

# Improving pension savings investing: The case of Russia

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## Abstract

Many countries seek to improve their pension systems by introducing corporate and individual savings plans to address the challenges of demography, social security, and economy. However, the establishing of a long-term, reliable savings system encounters multiple impediments. The retrospective analysis of Russian pension reforms offers some recommendations on solving the typical problems faced by reformers. Thus, in 2002 the Russian pension system was implemented by a mandatory savings pillar, which 20 years later the Ministry of Finance substituted by voluntary savings. As this period appeared shorter than the average life span, this measure proved ineffective in increasing pension payouts for future retirees. The frequent regulatory changes and the shrinking workforce coverage as the state prioritized the welfare of the current pension recipients also infringed upon the interests of future retirees. Pension savings investments were further affected by the economic policy aimed at the minimal return requirements which resulted in a more conservative asset allocation strategy and inefficient active management in non-state pension funds. The study demonstrates that policy actions to overcome these impediments and to raise the replacement rates for future retirees should include (a) steady regulations within a pension savings system of no shorter than 40 years; (b) the savings pillar covering no less than 80% of the workforce; and (c) the asset allocation strategy involving a bigger share of equity, longer time horizon and clear benchmarks. These recommendations can be applied to emerging market economies concerned with improving and reforming their pension systems.

*Keywords:* non-state pension fund, mandatory pension savings, replacement rate, pension savings portfolio.

*JEL classification:* G11, G17, G18, H55, J14, J26.

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## 1. Introduction

As the economic and financial landscapes evolve, the challenges of creating and managing pension savings are a pressing concern for each country and its government. The mandatory pension savings pillar has become a common solution. The World Bank (1994) accelerated the introduction of pension savings in developing countries by establishing a mandatory pension savings system and proving the need for multitier pension systems and privatization of public pension plans. However, there is no consensus in the economic literature on the factors determining the success of such programs or on measures that define success, including investment performance, coverage, and other parameters. Examining the experiences of various nations while considering the unique characteristics and outcomes of such reforms is the primary method for studying such complex systems. For example, the OECD (2022) emphasizes the importance of learning from past experiences in reforming the pension system, learning what works well, and learning what could work differently.

The history of the pension savings system in Russia is an important and complex case, the study of which can offer valuable options to policymakers undertaking similar reforms in the future. In 2002, the formation of a mandatory pension savings system began in Russia, and by the end of 2022, the Russian Ministry of Finance announced plans to privatize pension savings and transform this system into voluntary pension plans and a long-term savings program. This study aims to provide an understanding of the long-term experience of pension savings investing, focusing on empirical evidence and an evaluation of the performance of non-state pension funds (NPFs).

Our key contributions to the topic of pension savings investments are summarized as follows.

If the existing mandatory pension savings rules had been persistent for a 40-year time horizon, the favorable macroeconomic conditions and high returns of financial instruments developed in the 2010s could have made it possible to reach a 75% replacement rate for lost earnings for a person with an average wage. The key challenge for the government was keeping the “rules of the game” unchanged and maintaining the stability of financial markets.

The state’s desire to support the outpacing growth of pension payments to current pensioners was one of the primary reasons for terminating the mandatory pension savings system. Owing to frequent rule changes, the redistribution of pension savings to pay for state insurance pensions, and the interruption of savings plans after only 20 years, it has been difficult to fully recognize the benefits of funded pensions over insurance pensions.

The results of pension savings investments by non-state pension funds are hardly satisfactory. The average gross return of the pension savings portfolios fell short of inflation between 2005 and 2022. The excessively conservative asset allocation strategy chosen by funds on their own initiative and the unfavorable effects of active portfolio management are the main drawbacks of investing pension savings in NPFs.

The remainder of this paper is organized as follows. The first section provides a brief literature review and theoretical context for designing and administering pension savings systems. The second section provides an overview of the imple-

mented global funded pension reforms and the major issues that have arisen. The third section provides a historical overview of the implementation, reform, and seizure of the mandatory pension system in Russia, as well as empirical evidence of pension savings reform in Russia from 2002 to 2022. The fourth section describes the stochastic model that we employ to determine the necessary conditions for the successful investment of pension savings and to establish criteria for evaluating the performance of this process. The fifth section examines the results of managing pension portfolios for non-state pension funds as well as the factors contributing to the observed underperformance. The conclusion provides primary recommendations for changing the mandatory pension savings system and pension savings investment.

## 2. Literature review and theoretical background

Since the second half of the twentieth century, many countries have been modernizing their pension systems, involving the use of corporate and individual savings plans, as well as state pension programs. Objective factors such as the increasing demographic burden on the working population, the lengthening of life expectancy and consequently, the periods of pension payments, the substantial increase in public spending on social security needs, changes in employee structure and motivation to work, and the intent to form an additional source of long-term funding for economic development all contribute to the need for savings plans.

Hayek (1960) and Friedman (1962) predicted the emergence of a funded pension, viewing private financial services as an alternative to expanding the role of the state in social insurance. The idea of private pension systems became popular as a result of changes in the world economy during the 1970s, which ended the active social policy of welfare states, as well as the implementation of liberal market reforms in the 1980s and the 1990s, which led to an increase in openness of economies, free movement of capital, and growth of financial markets. The destruction of the administrative-command economies of former socialist countries, as well as the need for pension reforms in these countries, was a significant catalyst for the use of funded plans.

The economic literature lacks consensus on the factors accelerating the implementation of mandatory funded pension plans. Each country has unique motivation from political reasons through government fiscal deficits to demographic conditions (Immergut and Anderson, 2007; Verbič and Spruk, 2019; Müller, 2003; Gyra, 2013; World Bank, 2019). More important for the current study are the criteria that governments use to measure or target the success of funded plans' implementation.

Several conditions must be met for the successful investment of pension savings, according to empirical evidence from mandatory pension savings implementation. First, persistent rules of the game and continuous operation of financial markets are required for at least a typical working and accumulation period of 40 years and a subsequent payout period of 20 years for each individual (Rashid et al., 2003; Sinyavskaya, 2011; OECD, 2020; World Bank, 1994).

When tracking the effectiveness of a funded system, it is important to evaluate its effects on the replacement rates of the lost earnings of workers with various

income levels and the sufficiency of savings for the entire survival period (Impavido, 2010; Rudolph et al., 2010). Only if the long-term profitability of pension savings investment exceeds inflation and wage growth rates do savings plans significantly increase replacement rates for lost earnings (Maleva and Sinyavskaya, 2005; Sinyavskaya, 2011; World Bank, 1994). The profitability and risks of financial assets must be evaluated using stochastic approaches to predict how pension savings will affect the well-being of participants (OECD, 2020). According to Rudolph et al. (2010), Blanchett (2014), Mitchell (2020), Poterba (2014), and the OECD (2020), the risk management of pension savings insufficiency depends on investment return as well as adjustments to contribution rates, the duration of the accumulation period, and the method of receiving regular pension payments.

Funding schemes should aim for the broadest possible coverage of the labor force, including workers with low incomes. Plans involving auto enrollment, in which employees are automatically enrolled in the pension plan when signing an employment contract, have significant potential for expanding the range of employees covered by pension plans (Benartzi and Thaler, 2004; GAO, 2022; Mitchell, 2020; Benz and Ptak, 2022).

Empirical studies suggest recommendations for improving pension savings investment efficiency, focusing on market characteristics and asset allocation rather than active management methods, such as security selection or market timing (Brinson et al., 1986, 1991; Ibbotson et al., 2000, 2010; Munnell et al., 2012). Pension savings portfolios should be less conservative, focusing on long-term stock investments and global diversification for high performance (Bekaert et al., 2016; Blanchett et al., 2013; Estrada and Kritzman, 2019; Jordá et al., 2017; World Bank, 1994).

