, and Kazakhstan.

Discussion

The comparison between the experience of Western and CEE countries demonstrates that when the pension market is immature and unregulated, the public will seek other financial risk mechanisms. This may lead to political pressure becoming focused on governmental transfers through measures such as increasing social security and imposing minimum pension guarantees. This process explains the divergence in market designs between the various countries that have chosen funded-capitalized pension schemes, dealing with the same challenges of low fertility, longevity, and fiscal risks. According to the above model, the relatively stable pension landscape in advanced countries is due to a balance between fiscal needs and the system's generosity (Fultz and Hirose 2019). That stability is realized through liberal markets, a competitive as well as the sophisticated private financial sector, and high levels of government regulation. These inherent mechanisms may diversify asymmetric information, prevent market distortions, and provide efficient and readily available instruments for hedging financial risks through capital markets. In other words, when the first order is implemented, it is easier for the government to lower its interventions through the second and the third orders.

Given the political economy of reforms, the large voting power of people nearing or beyond retirement age may again mount up, forcing a recalibration of public pensions and the regulating of private pensions (Munnell and Quinby 2009). Indeed, the literature recognizes that imposing a minimum pension guarantee is an important condition for any transition to a more funded-capitalized scheme, in order to ensure the sustainability of pension schemes and to make them politically acceptable (Wolf and Ocerin 2021; Marchal, Marx and van Mechelen 2014). Almost all actual reform proposals have included scheduled benefits guaranteed under current law (Antolin et al. 2011). Amid volatile markets, pension guarantees are increasingly seen as required.

In view of the above, it is not surprising that a global trend toward the implementing of minimum pension guarantee mechanisms is now being observed (Lachance and Mitchell 2003). Guarantees have recently become more common as part of DC schemes, especially in Latin America, which has been at the forefront of pension privatizations (Mesa-Lago and Valero 2020). In implementing minimum pension guarantees, the countries concerned are joining such stable European pension economies as those of Finland, Germany, Italy, Switzerland, Greece, Spain and Portugal.

Conclusion

Each player in the pension field holds leverage positions in some conditions. The aging of societies causes a privatization trend, levying stress risks on individuals.

We seek to shed light on a hidden shift of risk, from the individual back to the government, in funded pension schemes, that until now has been little studied.

This paper has stressed key dimensions of the complex public/private relationships, and has drawn attention to aspects of risk-sharing between different periods and among different earning cohorts. In all these instances, the governments concerned have played significant roles as central planners and as mediators. In addition, the paper highlights the power of the individual in the area of pension systems. Governments that ignore the burden of risk placed on individual shoulders may one day discover that they have to bear the enormous fiscal cost of reverting from a funded pension scheme due to political pressure toward reversal.

According to the theoretical model, government intervention in the form of unfunded pillars or minimum pension guarantees is needed to increase the sustainability of pension reform. This may seem odd since the governments involved began by trying to minimize their expenses. The question can be summed up as follows: what level of premium is the government prepared to finance in order to increase the sustainability of a funded pension system? Diversifying the risks borne by participants through giving some weight to social security and minimum pension guarantees can create an equilibrium within which fiscal expenses will be reduced, and a substantial share of the population will benefit compared to the previous pension scheme. Moreover, the extent of the unfunded pillar or the government intervention highly depends on the market conditions and the benchmark of participating expectations. In an undeveloped capital market or with weak regulation, individuals cannot privatize pension accounts, and the government has to take a stand with the second and the third pillars.

Over the past three decades, experience in the CEE and Latin American countries has shown a convergence toward an equilibrium pension design. In such a design, the government recognizes its responsibilities within the risk-sharing framework and acts to diversify some of the risks traditionally borne by the individual. The recent financial crisis set off by the COVID-19 pandemic confirms this process, as we have witnessed large government bailout programs due to political pressure. The public assistance that has had to be given to pension markets and labor markets around the world reaffirms the inability of individuals to withstand large fluctuations in the market for long, especially if the people concerned are elderly or close to retirement.

It is important to keep tracking the evolution of funded markets within pension systems, especially after the turmoil of the COVID-19 financial crisis. One result of previous experience is that financial and systemic shocks tend to heighten public reactions. Governments need to consider strengthening unfunded pillars, even if only temporarily, as a way to avoid political pressure for reversals. Such reversals may impose far greater fiscal costs on central planners, at a sensitive time when fiscal debts are high following the COVID-19 pandemic crisis.

Appendix

<i>Funded rank</i>	<i>State</i>	<i>Dominant pension scheme (accrual rate)</i>	<i>Average replacement rate</i>	<i>The second order</i>	<i>The third order</i>
High funded	Denmark	Mandatory occupational DC	74%	High coverage in the funded pension scheme	High first tier. Minimum (36% AW)
	Switzerland	Dominant DB + Mandatory occupational DC	42.4% Full career—44%	High coverage in the funded pension scheme; 2019—increasing public pillar contributions Risk for self-employed	Minimum (22% AW)
	UK	Dominant DB (fixed benefit) + Mandatory personal DC	21.7% Full career—30%	Funded-1993; 50% coverage on funded pension schemes	Basic
	Netherlands	DB (1.75% + 0.77%B) + Mandatory occupational DC	70.9% Full career—80%	High coverage in funded pension scheme	Minimum (12.50 Euros a month) + Social assistance
	Canada	DB (0.63% + 0.3%5B)+DC	39%		Minimum (32% AW) Social assistance + Holistic model basic pension
	Israel	Mandatory personal DC	50.10%	1995—Funded; Transition from DB to radical DC with minimum state intervention; High coverage in funded funds	Basic + rate-of-return subsidy (from the 1970s)
	Ireland	Mandatory personal DC	27% Full career—35%	Less than 60% coverage in funded pension schemes	Minimum (34% AW)
	Iceland	DC	70%		Social assistance

(Continued)

<i>Funded rank</i>	<i>State</i>	<i>Dominant pension scheme (accrual rate)</i>	<i>Average replacement rate</i>	<i>The second order</i>	<i>The third order</i>
Mix pension scheme	Lithuania	Dominant Points (0.5% + 0.4%B) + DC	24%	2004-Funded; since 2009—Downsizing individual accounts; first pillar dominant—point scheme	Minimum (12% AW); Insurance as part of the point system by contributions;
	Finland	NDC (1.5%)	57%		Minimum/Social assistance
	Germany	Points (1%) + Mandatory personal DC	38.7% Full career—50%	40% coverage on funded pension schemes	Minimum (20% AW)
	Norway	Dominant NDC (1.05% + 0.4%B) + Mandatory occupational DC	45%		High first tier. Minimum (32% AW)
	Estonia	Points + DC	51%	Funded—2002; 2009—suspension contribution to the second pillar. Transition to a NDC pension scheme	Basic/universal benefit
	Slovakia	Dominant Points (1.19%) + DC	62%	2005—Funded; Since 2012 reducing contribution to individual accounts. Since 2017—increasing up to 6% in 2024	Basic (23% AW). Since 2009 minimum rate-of-return—Pension fund management companies are required to guarantee a zero percent rate-of-return every six months
	Russian Fed.	Points + DC	49.60%	Funded—2002; 2012—Contributions to individual accounts are diverted to social insurance	Minimum (4,983 RUR); Basic pension indexed to the average wage