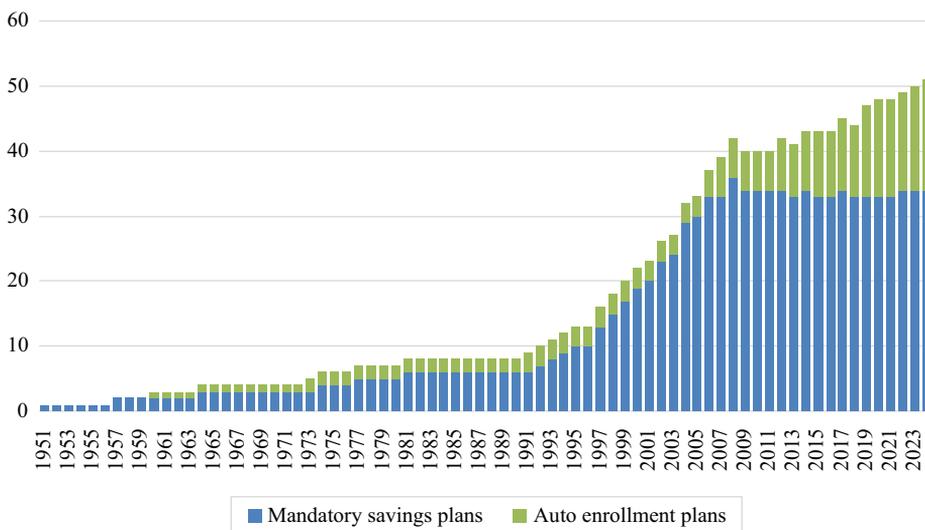
It is necessary to use benchmarks created by considering the structure of individual portfolios to evaluate the outcomes of managing pension savings portfolios (Lim and Wong, 2010; OECD, 2020; Rudolph et al., 2010; Rudolph and Saba, 2016). Finding the right balance between applying prudent investor rule and stringent government regulation to pension savings portfolios is crucial (Abramov et al., 2015; Davis and Yu-Wei, 2009; Brunner et al., 2008; Rudolph et al., 2010). Personifying individual portfolios, utilizing life cycle strategies, and using robo-advisors can further enhance an insured person's well-being (Mitchel, 2020; Mitchell and Utkus, 2021; OECD, 2020; Rudolph, 2019).

As demonstrated in the fifth section, ignoring recommendations can lead to inefficient investment of pension savings in non-state pension funds.

### **3. Personal savings pension plans in the world**

The first mandatory savings plans were established in Malaysia in 1951, Singapore in 1957, Denmark in 1964, Iceland in 1974, Chile in 1980, and Australia in 1992. Unlike voluntary savings programs, these pension plans require certain groups of the population to participate to ensure a higher level of coverage of the working-age population, including workers with relatively low labor incomes.

The World Bank (1994) report substantiated the need for countries to switch to a multitier pension system, privatize pension plans, and form a mandatory pension savings system, which accelerated the introduction of pension savings



**Fig. 1.** Number of countries with mandatory pension savings plans and corporate auto enrollment plans, 1951–2024.

Source: Authors' calculations.

in developing countries. This report has largely served as the foundation for national system reforms carried out with open discussion and World Bank financial support (Müller, 2001; Orenstein, 2008; Ortiz et al., 2018). According to Orenstein (2008), 52 countries received various forms of World Bank assistance in implementing pension reforms between 1994 and 2004.

There is yet to be a single evaluation of the effectiveness of the process of establishing private pension systems in the 1990s and the 2000s. Although these reforms have been criticized (Ortiz et al., 2018), we believe they have contributed positively to the development of a more robust and diverse pension system in most countries. The number of countries using mandatory pension savings increased from six in 1981 to 34 in 2023 (Fig. 1), and auto enrollment funded pension plans are now observed in 16 countries (only two in 1981). Our calculations are based on a sample of 83 countries, representing approximately 75.2% of the world's population and 94.6% of global GDP in 2022. Corporate auto enrollment plans became available in Ireland starting on January 1, 2024. Only a few countries (Argentina, Hungary, Bolivia, Slovakia, and Poland) have abandoned mandatory funded pensions, with the latter two introducing auto enrollment corporate pension plans.

As Fig. 2 shows, the global value of assets in funded pension plans (including defined contributions and funded defined benefit plans) increased 9.4 times from \$5.2 trillion in 1992 to \$49.1 trillion in 2022. Over the same period, the share of these assets in global GDP increased from 20.5% to 48.8%. This significant growth highlights the increasing importance of these plans in the global economy. It also suggests a growing recognition of the need for individuals to secure their financial future through long-term savings and investment.

The severe turmoil experienced by the financial markets of developing countries over the past 20 years has complicated the management of pension savings schemes. Table 1 shows that in Estonia, Latvia, and Russia the return of pension savings portfolios was below the inflation rate. However, in most emerging mar-

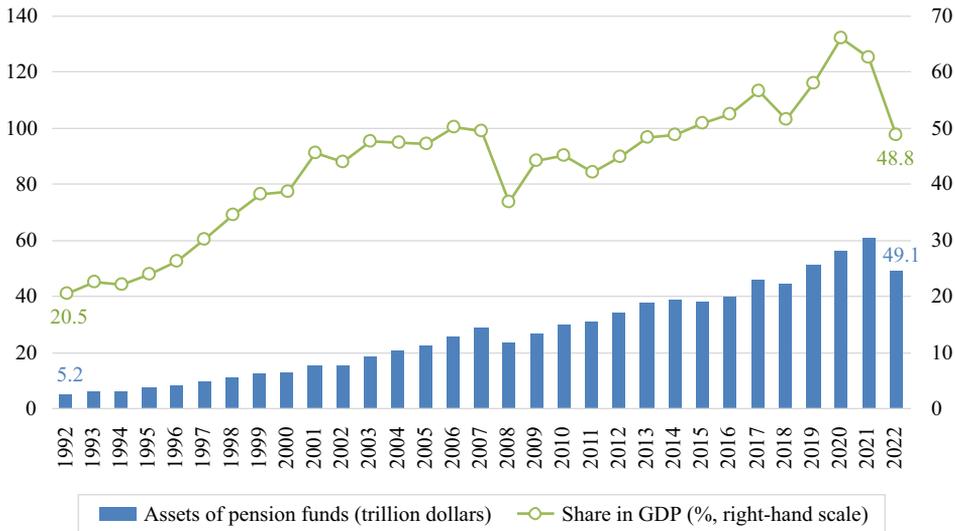


Fig. 2. The value of pension fund assets in the world (total all funds' assets), 1992–2022.

Source: Authors' calculations based on OECD Funded Pension Statistics data.

Table 1

Annualized real returns on pension portfolios in a sample of developed and developing countries over long-term horizons (%).

Developing countries	Period	Real return, %	Developed countries	Period	Real return, %
Chile	2003–2022	3.1	Australia	2003–2022	4.0
Colombia	2003–2022	4.8	Germany	2003–2022	1.9
Poland	2002–2022	2.0	Denmark	2003–2022	3.3
Estonia	2003–2022	−0.6	Canada	2003–2022	4.1
Romania	2008–2022	0.7	Iceland	2003–2022	3.3
Latvia	2003–2022	−1.4	Netherlands	2003–2022	3.1
Lithuania	2004–2022	1.7	Norway	2003–2022	3.5
Croatia	2002–2022	2.2	Switzerland	2003–2022	2.8
Russia	2004–2022	−0.5	USA	2003–2022	1.0
Average		1.3	Average		3.0
Strategy 60/40:					
Developing countries <sup>a)</sup>	2004–2022	2.3			
Russia	2004–2022	5.5			

Note: <sup>a)</sup> U.S. dollar return of the portfolio, consisting of MSCI EM index and ICE BofA Emerging Markets Corporate index, minus U.S. inflation.

Source: OECD (2023a); Better Finance (2023); MSCI (<https://www.msci.com/our-solutions/indexes>); Federal Reserve Bank of St. Louis (<https://fred.stlouisfed.org>); author's calculations

kets, mixed equity and bond portfolios had positive real returns. The average real return of the nine emerging markets was 1.3%. Moreover, the 60/40 mixed strategy, consisting of equities and corporate bonds, had real return 2.3% for developing countries and even higher real return of 5.5% for Russia despite the severe effects of the sanctions in 2022. Thus, even under current conditions, the prerequisites for successful pension savings system remain in most developing countries.

The coverage of mandatory pension savings and auto enrollment plans, especially among workers with low incomes, remains an important performance

indicator since larger coverage leads to larger pension portfolios and more efficient investment due to economies of scale. According to OECD (2023b) data, by 2022, 65.4% of the working-age population was covered by pension plans with mandatory and quasi-mandatory<sup>1</sup> savings requirements. In Denmark and Latvia, mandatory savings covered 100% of the working-age population; in Sweden, they covered 96.4%; in Bulgaria, 88.4%; in Chile, 84.3%; in Iceland, 83.2%; in Russia, 79.3%; in Australia, 78.5%; and in Mexico, 71.9%. Corporate plans involving auto enrollment had an average workforce coverage rate of 50.5%, with coverage rates of 80.8% in New Zealand, 78.8% in Lithuania, 52.0% in the United Kingdom, 13.4% in Turkey, and 11.0% in Poland.

As a result of increased financial market volatility and numerous challenges to the global economy during the 2008 global financial crisis, the Eurozone crisis in 2011, the COVID-19 pandemic in 2020, and the escalation of geopolitical conflicts in 2014 and 2022, many countries have been forced to significantly change the parameters of their pension systems, including mandatory savings pillar. OECD (2017, 2019, 2021) reviews provide an in-depth discussion of these changes. In this study, we focus on only a few major structural changes that occur in a system of mandatory pension savings.