<i>Funded rank</i>	<i>State</i>	<i>Dominant pension scheme (accrual rate)</i>	<i>Average replacement rate</i>	<i>The second order</i>	<i>The third order</i>
Mix pension scheme	Latvia	NDC + Mandatory personal DC	45%	2001—Funded; 2009—Reversal; 2009—Individual account contribution reduced from 5.5% to 1.5%; In 2016 after stabilizing—gradual increase to 6%; High coverage in funded funds. The pension yields in the DC are negative on average (−1%). 1st pillar dominant—a NDC scheme	2014—minimum income level of 40% of the median income; 2017—Minimum (17% AW)
	Sweden	Dominant NDC + Mandatory personal DC	54.10%	1994 ' Transition from DB to NDC; High coverage in funded funds	Minimum (31% AW)
	Poland	NDC (0.67%)	29.4% Full career—37%	1999—Funded; 2014—Terminating individual accounts and transferring to “ZUS” all individual accounts back to social security PAYG and mandatory public NDC; Option to voluntary contributions to private funds	Minimum (including the minimum rate-of-return from a band)
	N. Macedonia	Dominant DB + DC		2006—Funded; 2011—Reversal; Contributions to mandatory individual accounts reduced from 7.42% to 5.25% and strengthening the first pillar	Minimum (82% MW)
	France	Points (1.75%)	60.1% Full career—62%		Minimum (23% AW)
	Italy	NDC (1.75%) + Mandatory personal DC	79.5%	Less than 20% of overall participants enrolled in funded pensions; Generous pension scheme—For full career replacement rate of 90%	Minimum (24% AW)

(Continued)

<i>Funded rank</i>	<i>State</i>	<i>Dominant pension scheme (accrual rate)</i>	<i>Average replacement rate</i>	<i>The second order</i>	<i>The third order</i>
Dominant DB scheme	Bulgaria	DB + private DC	69.3%	2002—Funded; 2007—Reversal; 2014—second pillar account holders were allowed to return to the first pillar while refunding their account balances to the government (this option is available until five years before retirement)	Minimum since 2014
	Slovenia	DB (1.25–1.38%) + voluntary DC	39.0%	1999—funded; 2012—reverting back to DB with no mandatory funded fund	2012—Social redistribution laws. Solidarity and minimum pension Minimum (35% AW)
	Belgium	DB (1.33%)	46.6% Full career—62%		Minimum For low earners, the replacement rate—71%
	Spain	DB (2% until 2019) + Private DC (Voluntary)	73.3%	Less than 5% of an overall participant enrolled in funded pensions; Generous pension scheme—For full career replacement rate of above 80%	Minimum (27% AW): 657 Euro per month + means-tested program Work break of 5 years does not influence future benefits. For low earners, replacement rates—83% on average
	Portugal	DB (2.25%) + Private DC (Voluntary)	74.4%	Less than 5% of overall participants enrolled in funded pensions; Generous pension scheme—For full career replacement rate of above 90%	Minimum (30% AW) + means-tested (11% AW)

<i>Funded rank</i>	<i>State</i>	<i>Dominant pension scheme (accrual rate)</i>	<i>Average replacement rate</i>	<i>The second order</i>	<i>The third order</i>
Dominant DB scheme	Austria	DB (1.78%) + Voluntary DC	76.5%	Less than 15% of overall participants enrolled in funded pensions	Minimum (30%AW) + means-tested social benefits
	Greece	DB (2.57%)	49.9%		Minimum (34% AW)
	Ukraine	DB		2004—Introduction of individual accounts—low coverage. 2017—Increasing benefit only for the current generation	Minimum (2016)
	Moldova	DB	25.8%		Minimum (2017)
	Serbia	Points (1.28%)	70.9%		Minimum (25% AW)
	Albania	DB	40.5%		Basic
	Luxembourg	DB	76.70%	Less than 7% of overall participants enrolled in funded pensions	Minimum (36.8% AW)
	Kazakhstan	DB		1998—Funded; 2004—Starting reversal trend back to DB; 2013—Consolidation of ten private pension funds into the public pension fund (UPF); Implementing PAYG DB financed by the state budget and managed by the National Bank of Kazakhstan	Minimum—2013—BSP; 2018—54% MW

Notes

1. As the government cancels its obligation to maintain the specific replacement level, its financial position changes as the pension design transition goes ahead. The government buys options for the former particular level of replacement.
2. In other words, individuals, through buying annuities, absorb the longevity risk as a group belonging to the same-age cohort.

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