The development of auto enrollment plans, in which employees are enrolled in the corporate program by default unless they specifically opt out, is one of the directions of structural reforms of funded pension plans. Such plans are becoming more prevalent as an alternative to mandatory pension savings (Poland, Slovakia) and as an addition to the voluntary programs of the second pillar pension system in countries where mandatory pension savings were not implemented (USA, New Zealand, Great Britain, Turkey, Ireland). Similar to mandatory pension plans, auto enrollment plans tend to have high coverage rates and encourage voluntary increases in contribution rates (Thaler and Sunstein, 2008; OECD, 2012; Heinz and Rudolph, 2016; Rudolph, 2019). Furthermore, these plans may offer more flexibility to both employers and employees than mandatory pension savings. Corporate auto enrollment plans are currently available in the following countries: Poland (since 2019), Turkey (since 2017), Italy (since 2007), Denmark (since 1991), Sweden (since 1960 for white-collar workers and since 1973 for blue-collar workers), the United Kingdom (since 2012), the United States (since 2006), New Zealand (since 2007), the Philippines (since 2020), Lithuania (since 2019), Georgia (since 2019), Brazil for federal government civil servants (since 2012), Chile for self-employed (since 2015),<sup>2</sup> and Canada (since 2014) for those employed in Quebec. Countries implementing this type of pension plan include those with civil law (e.g., Italy, Poland, Turkey, Brazil, and Chile) as well as those with common law.

Various types of pension savings plans are still being implemented all over the world. The fact that pension systems differ in viability and efficacy from country to country emphasizes the importance of separately assessing each experience. We examine the Russian case in the following section.

<sup>1</sup> Corporate savings plans in continental Europe and Scandinavia where mandatory employee participation in plans is ensured not by direct legislation, but by the requirements of collective agreements involving employers and trade unions.

<sup>2</sup> It can be viewed as a temporary measure designed to prepare self-employed people for the transition to the mandatory pension savings system that applies to all employees.

#### 4. Past and future of pension savings plans in Russia

In this section we provide a brief history of reforms of the mandatory pension savings in Russia. The assessment of the performance of pension funds is not complete without an economic context that describes how often rules have changed, structural changes have been made or the composition of participants was altered. In addition to portfolio management problems, that we can access, the pension funds in Russia faced a very volatile regulatory environment, which also had a significant impact on the decline in performance.

Russia implemented mandatory pension savings in 2002 with the goal of addressing strategic tasks such as increasing payments to future retirees, reducing the demographic burden, linking pensions to lost work income, increasing personal responsibility for financing future pensions, and ensuring social security financial stability. The pension reform also sought to reduce illegal or untaxed labor income, employer tax burdens, state monopolies in pension activities, and the pension system's reliance on political factors (Maleva and Sinyavskaya, 2005).

After many frequent changes, the final model of funded pension plans was put together in 2008, considering the best world practices. Of the total social contribution to the Pension Fund of the Russian Federation (PFR), 6% of employee's income were transferred to the employee's individual pension account in the PFR or a non-state pension fund.

Employees had three options for investing pension savings: investing through private management companies, transferring savings to NPFs, or, by default, leaving savings in the PFR under the management of the state management company VEB (formerly Vnesheconombank). Men and women born in 1967 and younger were required to participate in the savings plans. In 2004, the NPFs began to administer mandatory pension savings.

Employees' mandatory participation in funded pensions ensured a wide range of coverage for the working population. Enacted during the rise of the domestic stock market, the emergence of the corporate bond market, and the deceleration of inflation, this reform inspired optimism that it would significantly enhance the quality of life for future retirees. Savings could have provided a long-term financial foundation for subsequent stock market growth and investment.

The pension savings pillar has been subject to restrictions since mid-2010. Federal Law No. 167-FZ was amended in 2014,<sup>3</sup> introducing a temporary moratorium on new contributions and reallocating 6% of wages (previously allocated to pension savings) to the insurance component of the labor pension. The moratorium is extended until 2025.

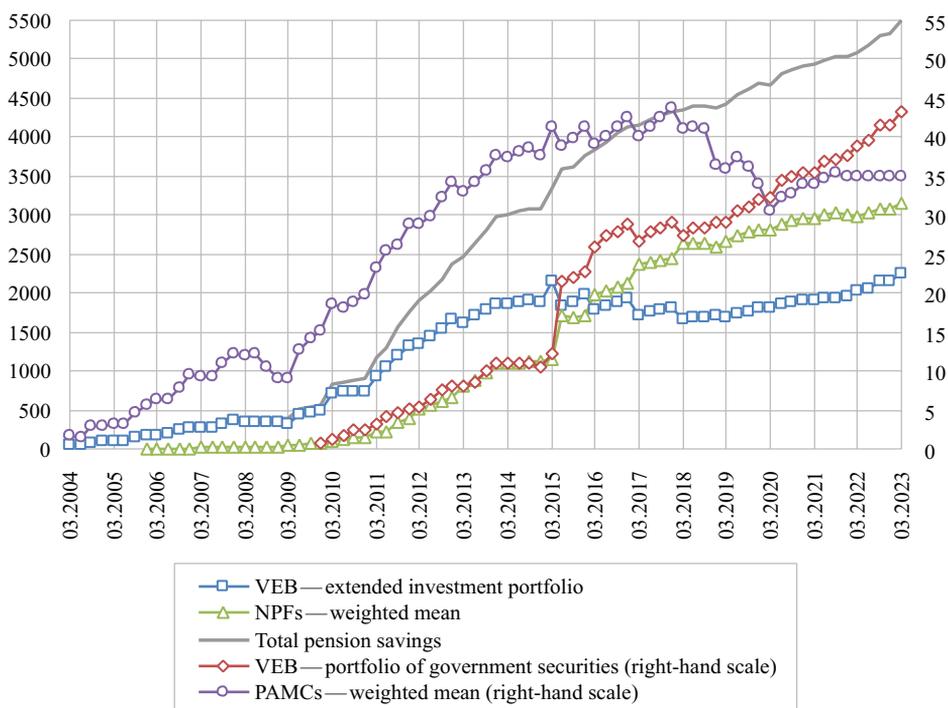
Two factors influenced this decision. The government prioritized increasing state pensions for current pensioners over payments to future retirees through funded plans, resulting in a limitation of funded social contributions and redistribution of funding sources in favor of insurance pensions (Sinyavskaya, 2011; Abramov and Chernova, 2023). Consequently, the cohorts of men and women born in 1953–1966 and 1957–1966 were removed from the pension savings system in 2005, the previously anticipated increase in the rate of contributions to the funded pension of up to 6% was slowed down and was completed only

<sup>3</sup> [https://www.consultant.ru/document/cons\\_doc\\_LAW\\_34447/](https://www.consultant.ru/document/cons_doc_LAW_34447/)

in 2008, and ultimately, the contributions to the funded pension were frozen in 2014. Another reason is the underperformance of pension savings in NPF and management company portfolios, which is the subject of this study.

Fig. 3 demonstrates that by the first quarter of 2023, total pension savings reached 5.5 trillion rubles, or 3.6% of GDP. Of this amount, 3.2 trillion rubles (2.1% of GDP) were held in NPFs, 2.3 trillion rubles (1.5% of GDP) were in the portfolios of the State Management Company, and 0.03 billion rubles (0.02% of GDP) were in the portfolios of private management firms. Since contribution rates increased to 6% in 2008 and until a moratorium on pension savings was enacted in 2014, pension savings grew at their highest annual rate of 52.1%. Although the contribution rates were lower between 2004 and 2008, savings increased by an average of 45.4% annually. However, from 2014 to 2022, savings grew by only 6.8% annually, after the moratorium. Contrary to what was anticipated at the beginning of the reform, the size of pension savings in non-state pension funds eventually exceeded that in the State Management Company only by 2014.

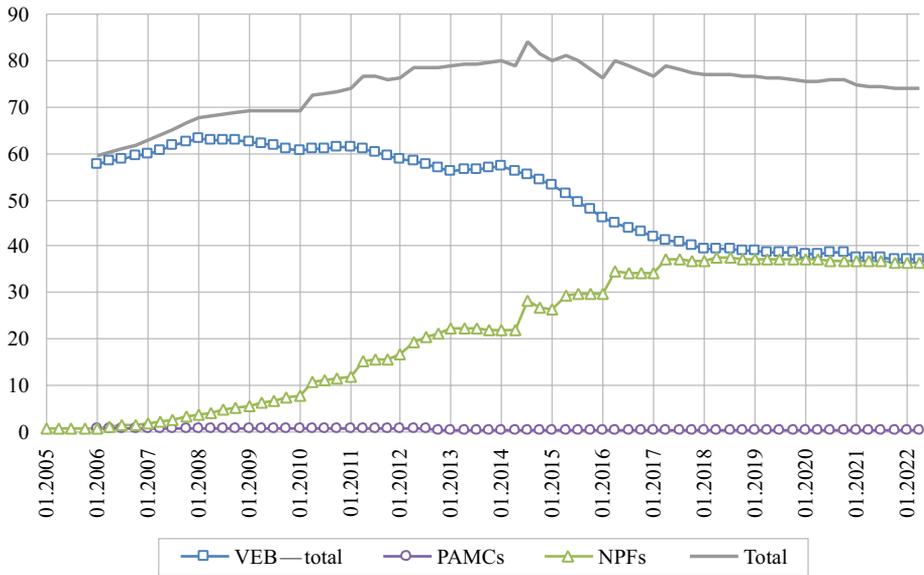
Pension savings have a significant impact on domestic financial markets. Pension savings accounted for an average of 11.42% of government bond funding sources in 2022 compared to 25.6% in 2011. The NPF pension savings portfolios were reoriented, primarily toward corporate bonds with higher yields, which had an impact on this decline, in addition to the moratorium introduced in 2014.



**Fig. 3.** Market value of pension savings by different groups of asset managers, and total, 03.2004–03.2023 (billion rubles).

*Note:* Market value of pension savings in private asset-management companies (PAMCs) and in VEB's portfolio of government securities is comparatively small (35 billion and 43 billion rubles compared to 5,494 billion rubles total in Q1 2023) and both lines are hardly visible.

*Source:* Authors' calculations based on data from NPF Constructor project (<https://ipei.ranepa.ru/ru/npf-ru>), Bank of Russia, and Pension Fund of the Russian Federation.



**Fig. 4.** Number of insured persons in the funded part of the pension system, 01.2005–02.2022 (million).

*Note:* The share of private asset-management companies (PAMCs) in a number of insured persons is comparatively small (0.2 million people compared to 73.8 million total) and the line is hardly visible.

*Source:* Authors' calculations based on data from NPF Constructor project (<https://ipei.ranepa.ru/ru/npf-ru>), Bank of Russia, and Pension Fund of the Russian Federation.

Pension savings accounted for an average of 13.75% of the value of corporate bonds in 2022, peaking at 21.88% in 2016. Savings had a symbolic impact on domestic stock market demand over the years, with an all-time high of 0.99% in 2016 and 0.42% in 2022.

One notable achievement of the pension savings system is the high coverage rate of the working-age population with funded plans, which reached 88.67%, or 73.99 million people, in 2022 (Fig. 4), of which 36.57 million were served by the NPFs. Corporate pension plans that cover the majority of the working population not only broaden the pool of individuals interested in enhancing their own financial security and ensure the financial viability of corporate plans but also provide extremely diverse groups of insured individuals with access to tax incentives for saving, economies of scale, and risk diversification.

The Federal Government regulates pension savings investment. Several main asset classes are available for NPF portfolios. Restrictions are presented in the form of a limit on the percentage of each asset in the portfolio as well as the concentration requirements. Over time, Russia's pension savings system has undergone several restriction relaxations (Table 2).

The performance of pension savings portfolio management is not sufficiently transparent. First, the Bank of Russia began to disclose the returns of these portfolios in 2013. Because reports are only released quarterly, it is impossible to calculate risk indicators for NPF portfolios, such as standard deviation or value-at-risk (VaR). NPFs are required to disclose various types of returns that frequently differ significantly. There is no unified official database of historical data on the financial and investment reports of NPFs.

**Table 2**

Evolution of pension savings portfolio limits by main asset class (%).

Asset class	Maximum share of an asset in a portfolio				
	Since 2002	Since 2005	Since 2007	Since 2009	Since 2015
Cash	20	20	20	80	80
Deposits	20	20	20		
Mortgage securities	40	40	40	40	40
Government bonds	100	100	100	100	100
Corporate bonds	50	60	80	80	80
Municipal bonds	40	40	40	40	40
Equity	40	45	65	65	65
Foreign investment funds	0	0	20	20	20

Source: Compiled by the authors.

Nonetheless, the RANEPА Institute for Applied Economic Research’s NPF Constructor database<sup>4</sup> allows for the evaluation of many indicators of NPF activities in managing pension savings. Data from the State Pension Fund, 29 active non-state pension funds, and 76 liquidated non-state pension funds that managed pension savings from 2005 to 2022 are included in our sample. Each NPF has a single portfolio, whereas the State Pension Fund allocates pension savings to two VEB portfolios and several private asset management companies (PAMCs). Full data for the state pension fund for 2022 had not yet been made public at the time of this publication

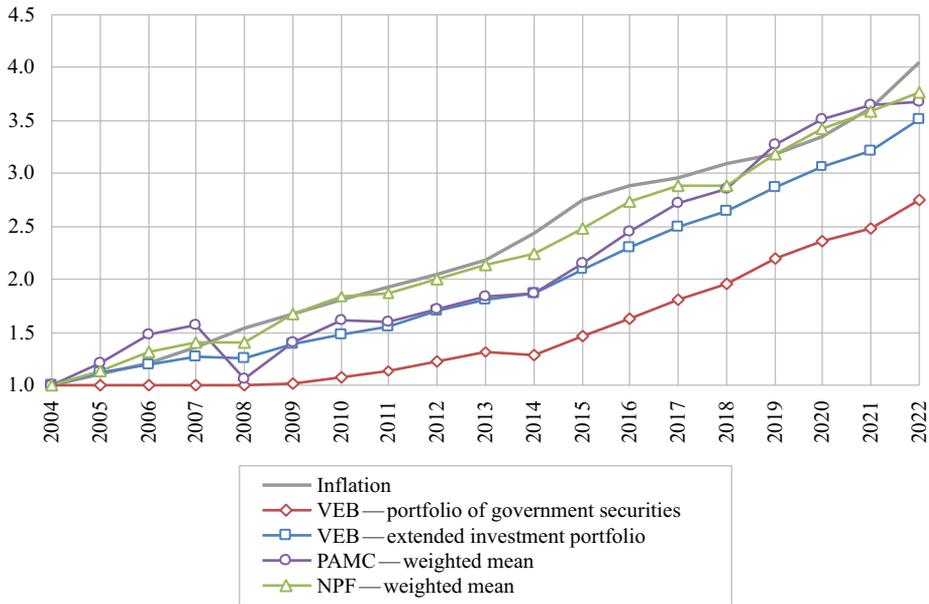
Pension savings portfolios did not perform as well as anticipated. All pension savings portfolios had a cumulative return between 2005 and 2022, which was lower than the cumulative inflation rate (Fig. 5). The most successful portfolios were those in private asset management companies, to which the PFR transfers only a small portion of the savings, and in NPFs. With an annualized inflation rate of 8.1%, the average returns for PAMC, NPFs, and VEB’s extended portfolio were 7.5%, 7.6%, and 7.2%, respectively.

Following pension savings moratorium, the Russian Federation’s government and the Bank of Russia actively promoted corporate pension plans as an alternative to the mandatory pension savings system. Plans to establish investment pension capital (IPC),<sup>5</sup> an automatically subscribed corporate pension plan, were made public in 2016. These proposals called for the introduction and gradual increase in employee contributions to the new corporate plan of up to 6% of earnings, with the government cofinancing these contributions. Employer contributions were not required (Rudolph, 2019). It was intended to establish a new central pension administrator (CPA) based on an entity chosen by the Bank of Russia to manage IPC. The idea was to use NPFs to invest these savings, giving participants the option to select the best fund. Additionally, over a 5-year time frame, pension funds had to guarantee the preservation of the market value of contributions. The proposed IPC mechanism in Russia was similar in many ways to the occupational pension plans for auto-enrollment introduced in Turkey in 2018.

The Russian government’s social bloc believed that the auto enrollment mechanism violated Civil Code requirements, resulting in unsuccessful promo-

<sup>4</sup> <https://ipei.ranepa.ru/ru/npf-ru>

<sup>5</sup> <https://www.cbr.ru/press/event/?id=613>



**Fig. 5.** Cumulative pension savings portfolio returns and inflation, 2004–2022 (end of 2004 = 1).

*Note:* The share of private asset-management companies (PAMCs) in a number of insured persons is comparatively small (0.2 million people compared to 73.8 million total) and the line is hardly visible.

*Source:* Authors' calculations based on the data from NPF Constructor project (<https://ipei.ranepa.ru/ru/npf-ru>), Bank of Russia, Pension Fund of the Russian Federation, and Rosstat.

tion of IPC concept. The Bank of Russia rejected the later proposal to implement IPC in the form of ordinary voluntary plans.<sup>6</sup>

In 2019, the Russian Ministry of Finance published proposals for the implementation of guaranteed pension plans (GPP) instead of IPC.<sup>7</sup> In many ways, GPPs resembled IPC, including guarantees of the preservation of the market value of contributions. However, unlike the latter, GPPs were designed as voluntary pension plans administered by NPFs, with the assistance of a central pension administrator. Participation in GPP was intended to be encouraged through a variety of tax benefits, including personal income tax for employees and profit tax for employers. The Ministry of Finance decided to revise the relevant bill in February 2021 after the implementation of GPP was delayed.

The Long-Term Savings Program (LTSP), which came into effect on January 1, 2024, was approved as a result of improvements made in accordance with Federal Law No. 299 of July 10, 2023. The LTSP is a savings program that serves as a “safety cushion for individuals” in addition to being a pension product. The program requires a minimum of 15 years of participation. Participants are eligible for payments after this period or when they reach the age of 55 years for women and 60 years for men. A limited number of special life situations must occur for funds to be received earlier without penalty.

The state will provide more generous incentives for participation in the Long-Term Savings Program compared to GPP. Participants who contribute more than

<sup>6</sup> <https://www.interfax.ru/business/674142>

<sup>7</sup> The corresponding document was submitted as a comment to the official website on the Internet, where the relevant initiatives are discussed: <https://regulation.gov.ru/projects#npa=95019>

2,000 RUB can receive up to 36,000 RUB per year for the first three years of the program. They can also take advantage of a personal income tax base deduction for contributions of up to 400,000 RUB per year. Investment income from pension reserves in the LTSP will not be subject to taxation. NPFs are expected to manage pension reserves, abandoning the idea of a centralized administrator. Personal contributions will be insured for 2.8 million RUB.

As a result, beginning in 2024, the updated Russian pension system will include three tiers: state insurance pension, corporate pension, and individual pension plans. State insurance pensions are based on employers paying 22% of employees' wages and 10%<sup>8</sup> of wages above a predetermined limit (1917 thousand RUB per year from January 1, 2023). Corporate pensions form the second tier and retain mandatory pension savings with a freeze on new contributions until 2025. However, the fate of such savings remains unclear. The second tier includes the remaining former voluntary savings plans in non-state pension funds as well as the new Long-Term Savings Program, which is primarily funded by employee contributions. Participants in the LTSP will be able to enroll their previously accumulated pension savings in the new product. Individual pension plans, the third tier, will include voluntary supplementary pension programs managed by NPFs, life insurance products, and voluntary savings on individual investment accounts opened with various financial institutions.

Nonstate pension funds continue to be the primary administrators of investment portfolios in the remaining three types of corporate pension programs (plans) listed above. To understand how to invest not only the accumulated earlier pension savings but also the future assets of the new Long-Term Savings Program, it is crucial to assess the experience of managing pension savings portfolios.

## 5. The ideal model of pension savings portfolio in Russia

Before summarizing and analyzing the consequences of Russia's pension savings reform, we develop an ideal model of pension savings to show how this component of the pension system could improve the well-being of future retirees without frequent regulatory changes. This simple model, with several simplifications and assumptions, allows us to identify the combinations of growth rates of real wages, prices and market value of savings needed to achieve the sustainability of the pension savings system. We assess the form of pension savings model that existed before the moratorium on new contributions (until 2014).<sup>9</sup> Rather

<sup>8</sup> The Russian Federation's Pension Fund and Social Insurance Fund merged into the Social Fund of Russia on January 1, 2023. A single insurance contribution of 30% of earnings and 15.1% of earnings exceeding a predetermined limit was introduced. The old-age pension contributions, however, remained essentially unchanged.

<sup>9</sup> We assume that a typical pension system participant is 25 (or 45) years old. He intends to live for another 60 (40) years, of which 40 (20) will be spent working and 20 will be spent in retirement. In 2021, the average monthly salary was 57,244 rubles (\$777,24). To model the expected the replacement rate (RR), the conditions for the formation of pension rights at the beginning of 2022 were considered, assuming the existence of a funded element. The total contribution rate was 22%. We assume that 16% is allocated to social insurance and 6% to pension savings portfolio (as of 2023, 22% and 0%, respectively). The taxable base for the formation of pension rights was 1,565,000 rubles per year as of January 1, 2022. An extra 10% is charged over this amount, but these contributions are not reflected in the individual account or pension points for the insured person. Insurance pension is indexed by the extent of inflation.

than predicting what could have happened if pension savings were left intact, we aim to describe the conditions necessary for investment management, under which such a system can improve the well-being of its participants.

We assume that pension savings transform into pension growing annuity (to include indexing of pensions both for insurance and savings elements) when a person reaches 65 years. We start from an average wage in Russia and model several growth rates, considering that only a part of income that is less than the legislative limitations can be used for contribution. The faster the wages grow, the less will be the contribution to pension savings (maximum 6% of the legislative limitations). It means that real wage growth, inflation rate and returns are main factors of replacement rate.

The replacement rate (RR) for the lost earnings of insured persons is the primary indicator of the efficiency of pension savings investments. To achieve a median replacement rate of not less than 75% for a person with an average income, we estimate the minimum return required when combined with inflation and wage growth rates. Although the necessary RR can differ for each individual, the chosen target level is a reasonable starting point for most households, as highlighted in several studies (Blanchett, 2014; Munnell et al., 2014). The calculations were performed using the insured person's active employment periods of 40 and 20 years. In addition, the likelihood of an early pension savings runout for the ensuing 20 years following retirement should be minimized.

This simple model shows that for the success of pension savings nominal wage growth should be less than nominal return of savings portfolio during accumulation phase. During periods with high nominal wage growth, the pension funds need to choose investment strategies with higher risks and returns to achieve target replacement rate. Data shows that on average safer assets (bonds, deposits) dominated their portfolios from the start of pension savings introduction. We use our model to show the consequences of this decision.

According to Table 3, the development of the pension savings system was hampered by difficult economic conditions. While the annual nominal returns on government bonds and the 60/40 strategy (8.63% and 16.54%, respectively) exceeded inflation, the nominal wage growth rate of 14.15% outpaced both inflation rate and government bond return. Notwithstanding these obstacles, the 60/40 strategy<sup>10</sup> surpassed both inflation and wage growth. Russia achieved significant improvements in macroeconomic stability between 2013 and 2021, creating favorable conditions for boosting the effectiveness of pension savings investments. The annual return of 15.24% for the 60/40 strategy outperformed the inflation rate and wage growth rate (6.60% and 8.53%, respectively). The data from 2022 changed only a few long-term indicators. The return on the 60/40 strategy experienced a significant decline. Due to the extreme changes in domestic markets and macroeconomic conditions, which are still occurring, and the continued high volatility of all indicators, we exclude 2022 data points from our model.

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<sup>10</sup> The 60/40 strategy assumes that 60% of the portfolio is invested in stocks and 40% in government bonds. The investor holds half of the bonds to maturity and receives a yield to maturity, while selling the other half to meet current needs and maintain liquidity, receiving a price yield and coupons.

**Table 3**

Annual growth rates of wages and key benchmarks (%).

Period	Wage growth		Inflation	Bond return	60/40 return
	Nominal	Real			
2004–2021	14.15	5.55	8.13	8.63	16.54
2013–2021	8.53	1.94	6.60	8.44	15.24
2004–2022	14.15	5.36	8.33	8.43	14.25
2013–2022	9.15	1.95	7.19	8.18	11.20

Source: Authors' calculations.

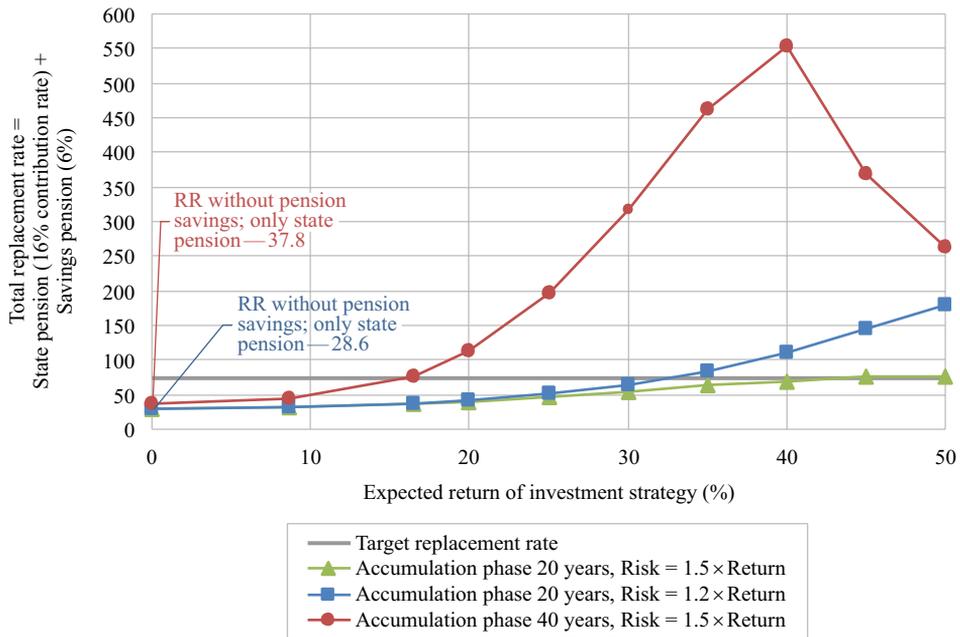
**Fig. 6.** Assumptions of the model for testing a shortened accumulation phase.

Source: Compiled by the authors.

We used constant inflation rates of 6.5% and wage growth rates of 8.5% per year recorded throughout the period of macroeconomic stabilization to estimate the contribution of pension savings to RR for 20- and 40-year accumulation periods and a 20-year pension payout phase (Fig. 6). This study compared government bonds and a 60/40 portfolio to determine the most accessible and effective investment strategies for pension savings portfolios from 2004 to 2021. The 2022 data points were excluded. Stylized strategies with a 20–50% annual return and the same risk–return ratio as for the 60/40 strategy (or slightly less) were tested to demonstrate successful risk management.

To ensure stability in the funded system, the insured person's pension savings are transferred to conservative government bonds (OFZ) after retirement. This strategy has an expected return (8.6%), which is higher than the risk measure and inflation. We assume that the annuity growth rate (6.5%) equals inflation and is less than the expected return, limiting the risk of shortages to 15% with unconditional indexation of payments.

The simulation results demonstrate that a 60/40 strategy with a risk 1.56 times the return achieves the target median of 75% RR during a 40-year accumulation period (Fig. 7). The replacement rate and failure risk of the plan increase proportionally with further increases in returns and risks. Reducing the accumulation period to 20 years will make historical investment strategies, such as government



**Fig. 7.** Total replacement rate at different accumulation phases from Monte Carlo simulations (%).

*Note:* The zero return point corresponds to the scenario in which all 22% of the contribution is allocated to the insurance part; at other points, the transfer of 16% of income to the insurance part and 6% to the savings is implied; a point with a yield of 8.6% corresponds to the OFZ strategy, and a point with a yield of 16.5% corresponds to the 60/40 strategy; the rest of the points suggest stylized strategies with a risk-return ratio indicated in the legend.

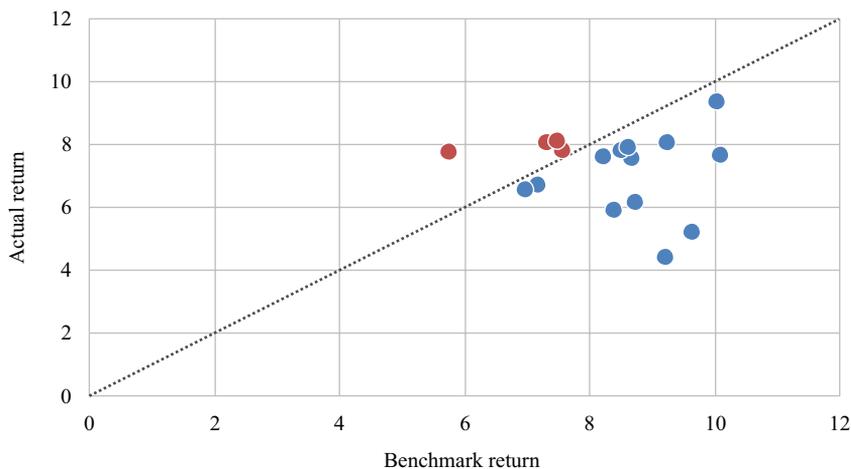
*Source:* Authors' calculations.

bonds or the 60/40 strategy, insufficient for achieving the target replacement rate. Higher-risk strategies are needed to increase returns, which can lead to unstable outcomes and worsen pensioner well-being.

It is noteworthy that the results of the 60/40 strategy decrease, but not significantly, when the 2022 data are included. Our model predicts that it will still be able to deliver an expected RR of 71,08% over a 40-year horizon. Due to the ongoing recovery of the Russian domestic market as of 2023, we chose not to include this result in our main analysis because it does not accurately reflect the long-term framework.

A similar analysis was conducted on the actual average portfolio of non-state pension funds. From 2004 to 2022, the average return was 7.53% with a standard deviation of 6.69%. The real return is close to zero, posing the greatest risk of a savings shortage during the annual indexation of payments.

Strategies with moderate rates of return and risk, a higher contribution rate to pension savings, and a 40-year time horizon combined can help achieve a 75% RR. Further tests of this model show that on a 20-year horizon, increasing the contribution to pension savings by up to 10% while maintaining a 22% total contribution rate requires an average annual return of 14% at a 21% risk. An illustration of the poor performance of NPF portfolios demonstrates that the efficiency of pension portfolio management is as important for achieving the target level of replacement rates as the investment time horizon and macroeconomic preconditions.



**Fig. 8.** Actual and modeled returns of non-state pension fund portfolios, 2007–2022 (% annual).

Source: Authors' calculations based on data from NPF Constructor project (<https://ipei.ranepa.ru/ru/npf-ru>), Bank of Russia, Pension Fund of the Russian Federation, and Rosstat.

## 6. Discussion of the results of pension savings reform in Russia

First, we evaluate the management of pension savings portfolios in NPFs based on their actual asset allocation structure by comparing gross returns to relevant benchmarks<sup>11</sup> from 2007 to 2022.

Due to insufficient data, the number of NPFs with known performance and portfolio composition over a 16-year horizon has been reduced to 17. Only four outperformed benchmarks (Fig. 8). The funds underperformed their benchmarks by an average of 1.13%, whereas the largest funds performed poorly (weighted average of  $-1.82\%$ ).

The return decomposition of the NPF pension savings portfolios was calculated using the approach of Bodie et al. (2020). Market return was determined as the return on a portfolio of benchmarks for each asset class with an average fixed asset allocation across all funds and periods. Table 4 shows that the average market return was 9.49% per year, which is the return from investing in benchmarks with a fixed long-term asset allocation common to all funds. Individual asset allocation deviations, on average, had no effect on performance and improved portfolio returns for only 28 funds. The performance of NPF was significantly reduced by active asset management, which included dynamic asset allocation, security selection, and market timing. Using active management, only two NPFs experienced positive excess returns. NPFs suffered annual losses of up to 5.24%, with an average loss of 1.84% per fund.

<sup>11</sup> Benchmark for each fund is the return of a portfolio with the fund's actual weights and the returns of benchmarks for each asset class. For government, corporate, mortgage, and municipal bonds and stocks, we use total return indexes provided by the Moscow Stock Exchange and Cbonds. The Bank of Russia provides deposit and interbank lending rates. We used the return of a 60/40 strategy for the U.S. market as the most typical representative of developed markets to model foreign investment funds. The S&P 500 total yield index accounts for 60% of this portfolio, the U.S. investment-grade corporate bond index for 20%, and the U.S. government bond index for the remaining 20%. The yield of the government bond index is used for other assets.

**Table 4**

Decomposition of the return of pension savings portfolios of non-state pension funds.

Return attribution	Actual return	Market return	Excess return from individual asset allocation	Excess return from active asset management
Number of funds with positive component	44	44	28	2
Minimum	4.55	7.75	-1.21	-5.24
Average	7.60	9.49	-0.06	-1.84
Weighted average	7.17	9.61	-0.03	-2.42
Maximum	10.63	11.52	0.54	0.66
Mean <i>R</i> -squared, %		61.50	41.60	15.48

Source: Authors' calculations.

**Table 5**

Return and risk of the main asset classes, 2004–2021 (%).

Asset class	Risk <sup>a)</sup>	Return <sup>a)</sup>	Return-to-risk ratio	Sharpe ratio <sup>b)</sup>
Government bonds (held to maturity)	1.41	7.68		
Deposits	2.18	7.77	3.57	-0.21
Cash	2.36	6.87	2.91	-0.57
Government bonds (mixed portfolio)	6.24	8.63	1.38	0.07
Corporate bonds	7.54	9.54	1.26	0.17
Municipal bonds	10.38	9.51	0.92	0.12
Mortgage securities	8.22	8.65	1.05	0.05
Government bonds (total return index)	11.80	9.47	0.80	0.11
Foreign investment funds	23.31	15.97	0.69	0.33
Equity	41.00	23.18	0.57	0.36

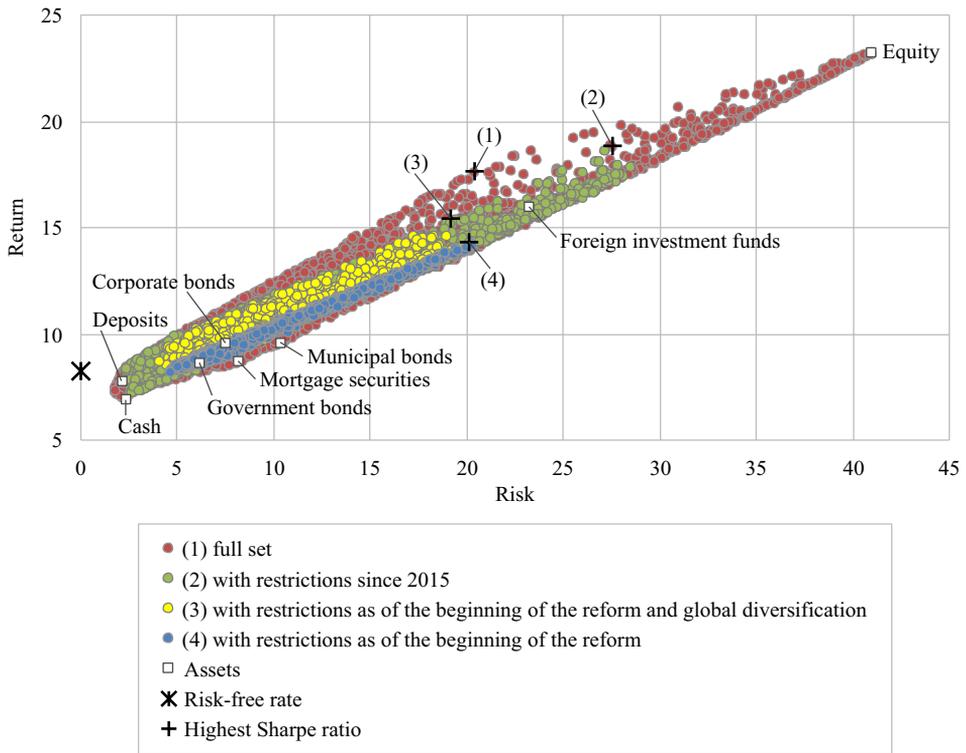
Note: <sup>a)</sup> Calculations based on annual data; <sup>b)</sup> risk-free return 8.22% is the 2003 average interpolated 18-year yield to maturity for the government bond yield curve.

Source: Authors' calculations based on data from Bloomberg, Cbonds, Moscow Exchange, and Bank of Russia.

Next, we build portfolios with the best risk-return trade-off considering the weight limitations imposed by the pension savings regulation law<sup>12</sup>. When compared using the Sharpe ratio, foreign investment funds, stocks, and corporate and municipal bonds showed the best performance (Table 5). Government bonds could improve performance only if the fund held a significant portion of the portfolio until maturity.

Pension savings portfolio restrictions underwent frequent changes during the pension reform. The maximum weight of equity in NPF portfolios ranged from 40% to 65%, while corporate bonds, foreign investment funds, and cash and bank deposits increased from 50% to 100%, 0% to 20%, and 20% to 80%, respectively. It is challenging to evaluate NPFs' efficacy because they do not disclose risk indicators for their pension savings portfolios. To address this, annual returns and standard deviations for each fund were modeled from 2004 to 2021 using benchmarks for each asset class, allowing for a comparison of optimal and actual asset allocations.

<sup>12</sup> We exclude data for 2022 from the analysis of portfolio sets and optimal asset allocations because, as of 2023, the Russian market largely retains its volatility and recovery trajectory for individual asset classes. The use of 2022 data and an incomplete crisis cycle in the Russian market will distort and unnecessarily overestimate the risks that should describe the long-term nature of portfolios.



**Fig. 9.** Portfolio sets: Complete and allowed for pension savings investment, 2004–2021 (%).

*Note:* Square dots represent single-asset portfolios, plus dots represent portfolios with the highest Sharpe ratio for each portfolio set.

*Source:* Authors' calculations based on data from Bloomberg, Cbonds, Moscow Stock Exchange, NPF Constructor project (<https://ipei.ranepa.ru/ru/npf-ru>), Bank of Russia, and Pension Fund of the Russian Federation.

Fig. 9 shows the four portfolio sets generated from 2004 to 2021. The first (1) is the full portfolio set (gray dots) with no weight restrictions. The available portfolio set (4) accounts for asset allocation restrictions at the start of the reform in 2002 and demonstrates allocations from which NPFs could have built their long-term strategy (white dots with a gray border). The next set (light gray dots with a black border) modifies the previous set by allowing for up to 20% investment in foreign investment funds (3). The final set (2) shows the available portfolios following the 2015 relaxation of restrictions on NPF pension savings portfolios (dark gray dots).

Restrictions on the allocation of pension savings, particularly limits on equity weight and global assets, significantly reduced opportunities for diversification and limited the potential performance of NPFs. As restrictions eased over time, funds were unable to compensate for profitability losses caused by earlier and more stringent regulations. For example, a 40–45% equity weight limit in 2002–2005 and a delay in allowing NPFs to collect and invest pension savings until 2004 prevented funds from capitalizing on high returns on equity, which averaged 54.8% in dollars from 2002 to 2006.

According to Table 6, stricter restrictions on pension savings allocation resulted in lower investment returns and Sharpe ratios. Risk-adjusted returns were the highest in the optimal portfolio with no restrictions. Both risk and return

**Table 6**

Optimal portfolios on different sets: Complete and allowed for pension savings investment, 2004-2021 (%).

Set	Portfolio set			
	(4) with restrictions as of the beginning of the reform	(3) with restrictions as of the beginning of the reform and global diversification	(2) with restrictions as of 2015	(1) full set
Return	14.32	15.40	18.83	17.63
Risk	20.11	19.13	27.56	20.37
Sharpe ratio (risk-free return 8,22%)	0.30	0.38	0.39	0.46

Source: Authors' calculations based on data from Bloomberg, Cbonds, Moscow Exchange and Bank of Russia.

**Table 7**

Asset weights within optimal portfolios in different sets, 2004–2021 and actual average distribution of NPF assets, 2007–2021 (%).

Asset class	Portfolio set				Average NPF asset allocation
	(1) full set	(4) with restrictions as of the beginning of the reform	(3) with restrictions as of the beginning of the reform and global diversification	(2) with restrictions as of 2015	
Government bonds	0	0	0	0	17.30
Municipal bonds	0	10	0	0	6.24
Corporate bonds	0	50	40	15	44.53
Equity	37	40	40	65	10.69
Foreign investment funds	63	0	20	20	0.00
Mortgage securities	0	0	0	0	1.83
Deposits	0	0	0	0	14.94
Cash	0	0	0	0	4.46

Source: Authors' calculations based on data from Bloomberg, Cbonds, Moscow Exchange and Bank of Russia.

would have increased if the restrictions had been set at the 2015 level from the start of the reform. However, despite these constraints, NPFs were able to generate the required returns to achieve high replacement rates for individuals earning average wages. The optimal portfolio with 2015 restrictions had a higher annual return than that of the 60/40 strategy, which had a replacement rate of 75% after 40 years of savings for a person with average income.

Without restrictions on asset allocation over an 18-year horizon, a portfolio consisting of 37% shares and 63% shares of foreign investment funds proved to be the most effective, as shown in Table 7. To promote the expansion of the domestic stock market, the 2002 and 2015 restrictions decreased the share of foreign securities and increased the share of financial instruments introduced by Russian issuers. However, NPFs' actual asset allocation was much more conservative, ignoring the benefits of investing in foreign assets and equity and instead focusing on bonds and bank products.

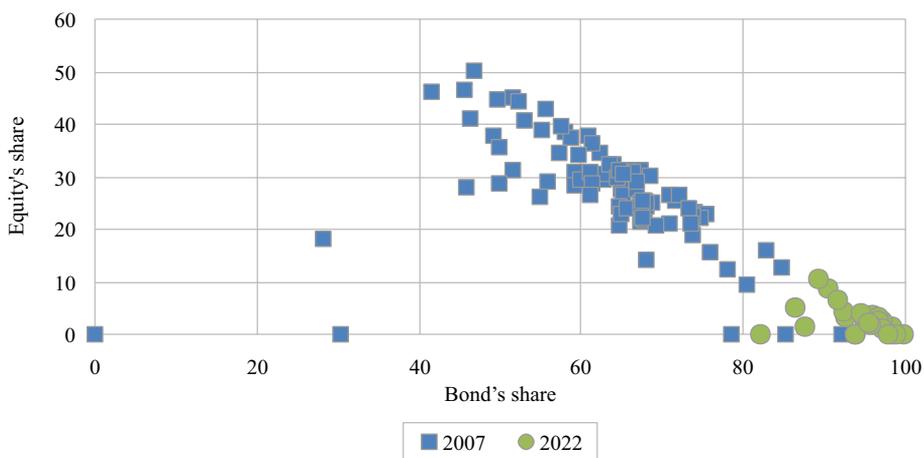
The moderately low profitability of investing pension savings in non-state pension funds over an 18-year period is largely due to poor selection of financial

instruments and significant deviations from optimal asset allocation. Restriction was not the only factor that affected allocation deviations. Another factor that led to the selection of more conservative strategies was the pressure to deliver positive annual returns.

The implementation of the pension savings guarantee system, which mandates a positive return on pension savings, began in 2015. The implementation of similar limitations in various countries has often elicited mixed responses from asset management companies. In a study by Castaneda and Rudolph (2009), the introduction of a minimum return requirement for funded pension plans had a negative impact on the motivation to select optimal portfolios. This requirement leads funds to base their investment decisions on competitor allocation strategies. Blake and Timmerman (2002) showed that using common benchmarks for pension funds increases herding behavior rather than striving for optimal portfolios.

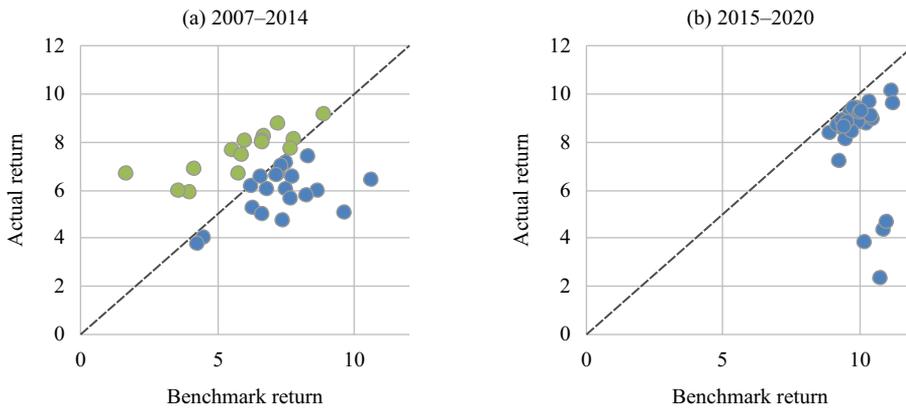
From our perspective, the introduction of a minimum return requirement has exerted a substantial influence on the operations of NPFs. The asset allocation exhibited a notable shift toward a more conservative approach, displaying significant convergence. The allocation of funds between bonds and equity exhibited substantial variation in 2007. However, the majority of funds ultimately converged toward the lower right quadrant, indicating an increase in the allocation to bonds and a decrease in the allocation to shares (see Fig. 10).

The difference between the gross return of NPFs and the benchmark increased significantly after the implementation of the minimum return requirements for pension savings. Fig. 11 shows that prior to the implementation of guarantees from 2007 to 2014, a sizeable proportion (more than one-third) of NPF portfolios outperformed their respective benchmarks. This phenomenon could potentially be attributed to security selection or market timing. The difference between the observed and simulated returns was, on average,  $-0.09\%$ . The results indicate that larger funds displayed superior asset allocation, as the weighted average benchmark return of  $7.02\%$  exceeded the overall average of  $6.70\%$ . In



**Fig. 10.** Investments of nonstate pension funds in equity and bonds, 2007 and 2022 (% of the portfolio).

Source: Authors' calculations based on data from Cbonds and NPF Constructor project (<https://ipei.ranepa.ru/ru/npf-ru>).



**Fig. 11.** Actual and benchmark return of portfolios of non-state pension funds (% annual).

Source: Authors' calculations.

addition, large funds had higher actual returns, as the weighted average was 6.81%, compared to the simple average of 6.60%. This suggests that prior to the establishment of the pension savings guarantee system, there was a greater degree of effectiveness in the management of large funds, achieved through superior asset allocation and active management strategies. All non-state pension funds underperformed their respective benchmarks between 2015 and 2022, primarily because of the implementation of the minimum return requirement. The difference between the actual return and the benchmark widened by  $-1.9\%$ . The inefficiency of funds in selecting securities within asset classes increased, particularly among large funds (weighted average of 6.98% and simple average of 8.13%).

In general, the investment strategies of Russian non-state pension funds have been significantly impacted by an excessively conservative asset allocation approach, inadequate active management practices, and prioritization of stability and risk aversion in pursuit of meeting the minimum return requirement. Consequently, these factors have contributed to the poor performance of NPF portfolios.

## 7. Conclusion

Initiated in Russia in 2002, the mandatory pension savings system represents a significant transformation of the Russian pension system, affecting most of the country's working-age population. In 2022, the government proposed reversing this reform in favor of voluntary retirement savings.

This is one of the first attempts to systematically comprehend the long-term operation of funded pensions, using NPFs as an example. According to our estimates, the introduction of a funded pension was reasonable and, under certain conditions, could significantly contribute to the enhancement of the wealth of future retirees. Based on current macroeconomic assumptions and the potential of a 60% stock and 40% bond investment strategy over a 40-year time horizon, the simulation results showed that a large number of insured people with an average income could have anticipated a 75% total replacement rate of lost earnings.

However, the actual outcomes of the pension savings reform fall far short of expectations. The state prioritized the improvement of the well-being of existing pensioners and, as a result, introduced regular restrictions on eligibility criteria and contribution rates for the funded pension system. This resulted in the reallocation of potential contributions to social insurance. These changes have significantly diminished the effectiveness of pension savings investments and eroded public trust. In addition, even if the contradiction between social insurance and funded pensions could be avoided, the benefits of funded pensions would not be fully realized within a 20-year timeframe.

The ineffective investment of pension savings by NPFs is a significant contributor to the poor performance of funded pensions. This was because of the excessively conservative structure of their portfolios and the negative impact of their active management strategies. The implementation of the state system of pension savings guarantees and minimum return requirements prevented the most egregious NPF misbehavior but did not improve their efficiency. In addition, this resulted in fund herding and a tendency to invest in the least-risky assets, which negatively affected portfolio returns.

Due to a lack of transparency regarding the management of pension savings portfolios in NPFs, public institutions were unable to quickly identify problems in the management of these portfolios and make recommendations to alter fund strategies.

The Long-Term Savings Program introduced in 2024 as a replacement of pension savings is a new financial instrument and will be examined in our future research. Pension funds are just beginning to offer LTSP to their clients at the time of writing this article, although the specific terms and investment decisions are still unclear. However, the relevant laws on the implementation and regulation of LTSP raise concerns about the possible recurrence of several problems of pension savings system. We expect overconservative portfolios in pension funds, opacity of information about the composition and dynamics of the portfolio returns on the individual accounts, lack of market benchmarks, etc. That is why the results and experience of pension savings are so valuable.

Based on the empirical evidence and analysis presented in this study, several recommendations for the development of a pension savings system can be formulated.

A large-scale transformation of pension savings should assume stable rules over a 40-year saving horizon and a 20-year payment period. The maximum participation of society in public discussions of the reform and the government's unwavering support for these transformations have contributed to the success of the reform in several countries.

It is preferable to develop the evaluation criteria for the proposed funded plans in advance. Such criteria may include the total replacement rate of the lost wages of insured individuals with varying income levels, as well as the system's coverage ratio among the working-age population. The use of a mandatory pension savings system or the implementation of accumulation plans with automatic enrollment makes it possible to maintain and increase the coverage levels.

The management of pension savings should place greater emphasis on the potential of national issuer equity and global portfolio diversification and should be supported by a comprehensive state strategy for the development of the domestic stock market.

An individual and transparent benchmark is required for the public to evaluate the performance of pension savings portfolios. Regular data on the profitability and risks of pension savings portfolios, asset distribution, and management expenses should be made available to the public for monitoring purposes.

Pension savings portfolios should be primarily passively managed and composed of domestic index funds with economies of scale and a transparent strategy for index tracking. Although the benefits of moderate global diversification are substantial, pension funds no longer have access to it as of 2022 due to restrictions on investing in foreign assets.

There is a significant global trend toward improving the efficiency of pension savings by individualizing the portfolios of insured individuals and tailoring them to their life-cycle characteristics and other personal preferences.

Many of our findings, which are based on the Russian case of pension savings investments from 2002 to 2022, are consistent with issues raised by researchers worldwide. Nonetheless, the Russian case has some distinguishing features and highlights several issues that must be addressed before any country can establish a long-term, reliable savings system.

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